



OpenAIRE Infrastructure Services: technologies for Open Science

Paolo Manghi

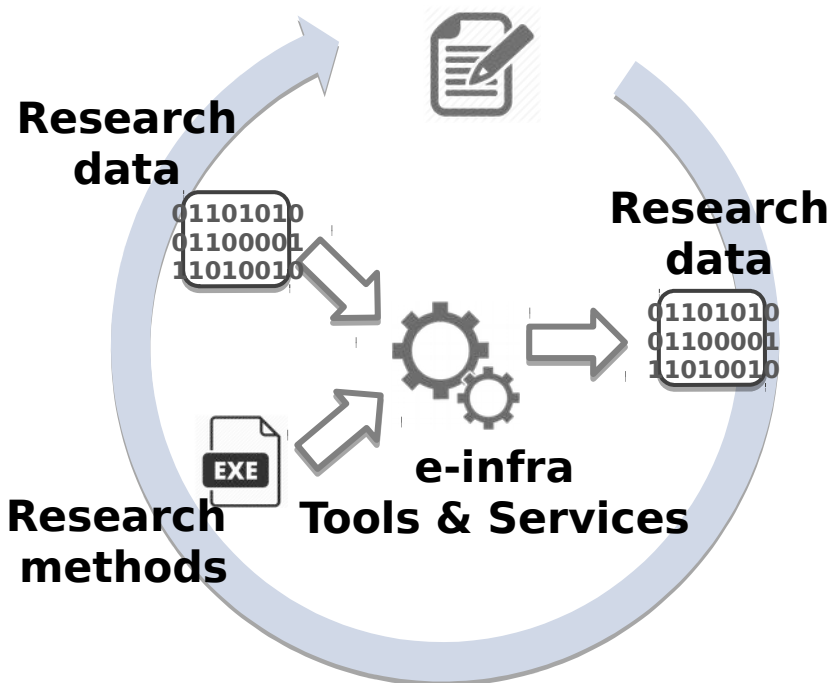
(OpenAIRE infrastructure)

**Istituto di Scienza e Tecnologie
dell'Informazione**

Consiglio Nazionale delle Ricerche

Research Communities and “digital” science

Research literature:
Articles, docs, white papers



Publishing



**Reuse/Reproduction and
Evaluation**



What does Open
Science
Publishing
mean?

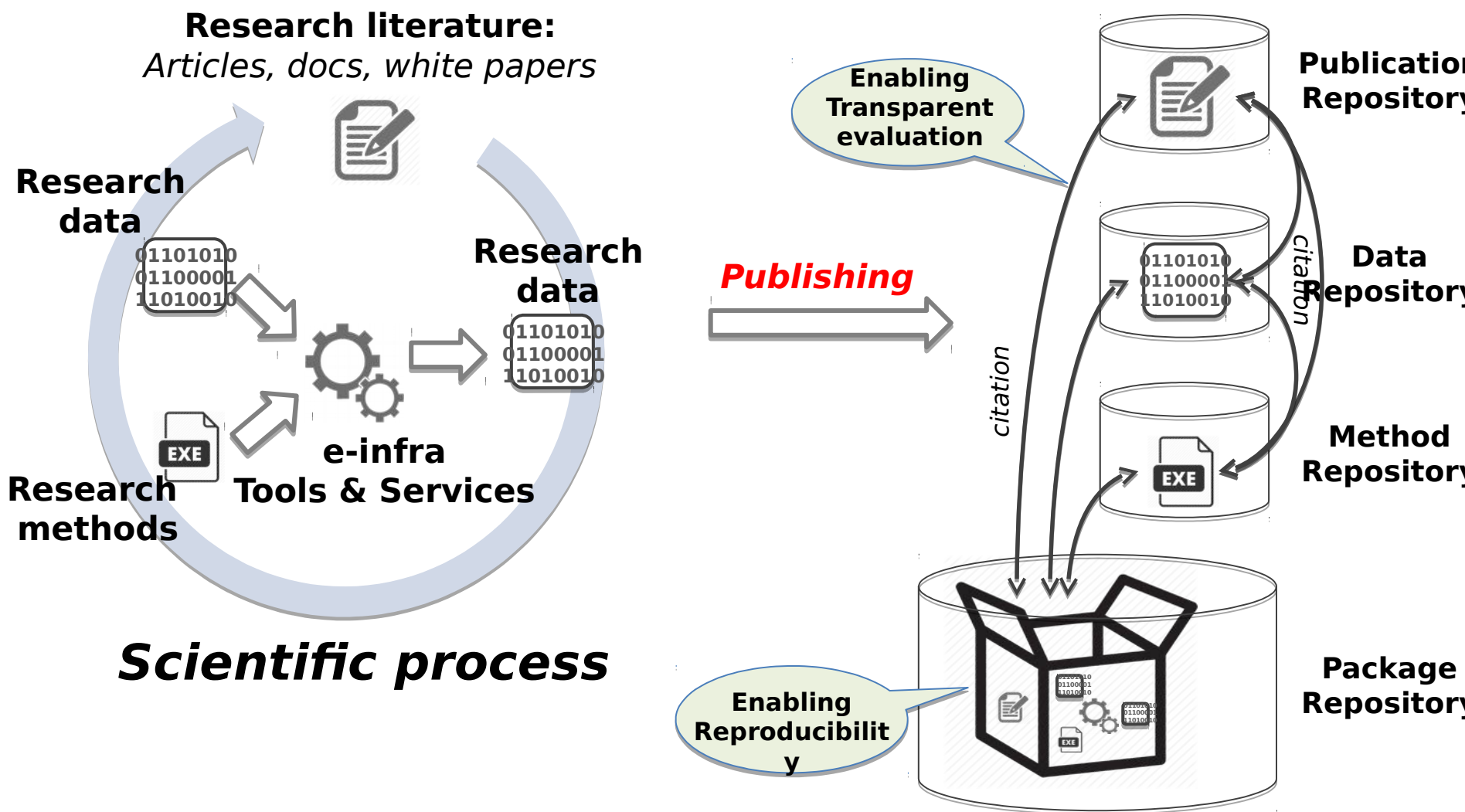
**Research
Communication
Infrastructure**

