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TERMINOLOGY

Terminology/Acronym	Description
FIF	FAIR Implementation Framework
Trust-IT	Core partner in FAIR-IMPACT leading WP7
DCC	Digital Curation Centre, core partner in FAIR-IMPACT leading WP2
FAIRsharing	A registry of data preservation, management and sharing policies from international funding agencies, regulators, journals, and other organisations.
WP	Work Package
PID	Persistent Identifier

Executive Summary

FAIR-IMPACT developed the FAIR Implementation Framework (FIF) to underpin the delivery of the project's expert (non-financial) support programmes. One of the main components of the FIF is a catalogue of resources to promote a range of existing FAIR-enabling tools, approaches and solutions that are available to support FAIR implementation in a practical sense. In this brief report we provide an update on the activities carried out during the final year of the FAIR-IMPACT project to update the FIF catalogue of resources and provide a snapshot of the set of more than 50 resources that are included in the final version.

1. Introduction

The FAIR-IMPACT project aimed to support the adoption and implementation of existing and emerging tools, methods and approaches for applying the FAIR principles in the research cycle across communities and geographies. To this end, FAIR-IMPACT developed the FAIR Implementation Framework (FIF)¹ which underpinned the delivery of in-kind support to three key stakeholder groups, as main targets for expert (non-financial) support in the project: Research Performing Organisations, Repositories and Data Service Providers, and National Level Initiatives.² One of the main components of the FIF is a catalogue³ of resources to promote a range of existing FAIR-enabling tools, approaches and solutions that are available to support FAIR implementation in a practical sense. Following an initial landscape analysis,⁴ the first iteration of the FIF catalogue of resources was released in May 2023⁵ and included 35 resources via the online portal. Several of the resources included in the first iteration of the FIF catalogue of resources were prioritised for our first open call for financial support in 2023⁶. An updated version of the catalogue was released in November 2023 with additional resources and improved browsing functionality.⁷ This brief report provides an overview of the activities carried out in the final year of the FAIR-IMPACT project towards updating the FIF into its latest version, and provides a snapshot of the set of 53 resources that are included in the final version of the FIF catalogue of resources.

2. FAIR Implementation Framework (FIF) Catalogue of Resources

2.1.1 The FIF catalogue portal

The FIF catalogue of resources in the form of a portal is built on Drupal CMS and is made available as a stand-alone website⁸ which is linked to the main FAIR-IMPACT project website.⁹ Both the stand-alone and main websites are provided and managed by Trust-IT,¹⁰ the leader of WP7 Dissemination, exploitation and communication.

2.1.2 Browsing the FIF content

The online catalogue presents a list of FIF resources in alphabetical order and shows the title, creator and a brief description of each resource, thus helping users to find tools and approaches that might be relevant to their research and research support needs. Over the

¹ <https://fair-impact.eu/fair-implementation-framework>

² FAIR-IMPACT's open calls for In-kind support <https://fair-impact.eu/apply-non-financial-support>

³ <https://catalogue.fair-impact.eu/#>

⁴ D2.1 Targeted landscape analysis report <https://doi.org/10.5281/zenodo.7581670>

⁵ M2.4 First iteration of FAIR implementation framework (1.0). Zenodo. <https://doi.org/>

⁶ <https://fair-impact.eu/1st-open-call-route-2-support-closed>

⁷ M2.5 Update of FAIR implementation framework (nr2) <https://zenodo.org/records/13342173>

⁸ FAIR Implementation catalogue of resources <https://catalogue.fair-impact.eu/>

⁹ FAIR Implementation Framework <https://fair-impact.eu/fair-implementation-framework>

¹⁰ Trust-IT <https://www.trust-it-services.com/>

final year of the FAIR-IMPACT project, the FIF metadata were updated to include FAIR-IMPACT's four thematic areas as represented by its pillar WPs - Interoperability, Metadata & Semantics, Metrics & Assessment, and PIDs. This update provided another facet to help users find relevant tools and resources (Figure 1).

Once a resource is selected from the list, users are presented with more detailed information including the level at which the tool/solution/approach is intended to be used, the expertise needed to make use of the resource, and a direct link to the online tool/resource.

