



*Research Lifecycle Management technologies for
Earth Science Communities and Copernicus users in EOSC*

Deliverable D1.1 Project Management Handbook

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Glossary

Acronym	Explanation
ADAM	Advanced geospatial Data Management
CA	Consortium Agreement
CNR	Consiglio Nazionale Delle Ricerche
DM	Data Manager
EAB	External Advisory Board
EC	European Council
EGI	European Grid Infrastructure
EOSC	European Open Science Cloud
ESI	Expert Systems Iberia
EU	European Union
FAIR	Findable, Accessible, Interoperable, Reproducible
GA	General Assembly
IM	Innovation Manager
INGV	Istituto Nazionale di Geofisica e Vulcanologia
IP	Intellectual Property
ISMAR	Istituto di Scienze Marine
MEEO	Meteorological and Environmental Earth Observation
MS	Milestone
MSFD	Marine Strategy Framework Directive
MSP	Maritime Spatial Planning Directive
OEG	Ontology Engineering Group
PC	Project Coordinator
PMT	Project management Team
PSC	Project Steering Committee
PSNC	Poznan Supercomputing and Networking Center
RELIANCE	Research Lifecycle Management technologies for Earth Science Communities and Copernicus users in EOSC
RI	Research Infrastructure
RO	Research Objects
SC	Scientific Coordinator
SDG	Sustainable Development Goals
SEA	Strategic Environmental Assessment Directive
T2	Terradue
TC	Technical Coordinator
TL	Task Leaders
UiO	Universitetet i Oslo
UPM	Polytechnic University of Madrid (Universidad Politécnica de Madrid)
VRC	Virtual Research Communities
WFD	Water Framework Directive
WP	Work package
WPL	Work Package Leaders

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1 Executive Summary

RELIANCE, short for Research Lifecycle Management for Earth Science Communities and Copernicus users in EOSC, aims to realize the vision of FAIR research in EOSC by adopting a holistic research management approach based on three key and complementary technologies: i) Research objects (RO) as the overarching mechanism to manage scientific research activities, which relies upon ROHub platform as the reference service; ii) data cubes as the mechanisms enabling an efficient and scalable Earth Observation data access and discovery, which relies upon the Advanced geospatial Data Management (ADAM) platform as the reference service; iii) text mining and semantic enrichment services allowing to extract machine-readable metadata from RO resources, enabling researchers to discover scientific information at scale and to structure their own research, and which rely on the AI-based platform COGITO as base system. As part of the integration in EOSC, RELIANCE services will leverage and integrate with some of the EOSC core-cross cutting and added value services, playing a complementary role to what is already available and bridging between various EOSC services. RELIANCE will pilot the services in three different Earth Science communities, fostering the use of Copernicus data and demonstrating their efficacy in real-life vertical and multi-disciplinary scenarios, and will launch an Open Call to engage other communities.

This document comprises the project management handbook. It contains all related information for running the RELIANCE project, including an introduction to the project and an overview of the rationale and the objectives. The main part of the document summarizes the information regarding the project management, structures and procedures, including some useful information from the Grant Agreement and its annexes, the Consortium Agreement and further decisions within the Consortium.

RELIANCE partners will use this handbook as a reference manual during the implementation of their actions. The handbook will facilitate the management of the project, the monitoring of the overall progress and the communication between project partners and the Commission. Accordingly, it also provides the relevant information about the collaboration and communication tools, the organization and management of the meetings, and the timely and quality production of the planned deliverables.

2 Introduction

2.1 *Scope*

This deliverable comprises all the necessary information, in the form of a handbook, to support the management of the RELIANCE project with focus on the methods, tools and guidelines that will be followed for project management and coordination, risk management and quality assurance.

The goal of this handbook is to provide reference information to all partners for an effective cooperation and communication within the Consortium. The initial version of this handbook is delivered in February 2021 (M2) but it will be updated throughout the duration of the project, if needed.

2.2 *Audience*

This deliverable is intended for internal use by the RELIANCE Consortium.

2.3 *Structure*

The rest of the document is structured as follows:

- Section 3 presents an introduction of the RELIANCE project, including an overview of the project, its objectives and concept, as well an overview of the user communities and scenarios, the methodology devised, the consortium and expected impacts.
- Section 4 presents the RELIANCE project management principles and instruments, providing the implementation overview, the organizational structure, the collaboration and communication tools, task forces, meetings and other management procedures.
- Section 5 presents quality assurance procedures, the deliverable production and review process along with the corresponding due dates, as well as the risk management procedures along with an initial risk table and associated mitigation strategy.

3 Project Summary Overview

3.1 Overview

RELIANCE will extend the EOSC service offering with a set of industry-strong, innovative, interconnected services for the open, efficient, and cross-disciplinary management of the research lifecycle. In accordance with FAIR and Open Science principles, it will adopt a holistic approach to address different research activities, spanning: discovery of and access to research data, methods and materials; extraction of valuable information from scientific literature; structuring data-driven scientific investigations as semantically rich research objects; FAIR-ness self-assessment; dynamic collaboration, sharing and dissemination considering the whole lifecycle as a first-class citizen; and supporting reproducibility, validation, versioning and reuse of research results. Core to the service portfolio are: **Research Objects** as the overarching information artefact to manage research, **Data Cubes** for efficient and scalable structured data access and discovery, and **Text Mining** for the extraction of information from scientific text as machine-readable metadata. RELIANCE will pilot the services in three different Earth Science communities, fostering the use of Copernicus data and demonstrating their efficacy in real-life vertical and multi-disciplinary scenarios, and will launch an Open Call to engage other communities. The high-TRL research enabling services portfolio will be onboarded in EOSC following established procedures, ensuring the interplay with crosscutting and added value services, and following a user-centric approach. RELIANCE will expose its services via APIs and libraries, enabling their use via different front ends and Jupyter notebooks. RELIANCE brings into EOSC more than 2800 research objects from research communities in Earth Science, Astrophysics and Bioinformatics, which have adopted research objects concept and tools, and will become the best ambassadors to enlarge and engage new communities

3.2 Project Objectives

The specific objectives of the RELIANCE project are outlined below.

Objective 1: Provision of a rich suite of services for Research Lifecycle Management in accordance with FAIR principle based on Research Objects, Data Cubes and Text Mining.

Objective 2: Integration and onboarding of RELIANCE research enabling services in EOSC, leveraging and connecting with other complementary EOSC services

Objective 3: Demonstrate the RELIANCE services and value proposition through a set of multidisciplinary and interdisciplinary case studies involving Earth Science and non-Earth Science domains.

Objective 4: Foster the adoption of Copernicus data and EOSC services in such scientific communities

3.3 Project Concept

RELIANCE aims to realize the vision of FAIR research in EOSC by adopting a holistic management approach, not just at the level of the data, methods, code or publications individually, but at the level of the whole research treating its lifecycle as a first-class citizen.

RELIANCE proposes a research lifecycle management service ecosystem based on three key and complementary technologies:

- Research objects (RO) as the overarching mechanism to manage scientific research activities. Research objects are semantically rich information objects that aim to account, describe and share everything about a research, including how things are related to each other. They have

been used and demonstrated in different communities in previous projects, and they are gaining rapidly more attention as a promising research-enabling technology. The reference service for this technology is ROHub, which currently hosts over 28 hundred ROs.

- Data cubes as the mechanisms enabling efficient and scalable data access and discovery, especially regarding Earth Observations data and products. In RELIANCE data cubes will be treated as first-class entities, aggregated and described in detail, e.g., how it was generated (specification) or used, in a Data Cube-centric research object. RELIANCE relies on the Advanced geospatial Data Management (ADAM) platform for the management of data cubes, which already hosts several cubes of global environmental geospatial data.
- Text mining and semantic enrichment services that extract machine-readable metadata from research object resources like scholarly communications and data cube descriptions, providing researchers with means to discover scientific information at scale and structure their own research. In RELIANCE, the AI-based platform COGITO will be used to deliver such functionalities.

RELIANCE brings into EOSC a consistent number of existing research objects from different communities as described in Section 3.1, but also strategic research communities, represented by three project partners, which have already embraced research objects as the mechanism to share and manage their research and would therefore be interested in having these services as part of the EOSC offering. These communities of early adopters will be the project ambassadors to enlarge the user communities, and to show the benefits to other stakeholders

3.3.1 *Service Logic*

Figure 1 depicts the RELIANCE service logic and high-level architecture. As depicted in the figure, RELIANCE services will be interconnected allowing seamless access from different user interfaces to the scientists' research work using research objects as the main connecting point. Data Cubes will be linked in the research object as first class entities enabling both an efficient access to large datasets like Copernicus data while facilitating reusability and reproducibility of the mechanisms to access such data. Text mining & enrichment services will be used to automatically enrich the research object with metadata extracted from the available annotations and textual resources aggregated, thus increasing their findability, interoperability and reuse. The latter may also recommend research objects, or even data cubes, based on their content to obtain measures of their impact. Some of these connections are already in place and will require only the necessary adaptations to EOSC. Also, as depicted in the figure, RELIANCE services will expose both Restful APIs and python libraries, enabling the communication between RELIANCE and other EOSC services, as well as their use from different user interfaces.

Moreover, as depicted in the figure, RELIANCE services will leverage and integrate with some of the EOSC core-cross cutting and added value services, playing a complementary role to what is already available and bridging between various EOSC services. They will allow, for instance, the connection of the data used by researchers, including data cubes for large structured datasets like Copernicus data and other datasets available from EOSC (e.g., EGI DataHub), the methods used to process such data (e.g., via EGI Jupyter notebooks), the Research Infrastructures (RI) used for research (to monitor their impact), and the final results published via scholarly communication services (e.g., Zenodo/OpenAire). Also, as part of the research lifecycle, different research object snapshots/releases may be generated, which can be deposited and published in scholarly communication platform services like Zenodo/OpenAire for its long-term preservation and citation. The final research object release will, thus, close the gap between the data services used in a research work, the RIs exploited and the scholarly communication services used to publish the research results.