Scientific process

Methods: e.g. software, workflows, protocols,
algorithms, scripts

Open Science publishing

Supporting **reuse/reproducibility** and **transparent evaluation**



Open Science publishing

**Enabling transparent
evaluation**

Enabling reproducibility

**Publishing of all kinds
of research artefacts**

**Publishing packages
of artefacts**

**Publishing up-to-date
record of research
artefacts metadata
and links**

Research Communication barriers to Open Science

Repositories lack support to Open Science publishing

No support for integration of repositories for methods or packages

Minimal or no support for links between artefacts in different repositories

No support for keeping repositories with up-to-date links between artefacts

Research communities lack culture of Open Science publishing

Lack of e-infrastructure for Open Science: e.g. repository limits above, exchange formats, workflows

Difficulties to **self-organize** and **sustain** research communication solutions: e.g. identify the problems, see the benefits, devise solutions, apply economy of scale

The OpenAIRE Infrastructure

European (and beyond)
infrastructure for Open Access and
Open Science




Networking infrastructure: Open Access/Science advocacy and support, global alignment and interoperability, etc.




Technical infrastructure: services for monitoring of Open Access/Science and Research Impact for funders and communities

OpenAIRE to support Open Science



**Facilitate Research Communities
and Adoption of Open Science
publishing principles** by supporting
publishing tools as-a-Service



**Facilitate repositories at moving
to Open Science publishing**
by supporting notification-based
research communication as-a-Service

OpenAIRE technical infrastructure

Deposit articles/datasets (DOI)



Stats:



• research impact
• trends

Entities:

- 14M+ publications (de-duplicated)
- 200,000+ links publication-project from 5 funders
- 20,000+ datasets linked to publications or projects
- 80,000+ organizations (de-duplicated)

Collected from:

- 700+ “direct” data providers
- 5,000+ “indirect” data providers (inherited from aggregators)