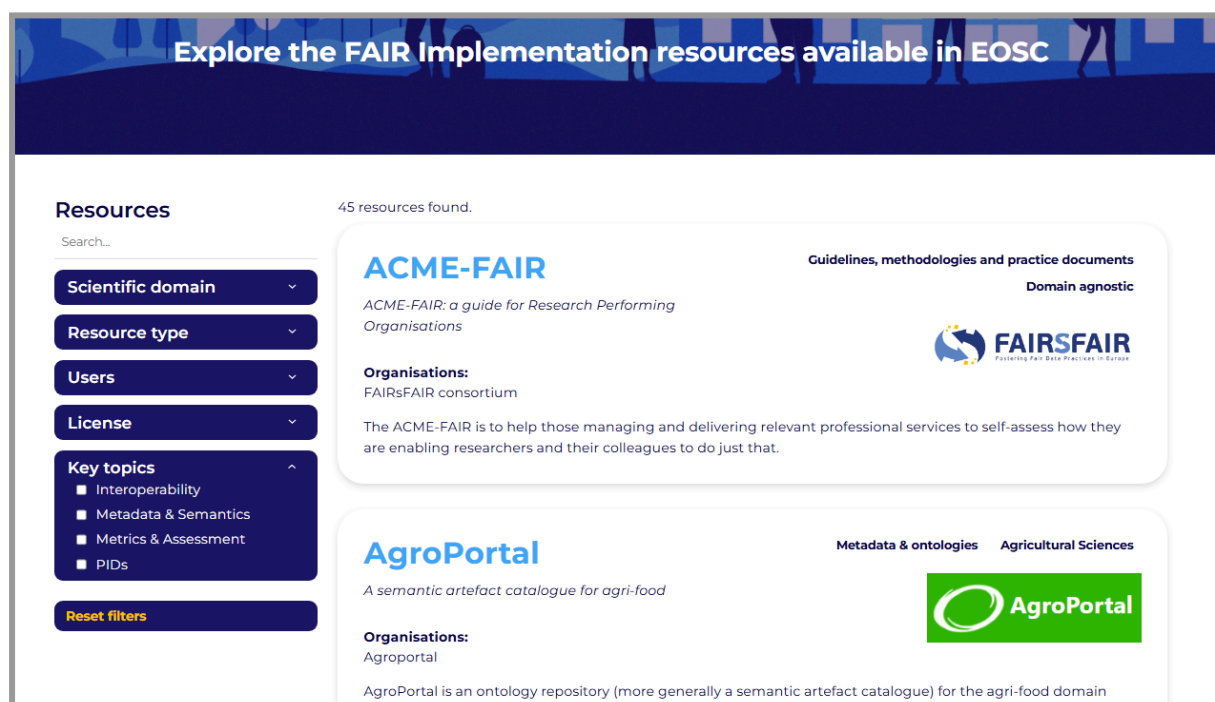


Figure 1 : FAIR Implementation Catalogue - sample view

2.1.3 Final update of FIF catalogue of resources

In March 2025, FAIR-IMPACT undertook a review of the resources presented in the FIF catalogue to ensure that they were still accessible and to identify new tools and resources that should be added. A number of candidate resources were submitted by the community via the online form.¹¹ The key priority for the additions to the FIF catalogue in March 2025 was to ensure that the emerging tools/approaches/solutions that were offered for testing and uptake via FAIR-IMPACT's second¹² and third¹³ open calls for financial support were included in the catalogue including several emerging resources that were produced by FAIRCORE4EOSC. By the end of the FAIR-IMPACT project, the FIF catalogue of resources included 53 tools/approaches/solutions. Please see Annex 1 for the list of resources included in the final version of the FIF catalogue of resources.

¹¹ <https://fair-impact.eu/ImplementationFramework-inputform>

¹² FAIR-IMPACT's second open call for financial support <https://fair-impact.eu/2nd-open-call-route-2-support>

¹³ FAIR-IMPACT's third open call for financial support <https://fair-impact.eu/3rd-open-call-route-2-support-opens-30-sept>

3. Conclusions and Sustainability

The FAIR Implementation Framework has been identified by the project as one of the Key Outputs included in its Sustainability Plan.¹⁴ The plan includes details on the FIF, its mapping across the EOSC SRIA and the MAR,¹⁵ the reasons and needs for sustainability in relation to its goal and assistance it offers in identifying the FAIR-enabling steps and resources, as well as the next steps for its sustainability. At a practical level, Trust-IT will maintain the FIF catalogue portal for a period of 5 years after the project ends in the form that it exists at the closing of the FAIR-IMPACT project, while further uptake is being considered in relation to future projects and initiatives. It will exist with a direct link from the main FAIR-IMPACT website, with KNAW-DANS as data controller and Trust-IT as main host and data processor. To help promote the FIF catalogue for wider use, the FIF has also been registered as a collection with FAIRsharing.¹⁶ Trust-IT and DCC have committed to reviewing the FIF resources presented in the final version of the catalogue annually for a period of two years after the end of the FAIR-IMPACT project.

