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Abstract

The Open Science Assessment Framework (OSAF) promotes Responsible Research Assessment (RRA) by emphasizing the evaluation of Open Science practices through both process and infrastructure. This document outlines the elements of the Openness Profile, Assessment Portfolio, and Assessment Registry, which are digital tools supported by the RAiD identifier system to enhance transparency and collaboration in research evaluations. Together, the OSAF method and infrastructure enable adaptable, context-sensitive research assessment while integrating outcomes with broader research information systems.



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Abbreviation List

ALLEA - All European Academies (The European Federation of Academies of Sciences and Humanities)

API - Application Programming Interface

ARRA - Agreement on Reforming Research Assessment

EOSC - European Open Science Cloud

CoARA - Coalition for Advancing Research Assessment

FAIR - Findability, Accessibility, Interoperability, and Reusability

FAIRCORE4EOSC - FAIR Convergence for EOSC

GraspOS - next Generation Research Assessment to Promote Open Science

JIF - Journal Impact Factor

INORMS - International Network of Research Management Societies

ISO - International Organization for Standardization

ORCID - Open Researcher and Contributor ID

OS - Open Science

OSAF - Open Science Assessment Framework

PID - Persistent Identifier

RAiD - Research Activity Identifier

ROR - Research Organization Registry

RRA - Responsible Research Assessment

SCOPE - Start with what you value, Context considerations, Options for Evaluating, Probe Deeply, Evaluate your Evaluation

SCOPE+i - SCOPE plus infrastructure

SEP - Strategy Evaluation Protocol

SURF - Samenwerkende Universitaire Reken Faciliteiten (Collaborative University Computing Facilities)

WG - Working Group

WP - Work Package

1. Introduction & Background

The Coalition for Advancing Research Assessment ([CoARA](#)) challenges us to develop more meaningful and equitable approaches to evaluating research and researchers. This shift involves moving from reliance on quantitative indicators—such as citation counts and journal prestige—to a broader, holistic view that accounts for diverse research practices and contributions. The Agreement on Reforming Research Assessment by CoARA, known as the [ARRA](#), establishes a forward-looking framework for research assessment centered on four main commitments. First, it emphasizes the importance of recognizing the varied ways researchers contribute to their fields and the unique career paths they may follow, ensuring assessment practices are tailored to the specific needs of each research area. Second, ARRA advocates for qualitative evaluation as the primary basis for assessment, with peer review as a core element, while supporting the responsible use of quantitative indicators to complement these evaluations. The agreement also calls for abandoning metrics, such as the Journal Impact Factor (JIF) and h-index, when used inappropriately in assessment, as these metrics can narrow the scope of what is deemed valuable. Finally, ARRA urges institutions to avoid the use of rankings for assessment purposes, as rankings often oversimplify and misrepresent the complexities of research impact and quality. Together, these commitments aim to create a more meaningful and inclusive approach to research assessment.

Implementing these new assessment practices involves institutional transformation, shifting from metrics-based evaluations to nuanced, qualitative approaches that consider factors such as Open Science (OS), societal impact, and interdisciplinary work. This transformation requires actively engaging stakeholders—including researchers, institutional stakeholders, and evaluators—to collaboratively define relevant criteria and ensure transparency. Through this inclusive approach, institutions can build support for new assessment practices, align with emerging research priorities, and embed a culture of fair, impactful evaluation into their core processes.

This report specifies how the Open Science Assessment Framework (OSAF) resources and infrastructure can support ARRA commitments in practice. This version of the OSAF includes refinements to the D2.2 OSAF report¹. These refinements are motivated by an effort to simplify usability and incorporate insights from the GraspOS pilots. A key result of this effort is elimination of assessment ‘phases’ to index the [INORMS SCOPE](#) framework with the various OSAF resources and infrastructure services. Instead, we now use SCOPE as the organizing structure. SCOPE as central in OSAF brings two additional benefits. First, SCOPE is an increasingly established approach for implementing RRA. Second, it supports the combining of existing and emerging

¹ Tatum, C., Anli, Z., Waltman, L., Hyrkkänen, A.-K., Pölonen, J., & Nordling, J. (2023). GraspOS Deliverable 2.2 "OSAF". Zenodo. <https://doi.org/10.5281/zenodo.11091512>

resources that enhance familiarity and usability, and avoid duplication of effort². In the remainder of this introduction, we provide a description to the OSAF, followed by an outline of its two components: assessment resources and assessment infrastructure services.

1.1 Open Science Assessment Framework

The Open Science Assessment Framework (OSAF) facilitates the transition towards Responsible Research Assessment (RRA)³ with particular focus on contributions to OS. This framework brings together processes and infrastructure to facilitate new assessment practices. In this context, *assessment processes* refers to the activities entailed in planning and performing research assessment, while *assessment infrastructure* refers to a set of services aligned with contemporary interoperability standards for research information systems. In this way, the OSAF assessment infrastructure (part of the wider GraspOS infrastructure) provides three key advantages. First, it is collaborative and open to all assessment participants. Second, it accommodates all assessment related documentation and agreed content to be evaluated. Third, its robust metadata schema and Application Programming Interface (API) enables direct transfer of data to downstream analytic services.

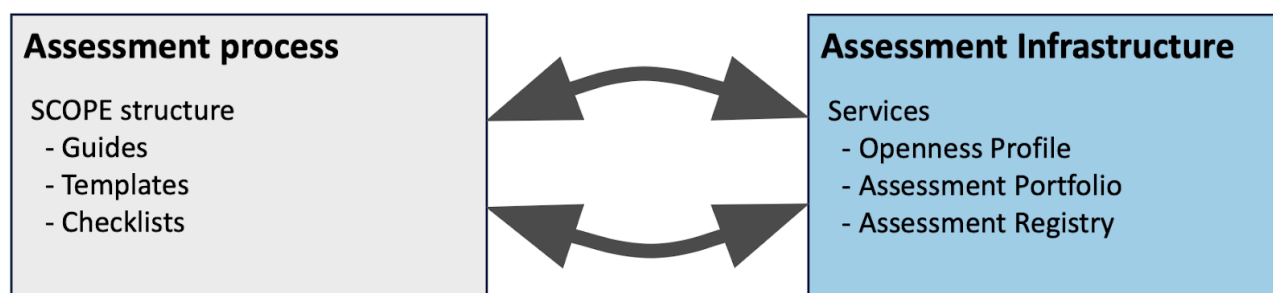


Figure 1: OSAF high level

Development and refinement of OSAF is based on engagement with the piloting process, involving collaboration together with WP5 GraspOS Pilots, WP3 GraspOS Services, and WP4 Federated Open Infrastructure. This method of codevelopment included regular meetings for discussion and

² European Commission: European Research Executive Agency, Oancea, A. and Wilson, S., *Report on research assessment*, Publications Office of the European Union, 2024, <https://data.europa.eu/doi/10.2848/931335>

³ Anna-Kaisa Hyrkkänen, Dragan Ivanović, Janne Pölönen, Marita Kari, & Elina Pylvänäinen. (2023). GraspOS Deliverable D2.1 "OS-aware RRA approaches landscape report" (1.0). Zenodo. <https://doi.org/10.5281/zenodo.8301792>

alignment, and a series of workshops (both online and in person) to address specific OSAF topics⁴. Workshop topics included stakeholder mapping, values and purpose, and assessment services, such as the Openness Profile.

Assessment Process

On the process side, we draw on numerous resources identified in the GraspOS landscape analysis for Open Science aware RRA. Of particular importance is adoption of [INORMS SCOPE](#)⁵ approach, as it provides a common structure for the full research assessment, from start to finish. In the GraspOS project we refer to the full research assessment as a 'research assessment event' which makes explicit the time boundedness of formal research assessments. In addition, we augment SCOPE, a high level assessment framework, with numerous templates, guides, and checklists.

