RESILIENCE

Grant Agreement 101079792, RESILIENCE PPP

Services Preparation and Implementation Strategy

Title of Deliverable:	Services Preparation and Implementation Strategy		
Deliverable Number:	2.1		
Type of Data:	Report		
Lead Beneficiary:	KUL		
Publishing Status	Public		
Last Revision Date:	27/03/2024	**by:**	Michiel De Clerck
Verification Date:	29/03/2024	**by:**	Francesca Cadeddu
Approval Date:	[DD/MM/YYYY]	**by:**	[Name]
Document Name:	RESILIENCE_WP2_Services Preparation and Implementation Strategy_01.00_FINAL		

Change History

Version Number	Date	Status	Name	Summary of Main Changes
00.01	30/01/2024	DRAFT	Initial Draft	First draft for discussion with WP2 Services
00.02	15/02/2024	DRAFT	2nd draft	Inclusion of comments and suggestions from WP2
00.03	11/03/2024	WORKING	First version	First version reviewed by internal reviewers
00.04	18/03/2024	DRAFT	Second version	Version for review by BoD
01.00	29/03/2024	FINAL	Final version	

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Distribution List

Name	Beneficiary	Role
BoD		
WP2 Services		
GenA		

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Acronyms

Acronym	Full Form
BoD	Board of Directors
DMP	Data Management Plan
EOSC	European Open Science Cloud
FAIR	Findable, Accessible, Interoperable, Reusable
GenA	General Assembly
OS	Open Science
OSI	Open Source Initiative
PPP	Preparatory Phase Project
RDM	Research Data Management
RS	Religious Studies
SDPT	Software Development Plan Template
SSHOC	Social Sciences and Humanities Open Cloud
TRL	Technology Readiness Level

1. Introduction

According to the Grant Agreement of the RESILIENCE PPP, the final version of D2.1 needs to provide a "detailed description of the strategy for implementing RESILIENCE services" (p.16). As an Intermittent version, this document covers the work done by WP2 so far and the findings and conclusions made along the way regarding this strategy, its guiding principles, the resulting service catalogue and related policies and possibilities. As an intermediate version of D2.1, this document offers an overview of the current state-of-affairs of the work done by WP2. Especially the progress reported on in *5 Implementation: core services progress* (see below) should be considered work-in-progress and not as finalised.

WP2 is tasked with providing an analysis of the internal and external environments of the service provider, to identify opportunities that benefit the organisation. The focus of this deliverable is mainly an exploration of the external environment of the wider European RI and e-Infrastructure landscape. 'D2.2 - User Services Catalogue' will complement this document by focussing on the opportunities available among both consortium members and the Religious Studies community.

RESILIENCE primarily serves the research community of Religious Studies, which is conceived here as the full range of scientific disciplines related to the study of religion. RESILIENCE serves research by improving access to digital and physical data on religion and to advanced tools, training, existing research infrastructures and expertise for new, digital, and data-oriented research on religion.

The goal of WP2 is to prepare the RESILIENCE RI services to generate, preserve and transmit knowledge about religion. This includes defining a strategy that enables RESILIENCE services implementation teams to deliver services that allow users to achieve their outcomes. This document covers why and how the strategy is driven both by the needs of the user and by Open Science principles.

An important step in the strategy is the implementation of a RESILIENCE service catalogue that is directed by a number of guiding principles outlined in this document. This includes the first steps taken towards the service catalogue and the next steps to be taken in its implementation. Throughout this preparatory work, certain core services were identified whose implementation is already underway.

Due to the diverse nature of types of services that the Religious Studies community can benefit from, any policies governing the use and outcome of services need to be sufficiently flexible and broadly applicable.

The Open Science policy is especially important because it reflects the values of our community which recognizes that access to scientific knowledge is a universal right. This can also help foster synergies with other RIs and e-Infrastructures and ensure that RESILIENCE is able to cooperate and collaborate more easily with them. At the same time, RESILIENCE must keep the researcher's interests in mind by emphasising that Open Science means "as open as possible, as closed as necessary" and providing full open access might be against their legitimate interests. Furthermore, the licensing rights of both researchers and RESILIENCE need to be supported and respected.

2. A Strategy driven by User Needs and Open Science

The RESILIENCE service strategy is driven by our research community. We act by continuously listening to researchers to nurture the iterative creation of an ecosystem of services/products/data that have the highest added value for the community.

With the growing importance of Open Science (OS) policies[1], RI's also have the role to facilitate the creation and support of an OS culture within their research communities and to drive the digital transformation of research towards the uptake of the FAIR Data Principles (i.e., making digital objects Findable, Accessible, Interoperable, and Re-usable)[2]. This is meant to ensure that research results and research data that are published online can be found and reused with respect to the licences and access rights attributed to them. RIs are also expected to integrate their services and research products (digital objects) into the wider European Open Science Cloud (EOSC) to make them FAIR for the global community. The implementation of EOSC is based on a long-term process of alignment and coordination pursued by the European Commission since 2015 with the many and diverse stakeholders of the European research landscape.[3] The aim is to connect RIs to EOSC but also to ensure added value of EOSC for the RI communities.[4]

[1] https://rea.ec.europa.eu/open-science_en
[2] ESFRI roadmap 2021 - strategy report on research infrastructures, https://roadmap2021.esfri.eu/strategy-report/
[3] https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en
[4] https://www.esfri.eu/esfri-events/3rd-esfri-ris-eosc-workshop

Many researchers in Religious Studies (RS) are unaware of or struggling to find their way in the new OS and FAIR expectations from funders and peers alike.[5] This lack of clarity can lead to uncertainty over the effects that OS policies have on their own licensing rights regarding their research data and research results, for example. The issue is not specifically limited to the community of RS, most European RIs have OS and FAIR data as a core component in their current strategy. They support their communities of practice by giving tailored advice in combination with access to domain data and technology services for collecting, processing, analysing, archiving, and sharing research results. RESILIENCE wants to contribute to the uptake of FAIR and OS principles in the RS community by providing it with this tailored support.

