SQAaaS: Fostering Service Integration

EOSC - Workshop: Bridging from theory to practice with EOSC-Synergy

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Speaker: Samuel Bernardo

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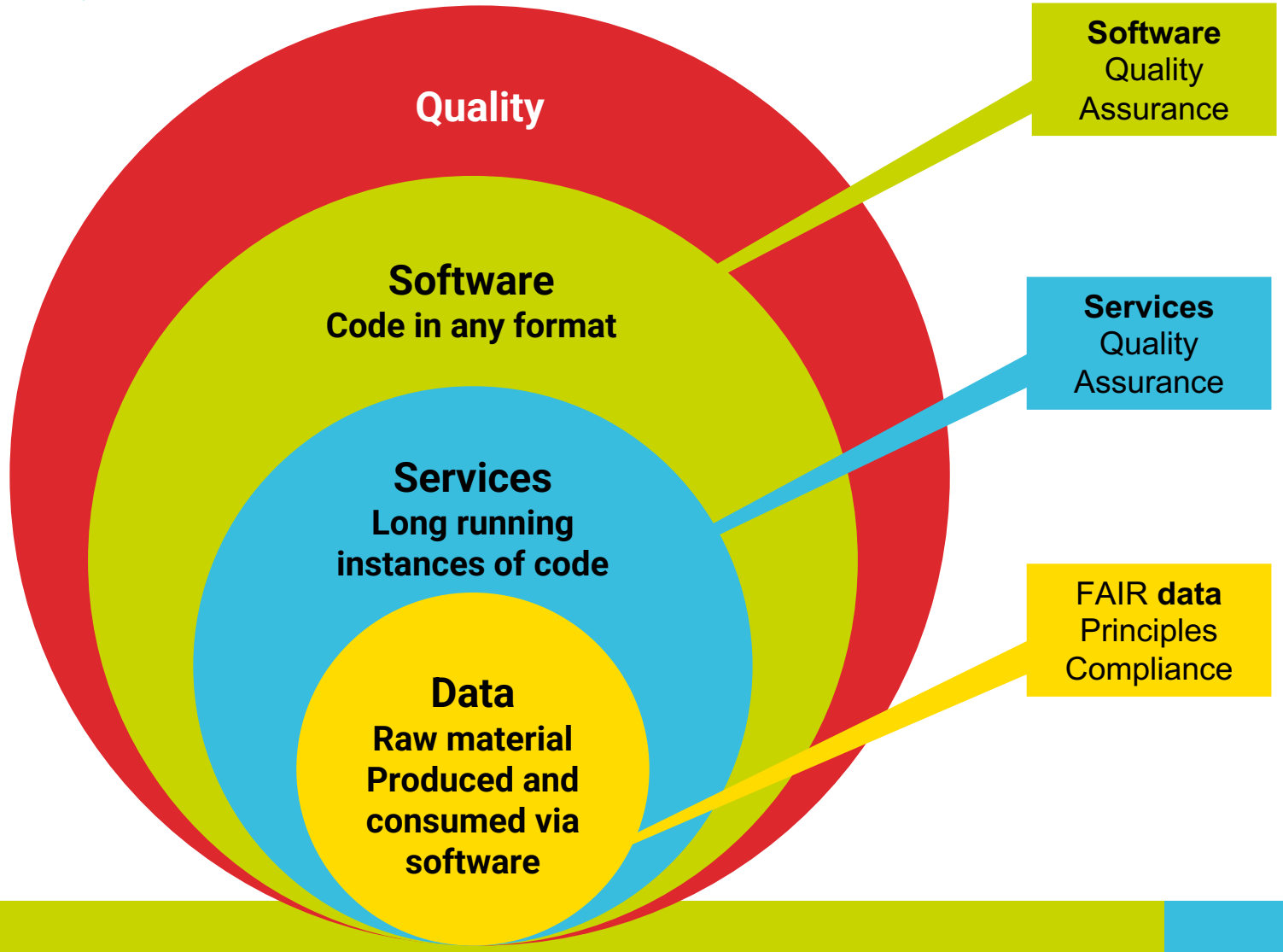
The EOSC Trinity

- Data is produced and consumed using software
- EOSC needs
  - **software**
  - **services**
  - **data**
- Quality must be transversal across EOSC software, services and data