Deduplicate

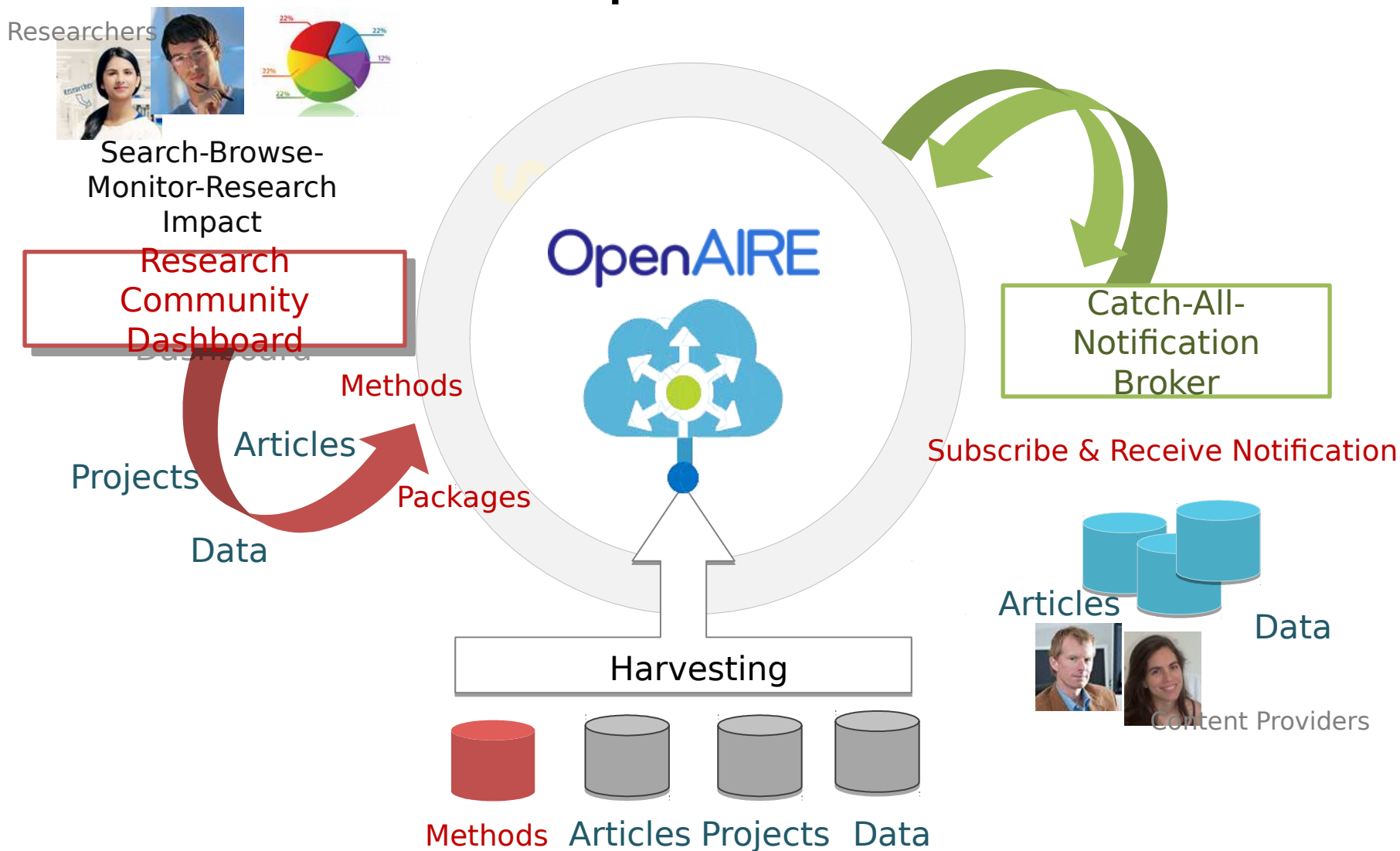
Harvest

Inference

Harmonize

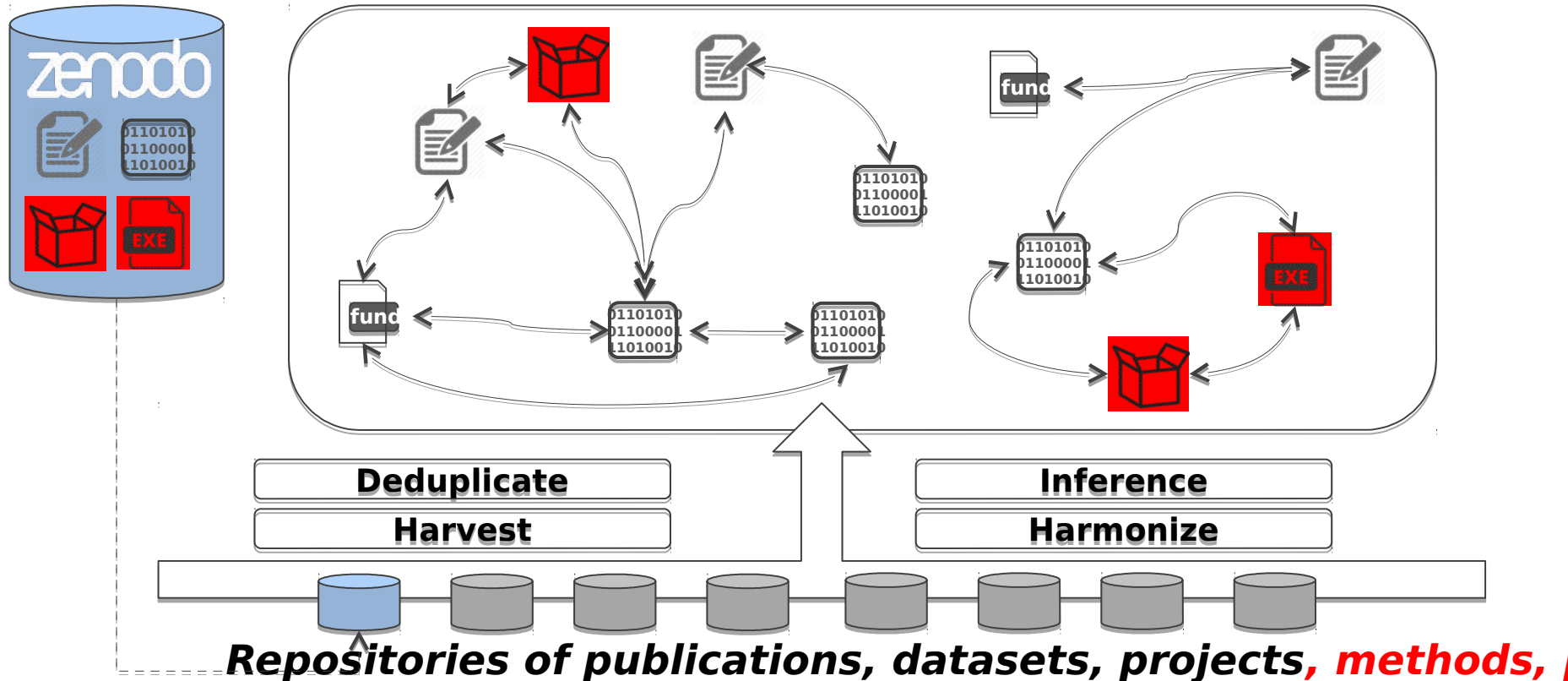
Repositories of publications, datasets, projects

Open Science as-a-Service (OSaaS) in OpenAIRE



OpenAIRE OSaaS: *methods and packages*

- **Metadata description for methods and packages:** citation and reproducibility (e.g. Research Objects, Rmap)
