FAIR-by-Design Methodology

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Supporting | eosc

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the European Union

Skills
4 eosc

- Skills for the European
- Open Science
- Commons

Skills 4 eosc

46 **partners**, 18 **countries**

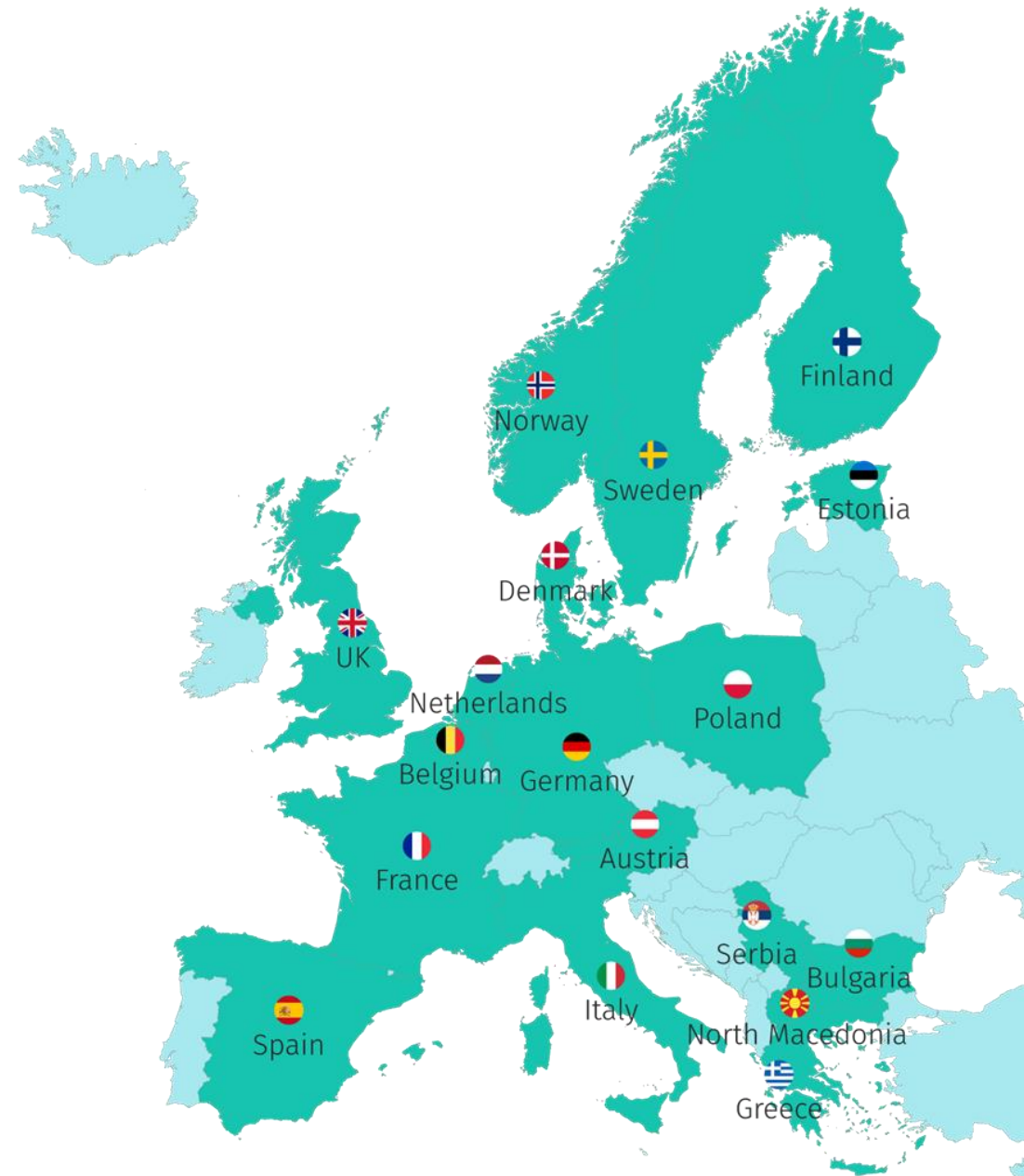"**Key doers**" in Open Science in their country/region/domain

