RESILIENCE

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D2.2 – User Services Catalogue

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Acronyms

Acronym	Full Form
AI	Artificial Intelligence
API	Application Programming Interface
BoD	Board of Directors
CESSDA	Consortium of European Social Science Data Archives
CLARIN	Common Language Resources and Technology Infrastructure
DARIAH	Digital Research Infrastructure for the Arts and Humanities
DOI	Digital Object Identifier
EOSC	European Open Science Cloud
ESFRI	European Strategy Forum on Research Infrastructures
FAIR	Findable, Accessible, Interoperable, Reusable
GenA	General Assembly
GLAM	Galleries, Libraries, Archives, Museums
HTR	Handwritten Text Recognition
IT	Information Technology
MDM	Master Data Management
OCR	Optical Character Recognition
OPERAS	Open Scholarly Communication in the Social Sciences and Humanities
OS	Open Science
OSCARS	Open Science Clusters' Action for Research & Society
PPP	Preparatory Phase Project
RDM	Research Data Management
RSRL	RESILIENCE Service Readiness Level
RI	Research Infrastructure
RS	Religious Studies
SDT	Service Description Template
SSH	Social Sciences and Humanities
SSHOC	Social Sciences and Humanities Open Cloud
TNA	Trans-National Access
TRL	Technology Readiness Level
VRE	Virtual Research Environment
WP	Work Package
WU Data	Working Unit Data

1 Executive Summary

The D2.2 User Services Catalogue constitutes the first consolidated catalogue of services within RESILIENCE. It brings together an spreadsheet-based register of around 120 community (in-kind) services contributed by partners, each described through a concise Service Description Template (SDT) and supported by a living Service Dictionary that contains authoritative field definitions and controlled vocabularies. The catalogue is designed for clarity and ease of use: its accompanying legend (Service Dictionary, chapter 3) allows readers to interpret each column, distinguishing minimum from preferred fields for both discovery and data export.

This deliverable operationalises the Service Strategy defined in RESILIENCE's deliverable D2.1 by distinguishing Core Services from Community Services – the focus of the catalogue – and by introducing a governance model suited to a distributed research infrastructure. While Community Services are curated by partners and, in the next phase, National Nodes, the current Data Unit (future Service Office) is responsible for maintaining the SDT, controlled lists, and validation workflows.

Quality, sustainability, and interoperability are enforced through minimal requirements and policies aligned with the D2.11 Master Data Management. Only services meeting a RESILIENCE Service Readiness Level (RSRL) of at least 7, and offering a stable landing page, helpdesk contact, and user documentation are listed publicly. The SDT follows the structure of the SSHOC Open Marketplace to ensure metadata compatibility, while the Service Dictionary preserves mappings between RESILIENCE and SSHOC fields, enabling seamless future federation with the EOSC EU Node. The onboarding process and the respective responsibilities for curation and maintenance are documented in full.

Looking ahead, the next phase will focus on the operational implementation of the Service Catalogue: digitising the onboarding and quality-control processes, integrating the catalogue with the SSHOC Open Marketplace, publishing concise contributor and RSRL guidance alongside the Service Dictionary, and exposing the catalogue through the RESILIENCE HORTUS platform. Expansion through National Nodes will continue, accompanied by targeted RSRL elevation efforts to raise the maturity of selected high-value services.

2 Introduction

2.1 Purpose and Context

In accordance with the Grant Agreement, Work Package 2 (WP2) was mandated to establish a User Service Catalogue that makes RESILIENCE services both findable and usable, and that lists only those services which have passed internal quality checks and are ready for operational use. This deliverable fulfills that objective by presenting a curated set of community services, described in a consistent manner and prepared for integration with the broader SSH and EOSC ecosystems.[1] It also provides practical guidance on how to read the accompanying Excel catalogue, describes the onboarding workflow and governance, and refers readers to the living Service Dictionary for field definitions and controlled vocabularies.

The D2.2 User Services Catalogue operationalises the framework set out in the D2.1 Services Preparation and Implementation Strategy[2] and applies the metadata model developed in the D2.11 Master Data Management (MDM)[3]. Where D2.1 outlined the strategic principles of a distributed infrastructure—defining the distinction between Core and Community Services and the role of National Nodes—and D2.11 defined the Service Description Template (SDT), Service Readiness Level (RSRL), and metadata governance, the present deliverable translates those foundations into a concrete, export-ready catalogue.

The catalogue is accompanied by a living Service Dictionary[4], derived from Chapter 5 of D2.11 MDM. This dictionary is the authoritative reference for SDT field definitions, controlled vocabularies, and the adapted RSRL scale. It is the single source of truth for catalogue semantics and technical mappings. In case of divergence between D2.11 and the Dictionary, the latter takes precedence.

2.2 Scope

The first two chapters of this deliverable outline the implementation context for RESILIENCE as a distributed research infrastructure where services are delivered primarily through partners and, in the

[1] GRANT AGREEMENT, Project: 101079792 — RESILIENCE PPP — HORIZON-INFRA-2021-DEV-02, Description of The Action (Part A), p.7.
[2] RESILIENCE PPP – D2.1 Service Preparation and Implementation Strategy, https://doi.org/10.5281/zenodo.16568333
[3] RESILIENCE PPP – D2.11 Master Data Management, https://doi.org/10.5281/zenodo.15599787
[4] RESILIENCE Service Dictionary, https://doi.org/10.5281/zenodo.17741280

future, National Nodes. In chapter 3, we explain the catalogue's coverage, its emphasis on transparency and maturity, and the practical application of the Service Strategy's nine guiding principles. It also outlines the discipline-specific needs of the study of religion and shows how interoperability with SSH/EOSC has guided design choices. Chapter 4 distinguishes Core Services from Community Services—the former summarised for completeness, the latter fully listed and described.

Chapter 5 serves as a user guide to the catalogue, explaining its structure, metadata schema, and relationships to the D2.11 MDM and Service Dictionary. Chapter 6 defines minimal inclusion requirements and onboarding procedures, and Chapter 7 sets out next steps for digitisation, integration, and expansion of the catalogue. Together, these later chapters establish the operational basis for the RESILIENCE Service Catalogue and prepare it for federation with the SSHOC Open Marketplace and, ultimately, the EOSC EU Node.