- **Interoperability guidelines for exchanging packages of interlinked artefacts:** enabling exchange of information across research communication infrastructure

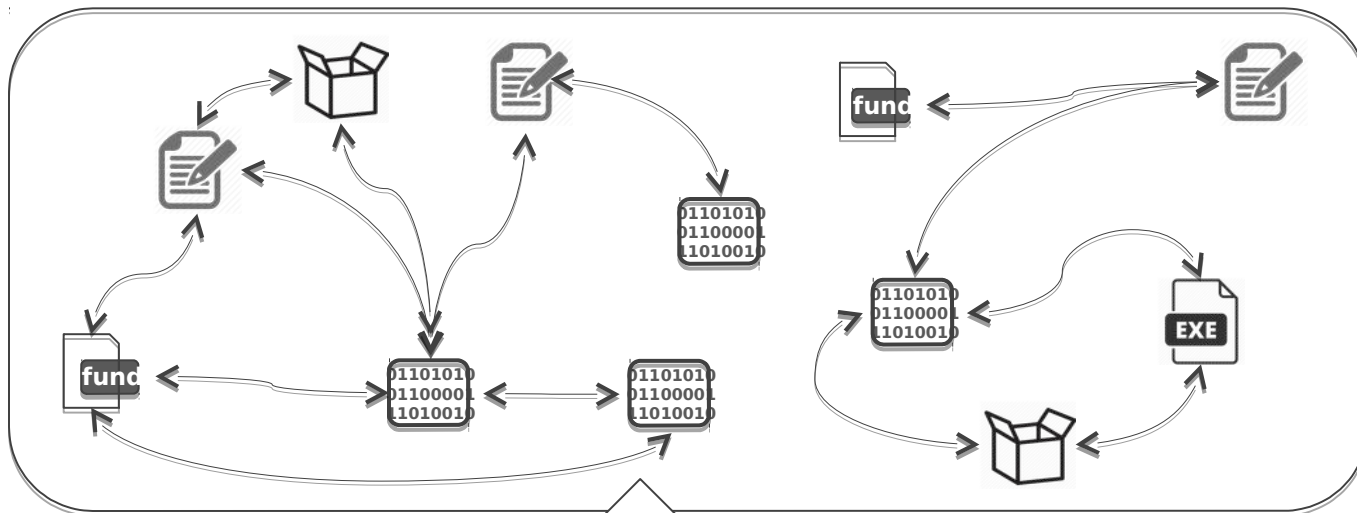
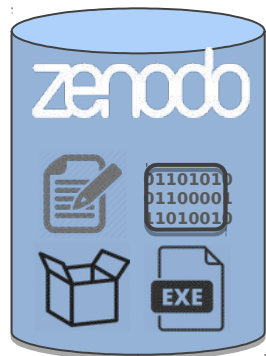


OpenAIRE OSaaS: *Dashboard for Research Communities*



Request
Dashboard

Open Science as-a-Service: Dashboard for Research Communities



Deduplicate
Harvest

Inference
Harmonize



Repositories of publications, datasets, projects, methods, ...