2 ESFRI **Research Infrastructure**

6.6 million €

September 2022 - August 2025

Skills4EOSC Main Objective

Advance Open Science skills by unifying the current training landscape into a common and trusted pan-European ecosystem, closing the three gaps identified in the **EOSC Strategic Research and Innovation Agenda 2021** in relation to Open Science competences:

- lack of **Open Science and data expertise**,

- lack of a clear definition of **data professional profiles and corresponding career paths**, and

- **fragmentation** in training resources.

Key Concepts

- Competence Centre and network

- Minimum Viable Skillset

- FAIR-by-design methodology for learning material

- Training of Trainers

- Master trainer

- Professional Networks

- User Support Network

- Co-Creation Mechanism

Co-creation

Key project output undergo a two step co-creation process:

- Consortium level

- Community level

  - Relevant materials are uploaded in the [Zenodo Community](#)

  - Relevant stakeholders are invited to participate to the co-creation

  - A feedback survey/questionnaire is used to collect feedback from stakeholders

  - Dedicated webinars/events are organised to allow broader discussion

Competences Definition

Skills4EOSC defines a minimum set of competences for each target in the **Minimum Viable Skillset**

Design learning paths & material

Through the **FAIR by design methodology**, learning materials for Training of Trainer programmes will be developed for various targets
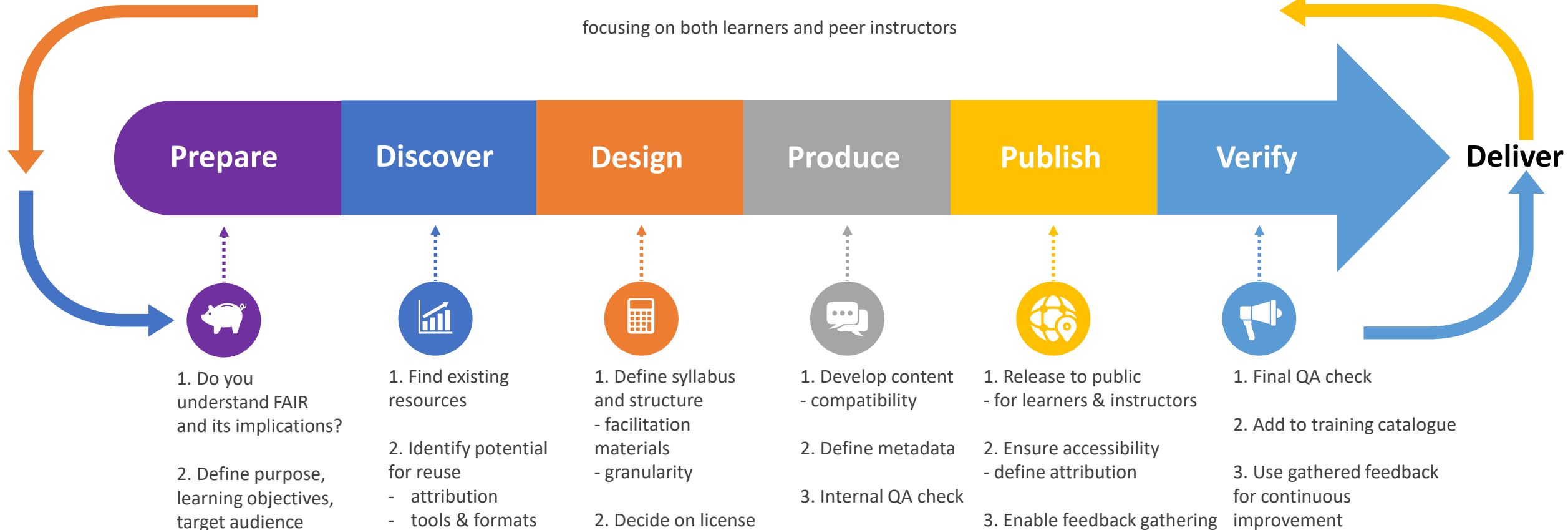
Training of Trainers delivery

Fall 2024

Training of Trainers will be delivered to Competence Centres members to multiply the specific competences inside the Skills4EOSC Network.