The accompanying Excel file is the authoritative listing for the current RESILIENCE Community Services. References in regards to the SDT point to the Service Dictionary (normative specification) and earlier deliverables (strategy and metadata design) to ensure traceability without repeating prior material.

3 RESILIENCE Service Strategy

3.1 Guiding Principles

RESILIENCE's service strategy — defined during the PPP (06/2022-05/2026) and documented in D2.1 — aims to deliver high-quality, sustainable, and transparent services that are findable and accessible, aligned with FAIR principles, and driven by user needs from the study-of-religion community. The catalogue is the central operational instrument to realise this strategy. Rather than re-stating theory, this deliverable applies it: it explains the metadata profile we use (SDT), the maturity requirements (RSRL), the onboarding workflow, and the governance that keeps records accurate and interoperable.

The Service Catalogue is a curated, export-ready catalogue of community services. Each entry follows the streamlined SDT and is accompanied by the living Service Dictionary, which contains authoritative definitions and controlled vocabularies. This structure enhances discovery and reuse, supports federation with SSHOC / EOSC without the need for re-cataloguing, and ensures long-term transparency regarding service maturity. While the Data Unit manages the template, lists, and workflow, the partners (and future National Nodes) provide and maintain the community services.

Implementation of the guiding principles defined in D2.1 has been achieved through specific measures:

Guiding Principle	Implementation
1. Expertise and Excellence	Development of RSRL Scale; currently, only services reaching level 7 or higher are included.
2. Research output should be FAIR & sustainable	Mandatory helpdesk or support contact; repositories rely on trusted, FAIR-compliant infrastructures identified in D2.4 Data Management Plan[5].
3. Transparency	Creation of the Data and Service Dictionary, clarifying SDT fields and illustrating the RSRL scale through examples.
4. Clear and concrete Service Description	Standardised, concise descriptions following D2.11 guidelines; resulting in the living Service Dictionary accompanying the catalogue.
5. Stakeholder-driven	Future expansion of community services will be coordinated by National Nodes based on our community's needs.
6. Findable and accessible	Persistent identifiers and a machine-readable SDT aligned with recognised ontologies.

[5] RESILIENCE PPP – D2.4 Data Management Plan (DMP), https://doi.org/10.5281/zenodo.17224714

Guiding Principle	Implementation
7. Integration with SSH and EOSC	Ongoing collaboration and future integration with the SSHOC Open Marketplace
8. Core services should serve a wide user base	Development guided by user feedback and the Service Strategy's results.
9. Community services can be locally driven	Progressive hand-off to National Nodes for decentralised maintenance within a unified governance framework guided by central Headquarters.

Table 1: Guiding Principles Implementation Measures

3.2 A Service Catalogue Based on User Needs

The primary goal of a RESILIENCE service catalogue is to cater to the needs of the study of religion (RS) community. To gain a better insight into the needs of this community, WP2 is also in close collaboration with WP3 Users. This collaboration mostly takes the form of joint workshops at RESILIENCE partner institutions as described in the 'Workshops Proceedings' deliverables.[6] This allows WP2 to both collect information on existing resources and to be closer to the work WP3 does to collect the needs of users. This collaboration combined with the mapping of existing services among the RESILIENCE partners serves to recognise gaps between the resources needed by and available to the RS community.

Filling these gaps requires reliable and sustainable services for the community, which is why technological readiness and sustainability are important aspects to consider when collecting information about existing resources.

Because RESILIENCE is part of this community, this allows for some flexibility in offering tools and services of a lower RSRL that are still in development if there are clear mentions about the development status or if users are explicitly involved in a testing phase. 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 validated but not yet fit for wide scale use while giving the service providers access to input and feedback from users.

[6] RESILIENCE PPP D3.1 – Workshops Proceedings 1st Batch, https://doi.org/10.5281/zenodo.16276706 ; D3.2 – Workshops Proceedings 2nd batch, will be published on the RESILIENCE Zenodo community in December 2025

3.3 Usage of Digital Tools in the Study of Religion

A short survey was sent out to all the RESILIENCE partners in 2025 which aimed to gain insight into the actual usage of digital tools amongst researchers in the study of religion, and the main obstacles they face in improving their digital literacy. This survey should be viewed as a pilot, with 40 responses from an estimated total pool of ca. 1200 researchers from 11 different countries. A more extensive report on the use of digital tools and the digital turn in theology and the study of religion will be published at a later date.

For finding tools and data, the responses confirm that researchers make use of a wide variety of tools for finding, organizing, and analyzing data, with choices reflecting institutional access and disciplinary habits. IxTheo was mentioned by eight different respondents, whose nationality varied enough to show that this service is being used beyond Germany. While well-established academic databases such as Google Scholar, WorldCat, JSTOR are mentioned, they are by no means dominant, with a multitude of smaller database applications, and institutional catalogues often the preferred option. This reflects the disciplinary variety of the data, which is also highlighted by the high number of applications per respondent (ranging from 0 or 1 to a whopping 29). Noteworthy, however, are a few unconventional responses such as Anna's Archive, a platform associated with pirated materials, and social media platforms like YouTube, TikTok, Instagram, and Facebook, and even Reddit API which suggests that some researchers are turning to informal or non-traditional sources for inspiration or supplementary data. There was only one mention of an RI, namely CLARIN.

Personal online research is still the most-cited method of finding new digital aids, but it's clear that most respondents use a wide variety of methods. Personal networks / contacts and faculty colleagues are also frequently used, and social media deserves an honorary mention as well. Clearly informal networks and ways of finding new tools are more used than formal, institutional ways, which is not surprising given the constantly changing landscape of digital aids and AI. It is also important to note that external conferences did not score very high for finding out about new digital aids. The role of the supervisor/promoter is a bit more positive, though here too a higher score could be expected given the impact of digital aids on research.