OpenAIRE OSaaS: *Dashboard for Research Communities*

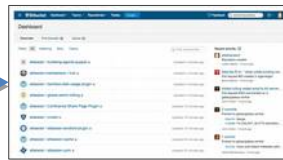


Researchers



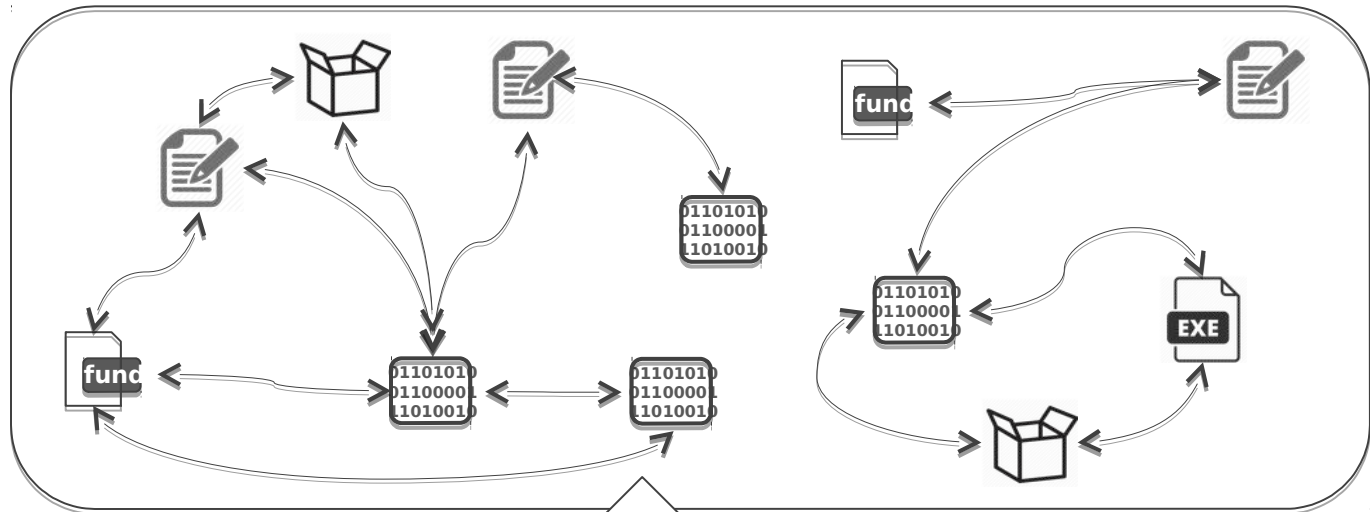
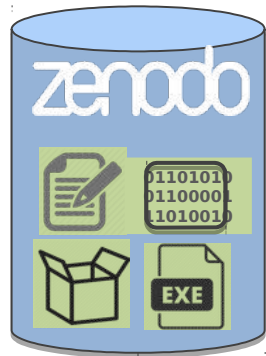
**Research
Community
Operator**

- Deposit (DOI)
- Claim



- Manage users
- Configure stats
- Configure inference

Open Science as-a-Service: Dashboard for Research Communities



**Deduplicate
Harvest**

**Inference
Harmonize**



Repositories of publications, datasets, projects, methods, ...