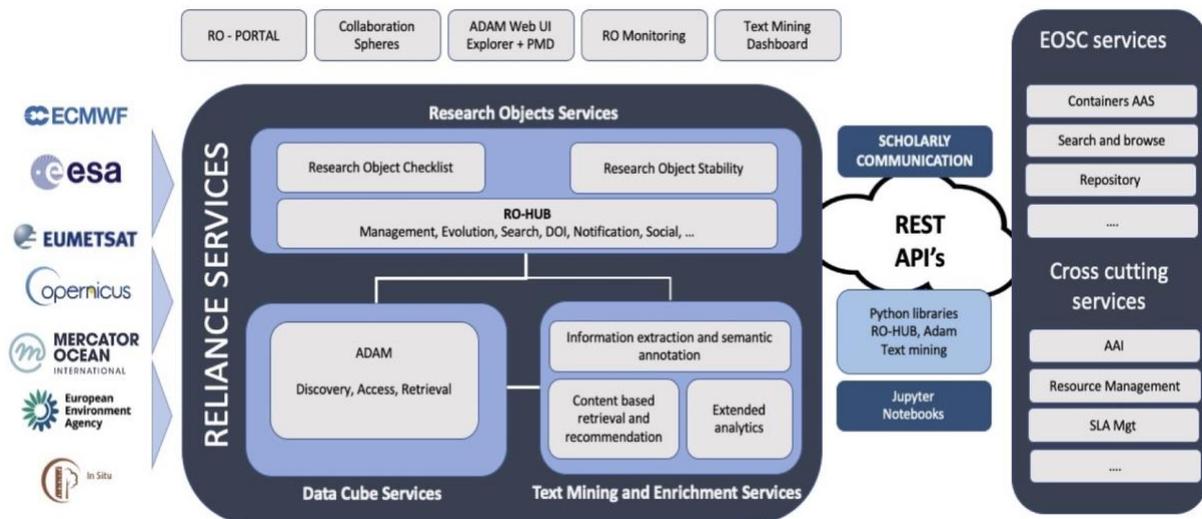


Figure 1 RELIANCE service logic and high-level architecture

3.4 Communities and Scenarios

The service portfolio of RELIANCE will be adopted by three Virtual Research Communities (VRC) fostering reproducibility and re-use by increasing the number of FAIR Research Objects. The VRCs cover different multidisciplinary working environments and include:

- Sea Monitoring VRC - represented by CNR-ISMAR
- Geohazard VRC (volcanoes and seismic) – represented by INGV
- Atmospheric and climate modelling VRC – represented by the University of Oslo

These research communities will validate and showcase the results of RELIANCE via real-life scenarios, distilled in the following case studies:

- **Multidisciplinary case study on 2020 lockdown:** aims to quantify the de-impact of the lockdown on the atmospheric and marine coastal environment, highlighting the role of open data and availability of pre-pandemic data, and post-pandemic data
- **Grand Challenge 1: Sea pollution** (SDG: 14 Life below water. EU Directives: WFD, MSFD, Habitat)
 - **Case study 1: Marine litter fate and distribution, from source to sink:** aims to quantify plastic inputs from inland to marine environment, and to carry out process-based monitoring and assessing of depositional and accumulation zones
- **Grand Challenge 2: Loss of Biodiversity and Sustainability (Biodiversity, fisheries, marine litter)** (SDG: 13 Climate Action and 14 Life below water. EU Directives: MSFD, Habitat, MSP)
 - **Case study 2: Marine ecosystem response to global warming and ocean acidification:** aims to deliver spatio-temporal distribution patterns of modern and fossil cold water coral in the Mediterranean Sea and their relation to present-day physico-chemical parameters and proxy-based reconstructions.
- **Grand Challenge 3: Extreme weather events and climate adaptation (biomass)** (SDG: 13 Climate Action and 15 Life on land).
 - **Case study 3: Terrestrial ecosystem response to global warming:** aims to deliver spatial-temporal distribution patterns of areas affected by vegetation browning and

those where conditions are favorable for such phenomena. Seasonal forecast maps and longer-term scenarios to inform local populations and for policy makers to devise adaptation strategies.

- **Grand Challenge 4: Reducing the consequences of large volcanic eruptions** (SDG: 11. Make cities & human settlements inclusive, safe, resilient & sustainable; 13. Climate action. EU Directives: SEA)
 - **Case study 4: A twin Eyjafjallajökull (Iceland) 2010 eruption** : aims to deliver maps of ash and tephra dispersal and density, explosion column height, maps of deposition zones.
 - **Case study 5: An explosive eruption at the Campi Flegrei (Italy) caldera** : aims to deliver maps of active deformation and time-series, models of magmatic source with estimation of depth and volume change in time, maps of swarm epicenters, magmatic isotopes content in gas emissions, multi-parametric interpretation of the available data.

3.4.1 Open Call

RELIANCE will implement mechanisms to attract other researchers and communities in Europe and even outside the European continent through the “RELIANCE Challenge”. In cooperation with International scientific networks, RELIANCE will leverage previous EOSC Early Adopter Programme targeting researchers and research communities in need of accessing to state-of-the-art technologies research infrastructures and services with the following actions:

- Train and support researchers on the usage of the resources and services made available by RELIANCE
- Set the stage for an interdisciplinary research environment fostering a culture of scientific cooperation within Europe and between European and other International researchers’ communities keen to join the EOSC service opportunities under the EU leadership
- Engage a new generation of researchers and scientists to cope with the grand challenge of natural and human environment relationships, leveraging on EOSC assets
- Gain skill in handling open data and generate confidence in the capability and capacity that will be provided in EOSC through RELIANCE

3.5 Methodology

The RELIANCE project is a 24 months initiative based on seven work packages as described in more detail in Section 4.1. The technical and research activities are carried out by three work packages (one per key technology), while an additional work package deals with the integration and onboarding of RELIANCE services into EOSC. Additionally, the project includes a work package devoted to outreach and exploitation that will be working side by side with the case studies work package, and all of them under the coordination of the project management work package.

The technical activities will deliver TRL9 services integrated into EOSC by working on the main pillars of the current offer (Research Objects, Data Cubes, Text Mining & Semantic Enrichment).

The networking activities will be built across two main phases and related milestones. During phase one, the project will focus on the grand challenges and associated case studies to be addressed by the three open multi - disciplinary Earth Science communities. The second phase will set out and publish the open call “RELIANCE Challenge” by M9 in order to select the topics to be addressed by the call, identify relevant and complementary non-Earth Science expertise, and design and execute the open call.

The research activities roadmap will address different challenges such as the alignment with metadata guidelines and EOSC recommendations; provision of guidelines and tools for self-assessment of FAIR research data compliance; provision of assisted mechanisms for quality evaluation and decay monitoring; leveraging the potential of research objects as citable artefacts, connecting with EOSC scholarly communication services, in order to incentivize openness, sharing and reuse of research data and other materials; supporting the validation of research claims.

3.6 Consortium

The RELIANCE consortium brings together a team which has consolidated its partnership throughout years of joint work on research object technologies within the Earth Science domain. Most of the partners have already cooperated fruitfully within past successful projects, including the EVER-EST project where the research object concept and tools were initially adapted to Earth Science.

The consortium involves 9 key international partners from 5 different European countries, including:

- Poznan Supercomputing and Networking Center (PSNC) - coordinator
- Consiglio Nazionale Delle Ricerche – Istituto di Science Marine (CNR - ISMAR)
- Expert System Iberia (ESI)
- Meteorological and Environmental Earth Observation (MEEO)
- Istituto Nazionale di Geofisica e Vulcanologia (INGV)
- Universitetet i Oslo - Department of Geosciences (UiO)
- Universidad Politécnica de Madrid (UPM) - Ontology Engineering Group (OEG)
- Terradue (T2)
- Alpha Consultants (Alpha)

The geographical distribution of the partners is depicted in Figure 2 below.

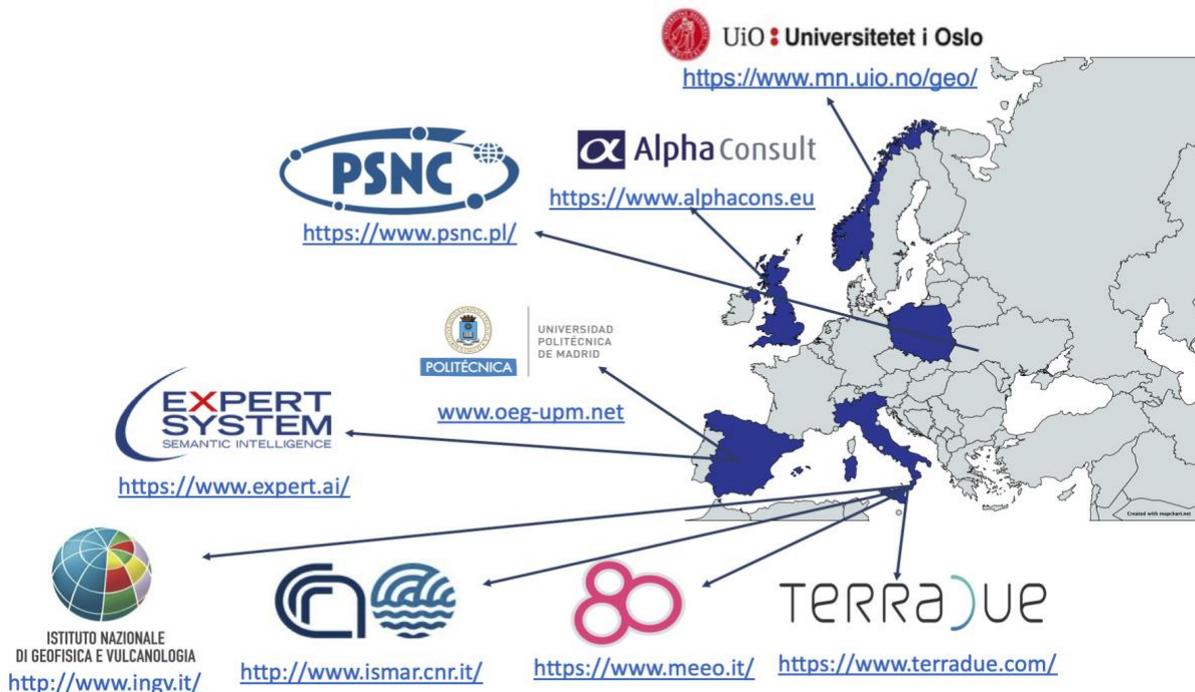


Figure 2 Geographical distribution of RELIANCE partners

Table 1 below outlines how RELIANCE partners cover well the required expertise to undertake the project activities and fulfill the project objectives