The SCOPE framework, created by the INORMS Research Evaluation Group, complements the principles of the ARRA and has proven valuable in advancing RRA. It is built on three core principles. First, it encourages "evaluation only where necessary," recognizing that sometimes incentivizing desired behaviors may be more effective than simply assessing them. Second, it advocates for "evaluation with the evaluated," meaning that evaluations should be co-designed and interpreted with input from the communities being assessed, ensuring relevance and inclusivity. Lastly, the framework stresses the importance of "drawing on evaluation expertise," applying the same rigor to evaluation processes as is applied in academic research itself. Through these principles, the SCOPE framework fosters a thoughtful, collaborative, and expertise-driven approach to research assessment that aligns closely with ARRA's goals.

The OSAF process resources are focused on operationalizing the transition to RRA. This set of resources are provided in three formats; templates, guides, and checklists. Where possible we adapt existing resources, such as the [Royal Society Résumé for Researchers](#) for use as an OS Narrative CV template. In some cases the OSAF resources extend SCOPE activities, such as providing a values statement template. In most cases however, the resources draw on insights from the GraspOS landscape analysis for OS aware RRA together with observations from the GraspOS pilots. The aim of the full set of process resources is to support the design and documentation of research assessment events, providing guidance toward operationalizing RRA principles while respecting the flexibility needed to implement in local contexts. All OSAF process resources are registered to the GraspOS Process Resources Catalogue (for details see Section

⁴ Himanen, L., & LIINAMAA, I. (2024). GraspOS Deliverable D5.2: Pilot findings and progress report (Draft). Zenodo. <https://doi.org/10.5281/zenodo.13629147>

⁵ Himanen L, Conte E, Gauffriau M, Strøm T, Wolf B, Gadd E. The SCOPE framework - implementing ideals of responsible research assessment. F1000Res. 2024 May 17;12:1241. doi: 10.12688/f1000research.140810.2. PMID: 38813348; PMCID: PMC11134161.

3.4 of Deliverable [D4.4](#)) and it is possible for the GraspOS end user to use the GraspOS infrastructure front-end to explore this type of resources.

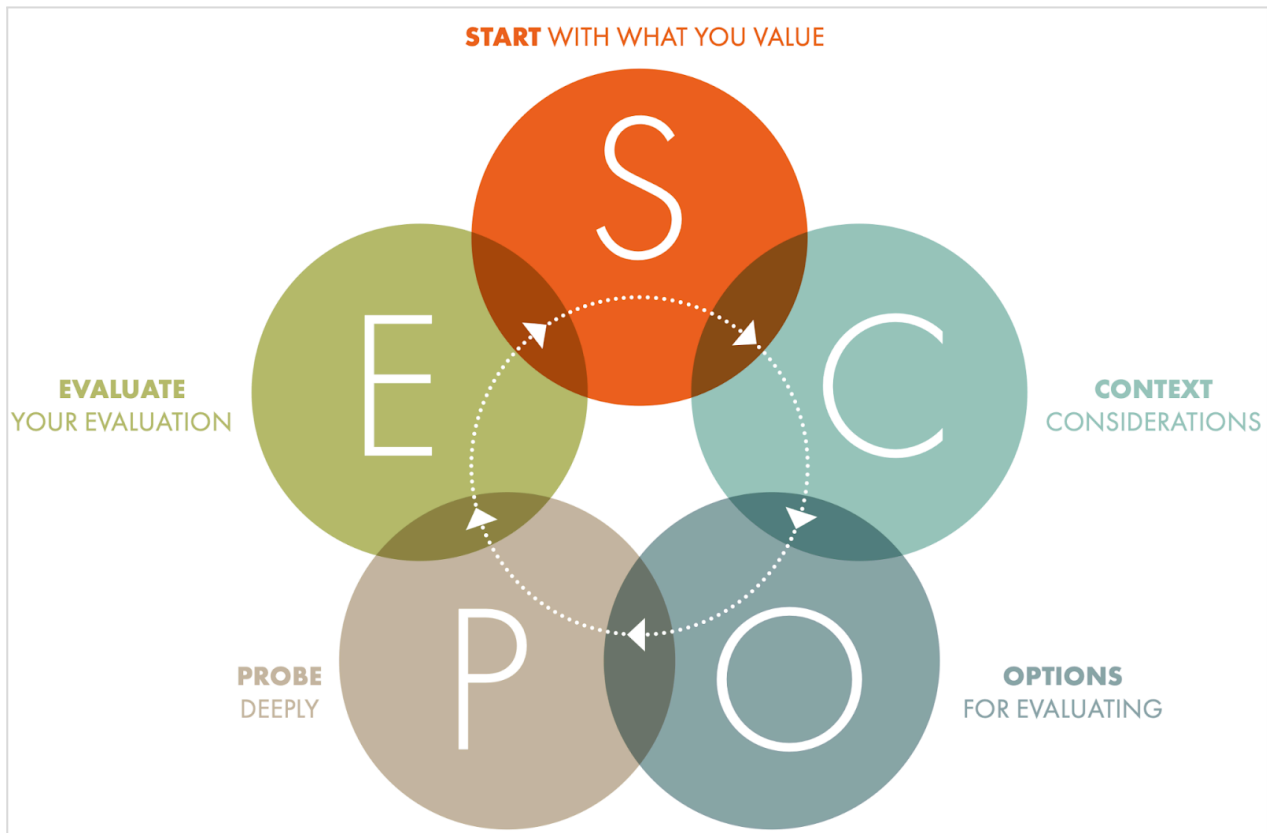


Figure 2: SCOPE framework

Assessment Infrastructure

On the infrastructure side, our focus is on introducing a few concepts and a set of related services that can support and facilitate OS aware RRA processes. We adapt and expand the Openness Profile – a portfolio concept for making visible one’s contributions to OS. We expand the portfolio form by introducing two new concepts that are specific to research assessment events: the Assessment Portfolio and the Assessment Protocol. The Assessment Portfolio is a digital resource that brings together evaluators and evaluands with an inclusive space for documenting the full assessment event. This could include early planning documents, collaborative assessment design, and agreed selection of material to be assessed, such as narratives and a diverse range of contributions. The Assessment Protocol is the framework in which the assessment is conducted providing details on the respective design.

Operationally, the OSAF infrastructure consists of three GraspOS services based on the Knowledge Exchange Openness Profile concept⁶. First is the Assessment Portfolio Registry. Assessment portfolios are minted from the registry service, which are then used to facilitate the collection of inputs for research assessment, serving both as an account of the agreed approach and associated evidence for a given assessment event and as a shared resource for conducting the assessment and documenting the outcomes. Second is the Assessment Protocol Registry. Assessment Protocols Registry is designed to register and publish assessment protocols after the completion of an assessment event. And third is implementation of the Openness Profile concept, an updatable display of an individual’s Open Science activities. All three of these services within the OSAF infrastructure are part of the GraspOS Open Infrastructure (see Figure 2) and are technologically underpinned by the Research Activity Identifier, also known as RAiD. Adaptation of the RAiD for use in research assessment is being developed in collaboration with the ongoing [FAIRCORE4EOSC](#) project.