Given that OS and easy access to data in both physical and digital form is a common denominator for the plurality of RS researchers, RESILIENCE can reach the widest possible community by focussing its strategy and effort during the Preparatory Phase (PPP) on giving access to core FAIR data services such as:

- a data repository solution for the FAIR data publication of research data in RS
- an elaborate TNA program for access to and expertise on physical as well as digital collections
- a data hub and discovery environment giving access to a wide variety of digital objects (incl. research data and code) described by metadata and referenced by a persistent identifier
- an RDM support desk

These specific core FAIR data services were selected as a priority during the PPP based on what is needed in the community and what can be achieved with the available means. During the PPP, the focus is still mainly on laying the organisational, administrative, technical and legal foundations for the infrastructure. The main purpose of this deliverable is to describe those foundations for the service preparation and implementation strategy. However, the implementation of these core services will also be explained in *5 Implementation: core services progress* (see below).

Core services are mature services owned by RESILIENCE to support the RS community alongside decentralised (in-kind) services and the implementation of existing resources from the wider European e-

[5] Confidential deliverable D3.2 from the Design Phase — Grant 871127 — RESILIENCE "Report on data management roadmap".

Infrastructure landscape. Decentralised services can be provided in-kind by consortium members or can be implementations based on the collaboration with other RI's or e-Infrastructures.

During the remainder of the PPP, RESILIENCE will continue to expand on the short-term service strategy based on the work being done in WP2 Services and WP3 Users to determine what is available for further implementation in the broader European landscape as well as what is needed by the community. Once the ERIC status has been reached, the community will be involved more directly in expanding the services strategy by integrating discussions on the topic in RESILIENCE initiatives.

FAIR should be a guiding principle in the entirety of the RESILIENCE service catalogue, making sure that core and decentralised (in-kind) services and research products are:

- findable by well described metadata,
- accessible by well described service conditions and documentation,
- interoperable by making sure the researcher can access and export data into a machine readable and preferably standard format so it can be published and shared with the community in a FAIR way,
- reusable by providing clear licensing information on how data or software can be used by others.

For digital objects, including data and software, open-source licences should have preference, though GDPR and other legal restrictions such as 3rd party rights might sometimes require an "as open as possible, as restricted as necessary" approach. To ensure the interoperability of the service catalogue, the EOSC Interoperability Framework is an essential point of reference to enable interoperability across resources and services.[6]

3. Guiding principles for establishing the RESILIENCE service catalogue

The following guiding principles will help to establish the priorities of the RESILIENCE service catalogue for the PPP. It considers expertise, excellence, FAIR, sustainability, transparency, and a clear description of the service, as guiding principles for the further development of the services. These guiding principles have also been summarised in a report intended for the partners involved in RESILIENCE to accompany the

[6] https://eosc-portal.eu/eosc-interoperability-framework

submission of this deliverable to inform them of the essence of this document. The rest of this document, as well as later WP2 deliverables, will describe how those principles will be translated into concrete actions.

1. **RESILIENCE services should be driven by expertise and excellence:** RESILIENCE should offer services in which the community can boast both expertise and excellence. For other services in which we hold only circumstantial expertise, RESILIENCE could look towards collaborations with e-infrastructures (e.g., EUDAT) and other RI providers in the Social Sciences and Humanities (SSH) cluster and beyond. The European Open Science Cloud (EOSC) marketplace will be a valuable additional source of services for researchers in need of technology.[7] RESILIENCE can help researchers find the right service in the wider offering of e-Infra and RI providers. By stimulating and coordinating a bidirectional input flow between user and service provider, RESILIENCE will boost the quality of research and services alike.
2. **RESILIENCE services that safeguard our community's research output should be both FAIR and sustainable:** In case RESILIENCE offers to host research output, be it data, research websites/blogs or research software, we should be able to guarantee that resources are and remain findable, accessible, interoperable, and reusable now and in the future (or for the minimum period indicated in a clear and transparent service description). This requires a certain service level maturity with a stable and robust infrastructure and a strong support team in place. This is necessary to prevent the loss of digital objects and thus the trust of our community who have put the safeguarding of their intellectual work into our hands. As a result, RESILIENCE should consider working with trusted and sustainable depositing solutions when possible or adhere to the expected requirements for a trustworthy repository when no existing solutions are available.[8]
3. **RESILIENCE should be transparent about its service offerings:** The service catalogue can contain innovative new services and tools that have a low technology/service readiness level (T/SRL[9]). It is however important to offer the potential user clear information on the experimental and possibly temporary nature of the service. The user should be able to export their research data in an open and interoperable data format to prevent data loss. By being transparent about the

[7] https://marketplace.eosc-portal.eu/
[8] See for example https://doi.org/10.5281/zenodo.7051012
[9] https://en.wikipedia.org/wiki/Technology_readiness_level

TRL, RESILIENCE can offer innovative and experimental tools of value to the community without running the risk of critique on quality and long-term availability of the service offering.