Lack of time and lack of money form the biggest barrier for finding and using new digital aids, followed by lack of training. Lack of time was also elaborated on more extensively, who cited "[…] heavy academic and

administrative responsibilities", and the trade-off between learning how to use a new tool and benefiting from it: "I always have a feeling that it will take me too much time to learn how to use the tool for it to really be useful enough for the trade to be justified." Financial concerns were also addressed, including for access to API platforms, and the issue of needing long-term access, requiring sustainable funding. While occasionally mentioned, ethical concerns and institutional issues were not as prominent as expected. While RESILIENCE cannot address all of these concerns, it can play a role in facilitating informal contacts between researchers via access to a single platform specifically dedicated to services and data for the study of religion, to encourage knowledge exchange and to provide extra training on specific key technological innovations and expertise.

When it comes to organizing data, the answers indicate a strong reliance on basic office software (Microsoft Excel, Word, Google Docs) and, to a lesser extent, on reference management tools such as Zotero. This implies that most respondents favor accessible, user-friendly tools rather than more advanced data management systems. For analyzing data, the predominance of Microsoft Word, especially as the first choice, indicates that textual analysis is still the norm in this group. However, this was not the case for the linguistic, historical, and empirical disciplines, which cited a large range of very specific tools. The service catalogue confirms this finding, with a large number of discipline-specific databases, tools, and services, and shows that this is still a key need for research on the study of religion.

The survey showed that a personal laptop is still the most used method for storing data, followed by an external hard-drive or disk. Neither of these are ideal solutions, nor do they incorporate more secure options such as Dropbox, One-Drive, or data repositories. There is a clear gap here that RESILIENCE can bridge via access to online data repositories, as well as training on FAIR data, data management, and data storage. This finding is confirmed by a small-scale qualitative study conducted at the KU Leuven Faculty of Theology and Religious Studies in 2023-2024, which found that researchers experience a lot of stress in trying to adhere to the correct data management practices. One of the key reasons for this is that the study of religion concerns sensitive data, and therefore requires the most secure data protocols. Researchers often feel torn between wishing to open up their data as much as possible, while trying to protect their sources as much as possible. Such concerns are easily addressed via training and clear guidelines, something which RESILIENCE aims to provide in the future.

3.4 The Diversity of the Study of Religion

As an interdisciplinary and multilingual area of inquiry, the study of religion entails a vast range of knowledge loci, leading to diverse sets of data, all of which are subject to their own limitations and specifications. They extend across time (historical and contemporary data), context (culture, geography, language, religion), and are multimodal, ranging from texts to audio, visual, and auditory data, as well as physical and material data. The study of religion thus suffers from both an abundance and scarcity of sources, with a huge number of printed records scattered across large and small archives and libraries across Europe that nevertheless remain inaccessible to researchers since they are neither indexed nor catalogued.

This diversity has three practical implications for the catalogue:

1. Hybrid access is essential. Digitisation improves reach but does not eliminate the need for on-site consultation of unique or rights-constrained material. The catalogue must therefore represent Physical, Virtual/Remote, and Hybrid access transparently (see section 5.3), as well as highlight the importance of physical access to sources.
2. Methodological specificity matters. Researchers search by what a service does (e.g., Digitise, Annotate, Analyse) as much as by what it is. Our adoption of EOSC categories plus TaDiRAH activities supports both discovery paths (see section 5.2).
3. Maturity and support must be ensured and visible. Given varied provenance (GLAM, universities, private archives), the RSRL gives researchers a clear signal of readiness and support expectations; inclusion at RSRL ≥ 7 ensures baseline reliability while allowing providers to improve over time.

3.5 Wider European context

RESILIENCE's catalogue is built to plug into the SSH/EOSC ecosystem without re-work. The D2.1 Service Strategy has set this direction, while the D2.11 Master Data Management (MDM) and this deliverable implement it with concrete steps. The MDM already positions RESILIENCE against EOSC's interoperability ambitions and CDIF thinking so and in this deliverable we apply that stance at catalogue level by (a) keeping discovery metadata lean and mappable, and (b) separating classification (Category/Activity) from access (Access/Order/Mode), which improves portability and filtering across portals.

From the very start of the PPP, we have worked on aligning with the EOSC Federation. The transition from the EOSC Future Marketplace to the new EOSC EU Node has been taken into account as continuity for the EOSC community is ensured.[7] Throughout the RESILIENCE PPP this switch and further evolutions of the EOSC EU Node have been closely monitored by WP2 to ensure it remained interoperable with the Federation.

One of the outcomes of the alignment between the Service Strategy and this monitoring activity is that the entryway to the larger EOSC should be through the thematic SSHOC and its Open Marketplace. This is why our SDT, including the EOSC Resource categories[8], activities (TaDiRAH), and essential discovery fields, mirrors SSHOC guidance as this ensures our records can be harvested or mapped with minimal transformation. It is for this purpose that we maintain a mapping table (RESILIENCE SDT → SSHOC Metadata Fields) alongside the Service Dictionary and will keep it updated during future changes. Where the Service Strategy captured the rationale for this alignment, D2.2 operationalises it.

Concrete actions we've taken to ensure interoperability are:

- Machine-readable SDT (with controlled lists managed in the Service Dictionary) to enable programmatic validation and export.
- Use of established vocabularies/ontologies from the MDM (e.g.: Schema.org application profile for platforms), avoiding custom semantics.
- Stable identifiers and resolvable links at record level (e.g.: landing page, helpdesk,...) to meet discovery and sustainability expectations.
- Future change-logging and regular review of both the Service Dictionary and the Catalogue for transparency and maintainability.

[7] https://eoscfuture.eu/newsfuture/eosc-future-signs-off/ ; https://digital-strategy.ec.europa.eu/en/news/commission-announces-winners-eosc-procurement

[8] https://wiki.eoscfuture.eu/display/PUBLIC/B.%2Bv4.00%2BEOSC%2BResource%2BProfile#B.v4.00EOSCResourceProfile-ResourceCategory

4 Core & Community Services

RESILIENCE operates as a distributed research infrastructure. Services are provided primarily through partners and, in the future, National Nodes rather than from a single central site. During the PPP, this resulted in two complementary workstreams:

1. Defining and piloting a limited number of Core Services operated directly under the RESILIENCE brand; and
2. Mapping, evaluating, and onboarding community (in-kind) services contributed by partners into a unified, searchable catalogue.