Table 1 Matrix of RELIANCE partners and project expertise

Partner	ROs	EO services & products	Text mining & semantic enrichment	EOSC ecosystem & integration	User communities	Operations & RI mgmt.	Business exploitation, sustainability	Dissemination & community building
PSNC	X			X		X		X
CNR					X			X
ESI	X		X				X	X
MEEO		X		X			X	X
INGV					X			X
UiO				X	X			X
UPM	X		X	X				X
Alpha				X			X	X
T2		X		X		X	X	X

3.7 Impact

The overall impact of RELIANCE will be to overpass the orthodox organizational structures of science with siloed and compartmentalized work that inhibits crosscutting and interdisciplinary cooperation to be up to the grand challenges of profound social environmental changes of our times, underpinning an intertwined relation between potential users, society and environment.

3.7.1 Impacts from the call

- Scale up the EOSC Portal through a growing catalogue to the broadest possible set of high-quality services and resources supporting the whole research life cycle from service providers across Europe and beyond
 - RELIANCE will support the growth of the EOSC Catalogue/Marketplace with well-interconnected high-TRL services for Earth Science that will allow providing an integrated support to the full research life cycle of this group of researchers
- More scientific communities across Europe are equipped and have access to state-of-the-art services (including storage and computing) for their research activities, increasing data-intensive research
 - Various services to perform specific research tasks are already available in EOSC, but they are difficult to be found and used interconnected. Research objects allow putting things into context, connect research outputs, allow researchers to seamlessly discover scientific results and explore new paths, and help to track the provenance and increase the visibility of all the actors who contributed to the work
- Facilitate Open Science practices across the research community in Europe with services to connect, share and re-use all type of research outputs, fostering collaboration and enhancing scientific discovery
 - With research objects, the delay between research results production and exploitation by others is drastically reduced. The RELIANCE services in EOSC uniquely position the research community to reap benefits of the latest research outcomes and will lead to rapid sharing of results and products. With research objects, research outputs are not limited to scientific papers and researchers can seamlessly discover scientific results and explore new paths. They also help to track the provenance and increase the visibility of all the actors who contributed to the work

- Support the collaboration in data provision and exchange across regional and national related infrastructures allowing the integration of data from a myriad of resources and research communities.
 - Geohazard community will be empowered to share in-situ data from local networks or local infrastructures, enhancing value-added EO-based research. Within the Sea monitoring community, RELIANCE will help the climate science community and the underwater noise community by enhancing: the integration of atmospheric, marine, and terrestrial climate components and the underwater noise with Earth observation data through sharable and re-usable Research Objects and data cubes. Research objects created by the Climate community would be made immediately accessible to everyone, regardless of their geographical location, local computing/storage resources or even technical skills.
- Foster synergies between pan-European e-infrastructure operators, leading to harmonized services, improved use of resources and economies of scale across Europe.
 - RELIANCE services will be able to act as a bridge between different EOSC services, facilitating the interoperability and consolidation of related einfrastructures, and fostering the cooperation between EU research communities and einfrastructures by supporting multidisciplinary management of the research lifecycle. They will support the engagement of user communities in EOSC, particularly from Earth Science disciplines and, in turn, increase the use of EU eInfrastructures.
- Coordinate and incentivize institutional and public actors so that they open up their services and resources to researchers across Europe, through a transparent and quality assured process.
 - RELIANCE will coordinate institutional and public actors that already provided some of their services for very specific communities so that these services, especially related to data, will now be made more available for researchers in Europe and worldwide. Including these services inside the EOSC service offering will ensure the transparent and quality-assured process mentioned in this impact item.

3.7.2 *Impacts for society as a whole*

RELIANCE will put its scientific communities in the condition to highlight the interactions between the premises and the consequences of the state of the environment, using the COVID19 lockdowns as an environmental laboratory in terms of anthropogenic impact and its recovery. This will allow not only to improve the overall research quality and results, but also the life of citizens as end users of the scientific chain of knowledge and discoveries. If RELIANCE activities prove effective, it will be able to boost the interaction between social, ecological, including medical scientists to achieve a common language to synthesize their research results and devise joint tools of work and science generation. In order to enhance the societal impact, RELIANCE will open a gate of synergic interplay with the H2020 project “Social Sciences & Humanities Open Cloud” (SSHOC) that combines a critical mass of partners organizations and associations developing the social sciences and humanities area of the European Open Science Cloud. RELIANCE will contribute to the popularization among science users, either scholars or science practitioners along with science funders (either public or private), the importance of data science use and expertise at the service of public good. RELIANCE also includes specific actions with related impact for international community engagements outside the EU borders. This is the case built with UNESCO Beijing Office and the Academy of Science of China in consideration of the outlook of research present and future development outside Europe.

4 Project Management

4.1 Implementation overview

The project consists of 7 work packages and 25 tasks distributed across them. Table 2 below lists the work packages, which last for the whole duration of the project (from month 1 to month 24), along with the lead participant and associated efforts in Person Months.

Table 2 Work Packages with lead participant and efforts in Person-Months

WP #	Work Package Title	Lead Participant	Person-Months
1	Project Management	PSNC	22,5
2	Outreach, exploitation and capacity building	ALPHA	47,5
3	Mining and enrichment of scientific text	ESI	40
4	FAIR Data Cubes for multidimensional research data and reuse	MEEEO	42
5	FAIR Research Objects for research lifecycle management	PSNC	35
6	EOSC integration and service offering	T2	36
7	Case studies and EOSC interaction	CNR	52
		Total	275

The Figure 3 below shows the Project Work Package breakdown structure and the main relationships between the project and the EOSC initiative and other stakeholders. The core implementation activities will be carried out through WP3 (Mining and enrichment of Scientific text) and WP4 (Cubes for multidimensional research data) which will both integrate/ rely on Research Objects evolution activities (WP5). The result of the work will be integrated into EOSC by WP6 activities, which will also assess the proper operational service capabilities and the Copernicus data pipelines. RELIANCE Services functionalities will be validated by the user communities in WP7 through both vertical and multidisciplinary scenarios. Earth Scientists will make use of RELIANCE Services and EOSC Service portfolio to exploit the integration of additional features such as the Jupiter Hub, Services for Scholar Publication, Cloud Computing capabilities, etc. It is worth reminding that Task 7.1 scenarios will be enlarging their user community throughout the open call carried out in WP2. The latter Work package will play a pivotal role for the initiative success in terms of user base enhancement. WP2 will be also in charge of developing a sustainability plan for RELIANCE Services within and outside the EOSC context.

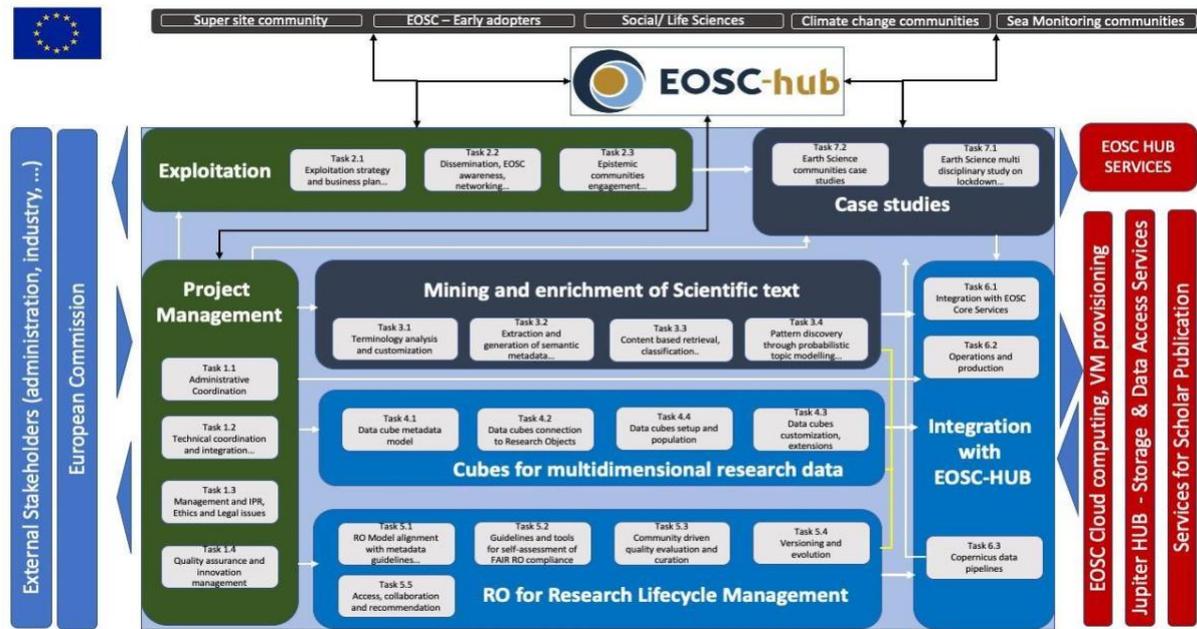


Figure 3 Work Packages and Task involving EOSC-hub

The figure 4 shows the workflow of the project milestones over the period of 24 months. The milestones recognized in the RELIANCE project are:

- **MS1 - Kick-Off** involving WP1 due dated (month) in M1 is verified by the start of the project, kick-off meeting and all activities due to start at M1 has effectively started
- **MS2 - Early onboarding, communication plan & project management setup** involving WP1, WP2, WP3, WP4, WP5 and WP6 is due dated (month) in M3 is reached by the set-up of Internal communication tool, web portal and onboarding of services and completion of D1.1, D2.3 D6.1
- **MS3 - Model and resources adaptation to EOSC** involving WP3, WP4 and WP5 is due dated (month) in M4 is achieved by the delivery of deliverables D3.1, D4.1, D5.1
- **MS4 - Data management plan and initial Data Cubes** involving WP1, WP4 is due dated (month) in M6 is achieved by the delivery of deliverables D1.2, D4.2, D4.4
- **MS5 - First service release** (RELIANCE services in EOSC v1, outreach & multi-disciplinary research and Open Call) involving WP2, WP3, WP4, WP5, WP6 and WP7 dated in M12 is achieved by the delivery of the deliverables D2.1, D2.4, D2.6, D3.2, D4.5, D5.2, D6.2, D6.4 and D7.1.
- **MS6 - Final service release** (RELIANCE services in EOSC v2) involving WP2, WP3, WP4, WP5, WP6 and WP7 due dated in M21 realized by the delivery of D3.3, D4.3, D4.6 and D5.3
- **MS7 - Service validation, outreach and final exploitation plan and Open Call results** involving WP1, WP2, WP6 and WP7 due dated in M24 recognized by the delivery of D2.2, D2.5, D2.6, D6.3, D6.5, D7.2 and D7.3.

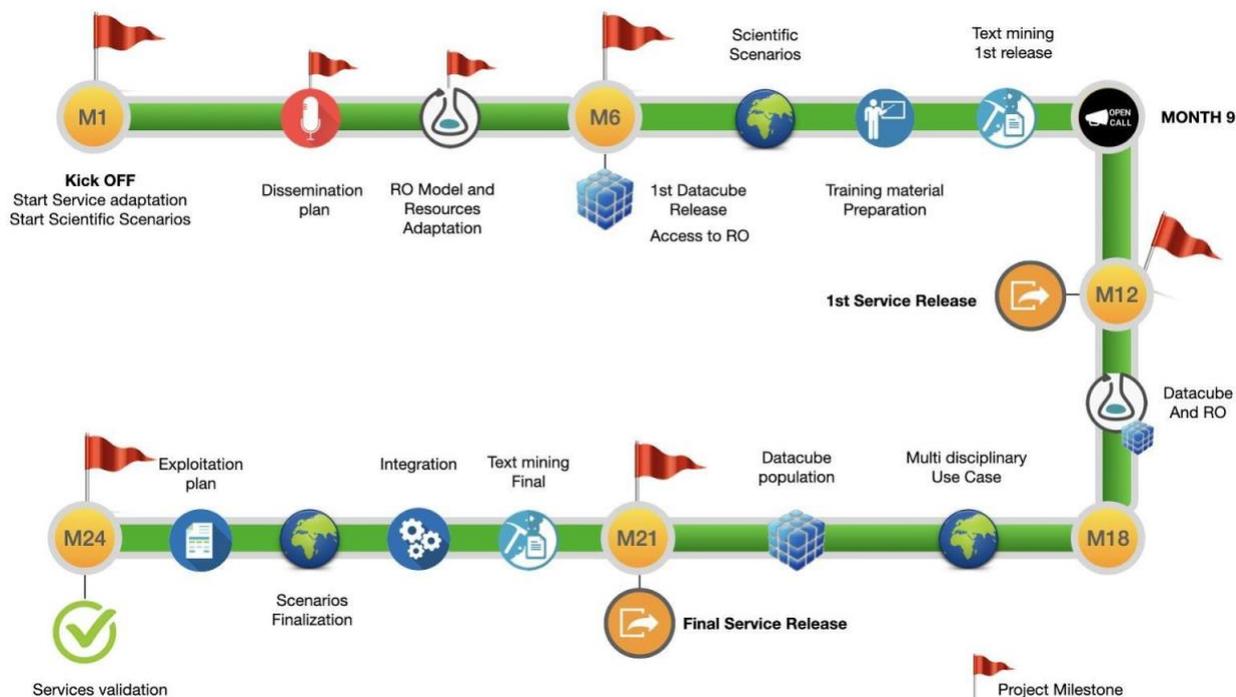


Figure 4 Milestones in the RELIANCE project

4.2 Organizational structure and decision making

This section describes the organizational structure and the decision making entities/personnel involved in the RELIANCE project.

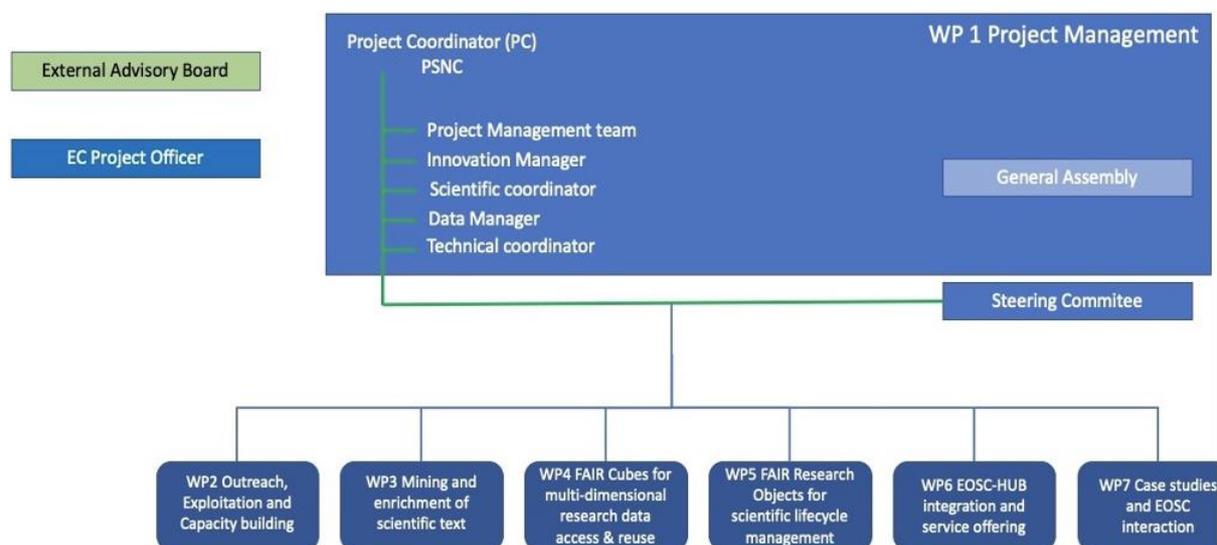


Figure 5 Project Management Structure

- The Project Coordinator (PC)**, is the overall responsible of the project and it is the main contact for the European Commission. The PC chairs the Project Steering Committee (PSC) and will establish the External Advisory Board (EAB) and will call for SC, ImT and EAB meetings. The PC is supported by the Project Management Team (PMT) including a technical project

coordinator, an administrative/financial manager and the general director. The PC is Dr. Raul Palma (PSNC).

- **The Scientific Coordinator (SC)**, working closely with the PC, is responsible to monitor impact of results in scientific communities, identify synergies and interdisciplinarity collaborations, recommend strategies to engage other communities leveraging the EOSC ecosystem, and expand the current user base of researchers. The appointed SC is Dr. Oscar Corcho (UPM)
- **The Technical Coordinator (TC)**, working closely with PC, is responsible for the overall technical coordination and management for the project by coordinating the definition of the technology and development strategy and also coordinating the technical activities between all work packages ensuring that all the technical milestones are met. TC also manages the technical integration of the technology components identified in the RELIANCE project. The appointed TC is Pedro Goncalves.
- **The Project management Team (PMT)** appointed by PSNC supports the PC in the day-to-day activities. The PMT supports all administrative and quality related issues and is responsible for ensuring that the project implements the established quality procedures and follows up all the internal administrative activities. The PMT has an administrative/financial manager at PSNC (Mr. Krzysztof Płotka), a technical project coordinator (Ms. Małgorzata Wolniewicz), and supported by PSNC director Dr. Cezary Mazurek.
- **Work Package Leaders (WPL)** are responsible for managing the tasks grouped in the WPs ensuring the timely fulfilment of duties from the scientific and technical point of view. WPLs coordinate between the teams that collaborate in their WPs assuring the timely execution of tasks and stimulating the interaction between partners involved. They are responsible for the consolidation of the reports and execution of the tasks within their WPs by monitoring the activity progress with respect to activity goals, milestones, results adequacy. The names of the WPs and the leaders are presented in the table 3 below:

Table 3 Work Package leaders

Work Package	Leader
WP1 - Project management and coordination	Raul Palma (PSNC)
WP2 - Outreach exploitation and capacity building	Emiliano Spaltro (ALPHA)
WP3 - Mining and enrichment of scientific text	José Manuel Gómez-Pérez (ESI)
WP4 - FAIR Data Cube s for multidimensional research data access & reuse	Simone Mantovani (MEEEO)
WP5 - FAIR Research Objects for the management of the scientific lifecycle in EOSC	Raul Palma (PSNC)
WP6 - EOSC Integration and Service Offering	Pedro Gonçalves (T2)
WP7 - Case studies and EOSC interaction	Federica Foglini (CNR)

- **Task Leaders (TL)** are responsible for the technical follow up of their specific task and the detailed coordination with the other tasks within the Work packages. They are responsible for leading the preparation of the deliverables resulting from their tasks and the coordination with other tasks for their participation in the deliverable preparation, and for the preparation and delivery of internal task progress reports to the WP leader.
- **The Project Steering Committee (PSC)** is the consortium's decision-making and arbitration board of the project. The Committee shall solve high-level management issues within the

Consortium that could not be resolved by the other management bodies or by the Project Coordinator involving mainly technical, financial, exploitation, replication, dissemination, planning and control matters.