4. **RESILIENCE services should have a clear and concrete service description**: RESILIENCE should strive towards clear and concrete service descriptions, so the user immediately understands what the service entails, what to expect (Technology/Service Readiness Level), how he will benefit, what the added value of using it will be, what the modalities of access are, and more. The service information should be findable through the RESILIENCE service catalogue (accessible through the RESILIENCE website) and distributed towards other service discovery platforms such as the SSHOC and EOSC Marketplaces.
5. **RESILIENCE services should be stakeholder-driven and follow market and digital innovations:** The RESILIENCE service catalogue should evolve over time by innovative input coming from researchers, developers, service providers, and projects alike. It should also follow market trends and digital innovations to remain state-of-the-art and relevant. This can happen through a dedicated trends/innovation discovery team actively monitoring digital as well as societal evolutions (e.g. influence of fake news on data validity, switch towards video "reels" communication). Concrete plans on how to continuously collect input for the service catalogue can be developed once the catalogue is up and running and will be included in the final version of this deliverable.
6. **RESILIENCE services should be findable and accessible for the end-users:**

   RESILIENCE services, once they are promoted to the community, should minimally

   - be findable via search engines, the RESILIENCE website, and (in the future) the RESILIENCE service catalogue and should
     - include a clear and standardised service description and value proposition;
     - provide transparency on its T/SRL and mode of access (short/long term, selection only, paid access…).
   - be accessible via a persistent link to the service/tool/database which
     - has a minimum Technology / Service Readiness Level 4 (Small Scale Prototype);
     - provides supporting documentation as well as contact information (e.g. helpdesk).

This means that the RESILIENCE Service Catalogue should focus on services that are findable and accessible for the users with a minimal TRL 4 (Small Scale Prototype) and higher[10]. This helps ensure that users are only given access to tools and services that are already reliable and sustainable. The incentive behind this principle is that research projects usually have a maximum duration of 4 years, which means that during that specific project a researcher has no immediate benefit in learning about tools becoming available after the end of that project. Additionally, our (digital) society evolves quickly. By 2025 some services might be offered by other providers, while other services are no longer relevant due to changing needs.

Services in their ideation phase (TRL 0-3) should not be promoted to research audiences on the service catalogue at this stage (or not go beyond a vague mention of other ideas for the future). This approach is specifically directed towards end-user audiences.

Components that serve as a necessary glue for the functioning and interoperability of the RI but that are of indirect value to our end-user audience, should not be included in the service catalogue. Those components can be essential for the technical operation of services but are not directly relevant for the audience for whom the catalogue is intended. Examples are email, security, AAI ...

7. **RESILIENCE services should be integrated into the wider Social Sciences and Humanities (SSH) and EOSC ecosystem:** RESILIENCE should strive early on towards interoperability and integration of services into the SSHOC and EOSC marketplaces. This will increase the visibility as well as demonstrate the quality and maturity of the service offering. RESILIENCE should also consider the interfacing with, and integration and adaptation of relevant services and tools developed by other communities to meet its users' needs. Most relevant to watch and collaborate with are the other SSH communities such DARIAH, CLARIN and CESSDA, with an open view towards initiatives and innovations happening in other science domains. This integration ensures that resources can also be discovered and used outside of the communities where they originated. The requirements for integrating services on the EOSC marketplace are mainly technical in nature with a preferred TRL of 8 or 9 with SSHOC being more flexible in accepting tools and services.

[10] CloudWatch, A brief refresher on Technology Readiness Levels (TRL), https://www.cloudwatchhub.eu/exploitation/brief-refresher-technology-readiness-levels-trl

Integration also requires resources to be described in a way that conforms to EOSC metadata schemes for describing services. To anticipate this, RESILIENCE service descriptions are based on those of EOSC and SSHOC. The final version of this deliverable, as well as D2.2, will contain more information on the progress towards integration with the wider ecosystem.

8. **RESILIENCE should offer core services that serve a wide user base**: RESILIENCE should prioritise the development of services that are valuable to a wide user base. Core services:
   - can be developed and hosted by partners but preferably enjoy some sort of central support,
   - should comply to a quality service level and include clear communication towards the BoD and GenA concerning the status, continuity, and development roadmap of the service,
   - should be transferable to another hosting location/organisation,
   - should be clearly branded as RESILIENCE.

   The RESILIENCE service strategy should be driven by user demand, fed by regular user consultations in combination with trend monitoring in the research- and wider digital market space. RESILIENCE WP3 has already held several workshops to collect input from potential users and is using those experiences to develop methods to collect user needs in interviews outside the context of those workshops as well.

   This continuous input means that core services will evolve over time. To meet those needs, RESILIENCE can decide to integrate other decentralised (in-kind) services into their core facility in consultation with the original service owner and the community. This can for example happen when a large user base and high value for the community have been clearly demonstrated. RESILIENCE might also decide to start new development trajectories when certain gaps in the service catalogue must be addressed to serve the specific needs of our user community.

9. **RESILIENCE node services can be locally driven:** Services developed by partners using (partial) RESILIENCE EU funding should be clearly branded as RESILIENCE and comply with the criteria of core services (cf. 08). As several in-kind services will (have) be(en) developed outside the context of RESILIENCE (e.g., digitization lab of a university library), they can of course have their own branding and decision structure. However, for their inclusion in the RESILIENCE service catalogue, they need to comply to a certain quality level if we want the in-kinds to be of true value to our

users. Preferably this is TRL 7 or higher, though pilot demonstrators can be included as long as the TRL is clearly indicated to the end users.