A process to foster quality and adoption

Push the EOSC state-of-the-art in software and services life-cycle
Facilitate the integration of EOSC services

Services Thematic or Generic	Quality Baselines	SQAaaS Platform	Quality Badges	Trusted Integrated Services
• Software source code • For EOSC services • Being integrated or being maintained	• Best practices • Conventions • Guide development and integration • Baseline for quality verification	• Framework to perform verification • Implements the quality baselines • Enables on-demand quality assessment	• Reward quality • Make quality attributes visible • Increase trust • Promote adherence	• More dependable • Easier to maintain • Easier to support • Easier to use • More reliable • Safer
Thematic Services **WP4 and external**	**Software baseline** **Services baseline** **FAIR principles**	**Jenkins Pipeline Library** **SQAaaS** **FAIR metadata validation**	**Digital badges** **OpenBadges**	**EOSC ready services** **Increased satisfaction** **Promoting adoption**

Innovation and achievements

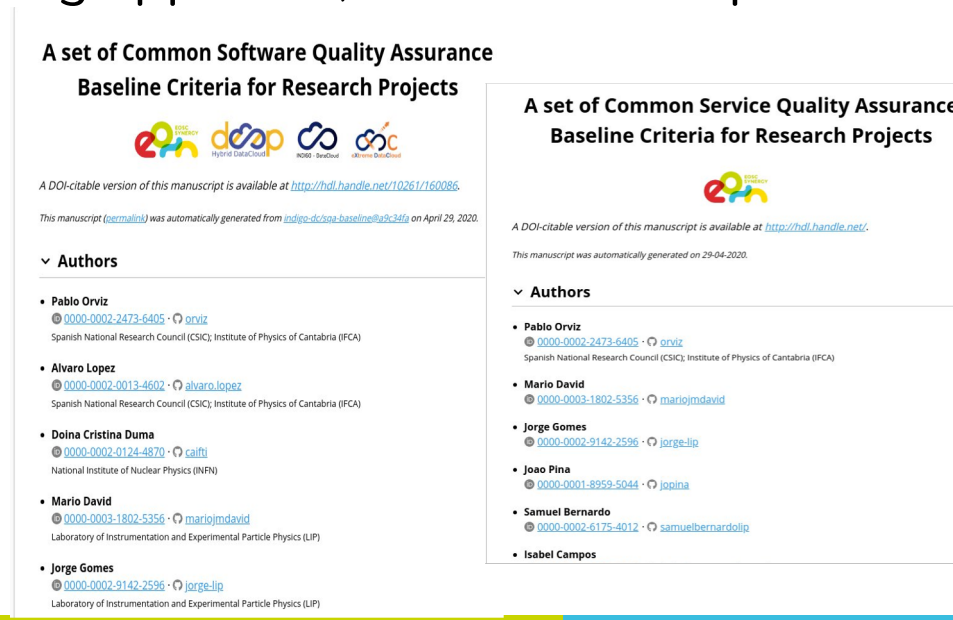
- Quality criteria for automated verification of software and services
- Easy deployment of CI/CD pipelines through JePL
- SQAaaS platform prototype for on-demand QA
- New tool for FAIR validation based on RDA indicators
- Convergence of FAIR with SQA practices
- Started integration of FAIR validation tools with CI/CD pipelines
- (SQAaaS)aaS private deployment of SQAaaS and Jenkins on demand
- More than 20 pipelines implemented

Software & Service QA baselines

- SQAaaS platform implements the quality baselines, with quality as reliability, sustainability, and reusability, to foster the adoption of EOSC services, which will improve, promote and reward quality
- Open to external contributions through github issues
- Automatic build of the documents, following a versioning approach, with html and pdf formats, available with DOI from **digital.csic**

Two documents/baselines:

- Software QA: based on SE practices, applied in previous projects (INDIGO-DataCloud, DEEP-HybridDataCloud and eXtreme DataCloud)
- Service QA: good practices for service deployment and delivery (focus: EOSC)


A set of Common Software Quality Assurance Baseline Criteria for Research Projects

A DOI-citable version of this manuscript is available at http://hdl.handle.net/10261/160086.