The catalogue published with this deliverable includes community services only. Core Services are summarised for completeness and managed separately within their respective tasks and deliverables. Distinguishing between Core and Community Services clarifies governance and sustainability: Core Services secure the essential baseline (discovery, access, FAIR publication, training), while the community catalogue expands the offer by showcasing mature, partner-operated services – an approach consistent with the Service Strategy's principles of leveraging strengths and avoiding duplication.

4.1 The RESILIENCE Core Services

Whereas Community Services can be more varied and diverse according to a number of requirements and/or opportunities, our limited core services should be based on the needs of the community (as it is also indicated in guiding principle number 8) and the available resources during the RESILIENCE PPP. This led to the implementation of:

- a data repository solution for the FAIR data publication of research data in RS (4.1.1)
- a data hub and discovery environment giving access to a wide variety of heterogeneous digital objects (4.1.2)
- an elaborated TNA program for access to and expertise on physical as well as digital collections (4.1.3)
- targeted training opportunities aligned with the methodological, digital, and domain-specific skills required within the study of religion (4.1.4)

Our community's specific user needs directly shaped the RESILIENCE Core Services, which are presented in the subsections below in the same order.

4.1.1 RESILIENCE Zenodo Community

The RESILIENCE community on Zenodo[9] for FAIR data publication. This general-purpose open repository allows researchers to deposit all research-related items, which are linked to a DOI and published under an open license. See the D2.4 Data Management Plan[10] for more information.

4.1.2 ReIReSearch

The online discovery platform ReIReSearch[11] where disparate digital resources and databases are searchable in a unified and standardized way thanks to extensive metadata provided by partner institutions. The platform includes an intuitive search interface to search collections of manuscripts, documents, and rare books within the scope of the study of religion. See Chapter 6 of the D.11 Master Data Management Plan for more information.

4.1.3 Trans-National Access (TNA)

The RESILIENCE TNA Programme[12] offers physical and virtual access across national borders to the most significant tools and sources in those disciplines related to the study of religion. TNA offers support and expertise for research stays at so-called TNA Hosts[13]: European institutions and libraries that possess unique collections and expertise on the study of religion as a whole. This includes, but is not limited to, the sources and expertise needed to conduct research on the contemporary and historical study of the world's major and minor religions, as well as new religious movements, secularization and non-religious worldviews, indigenous religions across the globe, and more.

Its aim is to facilitate and foster easy access to sources, resources, expertise and services for researchers in the study of religion, while ensuring an efficient access workflow and a single-entry point via the RESILIENCE homepage and central helpdesk. This offer thus combines access to data of major European

[9] RESILIENCE Community on Zenodo, https://zenodo.org/communities/resilience/records?q=&l=list&p=1&s=10
[10] RESILIENCE PPP D2.4 – Data Management Plan, https://zenodo.org/records/17224714
[11] ReIReSearch, https://reiresearch.eu/#/
[12] TNA Landing Page, https://www.resilience-ri.eu/tna_fellowship_programme/
[13] TNA Host,; https://www.resilience-ri.eu/transnational-access-hosts/

research institutions together with access to a vast network of experts for the study of religion. RESILIENCE therefore aims to not only attract academic institutions, but also policy makers, religious institutions, and independent research institutes. In short, the role of the RESILIENCE TNA program is fundamentally a facilitating one, benefiting both host and recipient, and supported by RESILIENCE's excellent professional network. See D2.5 TNA Services Management Plan[14] for a full description of the programme. A report on the TNA activities of the RESILIENCE Preparatory Phase will be published on 30 April 2026.

4.1.4 Training and Workshops

RESILIENCE is developing a user-centred training programme that focuses on providing courses that will bridge the gap between what is already available and what our users need. Training needs in the context of RESILIENCE and the study of religion focus on four key areas:

1. Training in already existing RESILIENCE Services such as TNA and ReIReSearch
2. Training in new skills emerging from unforeseen advancements in research and the digital humanities, irrespective of whether these are connected to RESILIENCE services or tools or not.
3. Training in Core Skills and Competences for the study of religion as a RESILIENCE service arising from expressed needs of our target audience. These include methodological competences in study of religion; ethical and cultural sensitivity and awareness; challenges of research in politically and religiously sensitive contexts, and more.
4. Training in Basic/Transversal Skills required for doing research in the field, such as IT and Digital skills, language skills, data management skills, computational skills, and more.

More information can be found in the D2.6 Training Services Management Plan[15].

4.2 The RESILIENCE Community Services

Community services are in-kind contributions from consortium partners and their local networks, currently coordinated through the consortium partners and in the future via National Nodes. Partners or Nodes identify regional resources, build local consortia, and contribute services and expertise to the RI; they also

[14] RESILIENCE PPP D2.5 – TNA Services Management Plan, https://zenodo.org/records/17601848
[15] RESILIENCE PPP D2.6 – Training Services Management Plan, https://zenodo.org/records/16568496

align with other national SSH consortia (e.g., DARIAH, CLARIN, CESSDA) to avoid duplication and maximise reuse.

Partners / Nodes have (and will) curate their own community services, request updates from providers, and notify changes in RSRL or Access conditions. The Data Unit (future service team) stewards the SDT and controlled lists, validates records for consistency, and maintains a change log aligned with batched updates. This split of responsibilities follows the distributed RI model set in D2.1.