4. Steps towards a RESILIENCE service catalogue

Because of these guiding principles, during the RESILIENCE PPP, the focus is mainly on the mapping of existing services (in-kind and from other RI's, e-Infrastructures,...) and on setting up procedures for the inclusion of services in the service catalogue. This will allow us to focus on increasing the visibility of qualitative and highly useful tools and resources already available at partner institutions and in the wider research ecosystem. We are also expected to integrate services and research products (digital objects) into the wider European Open Science Cloud (EOSC) to make them available for the global community. Because of this, the templates used to gather information on tools and services from partner institutions use EOSC categories for the description of service types as well as the questions asked from EOSC providers when submitting services to the EOSC marketplace to ensure compatibility.

The methodology of collecting information for this catalogue, its results and the procedures for onboarding will be discussed in more detail in 'D2.2 – User Services Catalogue'. This document contains a brief summary of the activities involved and their results.

Online forms were created based on the EOSC Resource Profile and Data Source Profile to collect information about potential in-kind services from RESILIENCE partners.[11] The online forms were the result of a thorough desk study of the information required by providers to submit resources to both the EOSC Marketplace and SSH Open Marketplace. Service descriptions between both platforms are interoperable but standardisation of service descriptions seems more feasible from EOSC descriptions to SSH Open Marketplace descriptions. The most important sources of information are the "Portal Profiles" documentation provided by EOSC and the 'Metadata guidelines" of SSHOC.[12]

This means that basing the RESILIENCE forms for service descriptions on the information EOSC gathers about services also allows the RESILIENCE service descriptions to be compliant with the information SSH

[11] https://wiki.eoscfuture.eu/display/PUBLIC/B.+v4.00+EOSC+Resource+Profile
https://wiki.eoscfuture.eu/display/PUBLIC/D.+v4.00+EOSC+Data+Source+Profile
[12] https://wiki.eoscfuture.eu/display/PUBLIC/EOSC+Portal+Profiles
https://marketplace.sshopencloud.eu/contribute/metadata-guidelines

Open Marketplace requires. The main difference appears to be that SSH Open Marketplace is set up in a way that allows users to suggest resources which are more lenient with regard to mandatory information.[13] As RESILIENCE has approached its consortium members to provide information on tools and services that they could contribute in-kind, it was feasible to require them to provide this much information. The preparation of this procedure to collect information about resources was conducted in collaboration with the Data Working Unit of RESILIENCE to give several partners the opportunity to provide input to help ensure that these forms were both feasible to fill in and interoperable with EOSC categories.[14]

Based on the responses on the forms, in-kind services can also be reliably divided according to the EOSC categories defined by EOSC and applied by SSHOC as well:

- Access physical & e-Infrastructures
- Sharing & Discovery
- Processing & Analysis
- Security & Operations
- Training & Support
- Aggregators & Integrators

At this stage, these EOSC categories are being used primarily to collect information about potential in-kind services. During the Design Phase, RESILIENCE developed its own way of categorising services.[15] How these different categorisations relate to one another will be described in D2.2. This will form the basis for further discussions on service categorisation.

There are three aspects to consider when collecting information about tools and services.

1) The quality and sustainability of services needs to be evaluated. Research services are often created to help in a research project or for a specific research team. Because they are created for a local team, it can be difficult for others to learn how to use it or to access them. Because they are made for a specific purpose at a specific institution, they might also not be sustainable in the long term due to a lack of funding or support. That is why we need to evaluate the quality and sustainability of

[13] https://marketplace.sshopencloud.eu/about/sshoc-eosc
[14] https://wiki.ni4os.eu/index.php/Resource_Category_and_Subcategory
[15] https://www.resilience-ri.eu/news/resilience-services-at-a-glance/

the services. We need to make sure that we offer our community services that are accessible and usable, not only at the moment we start onboarding them but also in the long term. This evaluation is also not intended as a judgement on the quality of a resource but can serve as a basis for assessment and advice for the improvement and uplifting of local services to become (more) compliant with the rules of participation.

2) Services need to be described in a clear and concrete way to the community. A good service description helps researchers find specific services and understand how to use them. This will be done by collecting information on the following aspects of a resource:
    - Basic Information
    - Marketing Information
    - Classification Information
    - Geographical and Language Availability Information
    - Resource Location Information
    - Contact Information
    - Maturity Information
    - Dependencies Information
    - Attribution Information
    - Management Information
    - Access and Order Information
    - Financial Information
3) It should be possible for RESILIENCE services to be integrated into the wider Social Sciences and Humanities (SSHOC) and EOSC ecosystem. Although this is not the primary goal when collecting this information, it is an important secondary objective to take into account regarding how we collect information. Using EOSC categories and criteria makes it easier to integrate services into the SSHOC and EOSC marketplaces. This will increase the visibility as well as demonstrate the quality and maturity of the service offering. RESILIENCE should also consider the integration and adaptation of relevant services and tools developed by other communities to meet users' needs.

Integration of partner services in the EOSC Marketplace is only the secondary objective, however. The requirements to enter the EOSC Marketplace are quite strict because of the expectation of a high

Technological Readiness Level (TRL). The primary goal of a RESILIENCE service catalogue is to cater to the needs of the Religious Studies community. Because RESILIENCE is close to this community, this allows for more flexibility in offering tools and services of a that are still in development if there are clear mentions about the development status or if users are explicitly involved in a testing phase. Tools and services that have a TRL that is lower than it should be for inclusion on the Service Catalogue can therefore still be promoted to specific users that are aware of and comfortable with the experimental nature of that specific service. This can have the dual benefit of offering earlier access to specific resources to (some members of) our community while also giving the providers of the resource a network of users that can provide input and feedback. This creates a win-win situation where researchers can find and use services or tools that are validates but not yet fit for wide scale use while giving the service providers access to input and feedback from users.