This manuscript (permalink) was automatically generated from indigo-dc/sqa-baseline@a9c34fa on April 29, 2020.

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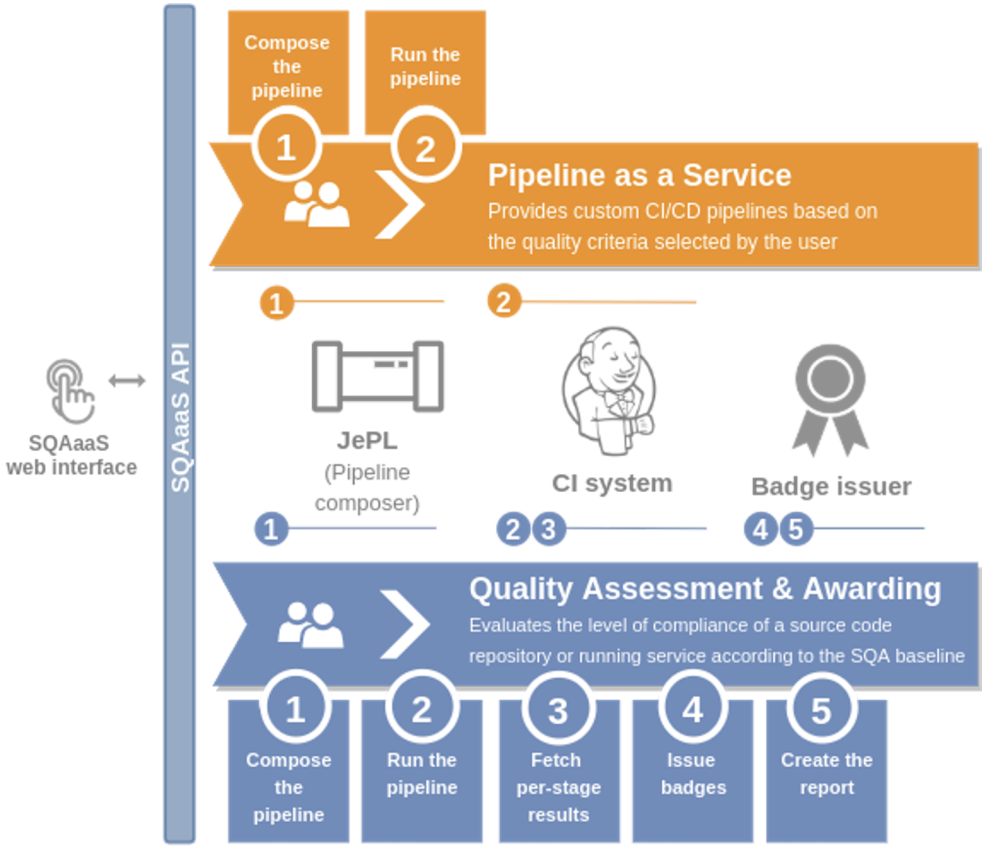
SQAaaS: platform to support integration

Facilitate the assessment of the quality of research software.

Dynamic composition and execution of CI/CD pipelines and analysis of the results.

A. Pipeline as a Service

B. Quality Assessment & Awarding



SQAaaS: architecture and components

Researchers and developers

SQAaaS Web Interface

1st prototype

Programmatic access

SQAaaS API Server

1st prototype

Badgr

Developers, computational scientists, RSE

Jenkins Pipeline Library (JePL)

In production

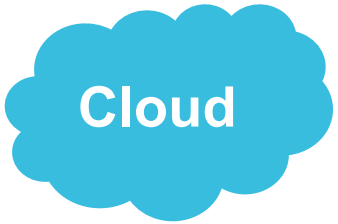
Jenkins

GitHub

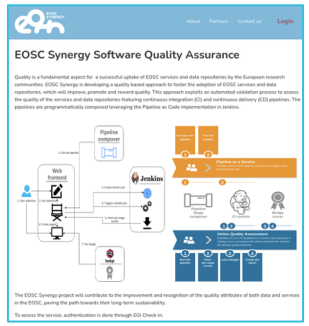
Jenkins Pipeline

SQAaaS: automated deployment

- Automated deployment of the complete SQAaaS platform
  - Facilitates SQAaaS production deployment, testing & promotes adoption
  - On-premises deployment in closed / private environments