¹⁴

¹⁵ <https://eosc.eu/sria-mar/>

¹⁶ FAIRsharing.org: FIF Catalogue of Resources; FAIR Implementation Framework Catalogue of Resources, FAIRsharing ID: <https://fairsharing.org/6364>

Annex 1 FAIR Implementation Framework (FIF) Catalogue of Resources

The table below provides a list of the 53 resources that have been included in the FIF Catalogue of Resources by the end of April 2025. The list is presented alphabetically. Please note that some of the items in this list are still being processed for inclusion in the online catalogue and will be available via the catalogue by the end of May 2025.

Resource name	Brief description	FIF catalogue link
ACME-FAIR: a guide for Research Performing Organisations	The ACME-FAIR is to help those managing and delivering relevant professional services to self-assess how they are enabling researchers and their colleagues to do just that.	https://catalogue.fair-impact.eu/resources/acme-fair
AgroPortal (A semantic artefact catalogue for agri-food)	AgroPortal is an ontology repository (more generally a semantic artefact catalogue) for the agri-food domain which features ontology hosting, search, versioning, visualization, comment, and recommendation; enables semantic annotation; stores and exploits ontology alignments; and enables interoperation with the semantic web.	https://catalogue.fair-impact.eu/resources/agroportal
Best practices for implementing fair vocabularies and ontologies on the web	Best practices for implementing FAIR vocabularies and ontologies on the web is a set of guidelines for ontology/vocabulary development and publishing.	https://catalogue.fair-impact.eu/resources/best-practices-implementing-fair-vocabularies-and-ontologies-web
Chowlk	Chowlk Converter is a web application that takes as input an ontology conceptualization made with diagrams.net and generates its implementation in OWL.	https://catalogue.fair-impact.eu/resources/chowlk
Compliance Assessment Toolkit (CAT)	The Compliance Assessment Toolkit enables the encoding, recording, and querying of compliance with the EOSC PID policy and more (including TRUST, FAIR, Reproducibility, GDPR, and Licences).	not yet published

CoreTrustSeal+FAIRenabling Capability Maturity Model	The CoreTrustSeal + FAIRenabling Capability Maturity Model was designed so that repositories can self assess their trustworthiness and FAIR enabling status simultaneously, with a view to developing and improving their practice.	https://catalogue.fair-impact.eu/resources/coretrustsealfair-enabling-capability-maturity-model
Data policy support for facilities science	This policy framework proposed a set of 21 elements to consider when formulating data policy for research infrastructures, especially in the photon and neutron (PaN) domain. Although the framework was produced specifically in the PaN context, it is sufficiently general that it is likely to be of value in other fields.	https://catalogue.fair-impact.eu/resources/data-policy-support-facilities-science
Dataset Maturity Model	This model assesses dataset maturity using indicators based on the FAIR principles.	https://catalogue.fair-impact.eu/resources/dataset-maturity-model
DO I-PASS for FAIR?	A paper based self assessment tool to measure the FAIR-ness of an organization.	https://catalogue.fair-impact.eu/resources/do-i-pass-fair
EcoPortal	EcoPortal is a repository for semantic artefacts that pertain to Ecology and Biodiversity. It hosts relevant ontologies and controlled vocabularies together with their metadata and it offers a suite of tools to discover, publish or utilise them.	https://catalogue.fair-impact.eu/resources/ecportal-0
EOSC Data Type Registry (DTR)	Enables the registration of different data types to support a high degree in machine actionability and interoperability in the management of structured research data.	not yet published
F-UJI: Automated FAIR Data Assessment Tool	F-UJI is a service based on REST, originally developed within the FAIRsFAIR project, piloting a programmatic assessment of the FAIRness of research datasets in five trustworthy data repositories.	https://catalogue.fair-impact.eu/resources/f-uji

FAIR Adoption Handbook for Universities	This is a teaching and training handbook for higher education institutions to help universities to apply the competence framework to their specific situation and needs.	https://catalogue.fair-impact.eu/resources/fair-adoption-handbook-universities
FAIR Connect	FAIR Connect is an Open Access publishing platform for the development and dissemination of good practices for professional FAIR-Data stewardship.	https://catalogue.fair-impact.eu/resources/fair-connect
FAIR Cookbook	Defined recipes for FAIRifying datasets, as well as more general topic guidance	https://catalogue.fair-impact.eu/resources/fair-cookbook
FAIR EVA: Evaluator, Validator & Advisor	FAIR EVA is a FAIR assessment tool that provides information about the FAIRness compliance for digital objects in an automatic manner.	not yet published
FAIR Implementation Profiles Wizard Tool	The FIP Wizard is a toolset that facilitates the capture of data in the FAIR Convergence Matrix questionnaire, declaring a FAIR Implementation Profile. It is used for the evaluation of the implementation status of FAIR data practices.	https://catalogue.fair-impact.eu/node/212
FAIR Signposting	A method to expose machine-actionable navigation links that indicate downloadable resources, types and attribution – particularly for scholarly and institutional repositories which use persistent identifiers like DOIs.	https://catalogue.fair-impact.eu/resources/fair-signposting
FAIR-Aware	The FAIR-Aware tool provides practical information and resources to (further) develop skills for FAIR data and is meant to incentivise researchers to make their data FAIR. This tool can be used both as a teaching tool and as a resource for researchers and data stewards.	https://catalogue.fair-impact.eu/resources/fair-aware