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FAIR-by-Design Methodology

Backward Instructional Design Empowered with FAIR principles

focusing on both learners and peer instructors

Prepare	Discover	Design	Produce	Publish	Verify	Deliver

Prepare

1. Do you understand FAIR and its implications?

2. Define purpose, learning objectives, target audience

Discover

1. Find existing resources

2. Identify potential for reuse
- attribution
- tools & formats

Design

1. Define syllabus and structure
- facilitation materials
- granularity

2. Decide on license

Produce

1. Develop content
- compatibility

2. Define metadata

3. Internal QA check

Publish

1. Release to public
- for learners & instructors

2. Ensure accessibility
- define attribution

3. Enable feedback gathering

Verify

1. Final QA check

2. Add to training catalogue

3. Use gathered feedback for continuous improvement

FAIR requires commitment

Time, Time, More Time
Additional work requires additional time. To provide full context and improve reusability, time is needed to make a record of all related information.
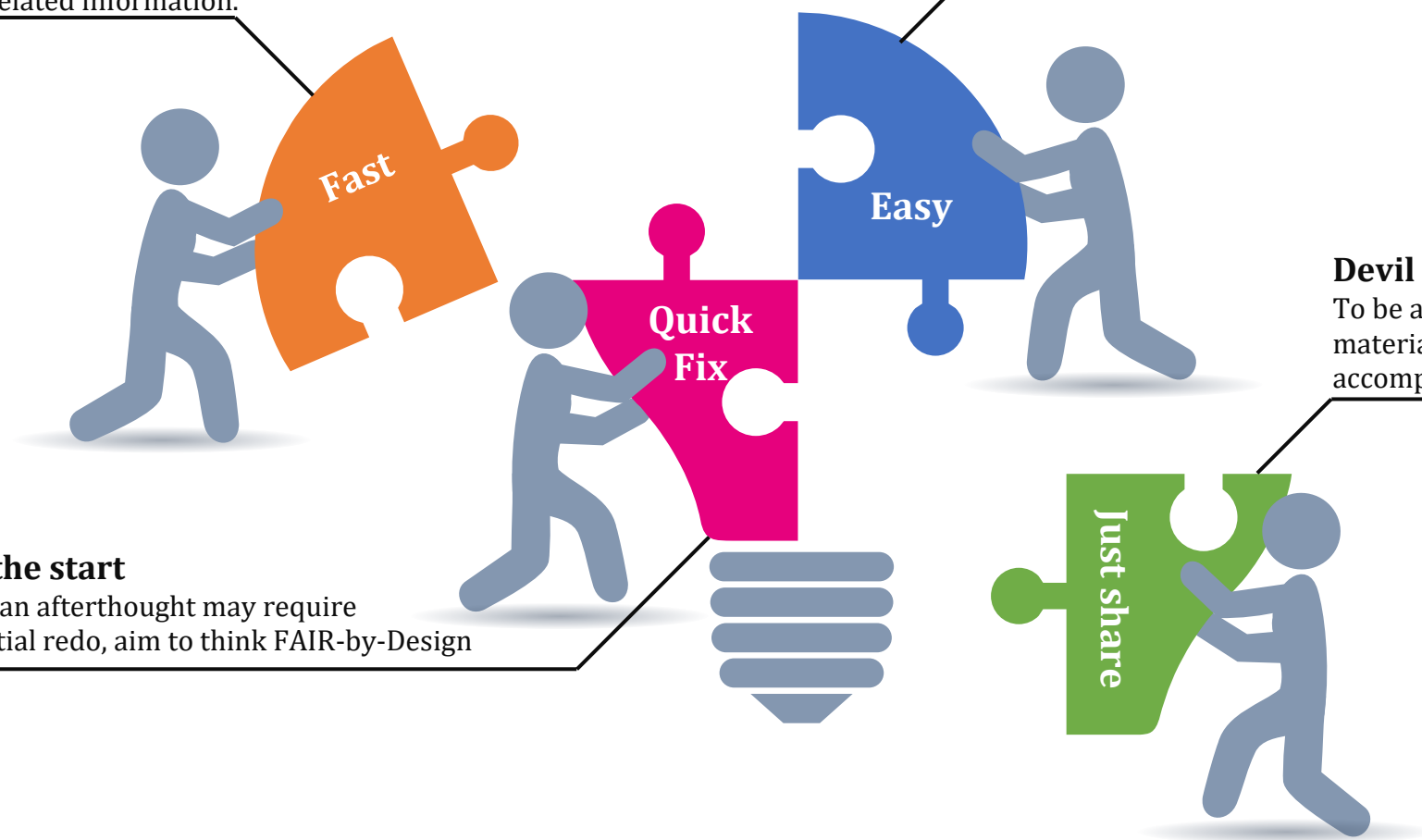
New skills
The development process requires knowledge about metadata, PIDs, repos, licensing, attribution, open file formats in addition to the typical learning materials design stuff
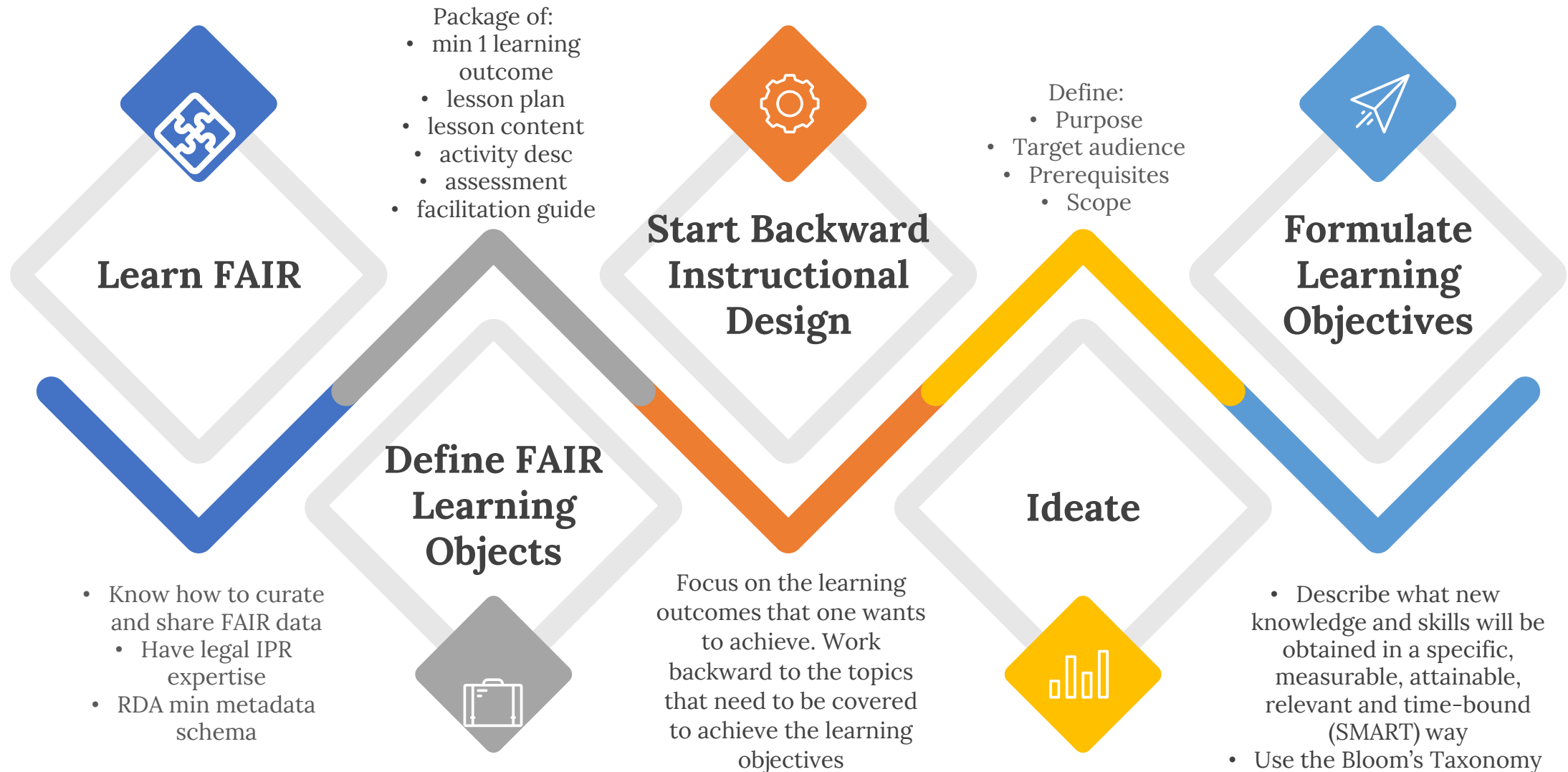
Devil is in the details
To be able to really reuse the materials they need to be accompanied with an instructor kit