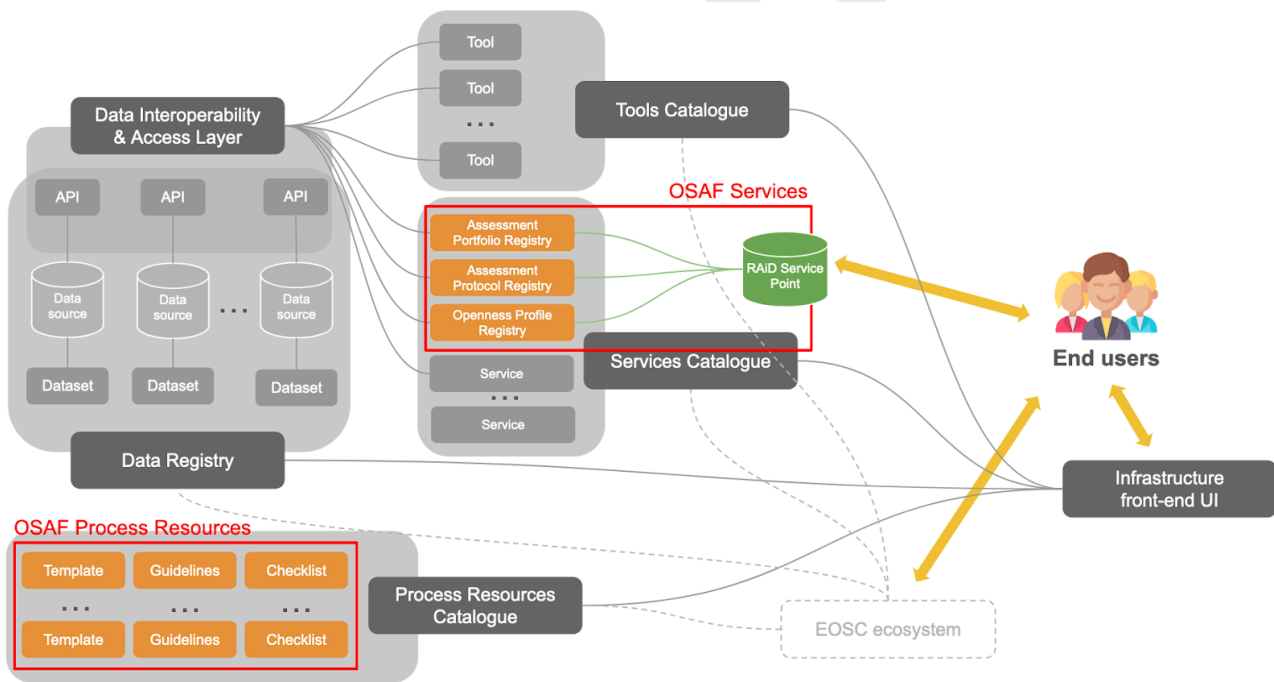


Figure 3: OSAF process resources and services in the GraspOS infrastructure.

The role of the OSAF assessment-specific infrastructure is to technologically augment the assessment processes. This weaving of process and digital technologies aims to prompt the development of new research assessment practices with ample space for contextualization and experimentation, while also on boarding the process outcomes and assessment outcomes within

⁶ Jones, P., & Murphy, F. (2021). Openness Profile: Modelling research evaluation for open scholarship. Zenodo. <https://doi.org/10.5281/zenodo.4581490>

contemporary research information systems and services. For example, each instance of the three services is minted with a Persistent Identifier (PID) together with an editable metadata record.

2. OSAF Resources & Services

The main body of the report is organized into two sections focusing first on the OSAF process resources and second on the OSAF assessment services.

2.1 Assessment Process Resources

This section is organized by the SCOPE framework, whereby process resources are clustered based on their relevance to the five individual SCOPE phases. While this ordering is suggestive of a particular sequence, it does not imply a rigid use case. Among the process resources, in some cases existing or related contributions are adapted, such as the Royal Society [Résumé for Researchers](#) (see D2.1 OS-aware RRA approaches landscape report). In all cases, assessment process resources listed in table 1 are tailored specifically for the Open Science and/or Responsible Research Assessment.

The following table indexes assessment process resources and assessment infrastructure resources to the relevant SCOPE phases. In the top row are the five SCOPE phases: 1) START with what you value, 2) CONTEXT considerations, 3) OPTIONS for evaluating, and 4) PROBE deeply, and 5) EVALUATE your evaluation. The resource names are in the left column of the table and they are each described in detail in this section. Although resources are often relevant to more than one SCOPE phase, each resource is described only once. It should also be noted that relevant stakeholders for a given assessment event will vary based on the context, purpose, and phase of the assessment.

Table 1. OSAF resources by SCOPE assessment process phases

Resource name	S	C	O	P	E
Assessment Portfolio guide	X	X	X	X	X
Responsible assessments checklist	X	X	X	X	X
Value statement template	X				
Purpose and context statement template		X			
Assessment team guide	X	X			
Assessment readiness template	X	X			
Open Science assessment guide	X	X			
Stakeholder mapping template	X	X			
Translating values, purpose and context into an assessment protocol guide			X	X	
Narrative CV template			X	X	
Strategy self-evaluation template			X	X	
Guide for evaluators and evaluands			X	X	
Guide for overcoming common obstacles in implementing RRA			X	X	
Guide on the diversity of OS contributions, roles and activities			X	X	
Guide on equity, diversity and inclusion (EDI)			X	X	
Indicator toolbox for assessment guide			X	X	
Data, Tools, and services guide			X		
Evaluating the evaluation guide					X
Assessment registry guide					X

It is worth mentioning that the list of assessment process resources is expected to be dynamic. More specifically, the GraspOS Process Resources catalogue, which collects them, is planned to be open for the inclusion of additional entries in the future (e.g., variations of the existing templates, guides, etc.). To make this possible a resources inclusion policy will be determined before the end of the project. However, at this stage, the focus of the project is to establish the basic list.

START with what you value

This first SCOPE phase establishes the local values and purpose of the assessment, which inform the assessment approach. Engaging these topics often involves complex interaction with a range of stakeholders with varying interests, especially in the context of assessment reform. Expected outcomes include a self-assessment of readiness for the assessment, both in terms of assessment infrastructure and enacting assessment reform.

Resources in this section

- assessment portfolio guide
- responsible assessments checklist
- value statement template
- stakeholder mapping template
- assessment team guide
- assessment readiness template
- OS assessment guide

Assessment portfolio guide

An assessment portfolio is a collaborative, multi-actor digital object that brings together the key information about assessment planning that informs the assessment design. The assessment portfolio also facilitates the delivery of content to downstream analytics (via API) and the documentation of the assessment outcomes. As this guide is relevant in other assessment phases, and its role is different in each phase, its specific role will be described in each relevant phase.

In this first phase, begin with minting a new portfolio from the GraspOS service point; input assessment team information, evaluators (when known), and evaluands. Document readiness self-assessment outcome, values statement, stakeholder mapping, and contextual factors). Documenting this qualitative input to the assessment is then available to all participants in the assessment design phase.

Responsible assessments checklist

Responsible assessments checklist is a self-evaluation resource for exploring the whole assessment process in detail. The purpose is to make sure that the principles of responsible assessment are followed in an assessment process. The checklist will build on and further develop recommendations identified in the OS-aware RRA approaches landscape report and incorporate insights from a similar resource developed by TSV for use in Finland.

Value statement template

Value statements help to identify what is valued about the entity under evaluation. Based on the definition in the [SCOPE framework](#), a value is a judgment made about what is important. The

entities to be assessed and especially methods to be used are ideally based on what is valued. This template will build on and update the value statement template developed for the GraspOS pilots.

Stakeholder mapping template

The aim of the stakeholder mapping template is to identify the relevant stakeholders of the entity in question. The stakeholder can refer to individuals or institutions, and everything in between, depending on the entity in question. The important questions to keep in mind are who determines what is valued, and who defines the purpose of the evaluation. The stakeholder mapping template is a resource for building a culture of responsible research practices and research assessment. This template will build on and update the Stakeholder mapping template developed for the GraspOS pilots.

Assessment team guide

The aim of the assessment team guide is to help identify the kinds of roles and expertise needed in an evaluation team. Assessment team guide is a resource for supporting the responsible use of qualitative and quantitative assessment methods and interpretation of results.

Assessment readiness template

The assessment readiness template is a resource for supporting responsible research practices. The aim is to describe the current status of the entity's research evaluation objectives, context, and resources. And to provide an indication of, for example, the entity's technical and expertise capacities and to establish the level of maturity towards research assessment reform. This template will build on and update the Pilot analysis template developed for and used by the GraspOS pilots.

Open Science assessment guide

The Open Science guidelines support selection of open databases and services, and the variety of open science practices considered in relation to local open science policies and priorities.

CONTEXT considerations

The context considerations phase focuses on understanding the environment, the purpose of the assessment, and stakeholders involved in the research. This includes clarifying an understanding of the research agenda, recognizing institutional and disciplinary influences, aligning with stakeholder interests, and specifying the level of analysis.

Resources in this section

- assessment portfolio guide
- responsible assessments checklist
- purpose and context statement template
- value statement template
- stakeholder mapping template
- assessment team guide
- assessment readiness template
- OS assessment guide

The above resources, apart from the Purpose and context statement template, are described above in the START with what you value section.