FAIR-by-Design Methodology for Learning Materials Development	A methodology for FAIR-by-design production of learning materials based on the backward instructional process that is extended with additional activities focusing on the implementation of the FAIR guiding principles.	https://catalogue.fair-impact.eu/resources/fair-design-methodology
FAIR-enabling data policy checklist	This checklist helps policy-makers to assess whether elements of their data policies are FAIR-enabling as well as providing recommendations on what should be addressed in policies.	https://catalogue.fair-impact.eu/resources/fair-enabling-data-policy-checklist
FAIR-enabling Repository Finder	The Repository Finder is a searchable registry of repositories with embedded content and metadata.	https://catalogue.fair-impact.eu/resources/fair-enabling-repository-finder
FAIR4Health Data Curation Tool	The tool is used to connect the health data sources which can be in various formats (Excel files, CSV files, SQL databases) and migrate data into a HL7 FHIR Repository.	https://catalogue.fair-impact.eu/resources/fair4health-data-curation-tool
FAIR4Health Data Privacy Tool	This is a standalone, desktop application developed by the FAIR4Health project. The tool aims to handle the privacy challenges exposed by the sensitive health data.	https://catalogue.fair-impact.eu/resources/fair4health-data-privacy-tool
FAIRassist	The FAIRassist tool, part of the FAIRsharing resource offers personalised guidance to discover resources such as data & metadata standards.	https://catalogue.fair-impact.eu/resources/fairassist
FAIRsharing	A curated, informative and educational resource on data and metadata standards, inter-related to databases and data policies.	https://catalogue.fair-impact.eu/resources/fairsharing

Federated FAIR Data Space (F2DS)	The F2DS is a unifying data space that is built by aggregating and enriching datasets from a set of multidisciplinary repositories, i.e. data sources, with the aim to facilitate data discovery and reuse. Although datasets are the primary focus of the resulting data space, other items are managed, including repositories and data sources, APIs, metadata schemas and ontologies.	https://catalogue.fair-impact.eu/resources/f2ds
FOOPS! Ontology Pitfall Scanner for FAIR	FOOPS! is a tool for assessing FAIRness level for ontologies. It is a web application that can be used for ontologies developed from many domains.	https://catalogue.fair-impact.eu/resources/foops
Framework for assessing FAIR Services	The FAIRsFAIR service assessment framework helps users self-assess how well their research data infrastructure services support FAIR data.	https://catalogue.fair-impact.eu/resources/framework-assessing-fair-services
Global Ocean Data Analysis Project (GLODAP)	A uniformly calibrated open ocean data product of inorganic and carbon-relevant variables.	https://catalogue.fair-impact.eu/resources/glodap-0
Guidelines for recommended metadata standard for research software within EOSC	A set of guidelines for collecting and curating research software metadata. These guidelines are directly addressed to end users, including software creators and curators in their quest to improve the FAIRness of their software.	not yet published
I-ADOPT Interoperability Framework	The I-ADOPT Interoperability Framework is a set of guidelines based on a simple non-domain specific ontology that supports the decomposition of complex observable properties into their essential atomic parts represented through the concepts in FAIR terminologies.	https://catalogue.fair-impact.eu/resources/i-adopt