At publication, the catalogue contains 119 services across 14 partner institutions. By focusing on each partner's strengths, we were able to compose an expansive and highly qualitative Service Catalogue, unique in the field of the study of religion. To illustrate the breadth of in-kind contributions, the following examples showcase partner strengths (non-exhaustive):

- Ecole Pratique des Hautes Etudes: physical collections and on-site consultation workflows.
- University of Münster and the Tübingen University Library: specialized information services for theology and the study of religion, and the data aggregator IxTheo.
- Fondazione per le scienze religiose Giovanni XXIII: extensive archival resources and libraries on a wide range of RS sources and manuscripts.
- Sofia University St. Kliment Ohridski: specialises in Bulgarian Medieval Written Heritage and offers access to Histdict and e-Medievalia, which are unique sets of digital tools that create new opportunities for Slavic and Byzantine studies.
- Volos Academy for Theological Studies: scholarly expertise
- University of Sarajevo: domain-specific datasets, tools, or archives.
- University of Leuven: offers major ecclesiastical archives and digitisation services.

5 Implementation of the Service Dictionary

The Master Data Management (D2.11) deliverable introduced the layered approach of a Data Dictionary and Service Dictionary to improve interoperability and discoverability across the RS community. The Service Dictionary, including the updated Service Description Template (SDT) provides the standard framework for describing every RESILIENCE service. Since then we have extracted this dictionary into a separate document that lives alongside the User Services Catalogue. Chapter 5 explains how those components are applied in practice within the catalogue and how the associated governance ensures consistency and reliability.

To reduce the burden on service providers, the SDT evolved from a comprehensive, EOSC-profile-based pilot to a concise four-tier template – minimum, preferred, technical, and optional fields. This refinement, informed by partner feedback and the OSCARS benchmark[16], reduced complexity while maintaining full interoperability. Detailed field definitions and code lists are maintained in the Service Dictionary, which prevails wherever wording diverges from D2.11.

5.1 The Service Description Template (SDT)

After finalising the operational version of the SDT, partner services were collected following the nine guiding principles from the Service Strategy. The steps taken include:

- Collection of basic information of potentially interesting services from partners, regardless of TRL; only name, link, description and internal contact information was required at that point
- Once the customized RESILIENCE SRL Scale was finished, two one-pagers with its explanation and examples was distributed so partners could assign a level to their own services
- Based on those RSRL levels, the presence of a stable link, and helpdesk/customer support, services were selected to be included in the catalogue
- Afterwards followed the collection of additional minimum and preferred fields

In the following sections, we apply the new SDT operationally to our current service catalogue Excel and clarify category and access types for end-users.

[16] OSCARS D2.1 - Clusters' Services and Data Sources Portfolios, https://doi.org/10.5281/zenodo.14881627

5.1.1 At a Glance

The different field types:

- Minimum (12 fields) – mandatory for catalogue inclusion: Name, Resource Organisation, Webpage Description, Category, Access Type, Order Type, Language, RSRL, Contact, Helpdesk information.
- Preferred (8 fields) – enrich discovery but are not gating: Sub-category, Access Mode, Access Process, Access Policy, Target Users, Tags, Geographical Location, Terms of Use / User Manual.
- Technical & Optional — applied only when relevant (e.g., versioning, dependencies, privacy policy); carried in the back-office but not required for inclusion.

For the semantics and detailed explanation of the fields, see the Service Dictionary.

The catalogue policy we have carried forward during the drafting of our service catalogue includes: services must meet RSRL ≥ 7, expose a stable link, and provide helpdesk/contact and terms of use. We have also implemented multiple controlled lists / vocabularies where possible to ensure FAIRness and interoperability. The full tables and definitions of those lists can be found in the Service Dictionary where they are maintained.

5.1.2 How to read the current Service Catalogue

The accompanying Excel file lists each service as a single row with the SDT columns below. This legend describes the labels for each column. For full field definitions, examples, and the technical/optional attributes (e.g., dependencies, version, policy links), see the Service Dictionary.

Column Name	Data Type	Remarks
Name	String	Human-readable title
Resource Organisation	String	Managing/delivering organisation (or coordinating node)
Webpage	URL	Persistent URL to the service or its information page
Description	String	

Column Name	Data Type	Remarks
Access Type	Controlled list	Physical / Virtual / Hybrid
Category	Controlled list	Applied by the Data Unit, based on the EOSC Resource Categories
Order Type	Controlled list	(Fully) Open access / Restricted Access / Order Required
Access Mode	String	Eligibility notes (eg: account only for students, institutional users only, excellence-based)
Language	Controlled list	Languages the webpage is accessible in
Target Users	Controlled list	Eg: researcher, student, citizen scientist,...
RSRL	Integer 1-9	Catalogue threshold is ≥ 7
Contact	E-mail / URL	Email or form URL
Helpdesk	E-mail / URL	Email or form URL; plus helpdesk page if distinct.

Table 2: Current Service Catalogue Metadata Fields

5.2 Categories and Activities

To ensure interoperability with the broader SSH ecosystem, RESILIENCE classifies services using the EOSC Resource categories as the primary scheme and will in the future complement them with TaDiRAH activities to express methodological aspects. This choice builds directly on the alignment work described in D2.1 and D2.11 and follows a desk study of SSH RIs and e-infrastructures such as the EOSC EU Node Resource Hub[17], DARIAH's tools and services catalogue[18], OPERAS Pathfinder and GoTriple platform[19], and the CESSDA Research Directory[20]. Together, those two categorizations provide a shared, standards-based language for discovery across RESILIENCE and downstream platforms such as the SSH Open Marketplace.

[17] https://open-science-cloud.ec.europa.eu/resources/all
[18] https://www.dariah.eu/tools-services/tools-and-services/
[19] https://pathfinder.operas-eu.org/search/services
[20] https://www.cessda.eu/Resource-Directory

The EOSC Resource categories[21] supply a stable, widely used top-level classification for "what the service is" (e.g.: Data Source, Processing/Analysis Tool, Training, Scholarly Communication). Using EOSC categories keeps RESILIENCE catalogue records compatible with the profiles and practices consulted during D2.11's template work and reduces custom mapping later.

The TaDiRAH activities capture "what the service is used to do" in SSH workflows (e.g., Digitise, Curate, Annotate, Analyse, Visualise). TaDiRAH is already adopted across SSH (incl. SSHOC/SSH Open Marketplace), which makes our activity tagging intelligible to users coming from other RIs. It also provides our users with an additional way of filtering and searching through our services.