To ensure the usability of a prototype service or one whose performance has not yet been tested with a wide user base, certain criteria still have to be met. A technology validated in a relevant environment (TRL-5), for example, can already be valuable to the community if a thorough user manual exists and a help desk is available. RESILIENCE can play an intermediary role between users and service providers in this regard by offering support in preparing user support and/or documentation towards providers and towards users by involving them as early adopters of services.

The methodology of collecting information for this catalogue, its results and the procedures for onboarding will be discussed in more detail in 'D2.2 – User Services Catalogue'.

5. Implementation: core services progress

Besides relying on in-kind services, RESILIENCE is also preparing and setting up some core services during the PPP based on existing initiatives in the European e-Infrastructure landscape, work done in previous projects and new initiatives.

5.1 Horizon-Zen: Data repository community for FAIR data publication

One service in the wider European research landscape whose potential for the Religious Studies community was recognized early on was Zenodo. Zenodo is a general-purpose open repository developed under the European OpenAIRE program and operated by CERN. It allows researchers to deposit research papers, data

sets, research software, reports, and any other research related digital artefacts. For each submission, a persistent digital object identifier (DOI) is minted, which makes the stored items easily citable. A RESILIENCE community on Zenodo can play an important role in fostering open access and open data practices among the RS researchers by giving them an accessible platform for publishing their data and results that also helps researchers receive credit by making the research results citable.[16]

Promoting the use of Zenodo among Religious Studies researchers has many advantages. The FAIR principles are incorporated in the platform. It is not only intended for datasets but also publications, posters, presentations, etc. This can help bring in more users to the platform because those are still more common in the Religious Studies community than research datasets. Use of the platform is also preferred by the European Commission because the data is stored at CERN, which receives financing from the EC for this service together with OpenAire. Sustainability is thus guaranteed and Zenodo is compliant with Plan S requirements for Open Access Repositories.[17]

A limited RESILIENCE community already exists on Zenodo but this will be expanded upon in the future.[18] RESILIENCE is part of the Horizon-Zen Early Adopter program.[19] This new HORIZON-ZEN grant will enhance Zenodo with FAIR-enabling capabilities and support communities. Through the Early Adopter program, they aim to be open community-driven. As an early adopter, RESILIENCE can be involved in the design process. This pilot was launched on March 20th, 2024, and the final version of this deliverable will include updates on its progress.

Looking into solutions for data repositories was one of the first initiatives taken by RESILIENCE during the PPP. Using data repositories is a relatively new phenomenon for the RS community which gives RESILIENCE the opportunity to bring community practices more in line with best practices. Initially, the focus was on exploring the EUDAT services B2SHARE and B2FIND.[20] Meetings with representatives of EUDAT were held

[16] https://about.zenodo.org/
[17] https://www.coalition-s.org/addendum-to-the-coalition-s-guidance-on-the-implementation-of-plan-s/principles-and-implementation/
[18] https://zenodo.org/communities/resilience
[19] https://about.zenodo.org/projects/horizon-zen/
[20] https://eudat.eu/catalogue

and the services were explored by WU Data in conjunction with RS scholars. This led to a positive evaluation of the EUDAT services.

However, the Zenodo Early Adopter program led WU Data to look more closely at the possibilities offered by Zenodo. Zenodo has a broader scope regarding resource types by also including publications, posters, presentations etc. This broader scope will make Zenodo more appealing to the RS community since they are more familiar with those resource types than with research data. This can lower the threshold to using data repositories and increase their usage by the community. The Early Adopter program is also an opportunity to bring RS community and Zenodo closer together and thereby further familiarise the community with the advantages of data repositories while allowing Horizon-Zen to benefit from input from the RS community.

Other advantages of Zenodo are its REST-API and OAI-PMH protocols and the clear developer documentation they provide for using them. These ensure the possibility to harvest data from the platform. There is a wide variety of data repositories available to researchers: national, institutional, thematic, etc. This distribution of data is an obstacle for researchers when discovering data. Initiatives to harvest the metadata of RS related data and research results can help resolve this issue. Clear procedures for the harvesting of data were therefore another important criterion when choosing which data repository to promote.

5.2 Trans-National Access

The RESILIENCE Transnational Access (TNA) Fellowship Programme offers physical and virtual access to a number of European institutions and libraries. Its aim is to facilitate and foster easy access to sources, resources, expertise and services for researchers in RS. The TNA hosts grant access to their collections of manuscripts, rare books, documents and materials. Furthermore, RESILIENCE aims at matching all successful TNA applicants with relevant scholars who can provide tailored expertise. Transnational Access is the first service offered by RESILIENCE to the Religious Studies community because there is a consistent need for better access to sources, resources, expertise and services in the RS community and because the implementation could benefit from experiences and expertise gained during the TNA program in ReIReS, a Horizon 2020 program that ended in 2021.

In addition, for the user, a TNA stay means faster access to resources, which means more effective use of research time. Each host institution also offers a place to work, help in navigating physical and digital collections, provides locally tailored travel and accommodation tips, as well as additional benefits unique to the institution. Crucially, the TNA user will enjoy expert guidance provided by senior scholars from the host institution, incorporating valuable networking opportunities to the research visit.