OpenAIRE OSaaS: *Dashboard for Research Communities*



Researchers



**Research
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Deposit (DOI)

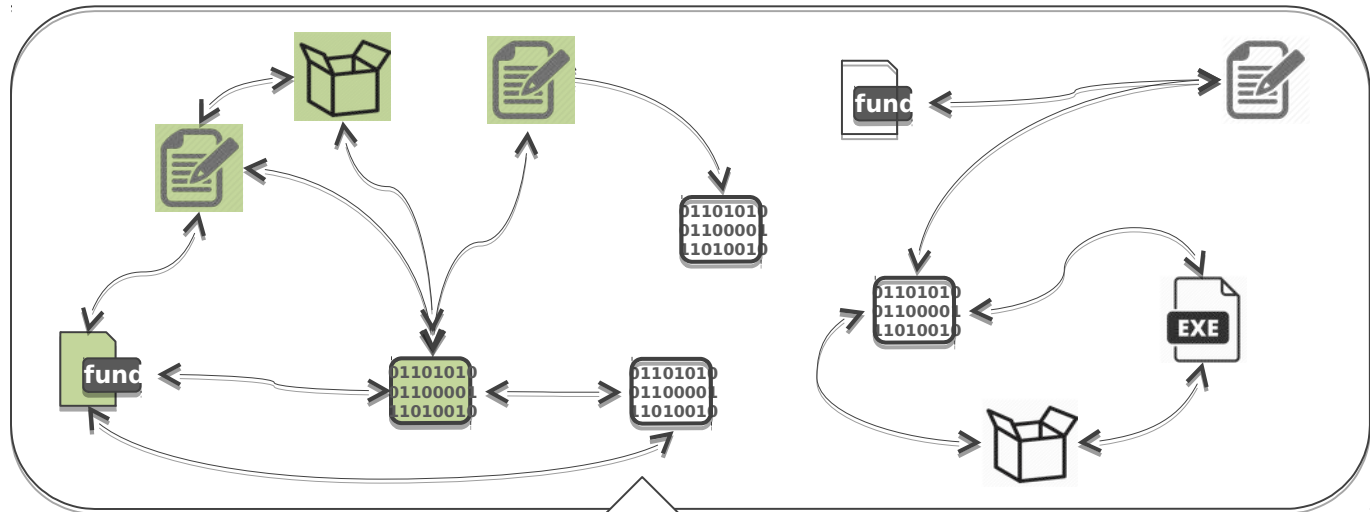
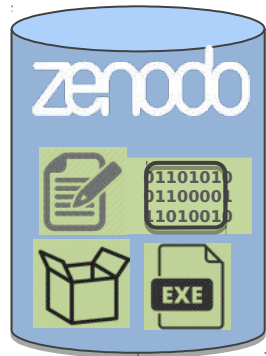
Claim

Stats: research impact & OA



- Manage users
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Open Science as-a-Service: Dashboard for Research Communities



Deduplicate

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Repositories of publications, datasets, projects, methods, ...

OpenAIRE OSaaS: *Dashboard for Research Communities*



Researchers



**Research
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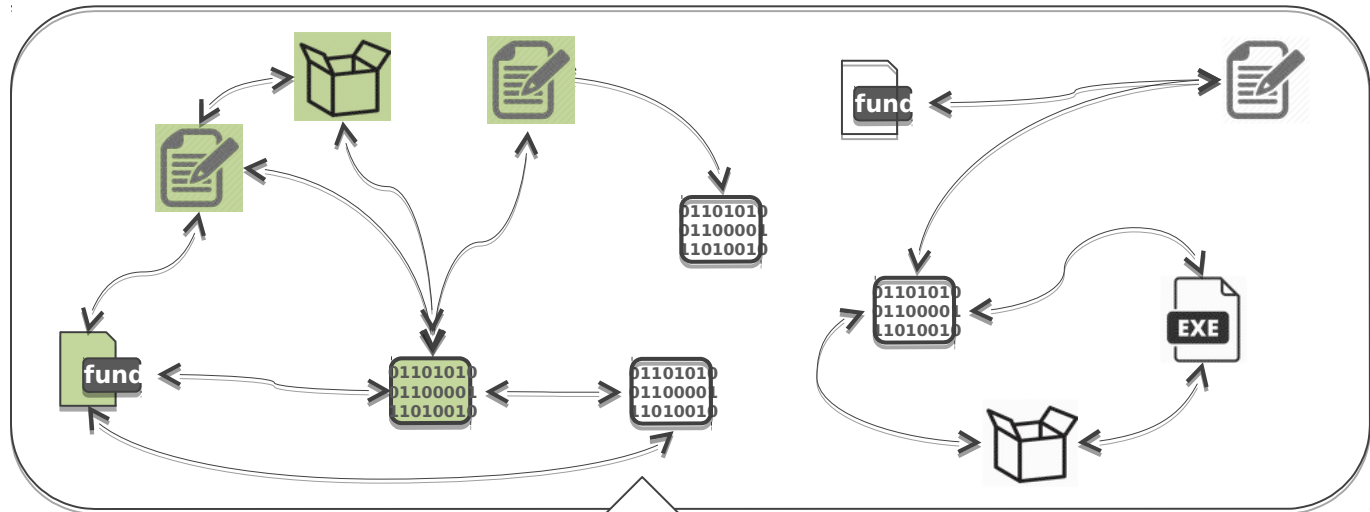
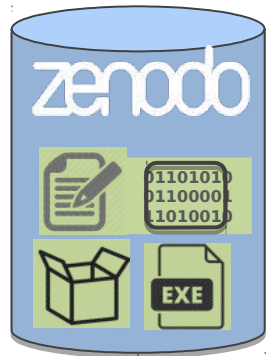
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Open Science as-a-Service: Dashboard for Research Communities



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Repositories of publications, datasets, projects, methods, ...