Many of RESILIENCE's community services span several areas. For example, the Book Heritage Lab provides access to Instrument & Equipment and Data and Material Analysis, as well as Education & Training and Consultancy & Support. Our approach permits multiple EOSC categories per record and several TaDiRAH activities, so users can discover a service via either its functional class or its workflow role.

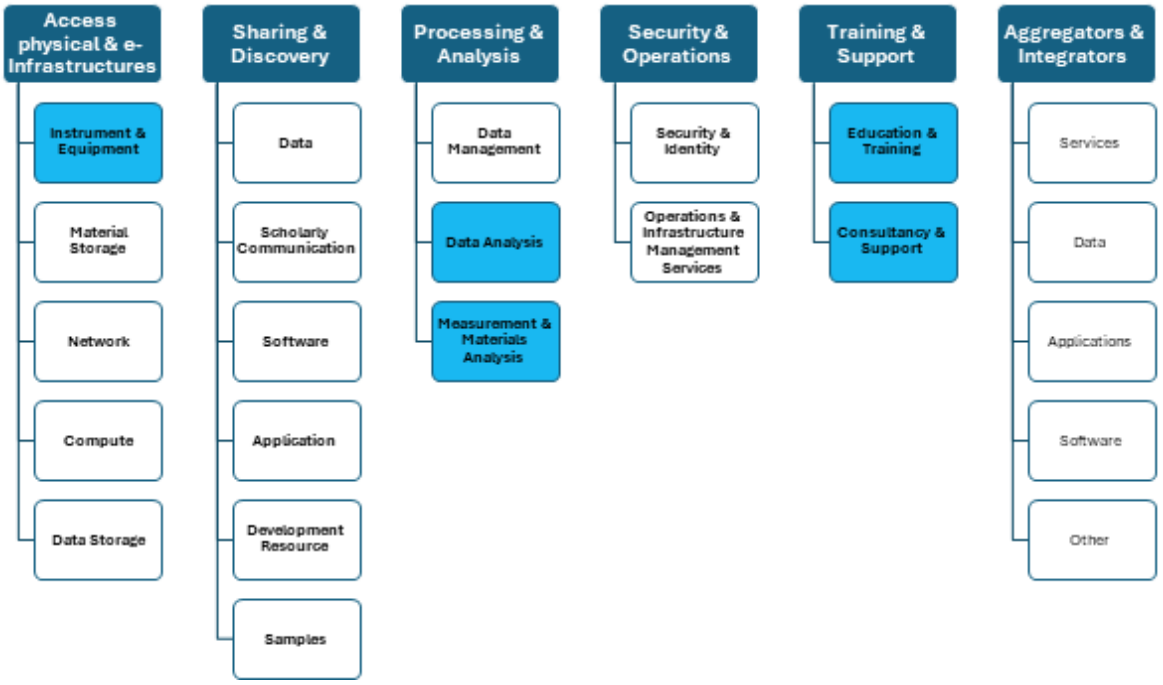

Figure 1: Supercategories & categories covered by Book Heritage Lab KU Leuven

[21] https://wiki.eoscfuture.eu/display/PUBLIC/B.+v4.00+EOSC+Resource+Profile#B.v4.00EOSCResourceProfile-ResourceCategory

Implementation of those categories on physical services such as Archives that can only be visited in person proved an interesting challenge. Physical holdings are now modelled as Material Storage and Data Source with Access Type 'Physical'. TaDiRAH activities can later on clarify the workflow touchpoints the service supports (e.g., Acquire, Digitise, Curate, Discover). Where an institution offers add-on services (e.g., Digitisation on demand, Scholarly consultation), they are currently added as additional categories to the same service but can in the future be recorded as separate services and linked via "Related Resources." This would make discovery even clearer while reflecting real-world service bundles. Field semantics and examples are defined in the Service Dictionary.

5.3 Access and Order Types

Where the Category/Activity fields answer what the service is and what it is used for, the Access Type and Order Type fields describe how users can reach and interact with a service. Together, they allow the catalogue to filter and compare services by availability and openness, ensuring transparency for both users and managers. They are mandatory elements in the Service Description Template and align with the EOSC and SSHOC metadata profiles.

During SDT testing by the Data Unit, several partners interpreted the "access" fields as pertaining to "open access" and thus the introduction of a new "service type" label was proposed to indicate whether a service is physical or digital. To preserve interoperability with SSH-wide practices (including the SSH Open Marketplace) and former EOSC Portal conventions, RESILIENCE retained the EOSC-style Access Type / Order Type separation and clarified the associated Access Mode / Access Process fields. Using these predefined terms ensures consistent filtering across the catalogue and compatibility with EOSC metadata harvesting. The field definitions are maintained in the Service Dictionary.

We distinguish between:

- Access Type (required): how users reach the service – Physical, Digital, Remote (Virtual), or a combination.
- Order Type (required): specifies under which conditions the service can be used; serves as the openness at a glance – (Fully) Open Access, Restricted Access, Order Required.
- Access Mode (preferred): eligibility criteria or constraints — account needed, institutional only, excellence-based, proposal required, etc.

- Access Process (preferred): short text or URL describing the practical steps to request, book, or purchase access.

To demonstrate the differences between the fields, a table with examples is provided:

Service	Access Type	Order Type	Access Mode	Access Process
ReIReSearch	Digital	Fully Open Access	https://reiresearch.eu/#/eula	NA
Book Heritage Lab	Physical	Restricted Access, Order Required	Proposal required; Institutional only for certain services	Link to booking/request form
Online Database	Digital	Open Access, Fully Open Access	Account required for the API	API key registrations page
On-site archival consultation	Physical	Restricted Access	Only accessible to researcher	E-mail to ask for access
Training on demand	Remote	Order Required	Pre-booking required	Online booking form

Table 3: Access and Order Types Examples

6 Onboarding of Services

6.1 Minimal Requirements

In line with the guiding principles of D2.1, RESILIENCE onboards only those services that meet a baseline level of maturity to ensure that all resources listed are reliable, sustainable, and FAIR.