Jenkins



SQAaaS platform

https://github.com/EOSC-synergy/SQAaaS
https://operatorhub.io/operator/jenkins-operator

Deployment in any cloud

Deployment on existing k8s

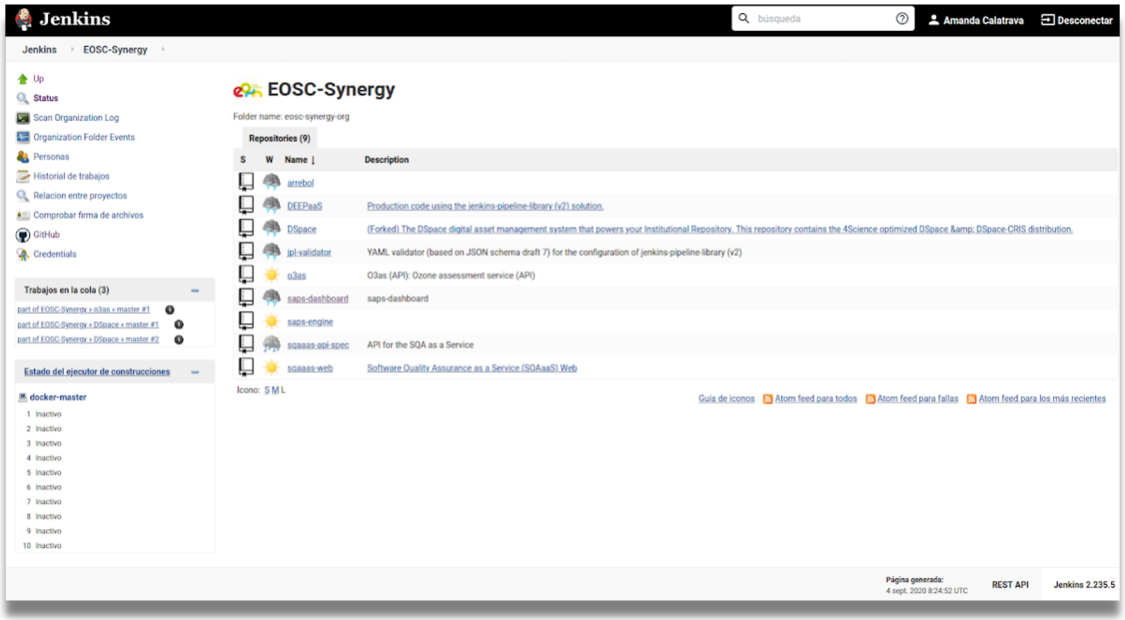
SQAaaS: Jenkins Pipeline Library (JePL)

What	Core component of the SQAaaS platform	• Implementation of baseline quality criteria • Creation and execution of pipelines for quality assurance, CI and CD • Can be used independently from other SQAaaS components
Why	Facilitates adoption of DevOps practices	• Development practices improvement • Enable automation of the QA process • Flexible tooling adoption for python (tox), java (maven) or any other tool
How	Using human-readable YAML format instead of Jenkins Groovy-based language	• Using docker compose and soon also supporting kubernetes • Easy creation and execution of complex pipelines for QA • Library leveraging the Jenkins PaC

JePL: https://github.com/indigo-dc/jenkins-pipeline-library Latest: release 2.1.0

SQAaaS: Jenkins instance for SQAaaS

- EOSC-Synergy Jenkins instance
- Checks automatically the projects in EOSC Synergy Github organization:
  - https://github.com/EOSC-synergy
- Jenkins Operator deployment to create your own Jenkins instances available:
  - A user deployable Jenkins with required plugins is almost ready for those that need on-premises solution



https://jenkins.eosc-synergy.eu/job/eosc-synergy-org/

SQAaaS: use cases already using JePL

- Internal JePL usage from SQAaaS services themselves
  - JePL schema validator (validates JSON schema & builds validator's Docker image)
  - SQAaaS Web (builds & publishes production Web)
  - SQAaaS API (validates OpenAPI spec, builds & publishes API docs