From the start
FAIR as an afterthought may require substantial redo, aim to think FAIR-by-Design

Fast

Quick Fix

Easy

Just share

1 - Prepare

Learn FAIR

Package of:
- min 1 learning outcome
- lesson plan
- lesson content
- activity desc
- assessment
- facilitation guide

Start Backward Instructional Design

Define:
- Purpose
- Target audience
- Prerequisites
- Scope

Formulate Learning Objectives

Define FAIR Learning Objects

- Know how to curate and share FAIR data
- Have legal IPR expertise
- RDA min metadata schema

Focus on the learning outcomes that one wants to achieve. Work backward to the topics that need to be covered to achieve the learning objectives

Ideate

- Describe what new knowledge and skills will be obtained in a specific, measurable, attainable, relevant and time-bound (SMART) way
- Use the Bloom's Taxonomy

2 - Discover

Get Inspired!

- There is no one key to rule them all
- Discovery is a lengthy, windy process
- Closed learning resources have value too

OER

- DOAB
- MERLOT
- OASIS
- OER Commons
- OERTX CORA
- GALILEO
- FORRT

EOSC

EOSC Training catalogue on the EOSC Marketplace

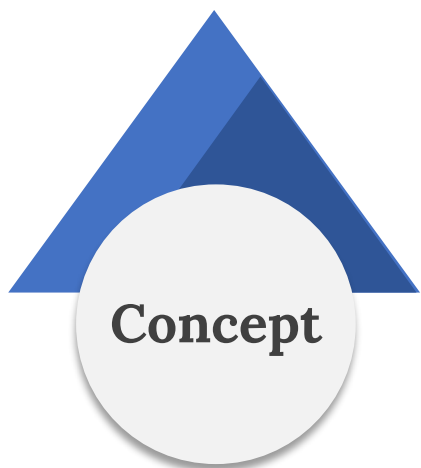Most EOSC projects have their own training catalogues and/or platforms

General

- Creative Commons Search - content provided under a CC license
- Zenodo - a multi-disciplinary open repository
- OSF - a free, open platform

