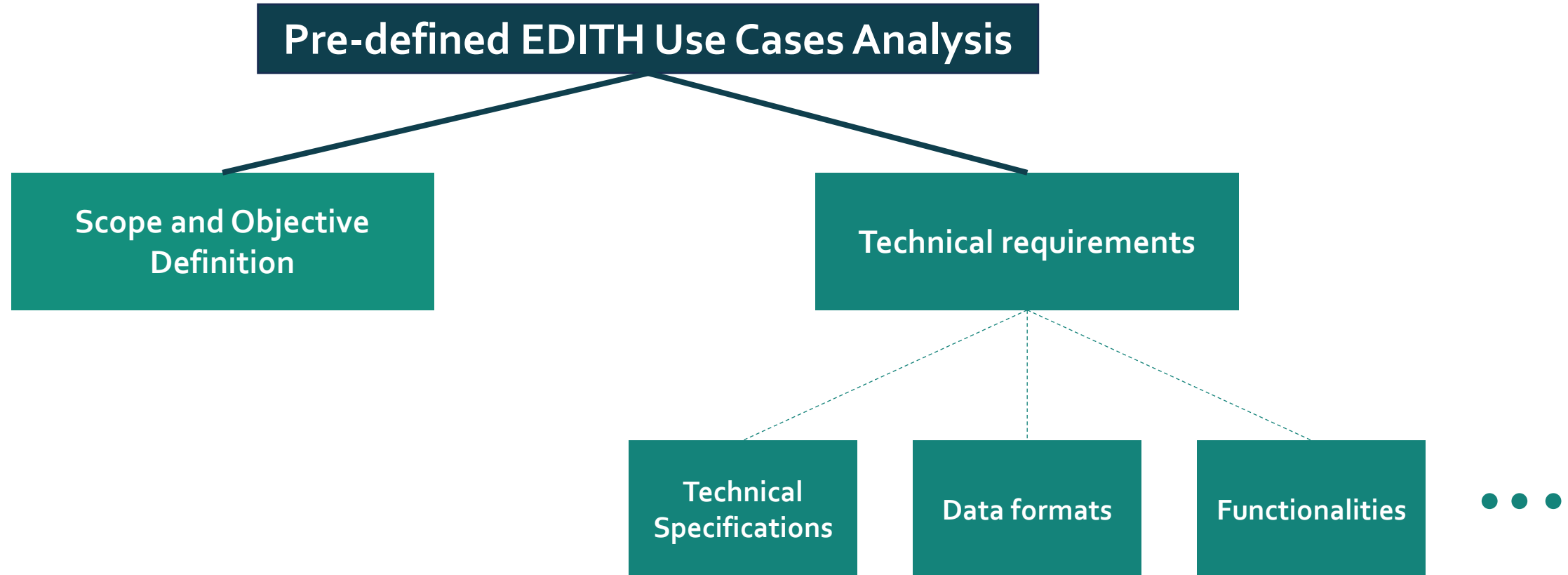# Envisioned Platform Processes and Services

Outline

- Preparatory phase

- Trinity of Software

- Cross-cutting directions

- Version 0.1

- Main Functionalities

- Compliance and Legal Considerations

- Governance principles and Decision-making processes

Ecosystem for Digital Twins in Healthcare

Requirements and Specifications

EDITH

Preparatory phase

Pre-defined EDITH Use Cases Analysis

Scope and Objective Definition

Technical requirements

Technical Specifications

Data formats

Functionalities

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Trinity of Software

Catalogue

- A place to share and discover research objects (publications, data, models,...)
- Unique (global) identifiers & versioning
- Metadata (manual, automated) to facilitate discovery
- Actual object may be available (stored) elsewhere
- Catalogue and harvesting services (federation, distribution)

Repository

- Safely store and retrieve digital research objects (pubs, data, models,...)
- Files (versioning, metadata)
- Unique (global) identifiers & versioning
- Access policies (and sensitive data)
- Long-term preservation (storage classes)
- File & Sync (personal space)