Purpose and context statement template

The purpose and context statement template is a resource for designing and documenting the assessment process. The aim of the template is to help describe the purpose(s) and context(s) of the entity's research evaluation process(es). This template will first be developed for the GraspOS pilots, and then modified for general use. The template will help to consider the specific needs and requirements for evaluation events (like indicators, methods, data, tools and services) according to the purpose of evaluation (e.g., monitoring, learning and improvement, or resource allocation and career assessment) and the level of assessment (e.g., individual, unit, institution, country). The purpose and context template is also a resource for recognizing the diversity of research and taking into account unintended consequences.

OPTIONS for evaluating

The options for evaluating phase draws substantially on the planning and readiness outcomes from the previous phases. The assessment approach, including the selection of assessment material and appropriate indicators, should be based on the values, context and purpose defined in the previous phases.

Resources in this section

- assessment portfolio guide
- responsible assessments checklist
- translating values, purpose and context into an assessment protocol guide
- narrative CV template
- strategy self-evaluation template
- guide for evaluators and evaluands
- guide for overcoming common obstacles in implementing RRA
- guide on the diversity of OS contributions, roles and activities

- guide on equity, diversity and inclusion (EDI)
- Indicator toolbox for assessment guide
- data, tools and services guide

The responsible assessments checklist is described above in the START with what you value section.

Assessment Portfolio guide

In this phase, the assessment portfolio provides access to the qualitative input developed in the earlier phases, for consideration in further developing the assessment design. Inputs to the assessment portfolio would include documentation of the assessment approach and the agreed assessment material to be assessed. This could include evaluands' narrative(s), a diversity of contributions, outputs and outcomes, and documentation of the qualitative and quantitative methods to be used. The final result is the creation of an assessment protocol, which is input into the assessment portfolio in preparation for performing the assessment.

Translating values, purpose and context into an assessment protocol guide

This guide can be used for translating values, purpose and context into practice in different evaluation settings. It supports e.g., the selection of research outputs and activities, databases, methods and indicators for an assessment. The guide also supports the selection of tools and indicators and helps ensure they are aligned with what is valued by the entity as well as the purpose and context of the assessment.

Narrative CV template

The narrative CV template is a resource for showcasing merits and skills in a structured and evidence-based manner. Building on the Résumé for Researchers template, the narrative CV template will provide prompts and definitions, and possibly a module, for recognizing a broad range of qualities, impacts, contributions and Open Science practices, with instruction as to the documentation of evidence if required (e.g., using Openness profiles).

Strategy self-evaluation template

The Strategy self-evaluation template is a resource for describing and evaluating the quality, relevance and viability of research at public institutions. The aim of the strategy template is to facilitate the assessment of the entity in light of its own aims and strategy. Building on the [Dutch Strategy Evaluation Protocol \(SEP\)](#), the strategy template helps evaluands to outline their aims and ambitions (e.g., in research, education, outreach, Open Science), the plan of action to achieve these aims, as well as the documentation and indicators suited to monitor their achievement.

Guide for evaluators and evaluands

Guideline for evaluators and evaluands is a resource for supporting the evaluators and evaluands to be active participants of an assessment process. The aim of the guidelines is to help understand the basic framework of rules and principles of responsible research assessment according to international and national legal regulations (e.g., laws and rights on gender equality and non-discrimination, [European Charter for researchers](#)), research integrity and ethics codes (e.g., [All European Academies ALLEA](#)), and key RRA and metrics recommendations (e.g., [DORA](#), Leiden Manifesto⁷, [CoARA](#)).

Guide for overcoming common obstacles in implementing RRA

This guide aims to help address and overcome common obstacles identified in the GraspOS Surveys. The two surveys conducted for the landscape analysis⁸ show that the situation and challenges of the nine GraspOS pilots vis-à-vis CoARA Agreement and assessment practices are very similar compared to the 54 landscape survey participants from 19 European countries. Based on these survey results it is now possible to identify guidelines to overcome common obstacles.

Guide on the diversity of OS contributions, roles and activities

Guidance on the diversity of OS contributions, roles and activities is a resource for recognizing a broad range of OS contributions and activities. The aim of the Guidance is to ensure that a wide range of practices and activities are considered, and that all who contributed are recognized.

Guide on equity, diversity and inclusion (EDI)

The purpose of equity, diversity and inclusion (EDI) guide is to facilitate consideration in an entity's assessment to the aspects contributing to such issues as career stage, field or discipline, multi-, inter-, and transdisciplinarity, basic vs. applied research, intersectionality, gender, sexual orientation, racial/ethnic origin, socio-economic status, disability and language.

Indicator toolbox for assessment guide

The indicator toolbox guide will provide a heuristic for selecting appropriate types of assessment indicators on the basis of an assessment's purpose, context and level of analysis. It draws on

⁷ Hicks, D., Wouters, P., Waltman, L. et al. Bibliometrics: The Leiden Manifesto for research metrics. Nature 520, 429–431 (2015). <https://doi.org/10.1038/520429a>

⁸ Anna-Kaisa Hyrkkänen, Dragan Ivanović, Janne Pölönen, Marita Kari, & Elina Pylvänäinen. (2023). GraspOS Deliverable D2.1 "OS-aware RRA approaches landscape report" (1.0). Zenodo. <https://doi.org/10.5281/zenodo.8301792>

relevant practices and literature identified in the D2.1 Landscape analysis (e.g., the EC expert committee report on Indicators Framework) and observations of the specificities from each pilot.

Data, Tools, and services guide

The GraspOS Data, Tools, and Services guide offers guidance on the optimal and correct use of the datasets, tools, and services that are currently part of the GraspOS open and federated infrastructure. The infrastructure is described in Deliverables [D4.3](#) and [D4.4](#), while the most recent list of these resources is described in Deliverable [D3.2](#). The guide offers a comprehensive overview of the most important strengths, characteristics, and limitations of the respective resources explaining how they can be used in indicative use cases.

PROBE deeply

Depending on the level of analysis (e.g., researcher, grant proposal, department, institution) performing the assessment can involve many layers of analysis involving multiple internal and external services and data sources, as well as a variety of different evaluation committee configurations. The Probe deeply phase is an effort to identify harmful impacts and possible unintended consequences related to the selected assessment approach.

Resources in this section

- assessment portfolio guide
- responsible assessments checklist
- translating values, purpose and context into an assessment protocol guide
- narrative CV template
- strategy self-evaluation template
- guide for evaluators and evaluands
- guide for overcoming common obstacles in implementing RRA
- guide on the diversity of OS contributions, roles and activities
- guide on equity, diversity and inclusion (EDI)
- indicator toolbox for assessment guide
- data, tools and services guide

The above resources are described above in the OPTIONS for evaluating section, except the responsible assessments checklist, which is described above in the START with what you value section, and the assessment portfolio guide described below in relation to this phase.

Assessment portfolio guide

In this phase, the protocol and agreed content to be assessed are available for the evaluators to probe deeply, adjust as needed and then for use in performing the assessment. This ensures all participants have access to all assessment materials. In addition, the assessment portfolio

provides machine-readable data, which can be ingested by analytical services via the API (Application Programming Interface).

Evaluate the Evaluation

After completing the assessment, this final phase has two parts. First is the final SCOPE phase, 'Evaluate your evaluation'. Second, register the assessment protocol and associated context together with the outcome of your evaluation.

Resources in this section

- assessment portfolio guide
- responsible assessments checklist
- evaluating the evaluation guide
- assessment registry guide

The responsible assessments checklist is described above in the START with what you value section.

Assessment Portfolio guide

In this final phase, the outcome of Evaluating the evaluation is added to the portfolio. Then the Assessment Portfolio is archived by simply adding an end date in the appropriate field. The content is no longer editable, but remains accessible to all contributors and remains otherwise closed.

Evaluating the evaluation guide

Evaluating your evaluation is a reflective process and the final stage of the assessment, where the effectiveness and impact of the evaluation itself are assessed. This involves reviewing whether the evaluation met its aims, were the results useful, and what kinds of opportunities are there for improvement in future evaluations.