- **The General Assembly (GA)** is the high-level management body of the project in which all participants are represented chaired by the Project Manager. Membership consists of one representative of each partner involved in the project. It is the ultimate decision-making body of the Consortium and responsible for the approval of the management structure, the project direction and Consortium Agreement.
- **Innovation Manager (IM)** coordinates the project activities that involve innovation and possible market uptake by means of networking, exploitation and IPR issues at a project level. IM also supports and overviews the targeted local communication and dissemination actions to be implemented. He is also responsible for tasks including protection of the background and results, overwriting dissemination of data, access rights for third parties. This role is appointed by Fulvio Marelli from T2.
- **Data Manager (DM)** coordinates the data management of the project to assure usability, accountability and quality of the data by valorizing it, either by using it for other market applications when possible and relevant or by making it open to the scientific community. This role will be appointed by the PSNC PMT.
- **The External Advisory Board (EAB)** advises on the long-term strategy of the project as well as on the impact of the project. EAB is composed of senior representatives of selected strategic organizations including the European Space Agency (representative still to be confirmed), UNESCO (Mr. Philippe Pypaert) and European Marine Board (representative still to be confirmed).

4.3 Collaboration and communication tool

Efficient collaboration and communication tools are vital for the success of the RELIANCE project. The overall internal project communication is supported by secure online collaboration tools, offering to each partner independent access to documents, reports, meeting agendas, supporting materials and other miscellaneous project information. This section provides an overview of the complete set of collaboration and communication tools such as mailing lists, online conference systems, project website, collaboration workspace platform, file hosting cloud services, software source control and issue tracker etc. All these components are being already identified for the smooth running of the project. The later subsections summarize the characteristics of each of the collaboration and communication tools identified for RELIANCE project in short.

4.3.1 Email & mailing lists

E-mail is the standard means of communication for exchanging information among the members of the RELIANCE Consortium. All communication within the Consortium should be preferably sent through the project mailing lists, in order to have better control of the different target groups of receivers and take trace of the emails sent. A set of separate mailing lists has been created to manage the information flows within groups of people involved in particular activities. The RELIANCE project mailing lists have been provisioned by PSNC and consist of the following:

- reliance@lists.man.poznan.pl is the general mailing list for all the members of the RELIANCE project
- reliance-ga@lists.man.poznan.pl is the mailing list for general assembly for administrative purposes.

- reliance-users@lists.man.poznan.pl is the mailing list for the end users of the RELIANCE project

4.3.2 Logo & templates

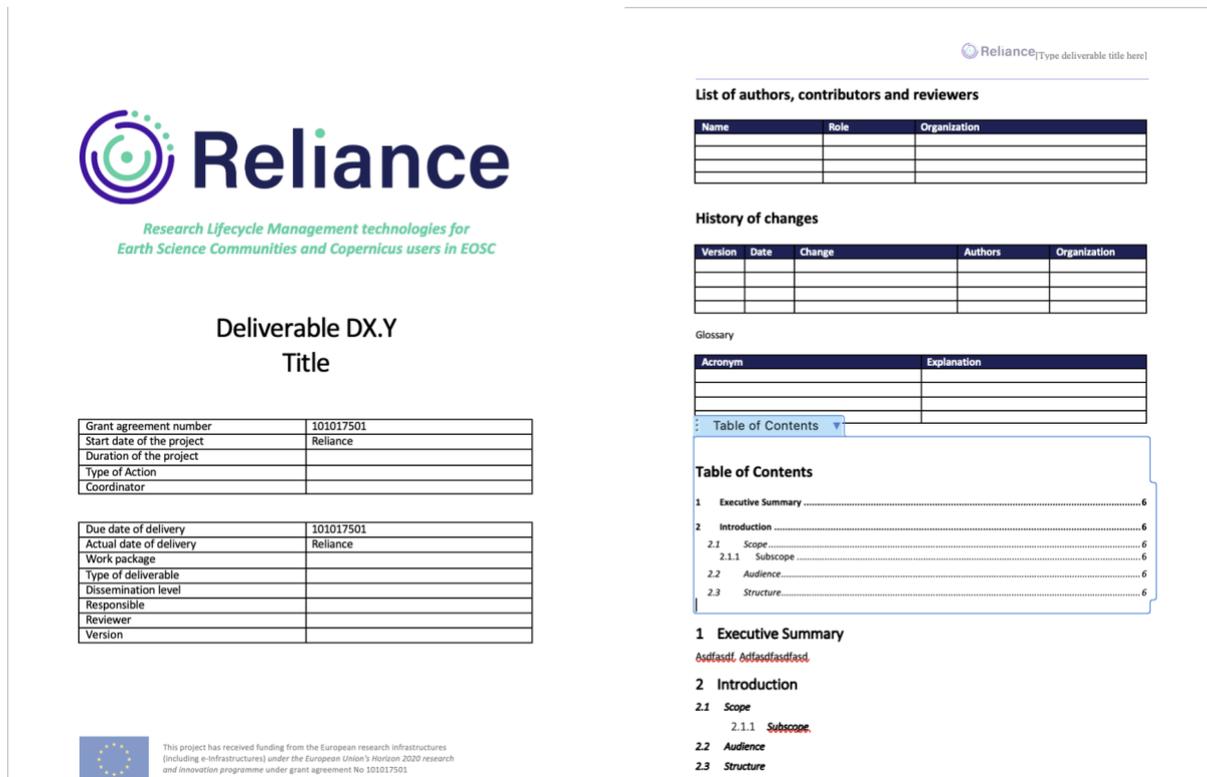
Logos are designed for the RELIANCE project and can be used for all the project documents, deliverables, and communication channels. Likewise, the templates of the project presentations and the deliverables are also designed and are ready to be used. Presently the logos and the document templates are stored in the file hosting cloud set up as a collaboration tool for the RELIANCE project. The logo (in different backgrounds) and the templates of deliverables and presentations can be previewed in the following links:

- Project logo: <https://box.pionier.net.pl/f/341d6c93bfc94baf9db9/>
- Template for deliverables: <https://box.pionier.net.pl/f/86320fb0e44a497ba225/>
- Template for presentations: <https://box.pionier.net.pl/f/7b1ad1bea8874bd5b79f/>

Figure 6 shows the logo for the RELIANCE project and figure 7 and figure 8 show the templates



Figure 6 RELIANCE project logo



The template includes the Reliance logo and tagline: "Research Lifecycle Management technologies for Earth Science Communities and Copernicus users in EOSC". Below this is the title "Deliverable DX.Y" and "Title".

Grant agreement number	101017501
Start date of the project	Reliance
Duration of the project	
Type of Action	
Coordinator	

Due date of delivery	101017501
Actual date of delivery	Reliance
Work package	
Type of deliverable	
Dissemination level	
Responsible	
Reviewer	
Version	

This project has received funding from the European research infrastructures (including e-Infrastructures) under the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017501

Reliance [Type deliverable title here]

List of authors, contributors and reviewers

Name	Role	Organization

History of changes

Version	Date	Change	Authors	Organization

Glossary

Acronym	Explanation

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1 Executive Summary
Asdfasdf. Adfasdfasdfasdf.

2 Introduction

2.1 Scope

2.1.1 Subscope.

2.2 Audience

2.3 Structure

Figure 7 Template for RELIANCE deliverables



Figure 8 Template for RELIANCE project presentation

4.3.3 Conferencing system

RELIANCE like all other projects require extensive collaborative interactions among the consortium located remotely. To address this requirement, well-known professional software for conferencing, which helps in conducting online meetings, video/phone conferences and desktop sharing is required. Webex¹ by Cisco Systems will be the platform of choice for the RELIANCE partners as it is flexible and easy to use and manage a virtual meeting with its communication features. It allows audio/video conferences over web browsers or WebEx applications on computers as well as mobile devices simultaneously. A WebEx conferencing system is maintained by PSNC in its cloud infrastructures², so it can be used for meetings organized by PSNC and also by other partners, however the partners are free to propose and use their own online conferencing systems of choice for the meetings they are responsible to organize. The relevant RELIANCE mailing lists are used by the chairperson or the PC to send a timeslot of calendar invitations including the link and/or the phone numbers for the conference.

4.3.4 Project website

For any project the project website is one of the most important dissemination tools, where the project concept and goals are presented to the general audience, and also where potential users and stakeholders will be able to find reports (deliverables) and link to results. For the RELIANCE project the website is still under construction (www.reliance-project.eu), and it is planned to be released by the end of February 2021 (M02).

4.3.5 Social media presence

Social media serves as the effective platform for the purpose of community building and dissemination purposes for any project. Through social media platforms the collaborative efforts and exchange of information with the user community is strengthened to a great extent. The interactive exchange through social media platforms is the ideal space for conversations between people from a wide

¹ <https://www.webex.com/>

² <https://pcss.webex.com/webappng/sites/pcss/meeting/home>

variety of backgrounds widens the prospects of the project, additionally it serves as the mode of advertisement and social notifications. RELIANCE has its official twitter handle as https://twitter.com/reliance_eosc, and also its LinkedIn profile <https://www.linkedin.com/company/reliance-project/about/>. The latter will be filled more intensively after the project Website will be online.

4.3.6 Collaborative workspace

The RELIANCE project collaborative workspace is set up in the PSNC cloud infrastructure using Confluence³. It is a collaborative wiki tool designed to help teams to collaborate and share knowledge efficiently. Within PSNC the workspace wiki for RELIANCE is present and being maintained in the location <https://docs.psnk.pl/display/RELIANCE/RELIANCE>. The collaborative workspace contains various pages regarding the basic information of the project e.g., Deliverable schedule and the reviewers, the calendar for the meetings and information regarding the user communities and the task forces. Confluence gives an easy-to-use approach for the partners to access the wiki pages of RELIANCE project. The workspace is mostly maintained by PSCS but can be accessed and modified by selected partners also. Figure 9 shows the RELIANCE wiki in the confluence workspace.