Platform

- Analyze, simulate, visualize, process, manage, interact, ...
- Software services (web apps, APIs, Jupyter notebooks, workflow engines, VDIs)
- Compute (HPC/HTC), storage and networking
- Collaboration and tiers
- Generic-purpose and domain-specific

Cross-cutting directions

- Open Source and Open

  - OS to be used exclusively for building, provisioning, operating the platform; any software to be provided as a service

  - Data and models can be proprietary (encouraged for industrial applications)

  - Commercial/Proprietary services (external) also supported (we are building an ecosystem)

  - Open Standards (support for proprietary standards only for interoperability)

  - FAIR guidelines; '*as open as possible, as closed as necessary*'

- Distribution and Federation

  - common understanding

- Distributed platform

  - Not centralized (all in one place), because not everything can be in one place (sensitive data) or are available (services); Assumption: a central node does exist

  - Trusted Research Environment (TRE)

    - Brings everything together, EU Health Data Space - compatible

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Main Functionalities

- Suite of loosely-coupled (and federated) software and services
  - Expandable by design; core building blocks
  - Process, analyze, visualize, simulate
  - Platform-wide access policies, tiers and quota

- Standardised Workflows
  - CWL Workflows authoring and execution (cloud, HPC) over multi-clouds; portable, replicable, and scalable

- Jupyter Notebooks
  - Interactive computing (cloud, HPC); portable and scalable

- VDI
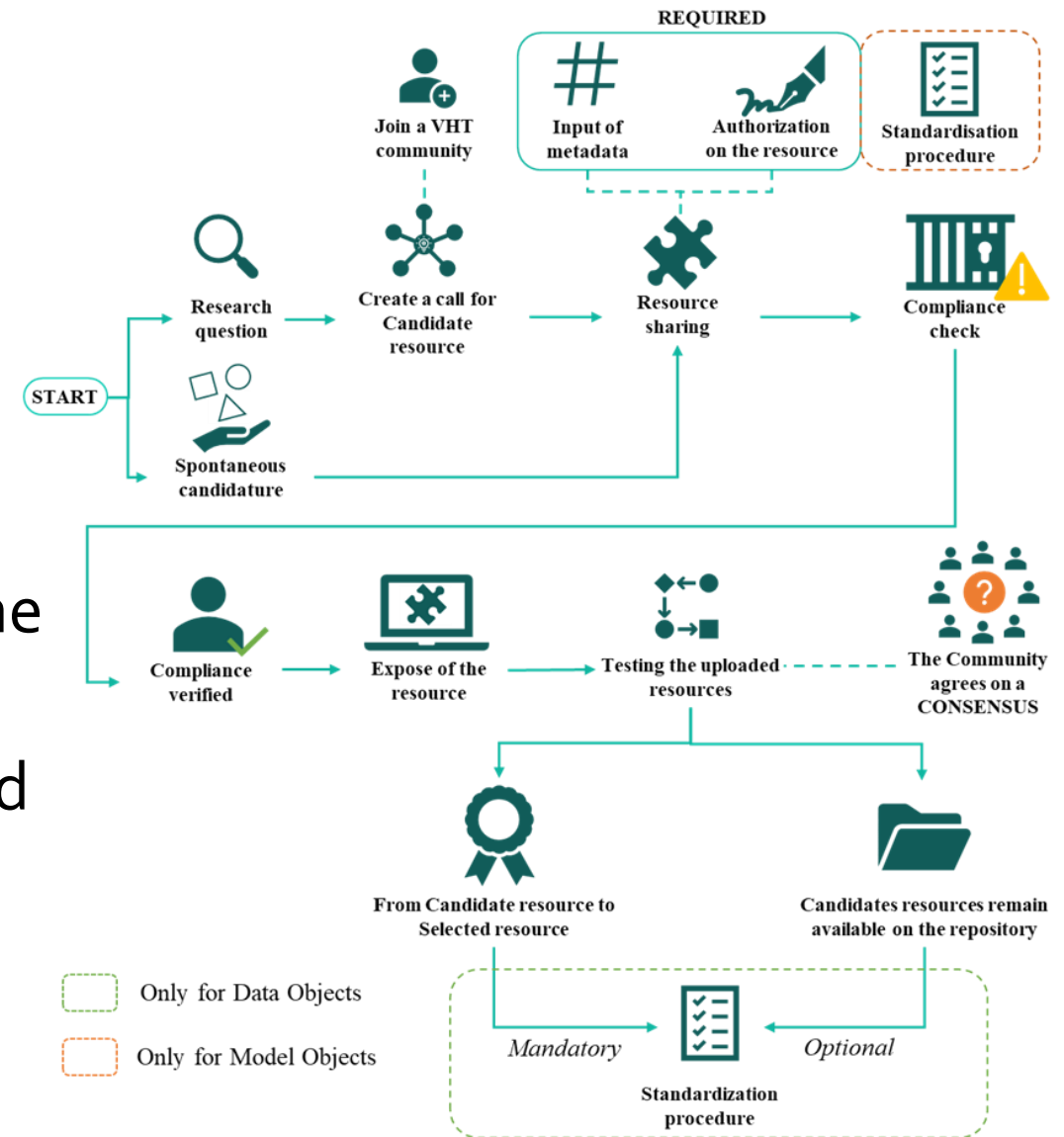 - Remote desktop (web-access); preconfigured and hardened (TRE for sensitive data)