Research Community: Open Science benefits

Common repository for publishing (deposition) of datasets, methods, and packages

- Can continue their publishing practices, but, if needed they have support for deposition of any artefact

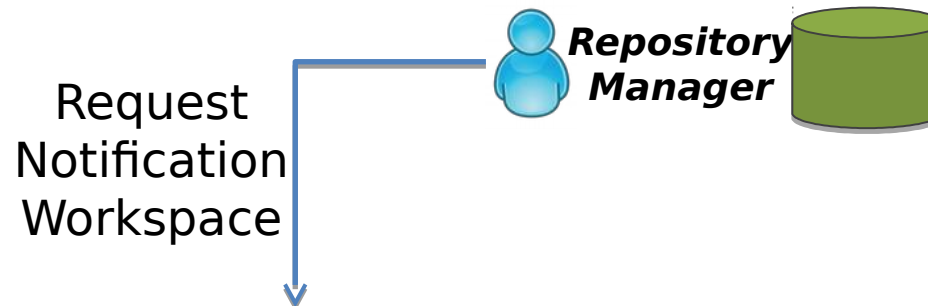
Collaborative curation of a community-specific research communication domain

- Community information space to share, discovery, and reuse (reproduce) scientific results

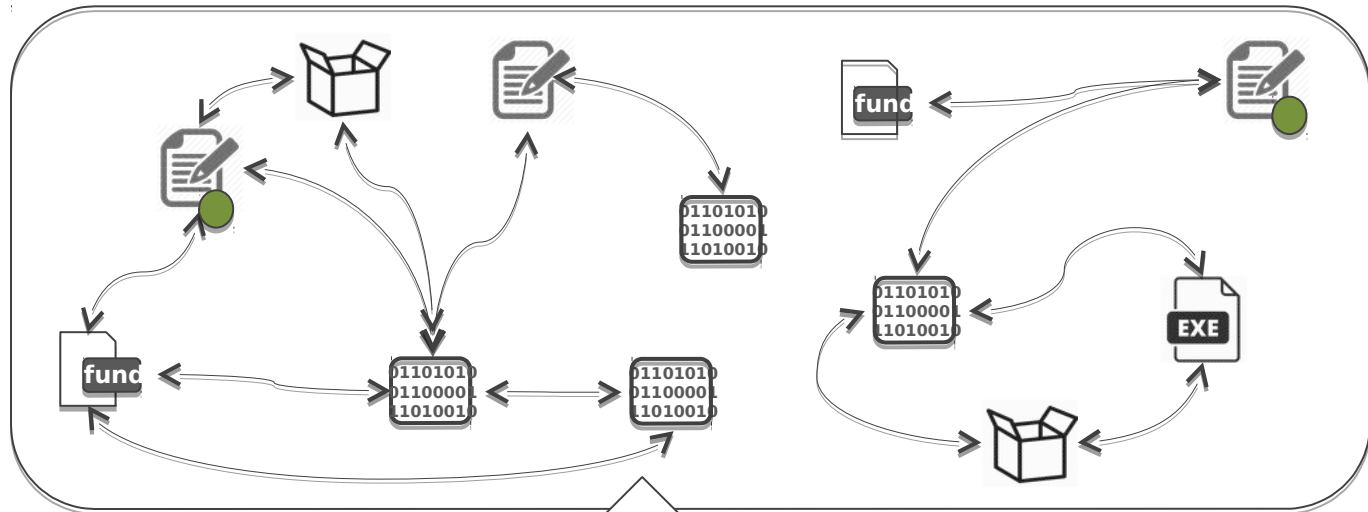
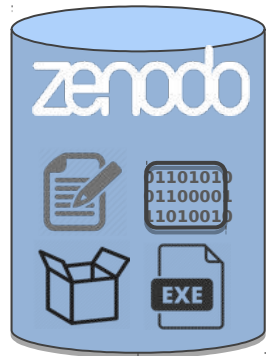
Research impact and statistics