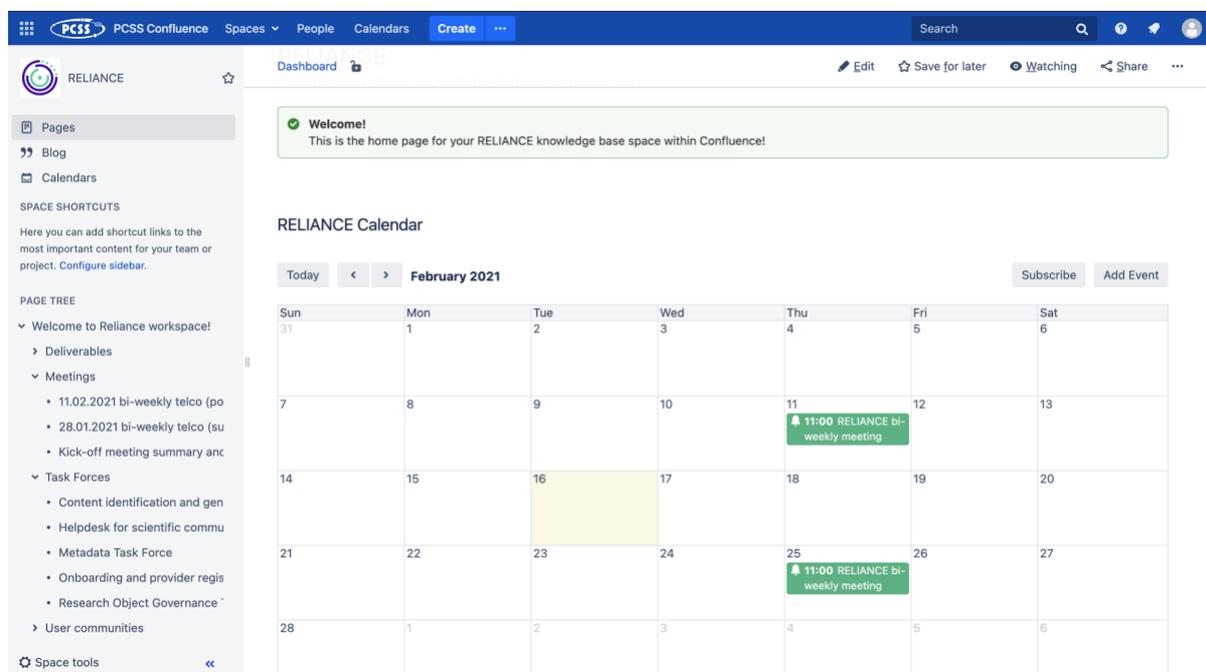


Figure 9 Confluence workspace for RELIANCE

4.3.7 Cloud storage & file hosting

The Cloud storage and file hosting collaborative tool will be used in RELIANCE for document exchange and storage. The private repository of the RELIANCE project is maintained within PSNC cloud infrastructures and access is limited to the project partners only. The box cloud storage⁴ is the system which serves as the file hosting service for RELIANCE. The dedicated box instance⁵ in PSNC's PIONIER

³ <https://www.atlassian.com/software/confluence/guides/get-started/confluence-overview>

⁴ <https://www.box.com/en-in/cloud-storage>

⁵ <https://box.pionier.net.pl/accounts/login/?next=/library/ee3e7194-f031-44a5-9186-3004475f3439/RELIANCE-space/>

network⁶ currently holds the file sharing service for RELIANCE project partners. Presently all the important project related documents are in this space and as the project advances the relevant documents will be stored here for collaborative access. Figure 10 shows the RELIANCE box repository within PSNC Cloud service.

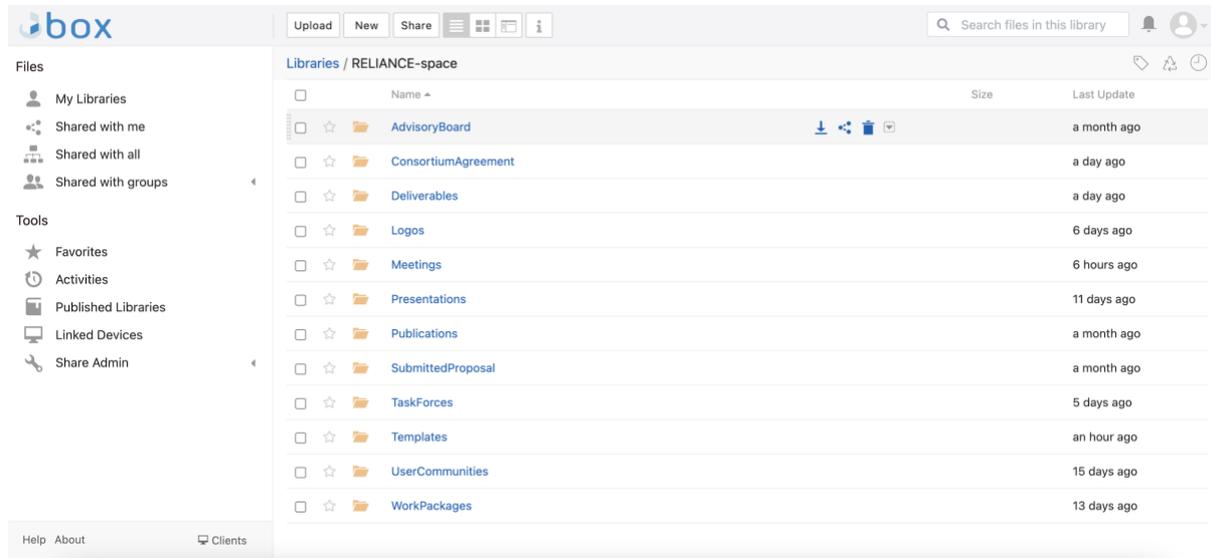


Figure 10 RELIANCE file hosting & cloud storage

4.3.8 Issue tracking

Issue tracking is an important aspect of the project management mainly from the development point of view. An issue tracking system is basically a computer software package that manages and maintains lists of issues in a project in a collaborative environment. For RELIANCE project the selected issue tracking system is JIRA⁷. Jira is a powerful work management tool for all kinds of use cases for example requirements and test case management, agile software development etc. PSNC being the infrastructure provider of the dedicated JIRA instance in its cloud holds the space for RELIANCE in <https://support.pcass.pl/projects/RELIANCE>. The figure 11 shows the page from the Jira issue tracking in the RELIANCE repository.

⁶ <https://en.wikipedia.org/wiki/PIONIER>

⁷ <https://www.atlassian.com/software/jira>

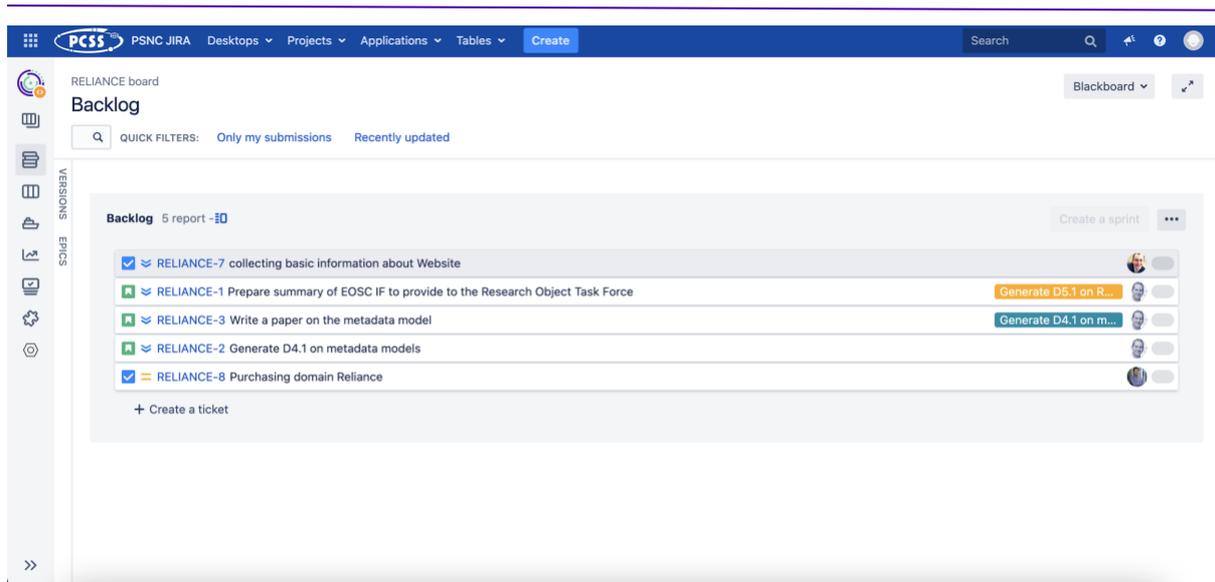


Figure 11 Jira workspace for RELIANCE

4.3.9 Software source control (Bitbucket)

Software source control or version control is vital for the maintenance and the evolution of the source code in a relevant project. There are various tools for software source control, out of them, for the RELIANCE project, the Bitbucket from Atlassian is used. It is a Git repository management solution designed for a collaborative development environment. It gives a central place to manage git repositories, collaborate on the source code and guide through the development flow. It also provides features that include access control, workflow control, pull requests, integration with JIRA issue tracker and REST API features for customizing the workflow . A Bitbucket instance for the RELIANCE project is already maintained within the PSNC cloud server⁸. This PSNC bitbucket instance can be used by any partner of the RELIANCE project, however they are free to use any source control system of their choice (e.g., already available organizational commercial source control system, if any) or any open source ones like GitHub etc. Figure 12 shows the bitbucket repository for RELIANCE.