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Version 0.1

Governance

EDITH

Populating the VHT

- Strategy to accept resources within the EDITH ecosystem

- Community plays a pivotal role in determining the resource to be used in the VHT

- Other resources not chosen to be inserted in the VHT can be still exposed on the EDITH catalogue
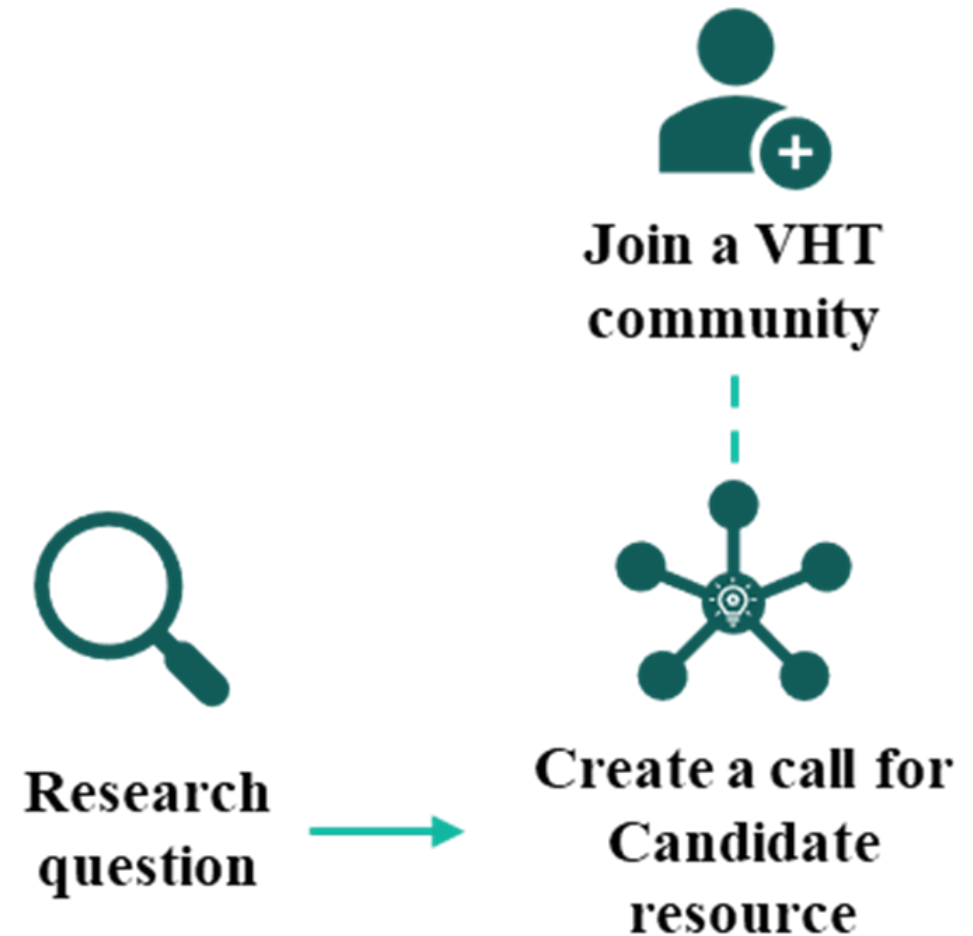
Populating the VHT