Multimedia

Provide for all learning modalities:
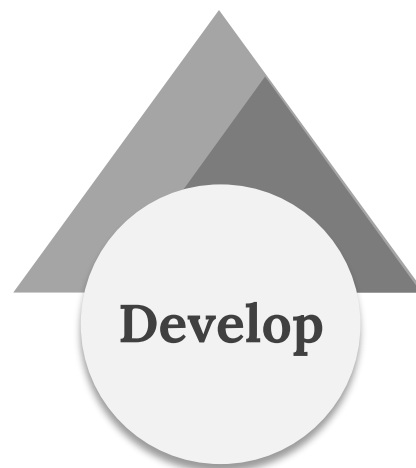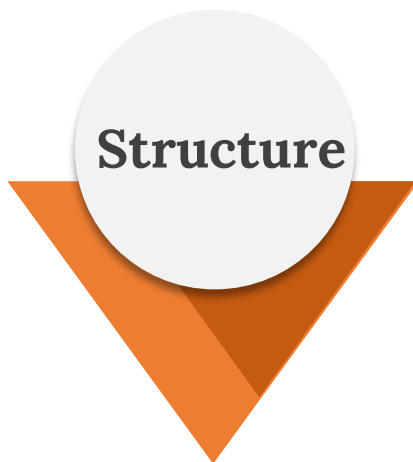- Read/write
- Auditory
- Visual
- Kinesthetic

3 - Design

Concept

- Sketch a content concept map
- Prepare a **syllabus**

Structure

- Create granular learning resources that can be easily reused
- Mix and match while respecting licensing rules

Develop

- Learning unit plan
  - Hunter's Model
- Content
  - Notebook
  - Slides
  - Activities
- Assessment
  - Quiz questions
  - Strategy

Facilitation Guide

A document that represents the trainers view and aims to enable a smooth and efficient training

Feedback form

Learners should be able to provide feedback on what worked well and what should be improved in the training and learning materials

4 - Produce

Tools & Formats

Editable vs Final
- Open file formats
- Web & Multimedia friendly
- Granular versioning
- Collaborative environment

Accessibility

Cover the **widest range of learner** variability w+w/o assistive technology

W3C WCAG 2.1(2.2) PDF/UA

Re-iterate & Finalise

Back and forth iterations
- Metadata = human + machine – readable
- License
- Facilitation Guide

Internal QA

Self-assessment
- Quantitative: required elements
- Qualitative: per LU

5 - Publish

Final preparations

Accompanying Files

- Readme
- Citation
- Code of conduct
- ...

To Repository

(FAIR) repositories

- fair-checker
- Search tools
- https://fairsharing.org/
- https://commons.datacite.org/repositories
- Add to Catalogue

To LMS

For Learners

- Add final content
- Create quizzes
- Setup feedback gathering
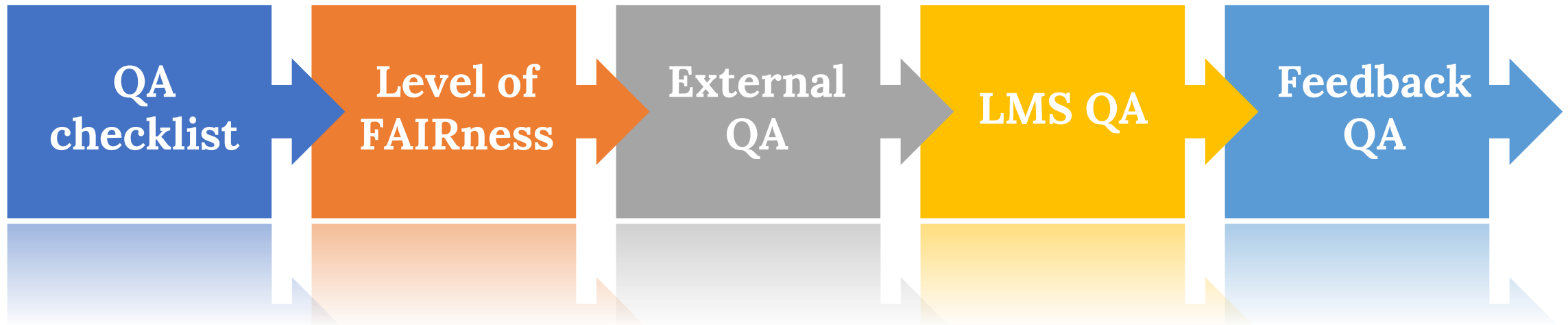- Add webinar room
- Define badges/certificates