Evaluating the evaluation guide is a resource for evaluation of the assessment process. Purpose of the guide is reflecting on the assessment process: Were the aims achieved? How to improve upcoming assessment and evaluation processes? Was the documentation transparent and open enough? Was the process in line with the values of responsible assessment? The aim of the guide is to help establish the criteria for evaluating the evaluation and to identify which actors could be included (e.g., the evaluands).

Assessment Registry guide

The Assessment Protocols Registry is designed to register and publish assessment protocols after the completion of an assessment event. These registered protocols would ideally include

documentation of the values, purpose and contextual factors related to the assessment, as well as the data sources and indicators used in the assessment. Individual identities and specific evidence used in the assessment are not included. Register an assessment from the GraspOS service point.

2.2 Assessment Services

In this section, we introduce the OSAF assessment services being developed under the GraspOS project, which are designed to support the structured collection and organization of research assessment information from initial planning through to the publication of assessment protocols. These services—Assessment Portfolio Registry, Assessment Protocol Registry, and Openness Profile Registry—each play a role in facilitating responsible and transparent assessments, enabling effective collaboration among participants and stakeholders while safeguarding sensitive information.

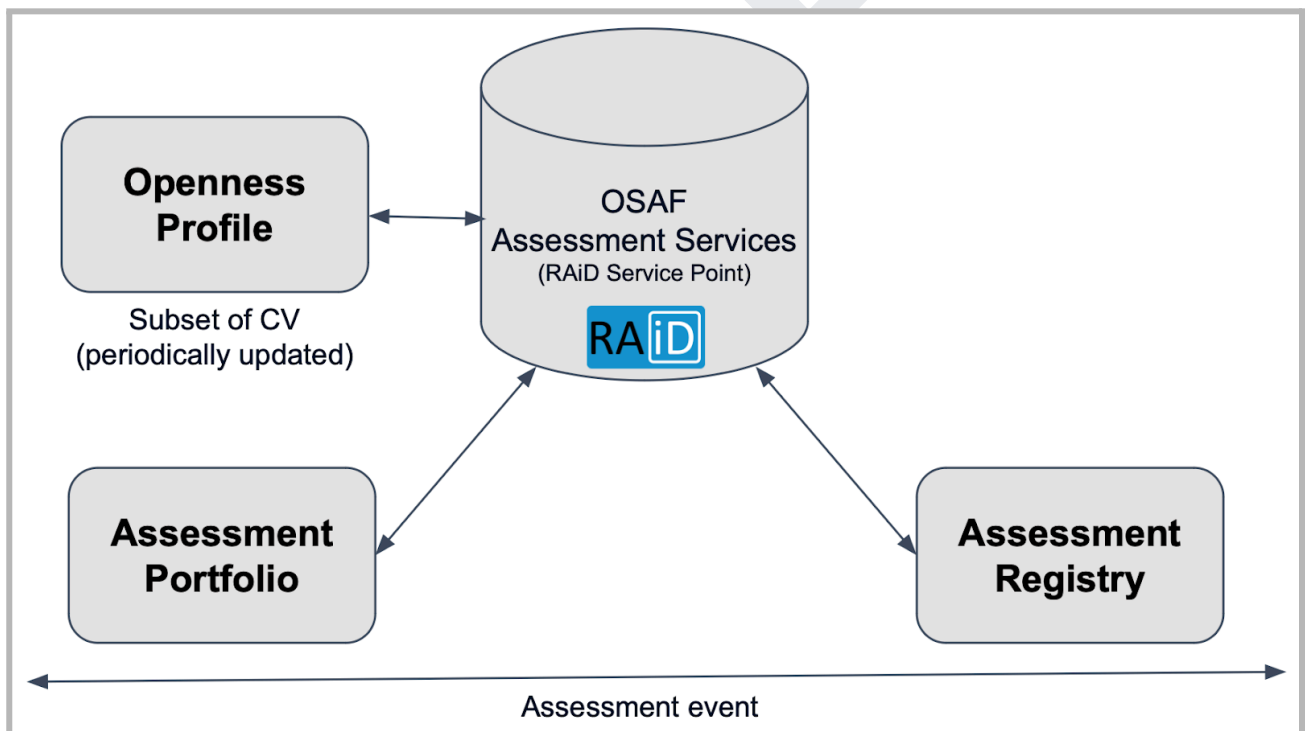


Figure 4. Illustration of OSAF services, working-draft

The Assessment Portfolio is a multi-actor digital portfolio that consolidates all key information and evidence needed for assessment events, providing a transparent yet private environment for participants and archival capabilities post-assessment.

The Assessment Protocol Registry enables publication of completed assessment protocols, documenting values, purpose, and data sources to enhance transparency, reuse, and community learning for future assessment events. Lastly, the Openness Profile is a portfolio for researchers used by researchers to highlight their diverse contributions to Open Science. The contents of an open profile can be transferred to an Assessment Portfolio in support of an assessment event. The scope and main functionalities of these services are described. Figure 4 illustrates the current working draft of these services.

Assessment Portfolio Registry

Scope & Main Functionalities: Assessment portfolios facilitate the collection of inputs for research assessment, serving both as an account of the agreed approach and associated evidence for a given assessment event and as a shared resource for conducting the assessment and documenting the outcomes. An assessment portfolio is a collaborative, multi-actor digital object that brings together the key information about assessment planning (e.g., a readiness self-assessment, values statement, and a purpose statement), agreed content to be assessed, and the assessment protocol (that articulates the assessment approach). An assessment portfolio also provides a means for collecting the contributions/outputs (evidence) to be assessed. It serves as a shared digital service for the full assessment event. During the assessment, the portfolio is 'locally' open to all participants of the assessment event, but closed to the outside world. This provides transparency and consistency to assessment participants (evaluators and evaluands) while also supporting privacy during the event. After completion of the assessment, the portfolio can be archived for historical reference. After completion of the assessment event, the assessment protocol itself, separate from any privacy concerns, can be published in the Assessment Protocols Registry to inform the community about the design in relation to the local context and stated purpose.

Implementation: The Assessment Portfolio Registry is a new service being developed as part of the GraspOS project and in collaboration with the FAIRCORE4EOSC project. It is currently under development, and a pilot version of the service is expected to be released by the end of the project. Adaptations to the RAiD under consideration for the research assessment use case include extension of the metadata scheme and implementation of a controlled vocabulary-based OPUS framework⁹. The extension of the standard RAiD metadata identifies objects as specifically related to an assessment event, such as contributions to be assessed, as well as the methods and materials used in the assessment, such as indicators and data sources. Analysis of the OPUS framework shows some common object types also in the standard RAiD metadata. However, many items from the OPUS framework will need to be added to have a complete mapping of contributions.

⁹ O'Neill, G. (2024). OPUS Deliverable 3.1: Indicators and Metrics to Test in the Pilots. Zenodo. <https://doi.org/10.5281/zenodo.10670779>. See Annex 2.

Assessment Protocol Registry

Scope & Main Functionalities: The Assessment Protocols Registry is designed to register and publish assessment protocols after the completion of an assessment event. These registered protocols would ideally include documentation of the values, purpose and contextual factors related to the assessment, as well as the data sources and indicators used in the assessment. Individual identities and specific evidence used in the assessment are not included. Publishing assessment protocols promotes transparency, reuse and mutual learning. In this way the Assessment Protocols Registry serves as a community resource to inform and inspire the design of future assessment events. In the context of the project, a registry of assessment portfolios will be implemented based on a Research Activity Identifier (RAiD) service point. Based on this implementation, each registered protocol will have a persistent identifier and a metadata record for documenting aspects of the assessment event and suitable for public consumption. Although a user interface is available for administering access and compiling content (useful for small tasks), this service will be ideally implemented on a local platform via API.

Implementation: The Assessment Protocols Registry is a new service being developed as part of the GraspOS project. It is currently under development, with a mature version expected to be released by the end of the project.