Initialization

- The process may begin starting from two different motivations:
  a) A potential user browses the catalogue in search of a specific resource not present yet
  b) A provider wants to share his/her resource and insert it in the EDITH ecosystem
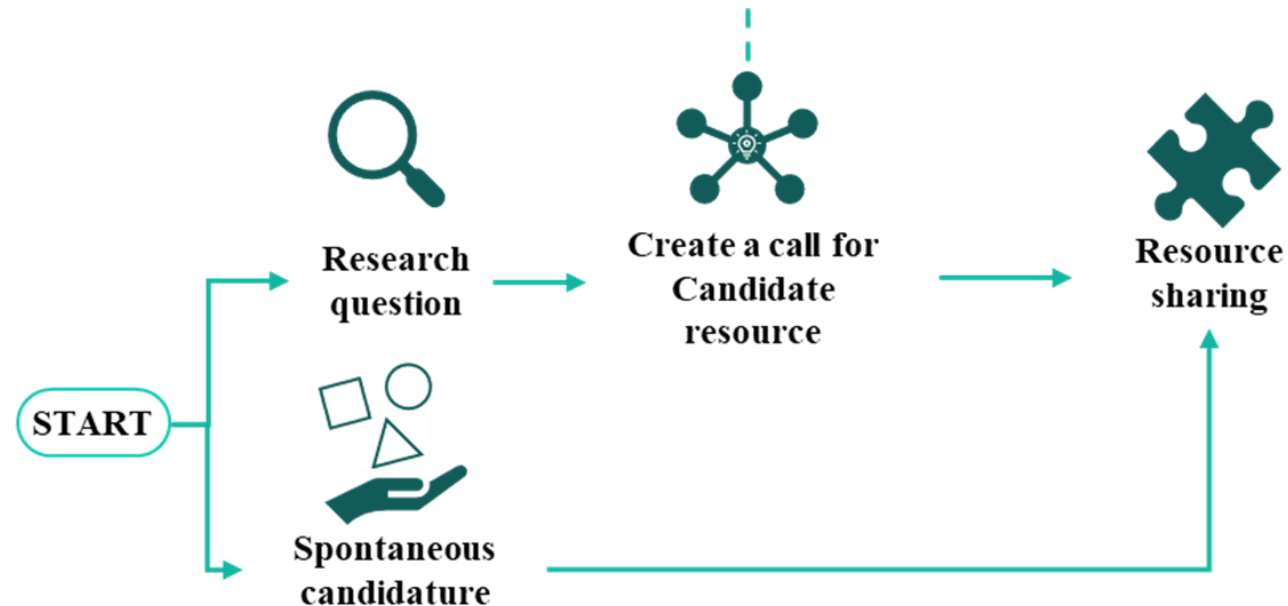
Populating the VHT
Candidate Resource

- In the a) case, the user creates a call for candidate resource to respond to the research question.