5.3 Data hub and discovery environments

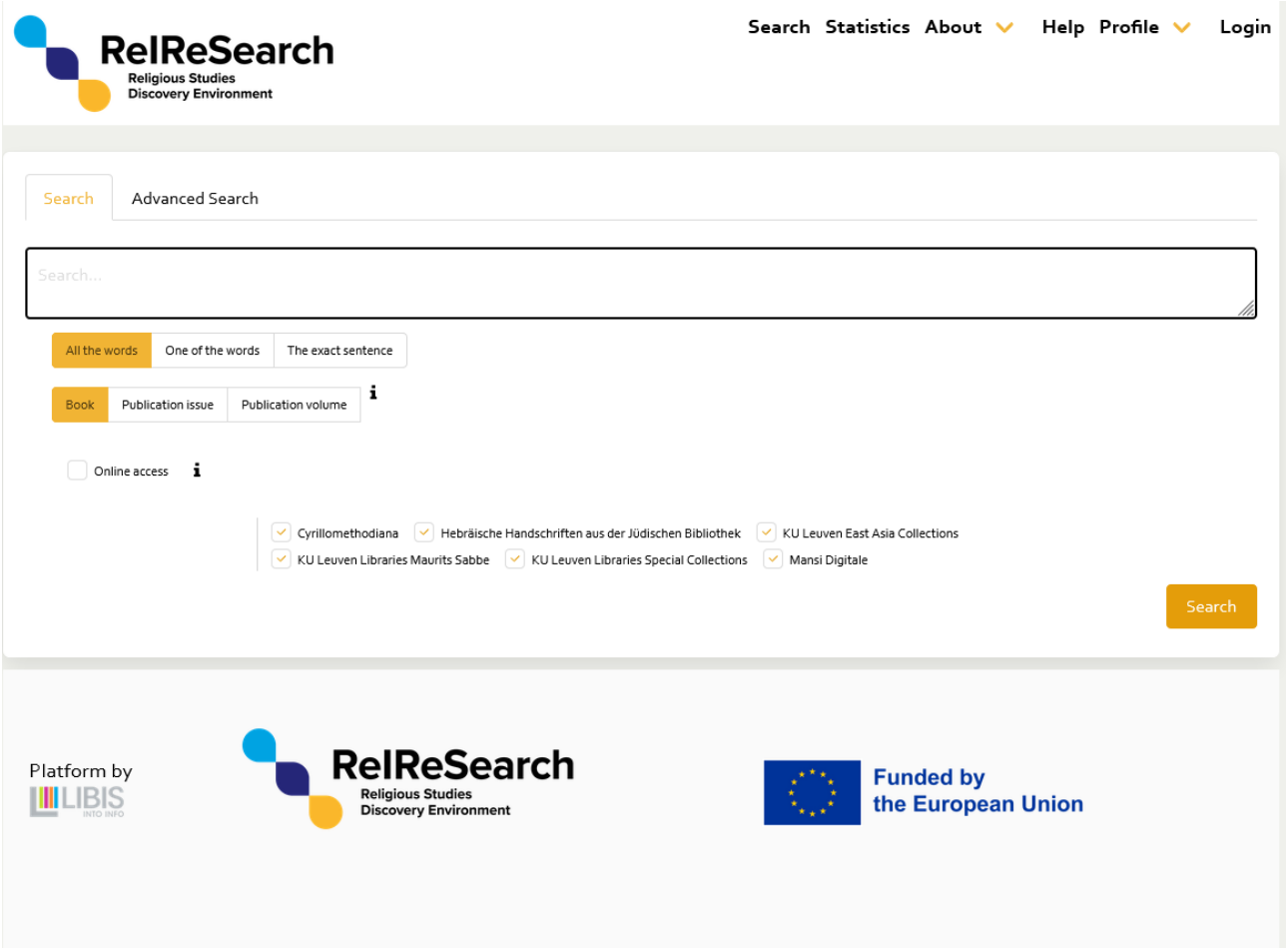
To resolve the need for a data hub and discovery environment that gives access to a wide variety of digital objects, RESILIENCE has two good services (Ixtheo and RelReSearch) available among its partners.

RelReSearch was developed in the context of ReIReS to provide a platform where disparate digital resources and databases relevant to Religious Studies are searchable in a unified and standardised way. To address the growing need of scholars to discover large sets of data easily and efficiently, RelReSearch was designed to explore data from different providers on a single platform. Because RESILIENCE shares this goal to provide fast and high-quality access to research data on religion and to ensure that this valuable service will not only remain accessible to the RS community but can also continue to expand, RESILIENCE adopted RelReSearch in its service catalogue. This guarantees the hosting and maintenance of the platform while also offering possibilities for the implementation of more functionalities and the inclusion of new collections.

To further complement the discoverability of research materials for the RS community, RESILIENCE also has an agreement with University Library Tübingen who manage the Index Theologicus, an international bibliography of Theology and Religious Studies.[21] While RelReSearch mainly focuses on the discoverability of digital resources and datasets that are generally used as primary sources, IxTheo is primarily a database for research publications but they have also expanded to include original sets of research data. With University Library Tübingen as an Associate Partner, RESILIENCE can build a close working relationship with the providers of free and open access service to the worldwide scholarly community with financial support from the German Research Foundation (Deutsche Forschungsgemeinschaft).

[21] https://ixtheo.de/

In 2023, the online environment of RelResearch was given a new look: it is now clearly recognizable as belonging to RESILIENCE and its (future) service catalogue and some minor improvements have been made. RelReSearch is open to include more collections from European institutions as long as these collections are in open access. To increase awareness about RelReSearch and to announce the RESILIENCE rebranding, new instructional videos were made and promoted. To attract potential new providers, a new introductory video on that topic was also recorded and promoted as well. After the release of those videos, an online demo was organised in December 2023 to offer both users and potential providers a closer look at the platform and give them the opportunity to ask questions.