Openness Profile Registry

The main ambition of the Openness Profile is to enable exposure of OS activities as an independent information entity, leading to a more diverse consideration of Open Science in research and related assessment. The diversity of Open Science contributions is catered for through a flexible ingestion of different types of entries, including quantitative and qualitative information. Qualitative information is captured through narratives, which facilitate structured and evidence-based input in supporting research assessment. A dedicated template for narrative CVs is being developed within the GraspOS project and will be made available for use in the piloting phase of the Openness Profile. The narratives can be supported by the Openness Profile, where evidence-based input can be inserted. Quantitative information is data that can be counted or measured in numerical values.

The pilots' ambitions of implementing the Openness Profile differ vastly from each other. Some pilots are planning on technical implementations to their existing infrastructure, either as a full implementation into the existing Researcher profile - the CSC pilot with the Research.fi, or as a mock-up of the Openness Profile as part of the existing Researcher profile - the UEFISCDI pilot with the Brainmap platform, with full implementation following after completion of the project pilot phase. Other pilots are considering making use of the RAiD (Research Activity Identifier) technology, which will be adapted for applicability of the Openness Profile, showcasing the contributions to Open Science. The project internal milestone report (MS6 Openness Profile -

specs for pilots are ready) provides examples of all of these three levels of Openness Profile implementations among the piloting organisations.

Different ways of implementing the Openness Profile among the pilots are the following:

1. Full implementation (CSC pilot: Research.fi)
2. Mock-up installation (UEFISCDI pilot: Brainmap)
3. Proof-of-concept - leveraging a RAiD service point combined with BIP! Scholar¹⁰ as a user interface (INRAE, CS and OPERAS pilots, tentative: CNR and UNIBE)

CSC - [Research.fi/Researcher profile](https://research.fi/researcher-profile)

Current state of specifications for full implementation, including open availability of e.g.:

- Narratives for openness indications
- Citations of policy papers/reports/guidelines
- Activities and prizes related to Open Science
- Methods/tool/software, e.g. shared via Zenodo/Github or other repository
- Activities in promoting openness, e.g. taking part in open science and peer-review communities
- Narratives on open notebooks, methods, open publications, adherence to FAIR principles, application of research in public administration, and utilisation of research-based information outside of academia

UEFISCDI - [Brainmap/Researcher profile](https://brainmap.eu/researcher-profile)

Mock-up of the Openness Profile, including open availability of e.g.:

- Research methods
- Completed Data Management Plans
- Peer reviewed and accepted software codes
- Citations of Open Access publications
- Co-designed Open Science courses

¹⁰ BIP! Scholar: <https://bip.imsi.athenarc.gr/scholar>

INRAE, CS and OPERAS - Proof-of-concept (tentative: CNR and UNIBE)

Demonstration version combining a RAiD service point with BIP! Scholar's user interface, with metadata schema adapted for the Openness Profile specific criteria, showcasing:

- Related object types, e.g. workflows, events, datasets, and physical objects
- All entries made openly available

The work on fleshing out the pilot organisations' ambitions towards the Openness Profiles is a work in progress, which will continue during the remainder of the project duration. This implies that the current representation of the pilot organisations' plans reflects the current state-of-play.

In the context of the project, an implementation of this registry will be realised based on the RAiD service point to be used for the Openness Profile Registry. While there is a user interface for administering access and compiling content (useful for small tasks), this service would be ideally implemented in a local platform via API.

Implementation: The Assessment Portfolio Registry is a new service being developed as part of the GraspOS project and in collaboration with the FAIRCORE4EOSC project. It is currently under development, and a pilot version of the service is expected to be released by the end of the project.

3. Conclusion

The GraspOS Open Science Assessment Framework (OSAF) seeks to facilitate new responsible research assessment practices by providing assessment-specific infrastructure and associated assessment process resources. This report details OSAF specifications for the GraspOS pilots. These resources and services facilitate consideration of diverse research outputs, inclusion of Open Science contributions, recognition of contextual factors and approaches to collaborative planning and performing new assessment practices.

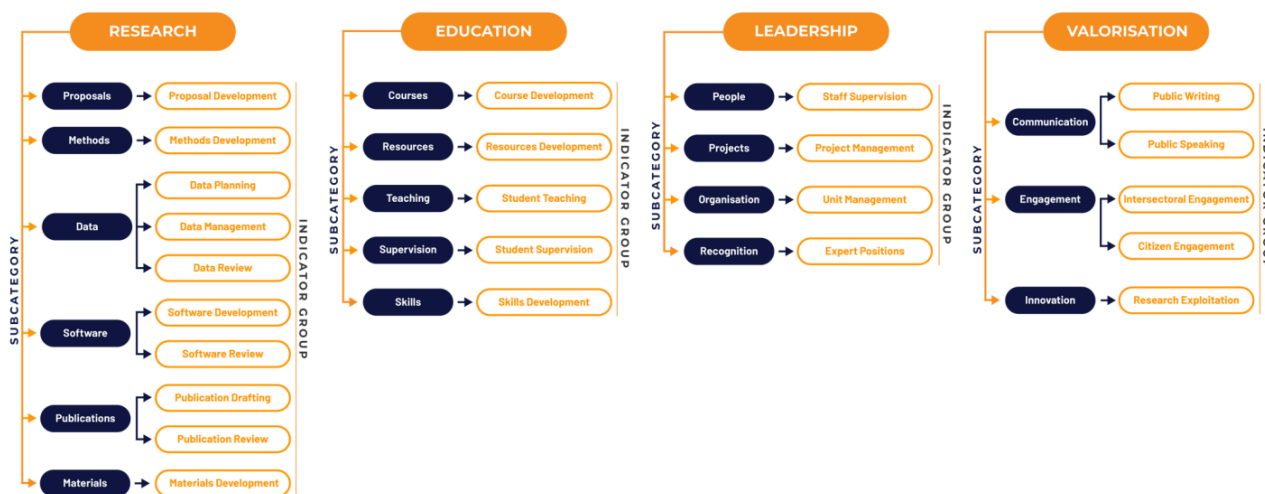
In this report, we outlined the main functions of the OSAF assessment resources and services. By detailing the specifications, this report provides the foundation for practical planning, testing and refinement of OSAF while also offering an initial view of how these resources can shape research assessment practices. Moving forward, iterative development of the OSAF resources will be focused on insights gleaned from pilot implementations and alignment with the broader GraspOS catalogue of tools, services and data.

4. Annexes

1. OPUS Research Assessment Framework (RAF)

The Researcher Assessment Framework (RAF)¹¹ is designed to recognize, for assessment purposes, the full scope of activities conducted by researchers within research-performing organizations and research-funding organizations. It includes indicators across four main categories—research, education, leadership, and valorisation—each with specific subcategories and indicators tailored to evaluate both traditional and Open Science contributions. The framework combines both quantitative and qualitative methods, enabling organizations to adopt a flexible approach aligned with their needs and priorities.

Figure 1: Categories, Subcategories, and Indicator Groups of Researcher Assessment Framework



¹¹ O'Neill, G. (2024). OPUS Deliverable 3.1: Indicators and Metrics to Test in the Pilots. Zenodo. <https://doi.org/10.5281/zenodo.10670779>

2. Analysis of OPUS research assessment framework (RAF)

The OPUS Research Assessment Framework (RAF) is available at <https://zenodo.org/records/10670779>

Table 2. Adding RAID related object types

OPUS RAF	Existing related object types	To add	Ideas from other platforms
Research			
Proposal	-	Proposal	Publication/Proposal (Zenodo)
Methods	Workflow, Standard	Protocol, Research Technique, Methodology	Research Technique (ORCID)
Data management plan	Output management plan		
Data Sets	Dataset		
Data review	-	Review	Publication/Peer review (Zenodo), Review (Schema.org), Peer review (ORCID)
Software	Software, Service		