- The user is advised to join the reference VHT community for that research question (e.g., dataset of a population within Alzheimer's disease, reference VHT community -> brain)

Join a VHT community

Research question

Create a call for Candidate resource

Ecosystem for Digital Twins in Healthcare

Populating the VHT

Resource sharing

Both in a) and b) cases, the providers start sharing the resource

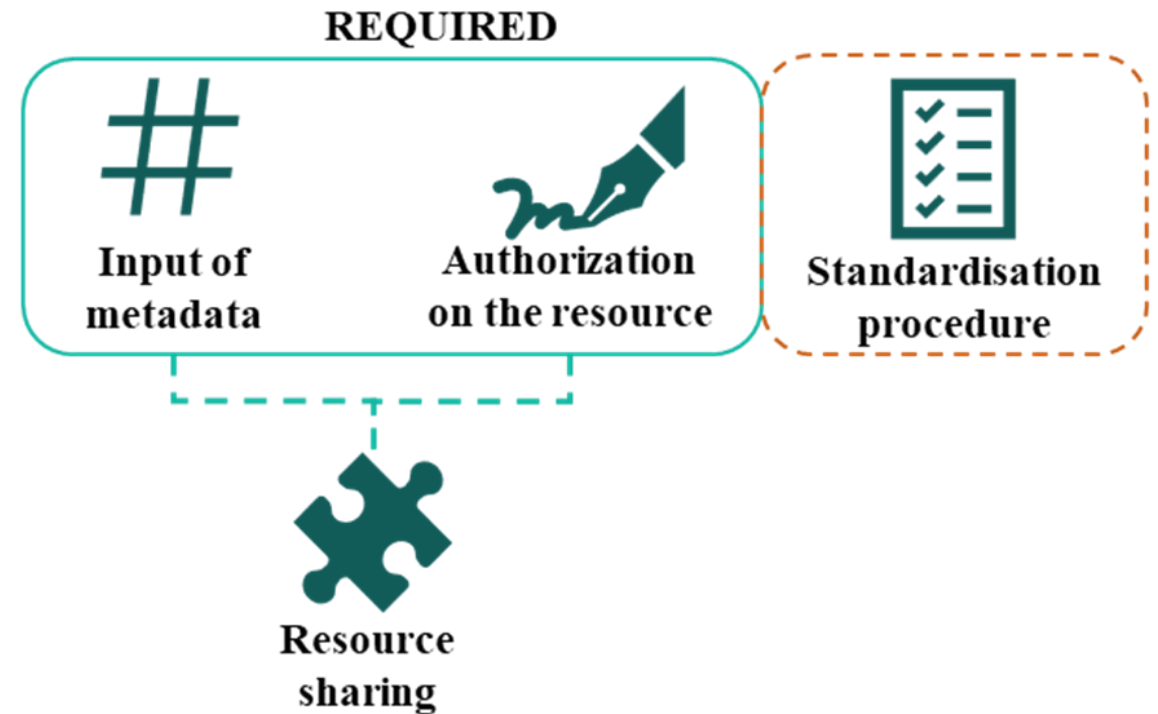Ecosystem
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Populating the VHT

Resource sharing

When sharing the resource, there are fundamental steps that must take place:

- **Input of metadata**: minimum set corresponding to the mandatory metadata set defined in the OpenAIRE platform

- **Authorization on the resource**: the provider must prove to have the rights in sharing the resource

- **(Only for candidate model objects) Standardization procedure**: it must be provided in a standardized format in terms of syntax and semantics