- WP4 thematic services with ready pipelines
  - **WORSICA** https://jenkins.eosc-synergy.eu/job/WORSICA/
  - **O3AS** https://jenkins.eosc-synergy.eu/job/eosc-synergy-org/ (o3* projects)
  - **SAPS** https://jenkins.eosc-synergy.eu/job/eosc-synergy-org/ (saps-* projects)
  - **LAGO** https://jenkins.eosc-synergy.eu/job/eosc-synergy-org/job/onedataSim/
  - **OpenEBench** https://jenkins.eosc-synergy.eu/job/eosc-synergy-org/job/bench_event_api/

- More than 20 thematic service repositories are already using JePL

SQAaaS: API server

What	**Core service that exposes an API to provide the SQA functionality as a Service**	• Provides an API for creation and execution of Pipelines as a Service • Quality assessment and awarding • Abstraction layer to simplify the use of JePL capabilities for SQA, CI and CD
Why	**Facilitates the creation of user interfaces and automation**	• Enable network access to the JePL capabilities to provide them as a Service • Enable simpler exploitation of JePL by user interfaces, other applications or web services for further SQA automation
How	**RESTful API that exposes the JePL capabilities and provides integration for badges issuing**	• Implements OpenAPI specification • Follows the API-first approach • Two repositories for API and implementation

OpenAPI spec: https://github.com/eosc-synergy/sqaaas-api-spec Latest: prototype/1.1 branch

API server: https://github.com/eosc-synergy/sqaaas-api-server Latest: prototype/1.1 branch

SQAaaS: API endpoints and status

- APIs endpoints for the EOSC-Synergy's SQAaaS API platform:
  - Production API: https://api.sqaaas.eosc-synergy.eu/v1/pipeline/
  - Staging API: https://api-staging.sqaaas.eosc-synergy.eu/v1/pipeline/
  - Development API: https://api-dev.sqaaas.eosc-synergy.eu/pipeline/
- Deployment in the scope of this project:
  - Current services are deployed on top of EGI Cloud Compute federation.
  - Automated deployment of Kubernetes through the IM.
  - API endpoints have authentication enabled using EGI Check-in for authentication.
- Now available for testing and early adoption by the thematic services

SQAaaS: Quality Badges

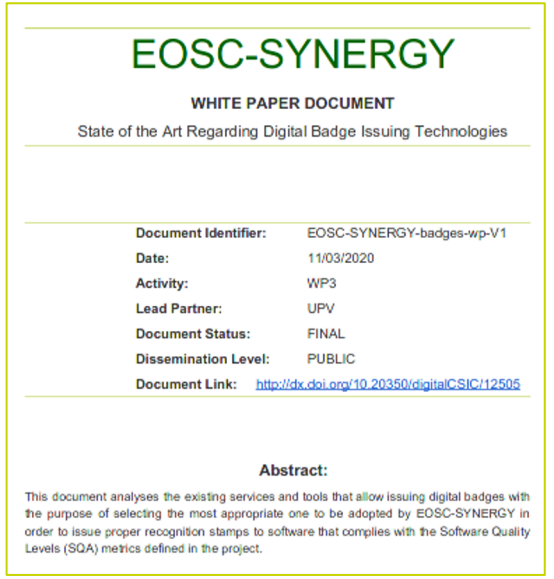
What	**A means for the SQAaaS to reward quality achievements**	• Reward of the quality achievements • Badges are produced as result of the online Quality Assessment & Awarding
Why	**Provide incentives and verifiable means of rewarding**	• Incentivize adherence to the quality baselines and FAIR principles • Improve software, services and data visibility • Give users access to quality information
How	**Using digital badges as quality credentials**	• Following the Open Badges specification • Using the Badgr implementation • The SQAaaS platform through the API Server and web can interact with Badgr and issue badges with metadata

Part of the SQAaaS components functionality.