Because some useful datasets in Religious Studies are not in the scope of ReIReSearch, WP4 has also created an online overview of useful datasets.[22] This has the added benefit of more flexibility than a data hub where all the data needs to be mapped and normalised for interoperability reasons. IxTheo, ReIReSearch and the overview of datasets are complementary services.

The next step in refining this service area is to continue coordinating those three elements to improve this section for the final version of this document with a clear description of the synergy between IxTheo and ReIReSearch. Both these services have their own strengths and domains of speciality that will need to be further defined and attuned.

5.4 RDM support

During the RESILIENCE Design Phase (2019-2021), the current research practices in Religious Studies were examined with the help of both surveys and interviews. Their results were presented and discussed in 'D3.2 – Report on data management roadmap'.[23] These research practices were also situated in the broader context of trends and evolutions in the FAIR data landscape. This comparison between the state of art in RS and best practices in the wider landscape concluded with a roadmap for RESILIENCE to improve data management practices in RS:

> *Both the survey results and interviews made it clear that, although researchers in Religious Studies are aware of the existence of certain data management solutions and tools, they do not very actively look into using them. RESILIENCE can help fill this gap by providing trainings and guidelines that direct scholars to community best practices and useful data management solutions. A helpdesk can provide support to researchers who are interested in making their data FAIR compliant while technical solutions are still being planned or developed. This can also help increase community engagement. Considering the variety of research data, practices and topics in Religious Studies, a stronger European network can improve data management practices that are particular to smaller research communities within Religious Studies.*[24]

[22] https://www.resilience-ri.eu/datasets/
[23] Confidential deliverable D3.2 from the Design Phase — Grant 871127 — RESILIENCE "Report on data management roadmap".
[24] *Ibid.*, p. 80.

A first step towards improving RDM support for the RS community was already included in the deliverable itself with the inclusion of a DMP template that incorporates guidelines for the domain of Religious Studies. The template provides a Religious Studies context to increase the understanding and affinity of RESILIENCE stakeholders with data management planning. This template will be used as a basis for an online DMP template using Argos, an online machine-actionable tool developed by OpenAIRE to facilitate RDM activities concerning the implementation of DMPs.[25]

With CINECA as a partner in RESILIENCE, the RI also has access to an important worldwide computing centre with an expertise in handling large amounts of data. The expertise of this partner will be utilised to provide secure data storage and transfer solutions to the RS community that adhere to RDM best practices.

6. Access Policy

An essential aspect to take into account when implementing specific services is how and under which circumstances users can have access to those resources. Although the access conditions are not necessarily the same for each service, there are some general principles that will be outlined below.

An overview of an access policy for RESILIENCE was already outlined in 'D8.1 – Governance Model, HR Policy and Management, Access Policy' of the RESILIENCE Design Phase:

> *The objective of the RESILIENCE Access Policy is to describe guidelines for access to RI facilities, resources and services provided to users. It specifies general principles on how the RI intends to regulate, grant and support access to its users from any sector. It indicates what type of access is provided and in which way. Of particular importance for the access policy is the maintenance of absolute transparency and open communication of access requirements and conditions.*[26]

The policy outlines that RESILIENCE aims to provide, as much as possible, a wide and unrestricted access to the tools and resources made available through the infrastructure taking into account the sustainability of those resources. This means that the emphasis is on open access to services unless there are practical

[25] https://www.openaire.eu/argos-guide
[26] Confidential deliverable D8.1 from the Design Phase — Grant 871127 — RESILIENCE "Governance Model, HR Policy and Management, Access Policy", p.37.

reasons to impose limits on the number of users such as, for example, in a Trans-National Access program or for resources with limited capacity.[27]

The tools and services offered by RESILIENCE should in principle be freely available for use by the scientific and educational community. However, it may be decided that some services are offered against a fee or with other restrictions with the specification of clear conditions. Users will need to accept the general terms of service regulating access to the specific resources.

End-user licences can further specify the access conditions for each resource. When depositing a resource to the RESILIENCE service catalogue, providers will have to specify the licence(s) with which the resource will be distributed to end-users.

7. Open Science Policy

7.1 Introduction

The RESILIENCE Open Science Policy reflects the values of our community that recognizes that access to scientific knowledge is a universal right. As such, RESILIENCE wishes to make the knowledge produced through its service offerings as openly accessible as possible for everybody (but as closed as necessary). RESILIENCE is committed to the advancement and wide dissemination of scientific knowledge on religion. With this policy, RESILIENCE sets the cornerstone for more open, collaborative, and responsive research on religion in support of the societal changes and challenges faced in an evolving world.

Open science is defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as "[...] an inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society, and to open the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community."[28]

[27] Ibid., p.37-48.
[28] UNESCO (2021), UNESCO Recommendation on Open Science: https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en

RESILIENCE recognizes open science as one of its guiding principles and commits to it by:

- supporting open science research practice and the uptake of the FAIR principles trough support of skills development;
- enabling the free dissemination of knowledge and the accessibility of outputs related to open science;
- encouraging open access to publications and their metadata;
- encouraging and facilitating the sharing of data and software under free, open source licences;
- facilitating access to existing world class infrastructure and services in support of open science;
- engaging with related SSH research infrastructures to ensure effective dissemination of existing knowledge and cooperation to advance open science.

The policy will typically be reviewed and updated every two years.