IVOA validator for Astronomy services	The online tool allows data centre and data repository managers to assess the compliance of their web services or digital objects with respect to the IVOA standards.	https://catalogue.fair-impact.eu/resources/ivoa-validator
LCT – License Clearance Tool	The License Clearance Tool provides technical solutions to address legal aspects in FAIR and ORDM. It addresses the complexity of legal interoperability in scenarios where available IPR options need to be examined for derivative works.	https://catalogue.fair-impact.eu/resources/lct
Linked Open Vocabularies	Linked Open Vocabularies (LOV) is an ontology search and reuse tool designed to help publishers and users of linked data and vocabularies to assess what is available and facilitate reuse.	https://catalogue.fair-impact.eu/resources/lov
LS Login	The Life Science Log in enables researchers to use their home organization credentials or community or commercial identities (Orcid/Linkedin) to sign in and access data. and services they need across multiple platforms.	https://catalogue.fair-impact.eu/resources/ls-login
Metadata Schema and Crosswalk Registry (MSCR)	The MSCR allows registered users and communities to create, register and version schemas and crosswalks with persistent identifiers (PIDs). The published content can be searched, browsed and downloaded without restrictions. The MSCR also provides an API to facilitate the transformation of data from one schema to another via registered crosswalks.	not yet published
Nanopublication Ecosystem	The nanopublication ecosystem provides an open and decentralized network of services, through which FAIR data can be published and queried in the form of small Linked Data containers called nanopublications.	not yet published

OGC Definitions Server	OGC RAINBOW is provided by the Open Geospatial Consortium (OGC), a membership based International Standards Organisation.	https://catalogue.fair-impact.eu/resources/ogc-definitions-server
OGC RAINBOW	OGC RAINBOW is a Web accessible source of information about things ("Concepts") the OGC defines or that communities ask the OGC to host on their behalf. It applies FAIR principles to the key concepts that underpin interoperability in systems using OGC specifications.	https://catalogue.fair-impact.eu/resources/ogc-rainbow
Photon and Neutron (PaN) ontologies to support FAIR	Exploitation of FAIR principles (especially Findability) can be hampered by the lack of consistency in metadata used to annotate data records and search databases. Several small ontologies have been developed to facilitate consistent semantics for terms within the PaN domain by providing global persistent identifiers, community agreed labels and synonyms, and human-readable definitions, annotations and references.	https://catalogue.fair-impact.eu/resources/pa-n-ontologies-support-fair
Ontology FAIRness Evaluator (O'FAIRe)	O'FAIRe (Ontology FAIRness Evaluator) is a metadata-based automatic FAIRness assessment methodology for ontologies and semantic artefacts.	https://catalogue.fair-impact.eu/resources/ofaire
Ontology Pitfall Scanner (OOPS!)	Ontology Pitfall Scanner! is a web application for ontology evaluation. Some of the aspects validated in OOPS! overlap with FAIRness evaluation criteria for ontologies.	https://catalogue.fair-impact.eu/resources/oops
OntoPortal (a generic technology for semantic artefact catalogues)	The OntoPortal technology allows anyone to set up a semantic artefact catalogue for a domain/project of interest.	https://catalogue.fair-impact.eu/resources/ontoportal

Photon and neutron research (PAN) infrastructures fair data implementation handbook	This handbook is intended for Photon and Neutron Research Infrastructures and covers various aspects, including developing FAIR PaN RI data policies, metadata standards for supporting PaN FAIR data, tools and processes for enabling, managing and sharing FAIR PaN experimental data by both humans and machines, adopting PIDs to support FAIR, implementing active data management planning at PaN RIs, and conducting FAIR self-assessments.	not yet published
Recommendations for FAIR Evaluation Services	16 step guidance and recommended actions if F-UJI tests fail	not yet published
RePol	RePol helps in defining and maintaining comprehensive and clear repository and privacy policies in line with the FAIR and Open principles. RePol uses a step-by-step wizard and self-explanatory forms to guide the process..	https://catalogue.fair-impact.eu/resources/re-pol
RO-Crate	RO-Crate has been established as a community effort to practically achieve FAIR packaging of research objects (digital objects like data, methods, software, etc.) with their structured metadata.	https://catalogue.fair-impact.eu/resources/ro-crate
RoLECT	Guided compliance self-assessment for legal and ethics EOSC Rules of Participation.	https://catalogue.fair-impact.eu/resources/rol-ect
The Open Science Community Incubator Program / OSC Starter Kit	Open Science Communities (OSC) are places where researchers make their Open and FAIR practices visible and accessible to their peers, e.g. by organising workshop, focus groups, symposia and other forms of peer-to-peer knowledge exchange.	https://catalogue.fair-impact.eu/resources/osc-starter-kit

VocBench	VocBench is a web-based, multilingual, collaborative development platform for managing and sharing reference data, controlled lists of codes and terms, thesauri and ontologies, used to organise information.	https://catalogue.fair-impact.eu/resources/vocbench
Widoco	Widoco is an ontology documentation tool that allows users to publish and create a customized documentation for an ontology automatically by following a series of steps in a GUI.	https://catalogue.fair-impact.eu/resources/widoco
WORCS: A workflow for open reproducible code in science	WORCS is a workflow for open reproducible code in science.	https://catalogue.fair-impact.eu/resources/worcs