	Software review	-	Review	Publication/Peer review (Zenodo), Review (Schema.org), Peer review (ORCID)
	Publication	Preprint, Journal article, Conference paper, etc.		
	Publication review	-	Review	Publication/Peer review (Zenodo), Review (Schema.org), Peer review (ORCID)
	Material	Instrument, Physical Object, Audiovisual, Image, Sound	Tool, Artwork	VisualArtwork (Schema.org)
Education				
	Course	-	Syllabus or Course	Course (Schema.org)
	Resources	Learning Object		
	Teaching	TO USE RELATED RAID		
	Supervision	TO USE RELATED RAID		
	Skills	Prize	Qualification, Award, Recognition, Diploma	
Leadership				

	Staff supervision	TO USE RELATED RAID		
	Project management	TO USE RELATED RAID		
	Organisation Unit Management	ORGANISATIONS		
	Recognition	Prize	Award, Recognition, Diploma	
Valorisation				
	Public writing	-	Newspaper article, Online Resource, Encyclopaedia entry, Dictionary entry	Newspaper article (ORCID), Online Resource (ORCID), Encyclopaedia entry (ORCID), Dictionary entry (ORCID)
	Public speaking	Event or TO USE RELATED RAID representing the event		
	Engagement	TO USE RELATED RAID		

3. Glossary

Agreement on Reforming Research Assessment (ARRA): The agreement establishes a common trajectory for transforming assessment practices within the research community, encompassing researchers and research-performing organizations. The overarching objective is to enhance the quality and impact of research. This agreement outlines key principles, commitments, and a timeframe for implementing reforms. It also sets forth the foundational principles for a coalition of organizations committed to collaborating in the execution of these changes.¹²

Analytics Infrastructure: This refers to the comprehensive collection of tools, technologies, processes, services, and resources utilized by an organization to gather, process, analyze, and visualize data with the purpose of making informed business decisions. This infrastructure is specifically designed to facilitate the extraction of insights, identification of patterns, and recognition of trends from extensive datasets.¹³

Application Programming Interface (API): It is a set of rules and protocols that allows different software applications to communicate with each other. It defines the methods and data formats that applications can use to request and exchange information. APIs enable developers to access the functionality or data of a software application, service, or platform without needing to understand its internal workings. They serve as intermediaries, allowing applications to interact and share data seamlessly. APIs are crucial for building integrations, enabling interoperability between different software systems, and fostering the development of third-party applications that can leverage the features of a given platform.¹⁴

Assessment Protocol: This is the framework in which the assessment is conducted.

Assessment Event: This is the actual assessment.

Assessment Infrastructure: This concept includes all the assessment items (such as portfolio and registry, see below) that make up the assessment process.

Assessment Portfolio: These are Responsible Research Assessment (RRA) templates which are specifically crafted to serve as purpose-built frameworks for the systematic collection and organization of both quantitative and qualitative indicators. They are designed to be adaptable and

¹² See <https://coara.eu/agreement/the-agreement-full-text/>

¹³ See <https://www.sciencedirect.com/topics/computer-science/analytics-infrastructure>

¹⁴ See <https://en.wikipedia.org/wiki/API>

suitable for various assessment needs, ensuring a comprehensive approach to capturing and structuring diverse types of data.

Assessment Registry: It enables the publication of an assessment protocol after the completion of an assessment event. “This refers to an online database of OSAF-based Assessment Portfolios and case studies in a structured and systematic way to promote experience sharing and mutual learning.”¹⁵

Coalition for Advancing Research Assessment (CoARA): This coalition unites a diverse array of entities engaged in research assessment and their affiliated associations. This includes research funding organizations, research-performing organizations, national/regional assessment authorities and agencies, learned societies, and researcher organizations. The shared objective is to collaboratively drive systemic reform, guided by the common principles and commitments outlined in the Agreement.¹⁶

Community-led approaches: “Community-led curation refers to the process of managing and organizing information or data by a community of individuals, rather than by a single organization or institution. Community-led curation enables a group of people with a shared interest to collectively curate and validate information, making it more accurate, comprehensive, and accessible. Whereas community-led annotation in this report refers to the process of adding additional information or metadata to existing data or information by members of a community. Community-led annotation can enhance the value and understanding of the information by providing additional context, clarifying meaning, or linking related data.”¹⁷

CRIS: Current Research Information System. Also referred to as Research Information System (RIM). A current research information system (CRIS) is typically a database used to store, manage and exchange research information (metadata for the research activity and outputs).¹⁸

¹⁵ See Anna-Kaisa Hyrkkänen, Dragan Ivanović, Janne Pölönen, Marita Kari, & Elina Pylvänäinen. (2023). GraspOS Deliverable D2.1 "OS-aware RRA approaches landscape report" (1.0). Zenodo. <https://doi.org/10.5281/zenodo.8301792>

¹⁶ See https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/coalition-advancing-research-assessment-coara-now-launched-2022-12-02_en#:~:text=The%20CoARA%20brings%20together%20a,researcher%20organisations%2C%20all%20willing%20to

¹⁷ See Anna-Kaisa Hyrkkänen, Dragan Ivanović, Janne Pölönen, Marita Kari, & Elina Pylvänäinen. (2023). GraspOS Deliverable D2.1 "OS-aware RRA approaches landscape report" (1.0). Zenodo. <https://doi.org/10.5281/zenodo.8301792>

¹⁸ Wikipedia entry for CRIS: https://en.wikipedia.org/wiki/Current_research_information_system

Crossref: This is an organization that provides Digital Object Identifiers (DOIs) for scholarly content. A Digital Object Identifier is a unique alphanumeric string assigned to a document (such as an academic paper, journal article, or book) to provide a permanent link to it, making it easy to locate and access online. Crossref's primary function is to facilitate the identification and linking of scholarly content on the internet. Crossref plays a critical role in supporting the infrastructure of scholarly communication by providing a standardized way to identify and link academic publications across various publishers and platforms. Researchers, publishers, and institutions widely use Crossref services to enhance the accessibility and connectivity of scholarly information.¹⁹

DataCite: This is an international non-profit organization that provides DOIs for research datasets. Similar to how Crossref assigns DOIs to scholarly articles, DataCite's primary mission is to offer a standardized way to uniquely identify and cite datasets. DOIs assigned by DataCite serve as persistent links to ensure the long-term accessibility and citability of research data.²⁰

Dutch Strategy Evaluation Protocol (SEP): The primary objective of an SEP evaluation is to assess a research unit in accordance with its own objectives and strategic direction. An independent assessment committee, comprised of experts, evaluates the unit's performance based on both the self-evaluation provided by the unit and a subsequent site visit. The overarching aim of the SEP is to uphold and enhance the quality and societal relevance of research while fostering ongoing discussions about research quality, societal significance, and sustainability within the framework of research quality assurance. To achieve this, the research unit is evaluated in the context of its own goals and strategy.²¹

European Open Science Cloud (EOSC): The pan-European project is devised to establish a virtual environment facilitating the sharing and access of research data across borders and scientific disciplines. At the core of this initiative is the EOSC Portal, serving as the primary gateway. It offers a unified access point to a diverse array of research resources and services, streamlining the process for researchers to navigate and leverage the available wealth of information.²²

FAIR: "In 2016, the 'FAIR Guiding Principles for scientific data management and stewardship' were published in Scientific Data. The authors intended to provide guidelines to improve the Findability, Accessibility, Interoperability, and Reuse of digital assets. The principles emphasize machine-actionability (i.e., the capacity of computational systems to find, access, interoperate, and

¹⁹ See <https://www.crossref.org/about>

²⁰ See <https://datacite.org/what-we-do>

²¹ See https://storage.knaw.nl/2022-06/SEP_2021-2027.pdf

²² See <https://eosc-portal.eu/about>

reuse data with no or minimal human intervention) because humans increasingly rely on computational support to deal with data as a result of the increase in volume, complexity, and creation speed of data.”²³

FAIRCORE4EOSC: The FAIRCORE4EOSC project is dedicated to advancing the European Open Science Cloud (EOSC) by developing and implementing essential components. Its primary objectives include supporting the creation of a FAIR (Findable, Accessible, Interoperable, and Reusable) EOSC and addressing identified gaps outlined in the Strategic Research and Innovation Agenda (SRIA). By building on existing technologies and services, the project aims to create nine new EOSC-Core components. These components are designed to enhance the discoverability and interoperability of a broader range of research outputs within the EOSC framework.²⁴