7.2 Open access to publications

RESILIENCE publications (eg. public deliverables, presentations, reports, etc.) should be deposited in the RESILIENCE community on Zenodo under an open licence, with CC-BY being the default standard.[29] Publication related metadata are made available for reuse under the CCo waiver in line with the FAIR principles.[30]

7.3 Open data

RESILIENCE is committed to supporting our community in making their research data publicly available. The RESILIENCE community on Zenodo was specifically set up to better support our research community towards open and FAIR data sharing practices. All RESILIENCE's data and associated data services will apply open and FAIR principles. Researchers making use of the RESILIENCE community on Zenodo will be required to publish their data under an open licence, with CC-BY being the default standard. Exceptions are made for legal opt-outs due to privacy, intellectual property rights, ethical aspects, and aspects of dual use.

[29] https://creativecommons.org/licenses/by/4.0/
[30] https://creativecommons.org/public-domain/cco/
https://www.go-fair.org/fair-principles/

7.4 Open source software

RESILIENCE software is made available as open source wherever possible, applying a licence approved by the Open Source Initiative (OSI).[31] Software development processes are expected to follow best practices as defined in the RESILIENCE Software Development Plan Template (SDPT).[32] RESILIENCE contributes to existing open-source software through active participation in relevant open-source communities (code contribution, roadmap input etc.).

7.5 Infrastructure provision for open science

RESILIENCE ensures that its selected open science infrastructures meet trusted quality standards and comply with FAIR principles (e.g. use persistent identifiers such as DOIs and ORCIDs).[33] RESILIENCE will adhere to the rules of participation and interoperability framework as specified by the European Open Science Cloud (EOSC).[34]

7.6 Education and training

RESILIENCE is committed to offering training courses and materials to increase knowledge and facilitate the adoption of open science by researchers in Religious Studies. RESILIENCE will make use of and disseminate existing materials to direct researchers to the relevant information for their level of training in OS principles. Any training resource created by RESILIENCE will be shared as open educational resources (OER).

8. Synergy possibilities with other RI & e-Infrastructures

RESILIENCE is open to cooperation and collaboration with other RI & e-Infrastructures for offering and re-using tools and services. As mentioned in this document, RESILIENCE does not aim to recreate existing services but wants to integrate into the wider European RI and infrastructure landscape by re-using what is available and useful to the RS community while also making its own service offering available to the wider European research landscape. The first step in resolving user needs should be to look at existing services in

[31] https://opensource.org/
[32] RESILIENCE PPP D2.8 RESILIENCE Software Development Plan Template (SDPT).
[33] Such as https://www.rd-alliance.org/trust-principles-rda-community-effort
[34] Rules of participation and Interoperability Framework in development by EOSC-A.

the wider landscape that can already meet those user needs. These can complement the services RESILIENCE that promotes to its community. By adopting EOSC Marketplace categories, we remain interoperable with their catalogue of services and that of SSHOC. This will facilitate the mapping of user needs to both existing resources in the wider landscape and to potential in-kind contributions. The choice of Zenodo as a data repository is also informed by the involvement of the wider research community. This can improve cooperation possibilities with other actors in the research landscape.

9. Conclusion

This Intermittent Deliverable of D2.1 has offered an overview of the general strategy towards service implementation of RESILIENCE, which relies mainly on the dual pillars of decentralised (in-kind) services and core services. During the PPP, effort is put towards mapping existing in-kind services among partners and improving their availability to the wider RS community via a service catalogue. The specifics of the work done for this mapping and its results will be further outlined in D2.2. For core services, the main focus up until now has been the (further) implementation and expansions of resources that already have a foundation to build upon.

Building upon the work currently being done in WP2 and completed during the Design Phase (2019-2021) of RESILIENCE, the general principles of an access policy can be drawn up which specific services will have to adopt and adapt to their specifications. Open Science principles are the driving force in this regard with the RESILIENCE Open Science Policy as the cornerstone for the work RESILIENCE is doing on the preparation and implementation of services.

The focus of this Intermittent Deliverable has been mainly on the work carried out so far in WP2 and the plans for the immediate future in 2024-2025. Emphasis was on the analysis of the internal and external environments of RESILIENCE (and its future nodes) as a service provider, to identify opportunities benefiting the organisation. Discussions on and input for this deliverable will also be further developed in WP2. The resulting ideas will be built upon to explore new interesting areas in which services can be developed or supported. Close collaboration with WP3 will also be maintained in order to follow up on the user perspectives that they are collecting. New developments in the wider European RI and e-Infrastructure

landscape will continue to inform the tasks in WP2, such as initiatives that will follow from the newly assigned procurement for managed services of the EOSC EU Node.[35]

The final version of this deliverable will report on the result of these plans as well as offer a more concrete view of the RESILIENCE strategy for services preparation and implementation in the next phase. As an intermediate version of D2.1, this document offers an overview of the current state-of-affairs of the work done by WP2. Especially the progress reported on in *5 Implementation: core services progress* should be considered work-in-progress and not as finalised. 'D2.2 - User Services Catalogue' will complement this document by focussing on the opportunities available among both consortium members and the Religious Studies community and how those elements will be implemented in a RESILIENCE Service Catalogue.

[35] https://digital-strategy.ec.europa.eu/en/policies/open-science-cloud

10. Reference Documents

Reference documents are intended to provide background and supplementary information.

ID	Date	Title/Reference
R1	18/08/2022	GRANT AGREEMENT, Project: 101079792 — RESILIENCE PPP — HORIZON-INFRA-2021-DEV-02