⁸ <http://git.man.poznan.pl/stash/projects/REL>

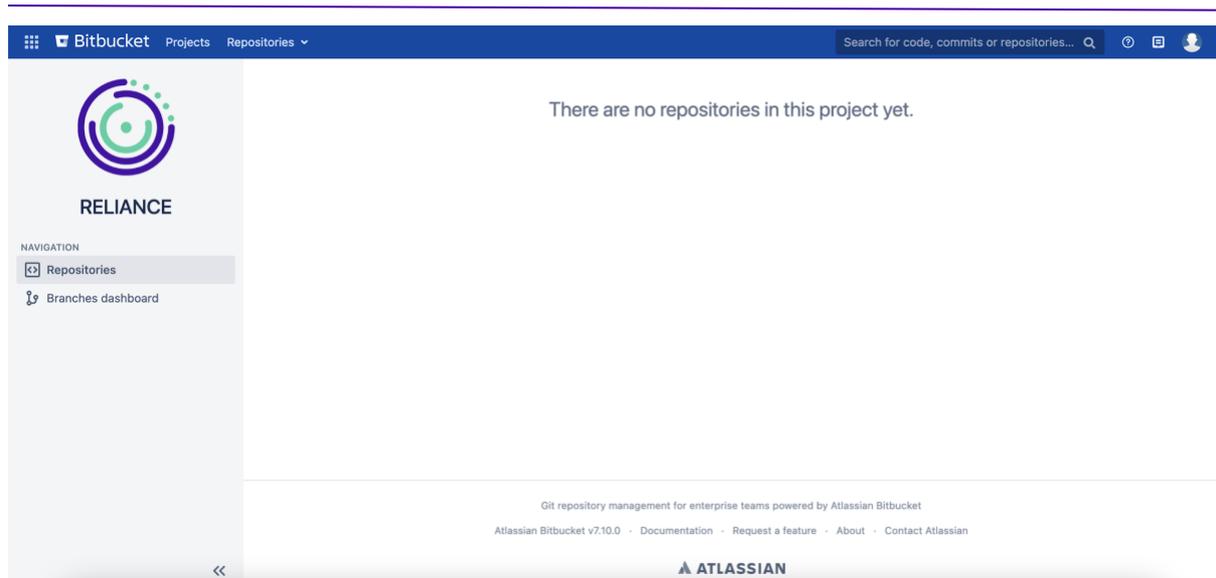


Figure 12 Bitbucket repository for RELIANCE project

4.4 Task Forces

In the RELIANCE project various task forces are being set up within the consortium to recognize and collaborate among the group of people working on specific topics of relevance across multiple work packages. After the kick off meeting few task forces⁹ are being set up in the RELIANCE project which are as follows:

- **Metadata Task Force:** This task force will promote the metadata models within the community and is expected to publish them over a reference portal. The metadata models will generally seek to be aligned with well-known metadata models. The members for this task force include at least UPM as coordinators. The user communities include CNR, INGV, and UiO and the technical partners addressing this task force include ESI and PSNC. This task force will be running until M4 (end of April 2021), and then its planned to be updated regularly with changes in metadata formats.
- **Research Object Governance:** The task force will work on describing how a Research Object (FAIR Digital Object) should be described for the user communities, and how it relates to ongoing implementations (OpenAIRE Research Knowledge Graph, RO-Crate, etc.). The expected results should include a well described RO model and a scientific paper describing how FAIR Digital Objects should be described. In this task force as of now the members include ESI (task leader), PSNC (project coordinator), UPM (scientific coordinator) and T2 (technical coordinator). This task force will be running until M4 (end of April 2021), and then will be updated regularly with changes resulting from the alliances with other initiatives (e.g., OpenAIRE-Advance).
- **Content identification and generation for ROs (ROhub) and data cubes:** This task force has the focus on gaining a common understanding of FAIR research objects, data cubes, content annotations and case studies. The collaborative tasks include identifying publications for the case studies (will be performed by CNR), generation/reuse of data cubes (will be performed by MEEO), generation of content annotations (will be performed by ESI) and generation of ROs (will be performed by PSNC). The task force will release the first version of the RO for case studies by the end of M12 and the second version till M24.
- **Helpdesk for scientific communities:** This task force is still under definition.

⁹ <https://docs.psncl.pl/display/RELIANCE/Task+Forces>

- **Onboarding and provider registration in EOSC (via EOSC Portal - EOSC Enhance):** This task force is still under definition.

4.5 Meetings

In order to ensure clear and efficient project management, regular conference calls and plenary meetings are planned for RELIANCE at various organizational levels and with different purposes and audiences. The types of meetings are as follows:

- **General Assembly meetings** are plenary sessions to be held at least three times per year additionally in extraordinary situations meetings can take place at any time upon written request of the PC or the GA members. The person who has the authority to call a meeting should initiate the procedure and must comply with the timeline rules for a general assembly meeting (i.e., 21 calendar days). The General Assembly is responsible for the overall management, communication and coordination of the entire project, emphasizing on the assurance of all work package activities integration. The purpose of the General Assembly meeting (chaired by the PC usually) is to agree on strategic guidelines for the project and steer the project according to agreed objectives. As of now all the General Assembly meetings are to be held virtually as conference calls.
- **Project Board meetings** are to be held bi-weekly as conference calls to monitor the progress of the project. The purpose is to decide on all relevant technical and administrative issues, in order to guarantee the project progress as planned. It is usually to be chaired by the PC as well. A meeting can be held on-demand in special cases on prior notice or on request. The meeting organizer(s) shall contact the Project Coordinator asking for a Webex timeslot. The meeting organizer(s) will distribute the information about how to join the meeting, usually sending a calendar invitation on the RELIANCE mailing lists, containing also a link and phone bridge details for the conference call.
- **Task force meetings** are to be planned by the TF leader and therefore may vary in their occurrence and frequency. For example, it can be bi-weekly virtual meeting for the TF partners. The details of these meetings are still to be finalized.

Always for any kind of meeting the organizer(s) are responsible to deliver the meeting agenda and the action points after the meeting. In the case of general meetings and project board meetings, that information is documented in the Confluence collaborative workspace¹⁰, while the presentations (other related documents) and the minutes or recording of the meeting are to be uploaded in the project cloud storage.

4.6 Management procedures

4.6.1 Conflict resolution

A clear decision making procedure simplifies the process of conflict resolution. A hierarchical approach is followed in the decision making procedure such as:

- Firstly, the effort is to be made to resolve the conflict at task or WP level
- If not resolved the conflict is to be discussed at the General Assembly (GA) and consensus is sought after to resolve the problem
- If the problem cannot be solved by consensus in the General Assembly then voting takes place, requiring a simple majority

Further information can be found in the Consortium Agreement giving a reference for General structure and General operational procedures for all Consortium Bodies, including voting rules.

¹⁰ <https://docs.psnec.pl/display/RELIANCE/Meetings>

4.6.2 Payments

The payment schedule, which contains the transfer of pre-financing and interim payments to Parties, will be handled according to the following:

- Funding of costs included in the Consortium Plan will be paid to Parties after receipt from the Funding Authority without undue delay and in conformity with the provisions of the Grant Agreement. Costs accepted by the Funding Authority will be paid to the Party concerned.
- The Coordinator is entitled to withhold any payments due to a Party identified by a responsible Consortium Body to be in breach of its obligations under this Consortium Agreement or the Grant Agreement or to a Beneficiary which has not yet signed this Consortium Agreement.
- The Coordinator is entitled to recover any payments already paid to a Defaulting Party. The Coordinator is equally entitled to withhold payments to a Party when this is suggested by or agreed with the Funding Authority.

The general rules for payments include:

- No funds can be paid out without the signature of Consortium Agreement (CA), which is currently under review by project partners.
- The pre-financing payment is 75% (80% from commission - 5% of Guarantee fund).
- The Interim payment is carried out within 90 days from receiving the periodic report by the EC (up to 90% of the EC contribution)
- The payment of the balance is carried out within 90 days from receiving the final report (remaining grant amount + the amount retained for the Guarantee Fund)

4.6.3 Reporting

Official Reporting to the EC for RELIANCE are as follows:

- Period 1: M1-M12
 - Periodic report to be submitted within 60 days (M14 – end of February 2022)
 - Technical & financial report
- Period 2: M13-M24
 - Periodic and final report to be submitted within 60 days (M26 – end of February 2023)
 - Technical & financial report

4.6.4 Knowledge management strategy and IPR

For the successful outcome of the RELIANCE project, it is expected that the consortium partners would generate new knowledge some of which might qualify for intellectual property protection (IP). Also, the consortium partners are obliged to disseminate the proposed new methods and tools in their own interest. In order to disseminate the results according to the open access rules (also safeguarding the IP rights of the partners) a strategy must be developed aimed at the proper management of the generated knowledge. The procedures for the management of Intellectual Property (IP) will consider the principles set in the Model Grant Agreement (GA) and in the Consortium Agreement (CA). The general principles are:

- Ownership of results belongs solely to the beneficiary that generates them (in full agreement of the GA and CA)

- Joint ownership by several beneficiaries comes into action in case results have been jointly generated by two or more beneficiaries and it is not possible to establish the respective contribution of each beneficiary, or separate them for the purpose of applying for, obtaining or maintaining their protection rights.
- Agreement on background where the beneficiaries will identify and agree (in writing) on the background for the action ('agreement on background'). Background will be clearly identified within the CA, which will be concluded among the partners before the GA is signed.
- Access rights to the beneficiaries will give each other access to the background needed to implement their own tasks under the action. The beneficiaries will moreover give each other access to the background needed for exploiting their own results, unless the beneficiary that holds the background has informed the other beneficiaries that access to its background is subject to legal restrictions or limits.