Framework: A framework is a basic structure underlying a system, concept, or text (Oxford Dictionary). In software development, a framework is a set of pre-established and reusable components, libraries, and tools organized in a specific structure. It provides a foundation for developers to build applications with standardized practices, reducing the need to recreate common functionalities from scratch. Frameworks are often designed to provide a common structure, enhance efficiency, and ensure consistency in different applications or processes. They offer a systematic way to approach complex tasks, enabling easier development, implementation, or analysis within a given domain.²⁵

H-index: The h-index, also known as the Hirsch index, serves as a metric to gauge the productivity and impact of a researcher's scholarly publications. Physicist Jorge E. Hirsch introduced this metric in 2005, aiming to provide a numerical assessment that considers both the quantity (number of publications) and impact (citation counts) of a researcher's work. Widely employed in academia, the h-index offers a quick evaluation of a researcher's overall influence and productivity within the academic community. However, it is crucial to recognize that the h-index is inherently biased, has severe limitations, and should not be used in the evaluation of a researcher.²⁶

Journal Impact Factor (JIF): The Impact Factor (IF) or Journal Impact Factor (JIF) is a scientometric index calculated by Clarivate, reflecting the average number of citations received by articles published in a particular journal over the last two years, as indexed by Clarivate's Web of Science. Functioning as a journal-level metric, the Impact Factor is often employed as an indicator of the relative significance of a journal within its field. Journals with higher Impact Factor values are

²³ See <https://www.go-fair.org/fair-principles>

²⁴ See <https://faircore4eosc.eu>

²⁵ See https://en.wikipedia.org/wiki/Software_framework

²⁶ See <https://en.wikipedia.org/wiki/H-index>

generally perceived as more important or prestigious within their respective disciplines compared to those with lower values.²⁷

Monitoring of Open Science and research: “Monitoring generates data on an intervention’s activity and impact over time in a continuous and systematic way. It helps identify and address any implementation problems of an intervention while generating at the same time as it generates factual data for future evaluation and impact assessment. (European Commission 2015). UNESCO recommends that “Member States should, according to their specific conditions, governing structures and constitutional provisions, monitor policies and mechanisms related to Open Science using a combination of quantitative and qualitative approaches, as appropriate” (UNESCO 2021).”²⁸

Open Access publications: Open Access is a publishing model for scholarly communication that provides readers with unrestricted access to research information unrestricted access to research information for readers at no cost. This is in contrast to the traditional subscription model, where readers typically gain access to scholarly content by paying a subscription fee, often facilitated through libraries or other institutions. The aim of open access is to remove financial barriers, making research findings freely accessible to a global audience, thereby fostering widespread dissemination of knowledge and encouraging collaboration among researchers.²⁹

Open Science: “The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines Open Science 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. It comprises all scientific disciplines and aspects of scholarly practices, including basic and applied sciences, natural and social sciences and the humanities, and it builds on the following key pillars: open scientific knowledge, Open Science infrastructures, science communication, open engagement of societal actors and open dialogue with other knowledge systems.” (UNESCO 2021.)”³⁰

²⁷ See https://en.wikipedia.org/wiki/Impact_factor

²⁸ See Anna-Kaisa Hyrkkänen, Dragan Ivanović, Janne Pölönen, Marita Kari, & Elina Pylvänäinen. (2023). GraspOS Deliverable D2.1 "OS-aware RRA approaches landscape report" (1.0). Zenodo. <https://doi.org/10.5281/zenodo.8301792>

²⁹ See <https://www.openaccess.nl/en/what-is-open-access>

³⁰ See Anna-Kaisa Hyrkkänen, Dragan Ivanović, Janne Pölönen, Marita Kari, & Elina Pylvänäinen. (2023). GraspOS Deliverable D2.1 "OS-aware RRA approaches landscape report" (1.0). Zenodo. <https://doi.org/10.5281/zenodo.8301792>

Open Science Assessment Framework (OSAF): The Open Science Assessment Framework (OSAF), developed in the GraspOS project, has three elements: the SCOPE+i method (SCOPE plus infrastructure) to help guide the use of SCOPE toward Responsible Research Assessment protocols and to implement the use of assessment-specific infrastructure in the SCOPE process, thereby extending SCOPE; digital Assessment Portfolios to facilitate collecting and sharing of diverse contributions to be included in an assessment event; and an Assessment Registry for publishing the assessment protocol from completed assessment events.

Open Science aware Responsible Research Assessment (OS-aware RRA): Responsible Research Assessment (RRA) that takes into account the Open Science paradigm, thus evaluating research practices in a manner that also aligns with the principles of Open Science. This approach emphasizes transparency, collaboration, and accessibility in research. In the context of RRA, it means assessing not only the traditional scholarly outputs but also considering practices such as open access, data sharing, and collaborative efforts. The goal is to promote research that adheres to Open Science principles, fostering a more inclusive and impactful research environment.

Open Researcher and Contributor ID (ORCID): ORCID, an acronym for Open Researcher and Contributor ID, is a global, non-profit organization that sustains itself through fees collected from its member organizations. It operates as a community-driven initiative with governance provided by a Board of Directors representing a diverse range of stakeholders. ORCID's structure is designed to ensure broad representation and involvement from its membership. The organization is further supported by a dedicated and knowledgeable professional staff, working collaboratively to advance the mission and objectives of ORCID in facilitating unique and persistent identifiers for researchers and contributors in the scholarly community.³¹

Persistent Identifier (PID): A persistent identifier is a long-lasting reference to a digital resource.³²

Research Activity Identifier (RAiD): “A Research Activity Identifier (RAiD) is a globally unique, persistent identifier (PID) for research projects and activities. It comprises both a RAiD name containing the unique persistent identifier ‘10.25’ (called a ‘DOI RAiD handle’), and a RAiD metadata record. A RAiD links a project with its non-sensitive metadata information (such as contributors, organizations, grants, instruments, publications and datasets), without linking this information between each other or duplicating information that can be found elsewhere.”³³

³¹ See <https://info.orcid.org/what-is-orcid>

³² See https://en.wikipedia.org/wiki/Persistent_identifier

³³ See <https://raid.org/overview>

Responsible Research Assessment (RRA): Responsible research evaluation centers around generating research metrics that align with specific principles, including ensuring data accuracy, transparent data collection and analysis, and the utilization of a diverse range of indicators.

Research Organization Registry (ROR): The Research Organization Registry (ROR) is a global initiative, led by the community, that serves as a registry for open and persistent identifiers assigned to research organizations. ROR plays a vital role in facilitating the unambiguous identification of institution names, enabling seamless connections between research organizations, researchers, and research outputs. This registry is utilized across various systems in journal publishing, data repositories, funder and grant management platforms, open access workflows, and other components of research infrastructure. Its primary functions include disambiguating institutional affiliations, enhancing the discovery and tracking of research outputs based on affiliations, and supporting open access publishing workflows, among other important use cases.³⁴

SCOPE: (Start with what you value, Context considerations, Options for Evaluating, Probe Deeply, Evaluate for Evaluation) – “The SCOPE framework for research evaluation is a five-stage model for evaluating responsibly. It is a practical step-by-step process designed to help research managers, or anyone involved in conducting research evaluations, in planning new evaluations as well as check existing evaluations. SCOPE is an acronym, where S stands for START with what you value, C for CONTEXT considerations, O for OPTIONS for evaluating, P for PROBE deeply, and E for EVALUATE your evaluation.”³⁵

Software Infrastructure: Infrastructure refers to the fundamental software components, tools, frameworks, and resources that deliver crucial support and services for the entire lifecycle of software applications, including development, deployment, and operation. This infrastructure establishes the underlying structure essential for the smooth functioning of software systems and applications. Software infrastructure encompasses a broad spectrum of elements that collectively contribute to the overall software ecosystem, ensuring the robustness and efficiency of software development and deployment processes.³⁶

³⁴ See <https://ror.org/about>

³⁵ See <https://inorms.net/scope-framework-for-research-evaluation>

³⁶ See https://en.wikipedia.org/wiki/Federated_architecture