REQUIRED

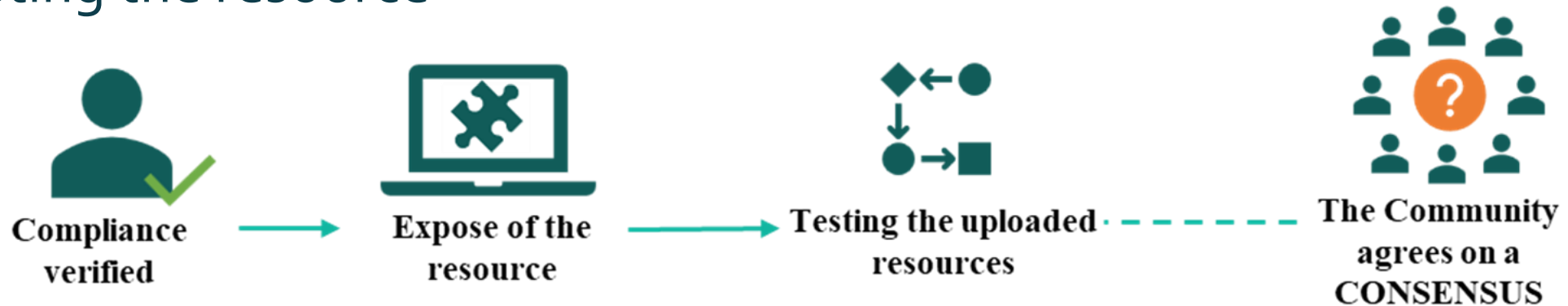Input of metadata

Authorization on the resource

Standardisation procedure

Resource sharing

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Populating the VHT

Compliance check

The authorization presented by the provider is further assessed by a human operator.

Resource sharing → Compliance check → Compliance verified

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Populating the VHT

Testing the resource

Compliance verified → Expose of the resource → Testing the uploaded resources ------ The Community agrees on a CONSENSUS
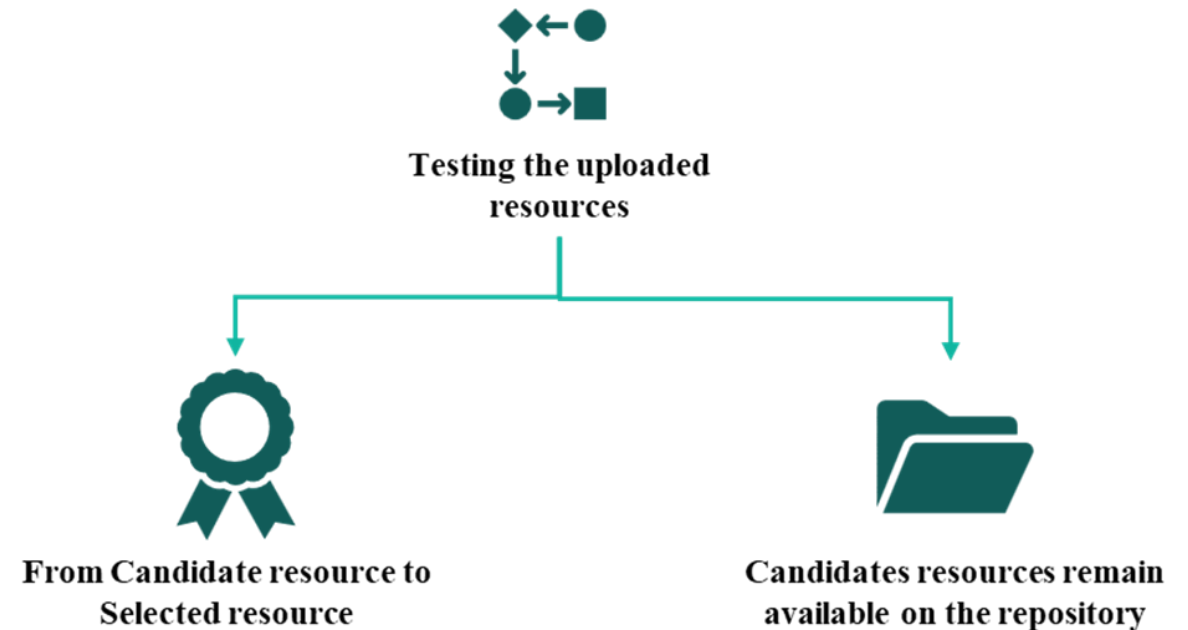
- Once the resource pass the compliance check, the resource is displayed on the **VHT catalogue**, being visible to visitors of the VHT ecosystem, together with the license decided by the provider, which must be accepted by the user when using that resource

- The resource is tested by the reference VHT community, giving score in terms of credibility, validity, and generalizability

- Simultaneously, the reference community works towards a consensus on the topic referring to that resource, if there are still some questions that need to be addressed, such as the ontology to be used (for data object).