6 - Verify

FAIR-by-Design QA checklist

Required vs optional

Review w/o cognitive bias
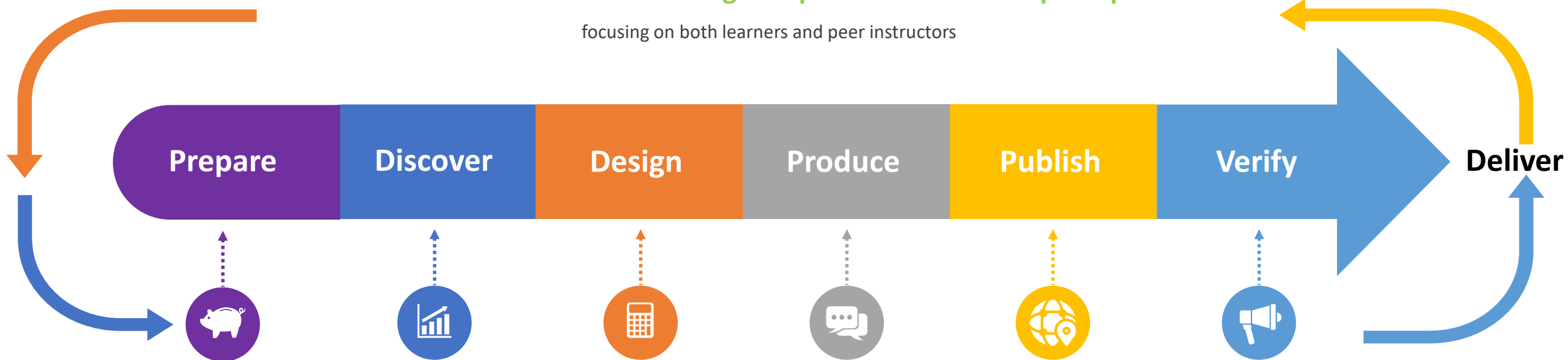
From a new learner perspective

Setup gathering from both perspectives

QA checklist → **Level of FAIRness** → **External QA** → **LMS QA** → **Feedback QA** →

FAIR-by-Design Methodology (recap)

Backward Instructional Design Empowered with FAIR principles

focusing on both learners and peer instructors

Prepare · Discover · Design · Produce · Publish · Verify · Deliver

Continuous Improvement

- GitHub issues
- Fork and pull requests
- Direct mail contact
- Other means of communication

Select items from the list that will be part of a new version

Internal	External	Analyse	Improve	Repeat

- Feedback form
- QA recommendations
- Self-reflection after training

Create a list of potential improvements with impact level (high, moderate, low)

Start a new cycle of the FAIR-by-Design methodology

FAIR-by-Design Methodology Details

Up-to-Date Methodology

- https://fair-by-design-methodology.github.io/FAIR-by-Design_Book/

ToT course on Skills4EOSC LMS

- https://learning.skills4eosc.eu/course/view.php?id=19

Training Gitpages

- https://fair-by-design-methodology.github.io/FAIR-by-Design_ToT/latest/
- GitHub
  - https://github.com/FAIR-by-Design-Methodology/FAIR-by-Design_ToT

Skills4EOSC Recognition Framework

Skills4EOSC provides a collaborative, adaptable and inclusive framework, focusing on digital/data skills and using existing technologies for recognising competencies within the EOSC ecosystem.

- A shared recognition framework that relies on common standards for skills recognition
- The framework is flexible and scalable by adapting to emerging skills and evolving EOSC community needs and provides cross-border skills recognition.
- The framework acknowledges a wide range of expertise and experiences and ensures inclusivity and diversity, also using digital tools like badges and verifiable credentials.

RESEARCHERS' SKILLS

Analysis of progress made in projects funded under Horizon 2020 and Horizon Europe, including the European University Alliances

Supporting

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Skills4EOSC Competence Centre

Skills4EOSC CC represent **a point of reference** in a specific Country/Region/Theme to find key **competences** to enable the practice of **Open Science** with adequate knowledge of standards, applications and tools and best practices for delivering, managing, re-using, sharing and analysing **FAIR** data, as well as other digital research objects.