Our minimum inclusion requirements are:

- RSRL level of 7 or higher;
- Publicly available documentation describing how to access and use the service;
- An active helpdesk or monitored contact channel;
- Evidence of regular maintenance;
- A stable, resolvable landing page or URL.

These requirements operationalise the PPP strategy and apply the SDT/RSRL framework introduced in D2.11 and outlined in the Service Dictionary.[22] Both the RSRL self-assessment and questions pertaining to documentation and the helpdesk are essential elements in the service description, and play an important role in the procedures to be followed after a description has been submitted.

A resource cannot be considered mature if any of the above requirements are not available. The Service Catalogue can, however, also contain innovative new services and tools that have a low technology/service readiness level if it offers potential users clear information on the experimental and possibly temporary nature of the service. By being transparent about the RSRL, RESILIENCE can offer innovative and experimental tools of value to the community without running the risk of low quality and limited availability of the service offering.[23]

6.2 RESILIENCE Service Level Readiness (RSRL)

A key part of developing procedures for evaluating and onboarding in-kind/community services, has been the implementation of our own RESILIENCE Service Readiness Level. This has helped us focus on

[22] RESILIENCE Service Dictionary v1.0, chapter 5, p. 16 - 20, https://doi.org/10.5281/zenodo.17741280 ; RESILIENCE Service Readiness Level overview and examples, https://doi.org/10.5281/zenodo.17701369
[23] RESILIENCE PPP D2.1 – Services Preparation and Implementation Strategy, https://doi.org/10.5281/zenodo.16568333

increasing the visibility of qualitative and highly useful tools and resources already available at partner institutions and in the wider research ecosystem.

The RSRL adapts the Technological Readiness Level (TRL) Scale[24] for the SSH field and GLAM context so non-technical providers can self-assess maturity consistently through plain-language descriptors and relevant examples. The need for such an adaptation became clear during meetings of the Data Unit that included both partners from the IT and GLAM sector, where using the TRL Scale simultaneously for technical and non-technical services caused too much confusion. The minimal requirement for onboarding on the RESILIENCE Service Catalogue is RSRL 7 or higher for existing (in-kind) services. This helps ensure that RESILIENCE offers the community services that are accessible and usable, not only at the moment of onboarding them but also in the long term.

As stated in the previous section, as well as the D2.1 Service Strategy, pilot demonstrators (RSRL >= 4) can be included in the future as long as the RSRL is clearly indicated to the end users. They can 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 validated but not yet fit for wide scale use while giving the service providers access to input and feedback from users.

For now we have implemented a two-tiered approach:

- Public catalogue (this D2.2): services with RSRL ≥ 7 only.
- Pilot catalogue (RSRL 4–6): curated "in progress" entries are tracked outside the public spreadsheet; they are clearly marked as experimental and do not meet EOSC EU Node Rules of Participation (min TRL 7).

During the PPP we have kept the Pilot catalogue as an internal backlog (separate internal spreadsheet). In the next RESILIENCE Phase, however, we may look into the development of an online portal in which the 'experimental' section of the Service Catalogue is closed off behind a login with explicit disclaimers and opt-in access, ensuring coordination between the users and providers. However, the technical implications

[24] https://wiki.ni4os.eu/index.php/Technology_Readiness_Level

of this feature need to be explored further before there is a chance of implementation. Promotion of such services to the public catalogue occurs once the service reaches RSRL ≥ 7.

6.3 Procedures for Onboarding

There are currently five steps to be undertaken when submitting a community service to the RESILIENCE Service Catalogue:

1. Submission – Provider, partner, or National Node completes the SDT Minimum fields
2. Validation – Data Unit check completeness and adherence to the minimum requirements
3. Decision – Data Unit accept (RSRL ≥ 7); returns with feedback (RSRL 4–6); or rejects (RSRL <4)
4. Completion & publication – Provider completes missing fields of the SDT; Data Unit normalises controlled terms and adds the record to the catalogue.
5. Review & Maintenance: Change log and annual sanity checks / updates ensure continued accuracy

This process balances quality control with inclusivity, enabling innovative tools to mature while maintaining public trust in the catalogue's reliability. Throughout the onboarding of community services, the Data Unit (future Service Officers) must collaborate with the provider to check if there is any mandatory information missing from the description. The submitted URLs need to be checked to see if they are correct and the websites themselves are active. Though it is not up to RESILIENCE to evaluate or determine the RSRL of a resource, an exploration of the available documentation and technical specifications can help determine whether the self-assessed RSRL is a realistic evaluation of the resource.

In regards to governance, there are three parties involved in the curation, publication, and maintenance of the RESILIENCE Service Catalogue:

- Data Unit (= future Service Team): stewards of the catalogue, owns SDT/controlled lists, validates submissions, manages the change log, and performs annual refresh.
- Partners (future National Nodes): curate local services, coordinate providers, and notify changes (e.g.: RSRL upgrades).
- Service Providers: keep records accurate; maintain helpdesk/documentation; flag maturity changes.

This matches the distributed RI model and Node responsibilities set in D2.1.

7 Next Steps

During the following years, RESILIENCE will move on from its preparatory, proof-of-concept phase to its operationalisation and implementation phase. The priorities for this coming period are threefold:

1. digitise onboarding and quality control so we can scale beyond manual curation;
2. integrate with the SSH Open Marketplace so RESILIENCE services are discoverable for a broader public of SSH researchers; and
3. expand and improve the catalogue through the National Nodes, while keeping our high quality level (RSRL ≥ 7) intact.

In parallel, we will make our Service Dictionary (SDT & RSRL) and short RSRL guides available on the catalogue website — akin to SSHOC's Metadata Guidelines[25] — so contributors and reviewers have one, consistent point of reference. Together, these steps turn the PPP investments into a sustainable, federated service catalogue for the study-of-religion community.

7.1 Integration with the SSHOC Open Marketplace

RESILIENCE has monitored the evolution from the EOSC Future Marketplace to the new EOSC EU Node to ensure uninterrupted interoperability. Since SSHOC acts as the main gateway for the SSH domain, the SDT directly mirrors its metadata guidance and vocabulary structure. A maintained mapping table (RESILIENCE SDT → SSHOC Metadata Fields) accompanies the Service Dictionary to guarantee compatibility during future updates.