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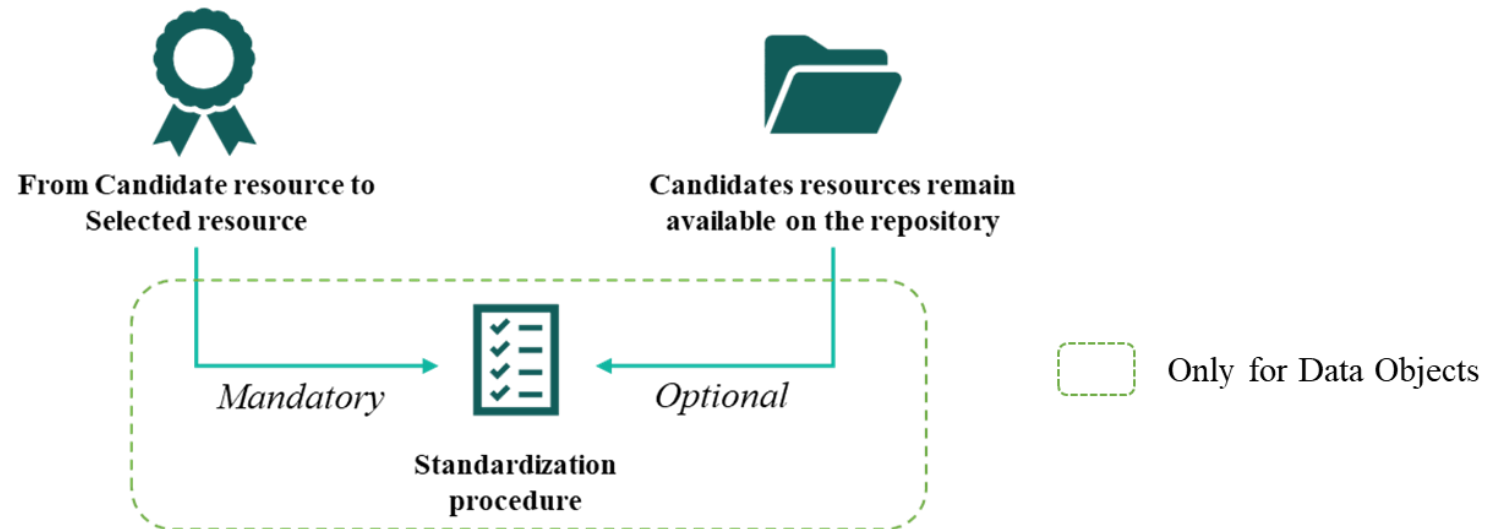
Populating the VHT

Resource selection

- The resource is tested for its integration in the VHT

- There could be more than one resource responding for that candidate resource

- Only one resource will pass from being "candidate resource" to "selected resource"

- Other resources will remain available in the repository to be used separately from the VHT

Testing the uploaded resources

From Candidate resource to Selected resource

Candidates resources remain available on the repository

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Populating the VHT

Resource selection

- If the resource is a dataset, the selected resource must undergo to the standardization procedure
- If the resource is a model, the standardization procedure is mandatory when the resource is uploaded
- The standardization procedure is optional for the candidate resources remaining available in the repository

http://www.edith-csa.eu

Deliverables available under tab 'dissemination/material'

Indication of interest via the contact form on site

EDITH