SQAaaS: quality badges status

- Technology scouting and whitepaper on digital badges.
- Selected Open Badges specification and using Badgr:
  - EOSC-Synergy: https://badges.eosc-synergy.eu/
  - European Badgr instance: https://eu.badgr.com
- Grap

- Issuing badges for successful pipelines within the SQAaaS



EOSC-SYNERGY

WHITE PAPER DOCUMENT

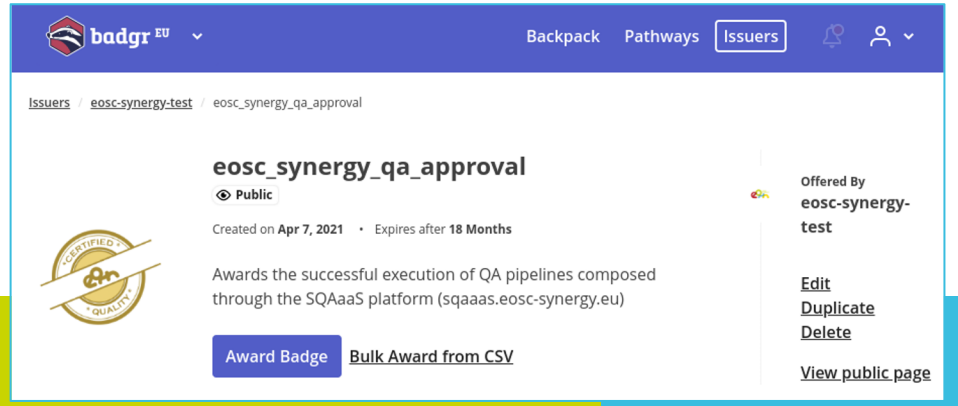
State of the Art Regarding Digital Badge Issuing Technologies

Document Identifier:	EOSC-SYNERGY-badges-wp-V1
Date:	11/03/2020
Activity:	WP3
Lead Partner:	UPV
Document Status:	FINAL
Dissemination Level:	PUBLIC
Document Link:	http://dx.doi.org/10.20350/digitalCSIC/12505

Abstract:

This document analyses the existing services and tools that allow issuing digital badges with the purpose of selecting the most appropriate one to be adopted by EOSC-SYNERGY in order to issue proper recognition stamps to software that complies with the Software Quality Levels (SQA) metrics defined in the project.

http://dx.doi.org/10.20350/digitalCSIC/12505



Objectives, approach & achievements

FAIR principles from theory to practice to support research

- Holistic approach from raising awareness to assessment tools, recommendations and training
- Quality for data, repositories and data infrastructure services

Enabling alignment and exploitation of FAIR principles

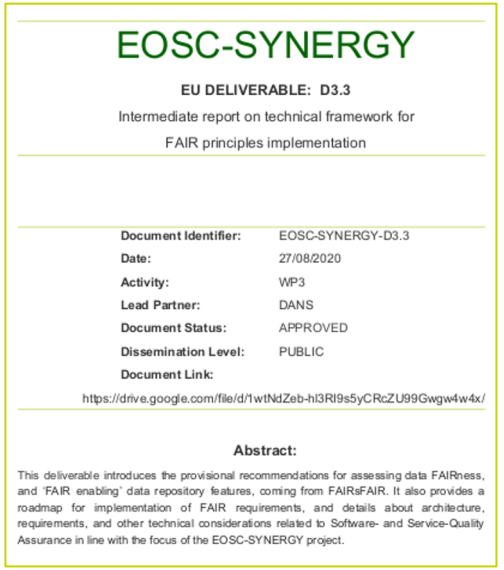
- Alignment with FAIRsFAIR and 5b projects
- FAIR quality criteria
- FAIR tools integration

FAIR technical framework to support FAIR best practices

- FAIR evaluator for RDA criteria
- Integration of assessment tools
- Repository actionable features to enable automated validation
- Training materials

FAIR applied to thematic services

- Assisting thematic services in adopting FAIR practices
- Assessing FAIR compliance
- Establish reference examples



EOSC-SYNERGY

EU DELIVERABLE: D3.3

Intermediate report on technical framework for FAIR principles implementation

Document Identifier:	EOSC-SYNERGY-D3.3
Date:	27/08/2020
Activity:	WP3
Lead Partner:	DANS
Document Status:	APPROVED
Dissemination Level:	PUBLIC
Document Link:	

https://drive.google.com/file/d/1wtNdZeb-hI3RI9s5yCRcZU99Gwgw4w4x/

Abstract:

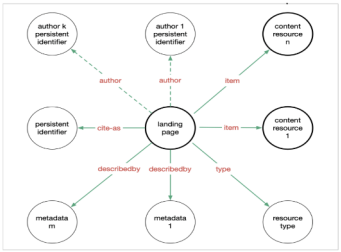
This deliverable introduces the provisional recommendations for assessing data FAIRness, and 'FAIR enabling' data repository features, coming from FAIRsFAIR. It also provides a roadmap for implementation of FAIR requirements, and details about architecture, requirements, and other technical considerations related to Software- and Service-Quality Assurance in line with the focus of the EOSC-SYNERGY project.

http://dx.doi.org/10.20350/digitalCSIC/12608

Technical Framework: Implementation

- General & Thematic Repositories:
  - Examples: DIGITAL.CSIC, SOCIB, Dataverse, DSpace
- Providing machine-actionable features
  - For supporting automated FAIR data and FAIR data checking

https://signposting.org/FAIR/



FAIR data point

- Service to expose data sets using machine-readable metadata
- Provides semantic interoperability

FAIR signposting

- Lightweight approach to increase FAIR compliance and facilitate machine interaction.

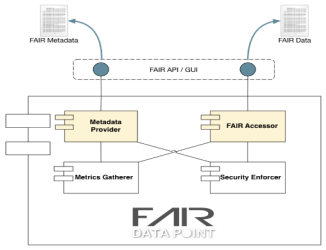
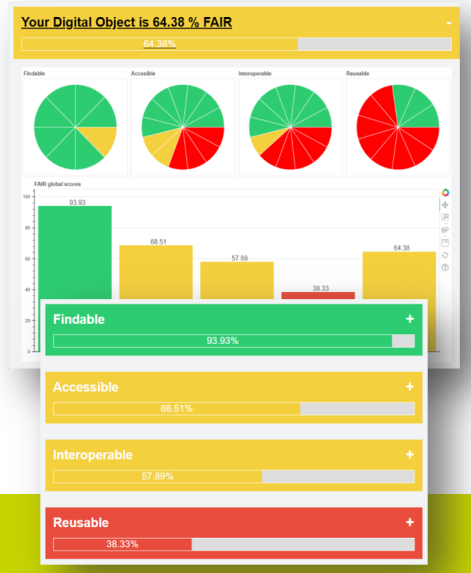
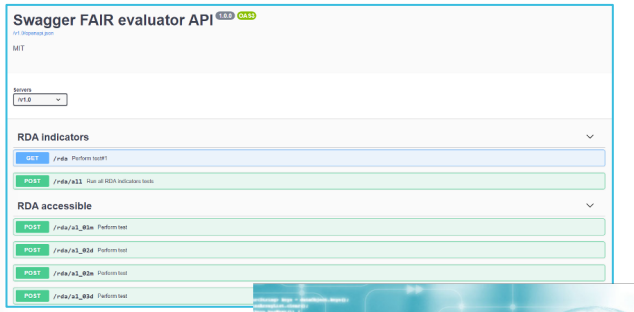


Figure 1 - *FAIR Data Point components*

FAIR assessment & FAIR criteria

- FAIR Evaluator & F-UJI
  - Open approach: JePL, CI/CD, Dockerized, OpenAPI.
- RDA Indicators & FAIRsFAIR indicators
- Being integrated in WP4 thematic Services
- FAIR Criteria





SQAaaS: Web interface

What	**User web interface for the SQAaaS platform**	• Friendly web interface for the less knowledgeable doing sw development • User interface that hides the underlying complexity and details of the SQAaaS • Static web site
Why	**Provide easy intuitive access to the SQAaaS capabilities**	• Make SQA available to wider audiences • Facilitate adoption of SQA practices • Reduce the learning curve to adopt SQA • Reduce the time and effort required to implement an SQA process
How	**Web interface that interacts with the SQAaaS API Server**	• Users just need to fill in the required input for each criterion • Based on the VueJS Javascript framework, intuitive modern, easy to use • Uses the SQAaaS API Server

sqaaas-web: https://github.com/EOSC-synergy/sqaaas-web Latest: stage branch

SQAaaS Web Demo: so simple that you can’t miss it

Access to SQAaaS Web at https://sqaaas.eosc-synergy.eu/

Gracias!

Obrigado!

Danke!

Dziękuję!

Vďaka!

Dekuji!

Bedankt!

Merci!

Thanks!

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