We will apply to the SSHOC editorial board and designate a RESILIENCE editor who can gatekeep entries into the service catalogue for quality and scope. Once we move on to the next Phase, National Nodes will be responsible for submitting or updating records through the SSHOC Open Marketplace. The RESILIENCE editor only performs light-touch checks and reconciles entries to our catalogue using stable identifiers and links.

Two principles keep this integration robust. First, only services at RSRL ≥ 7 are exported to SSHOC; experimental pilots (RSRL 4–6) remain in an internal pilot list until they mature. Second, we keep the

[25] https://marketplace.sshopencloud.eu/contribute/metadata-guidelines

normative specification (SDT, codelists, mappings) in the Service Dictionary so that SSHOC submissions remain consistent as labels evolve. Over time, we aim to automate parts of the exchange (e.g., periodic reconciliation and link checks) while preserving curation where it adds value.

We will also publish a concise "How to contribute to SSH Open Marketplace (for RESILIENCE)" guide – mirroring our Zenodo guide[26] – so Node contributors can upload with confidence. This will sit alongside the Service Dictionary on the catalogue website and be updated during regular reviews.

The mapping table of the current SSHOC Metadata to the RESILIENCE SDT looks as follows:

SSHOC Open Marketplace Field Name	RESILIENCE SDT Field Name
Label	Name
Actor	Resource Organisation
AccessibleAt	Webpage
Description	Description
Resource Category	Category
Mode of use	Access Type
Language	Language
TRL	RSRL
Custom Field	Contact
Helpdesk URL	Helpdesk Information
Authentication	Order Type
Authentication	Access Mode
Intended Audience	Target Users
Discipline	*This will default to 'Philosophy, Ethics & Religion'*

Table 4: Mapping Table SSHOC Metadata – RESILIENCE SDT

[26] Zenodo RESILIENCE Community Upload Guide, https://doi.org/10.5281/zenodo.17712867

7.2 The HORTUS Platform

RESILIENCE is in the process of developing its own dedicated platform to help users find, access, and use its services. A prototype called HORTUS was developed by ITSERR (Italian Strengthening of the ESFRI RI RESILIENCE), which is an interdisciplinary and distributed Research Infrastructure for Religious Studies whose main purpose is to strengthen the RESILIENCE RI in its preparatory phase, through its national institutional dimension, scientific positioning, technical development, and public perception. See the ITSERR webpage[27] for more information.

HORTUS aims to provide its users with a single discovery entry point across the whole future infrastructure — publications, events, projects, datasets, and people. The search unifies diverse metadata sources (eg: D4Science gCat, ElasticSearch index, SOLR metadata service) and enforces semantic alignment via metadata standards (eg: Dublin Core, DataCite, TEI). It supports cross-disciplinary retrieval and FAIR principles (Findable, Accessible, Interoperable, Reusable). HORTUS thus functions as a platform of platforms, enabling hosted IT applications — such as annotation tools, visualization engines, or AI services — to operate within its Virtual Research Environments (VREs).

Key features of the platform include a workspace that provides researchers with versioned file storage, access control, and preservation across project; and event management feature; institutional pages that consolidate project identity, team information, and outputs; a social feed and micro-posts; metadata and catalogue management, as well as metadata-set creation and custom object type; and a training centre and educational resources.

As HORTUS matures, the RESILIENCE Service Catalogue will appear there as a searchable component and, in time, as a personalized user view. HORTUS will consume rather than author service records: stewardship remains with the Data Unit (future Service Office), which provides the single, curated data feed.

[27] https://www.itserr.it/

7.3 Expanding / Improving the Catalogue

The creation of the catalogue in the PPP, has focused first on services within partner institutions. The next step is to move to a National Node-driven model that represents national ecosystems. Expansion will be paced and evidence-led as insights gathered through users and workshop outcomes continue to guide which gaps we address first (e.g., digitisation-on-demand, training offers, on-site archival consultation,...).

The shift to a Node-driven model will expand national coverage while maintaining consistent inclusion criteria (RSRL ≥ 7). Improvements will focus equally on breadth and quality: increasing completion of Preferred fields for better discovery; publishing an RSRL Elevation Playbook to guide upgrades; and introducing a monitoring framework tracking discoverability and user uptake.

Early pilot projects will be implemented to demonstrate how targeted interventions can raise maturity – such as enhancing multilingual usability of Histdict (UNISOFIA), onboarding Church Goes Green (VOLOS Academy) with inclusive design, and improving findability of EPHE's archival holdings. These examples will inform a reusable Service Readiness Elevation Playbook for future Nodes.

To facilitate controlled growth, RESILIENCE will publish concise provider documentation, hands-on training sessions, and a plain-language Service Policy that summarises inclusion and maintenance expectations. Together, these measures will enable the catalogue to evolve while preserving its clarity, consistency, and trustworthiness.

8 Conclusion

The User Services Catalogue marks a major milestone in RESILIENCE's journey toward a sustainable, user-oriented research infrastructure. By consolidating community services through a harmonised metadata model and shared governance framework, it delivers both transparency and interoperability across the 'study of religion' community. Together with the Service Dictionary it provides the foundation for future integration with HORTUS, SSHOC and EOSC.

In the next phase, RESILIENCE will focus on expanding the catalogue through its National Nodes, digitising onboarding and quality-control processes, and raising the maturity of high-value community services. These steps will ensure that the catalogue remains a living, authoritative resource – continuously evolving to reflect the diversity and excellence of the research services it represents.

9 Applicable Documents

Applicable documents are documents from which all requirements must be fulfilled in the context of the Grant Agreement, although they are not repeated in the present document.

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

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
R2	27/11/2025	RESILIENCE Service Dictionary v1.0
R3	30/5/2025	RESILIENCE PPP – D2.11 Master Data Management v1.0
R4	24/7/2025	RESILIENCE PPP – D2.1 Services Preparation and Implementation Strategy v3.0
R5	18/9/2025	RESILIENCE PPP – D2.4 Data Management Plan v1.1

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