4.6.5 *Data and Innovation Management*

The project will access data from multiple providers (source data) according to their respective data access policies, and will produce additional elaborated data and research products as defined in the selected use cases. The project will also access metadata from the resource providers and produce additional metadata and annotations. The rules and policies will be updated in the Data Management Plan that the partners will develop and update during the project but broadly it can be summarized below:

- **The source data** will be accessed and managed according to the data policy of the data provider. To achieve this goal, the project will implement all the required measures to prevent misuse of the source data and, if requested by the provider, access to the source data (as well as use of data infrastructures) will only be allowed to identified and authorized partners.
- **The elaborated data** will be delivered to the project partners and selected external communities for assessment. In some cases, a representative part of the elaborated data will be made available for dissemination to the public through the different communication channels. RELIANCE will store and preserve elaborated data within its infrastructure.
- **Metadata** that are being accessed and harvested by the RELIANCE project are made publicly available by the resource providers. RELIANCE will not modify resource metadata; but it will produce additional information (annotations) that complement resource metadata wherever necessary. Both resource metadata and annotations will be made publicly available where RELIANCE will clearly state the origin and authorship of the information

Whereas, innovation management will coordinate the project activities that will pave the way for innovation and exploitation/ uptake, "regulated" by the IPR handling strategy, and tightly interrelated with the networking, exploitation and business planning activities.

5 Quality assurance and Risk Management

5.1 Quality assurance

Quality assurance shall cover all the activities related to ensuring that the Grant Agreement is technically implemented and delivered with the quality as planned. To guarantee a continuous and careful quality assurance activity the RELIANCE Consortium has a dedicated role in its management structure (the technical coordinator or TC). The TC is responsible for the overall technical coordination and management for the project by coordinating the definition of the technology and development strategy and also coordinating the technical activities between all work packages leaders and task leaders ensuring that all the technical milestones are met and the deliverables and the internal reports are submitted in the due time and collaborate with the reviewers of the technical documents. The deliverable leader is responsible for coordinating the review process and for ensuring that it is completed in a timely fashion. The deliverable production process can be broadly subdivided into the following steps, for which a reference timetable can be identified:

- ~60 days before the deadline the deliverable outline (e.g., preliminary ToC) has to be stated using the deliverable template
- ~15 days before the deadline Partners must provide their final high-quality inputs.
- ~10 days before the deadline deliverable leader has to deliver the candidate version of the official document to the reviewer to assess the quality of the document.
- ~5 days before the deadline the reviewers must provide feedback to the deliverable lead partner, if necessary, the deliverable lead partner along with the involved partners must revise the document and implement the changes.

The deliverable schedule (Table 4) and the appointed reviewing partners for the RELIANCE project is already mentioned in the collaborative workspace wiki¹¹.

Table 4 RELIANCE project deliverable schedule and reviewers

Deliverable No.	Name of Deliverable	WP	Leader	Reviewer	Due date [months]
D1.1	Project Management Handbook	WP1	PSNC	T2	M2
D1.2	Initial Data Management Plan	WP1	PSNC	UPM	M6
D1.3	Project Activity Report Year	WP1	PSNC		M12
D1.4	Final Data Management Plan and Project Activity Report	WP1	PSNC		M24
D2.1	Business plan & exploitation strategy - Issue 1	WP2	ALPHA	ESI	M12
D2.2	Business plan & exploitation strategy - Issue 2	WP2	ALPHA	ESI	M24
D2.3	Project communication Plan	WP2	T2	UPM	M3
D2.4	Report on communication and dissemination materials and events Issue 1	WP2	T2	CNR	M12
D2.5	Report on communication and dissemination materials and events Issue 2	WP2	T2	CNR	M24
D2.6	RELIANCE Challenge Report	WP2	ALPHA	UiO	M24
D2.7	Report on Epistemic communities' cooperation and networking	WP2	ALPHA	INGV	M12
D3.1	Semantic resources	WP3	ESI	UPM	M4

¹¹ <https://docs.psnk.pl/display/RELIANCE/Deliverables+schedule+and+reviewers>

D3.2	Design, implementation and deployment of text mining and enrichment services Phase 1	WP3	ESI	UPM	M12
D3.3	Design, implementation and deployment of text mining and enrichment services Phase 2	WP3	ESI	UPM	M21
D4.1	Data Cube metadata model	WP4	UPM	MEEO	M4
D4.2	Data Cube API – Release I	WP4	MEEO	PSNC	M6
D4.3	Data Cube API – Release II	WP4	MEEO	PSNC	M18
D4.4	FAIR Data Cubes – Release I	WP4	MEEO	T2	M6
D4.5	FAIR Data Cubes – Release II	WP4	MEEO	T2	M12
D4.6	FAIR Data Cubes – Release III	WP4	MEEO	T2	M21
D5.1	RO model adapted to EOSC	WP5	UPM	ESI	M4
D5.2	Design, implementation and deployment of research object services, phase I	WP5	PSNC	ESI	M12
D5.3	Design, implementation and deployment of research object services, phase II	WP5	PSNC	ESI	M21
D6.1	EOSC Integration Plan	WP6	PSNC	MEEO	M3
D6.2	Annual report on EOSC Operation – Year 1	WP6	T2	ESI	M12
D6.3	Annual report on EOSC Operation – Year 2	WP6	T2	ESI	M24
D6.4	Copernicus Data Pipelines Report – Year 1	WP6	T2	MEEO	M12
D6.5	Copernicus Data Pipelines Report – Year 2	WP6	T2	MEEO	M24
D7.1	Report on Earth Science multidisciplinary case study on 2020 lockdown: requirements, testing, demonstration and population	WP7	CNR	UPM	M12
D7.2	Report on the interdisciplinary case study by expanded community on 2020 lockdown.	WP7	CNR	ESI	M24
D7.3	Report on the Earth Science case studies: requirements, testing, demonstration and population	WP7	CNR	MEEO	M24

5.2 Risk Management

5.2.1 Risk Management Methodology

In the RELIANCE project the risk management methodology has been designed on the existing risk management standard and practices. The continuous risk management approach being a widely accepted standard is thus followed in such ambitious projects like RELIANCE. The methodology has the following phases:

- **Context establishment phase**, determining the external and/or internal issues relevant to the project purpose and affecting its ability to achieve its intended outcome
- **Risk Identification/assessment phase**, that determines which risks are likely to affect the project and extracts their characteristics in a structured manner through internal

brainstorming at project / work package level. Risk analysis and risk evaluation are also included in this phase.

- **Qualitative Risk Analysis phase** aiming at evaluating risks and risk interactions to assess the range of possible project outcomes and the project activities' vulnerability to specific risks. The phase correlates the likelihood (frequency of the risk) and impact (risk affecting the performance, cost or time plan etc.) in 3 scales (high, medium, low)
- **Risk Response Planning phase**, that defines responses to threats and enhancement steps for opportunities.
- **Risk Acceptance phase** determines the informed decision to take for a particular risk.
- **Risk Monitoring & Control phase** executes the risk management plan and timely response to risk events over the course of the project. This phase also involves continuously tracking and assessing the identified risks mainly those ranked as high or medium exposure.

5.2.2 Initial Risk Analysis

At the beginning of the RELIANCE project, a set of risks associated with the work that will be undertaken in each work package at technical, business and management level has been identified with the collaboration of all WP Leaders. Table 5 presents the lists of risks the project has identified, to be re-assessed and managed across the project implementation.

Table 5 Identified Risks of the RELIANCE project

Description of Risk	Likelihood	Impact	WP(s) involved	Mitigation Strategy overview
Lack in organizational processes	Low	Medium	WP1	Can be minimized by ensuring implementation of a well-defined organizational structure clearly identifying the roles of partners involved
Partner(s) fail to complete their tasks	Low	High	WP1	The consortium is reasonably small and most of the partners have already collaborated in several projects. A Consortium Agreement governing the roles and responsibilities of all actors in the project will be signed. The critical WP are all coordinated by partners with track records in project execution. They will make sure partners comply with the work plan, identifying failures early so that corrective measures can be taken.
Partner default	Low	High	WP1	Limited by the high-level motivation of partners on the project objectives. The relevance and selection of partners with high interest, proven commitment and excellent past cooperation will eliminate any management risks. Some level of redundancy exists in the expertise of the partners, so that a re-organization of roles is always possible should one partner default.
Shortage of resources	Low	Medium	WP1	A detailed risk assessment and monitoring during the project will minimize this risk. Also, partners are prepared to temporarily commit more resources to the project, if needed.

Software fails to deliver expected functionalities.	Low	High	WP2, WP7	User requirements and use case descriptions are defined early in the project cycle, so that developers have adequate time to analyze them. Monitoring tools should be put in place to allow a constant control of the correct evolution of the services and a prompt reaction to delay.
Difficulties in accessing external data/tools	Medium	High	WP6, WP7	Identification of critical data early in the project lifecycle and arrange formal access agreements.
Problems with community building and poor communication among partners within the project consortium	Low	Medium	WP1, WP2	Regular virtual meetings will promote communication among the partners and ensure any issues are dealt with at the earliest opportunity. Periodic in-person meetings of the entire project consortium will encourage the development of a project community and ensure the development of a strong working relationship within the consortium.
Time for development is underestimated.	Medium	Low	WP3-7	Project milestones will monitor, detect problems early and take corrective actions. Case studies can be re-timed and re-scoped to mitigate delayed delivery of software.
Tools cannot interoperate	Medium	High	WP6	Integration work package set up with specific responsibility in this area.
Multi-disciplinary nature of the consortium may lead to disciplines working too separately	Medium	Medium	WP1, WP2	Effort has been distributed in a balanced way between partners. This ensures that partners from different disciplines will collaborate (it is hard wired in the project organization structure).
Difficulty in adapting and integrating existing components	Low	Medium	WP6	A careful analysis of existing components, interfaces and constraints will be carried out since the initial phases of the project, thus minimizing the possibility of problems during integration. It will allow choosing the best trade-off between usefulness and integration effort.
Data and metadata too heterogeneous and difficult to use and to exploit.	Medium	Medium	WP6, WP7	Tight interaction with data providers will be started from the beginning and continued along the entire project highlighting the due timeliness, possible problems and inconsistencies. This will lead to a careful selection of data and metadata and to the minimization of population and data management risks.