Competences	People and Institutions	Services	Resources	Operational Tools

Skills4EOSC Next steps

Starting from Autumn 2024 delivery of **Training of Trainers** activities

Strengthen **Competence Centre network** engaging with professionals and user support networks

Continuous engagement with **EOSC partnership and projects** on Skills&Training activities

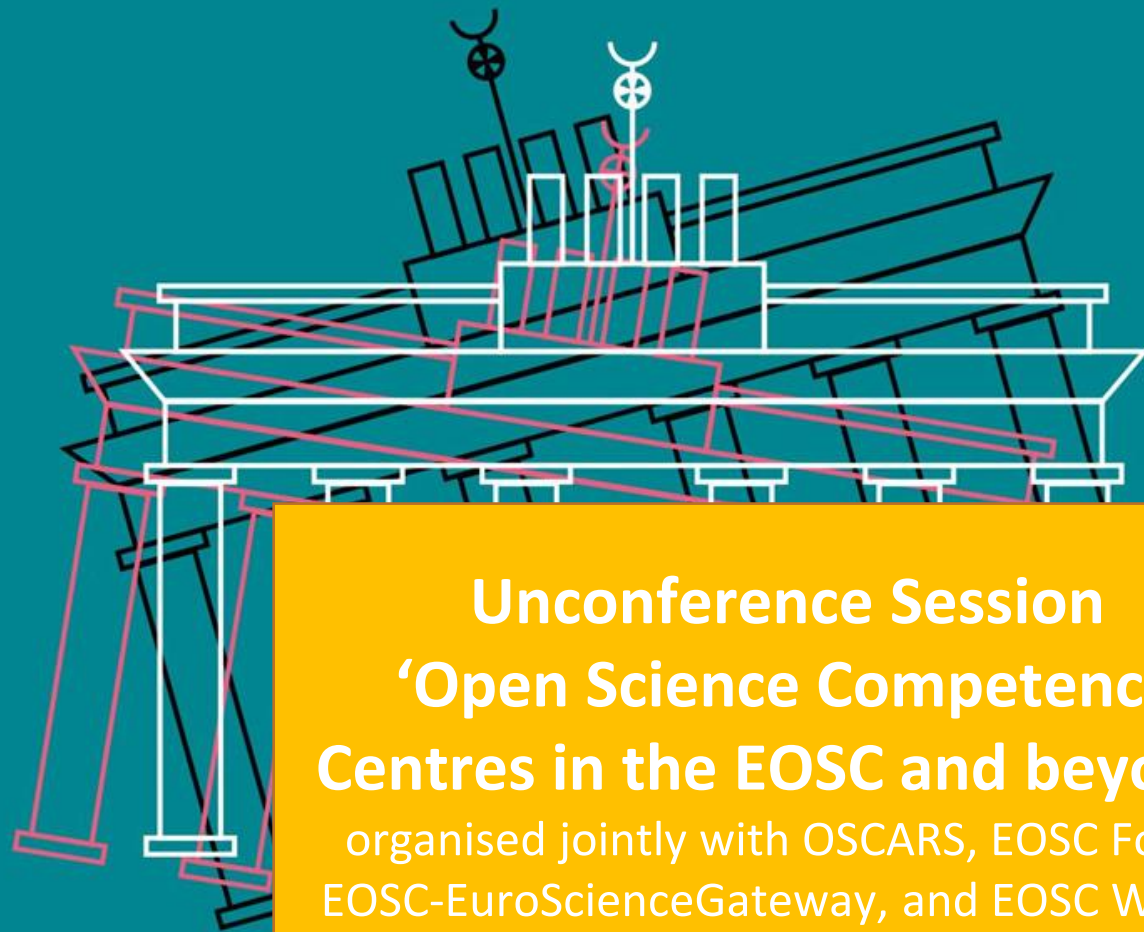**Sustainability** discussion involving relevant actors and EOSC partnership

Selecting a set of **interoperable IT services** facilitating the CCs alignment

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Thank you!
Questions?

Credit: Some of the slides in this presentation were created by SlideEgg

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