- Scientific reward strategies can be developed

OpenAIRE OSaaS: Notification Broker

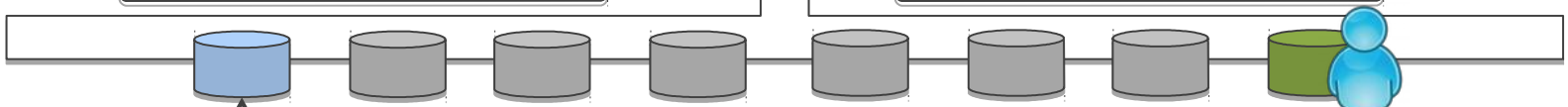


Open Science as-a-Service: Notification Broker for repositories



Deduplicate
Harvest

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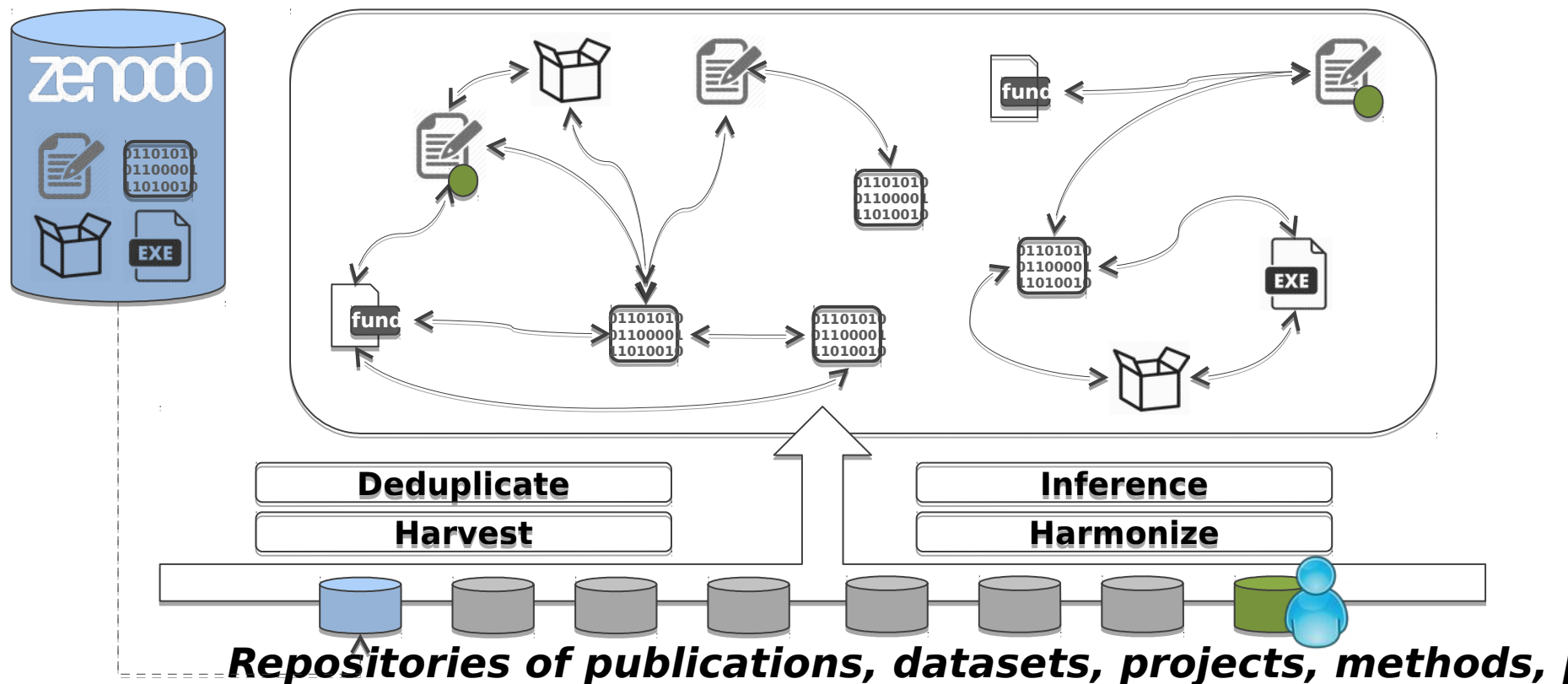
Repositories of publications, datasets, projects, methods, ...

OpenAIRE OSaaS: *Notification Broker*

- Subscription: enrichment or additions to repository
- Notification management



Open Science as-a-Service: Notification Broker for repositories

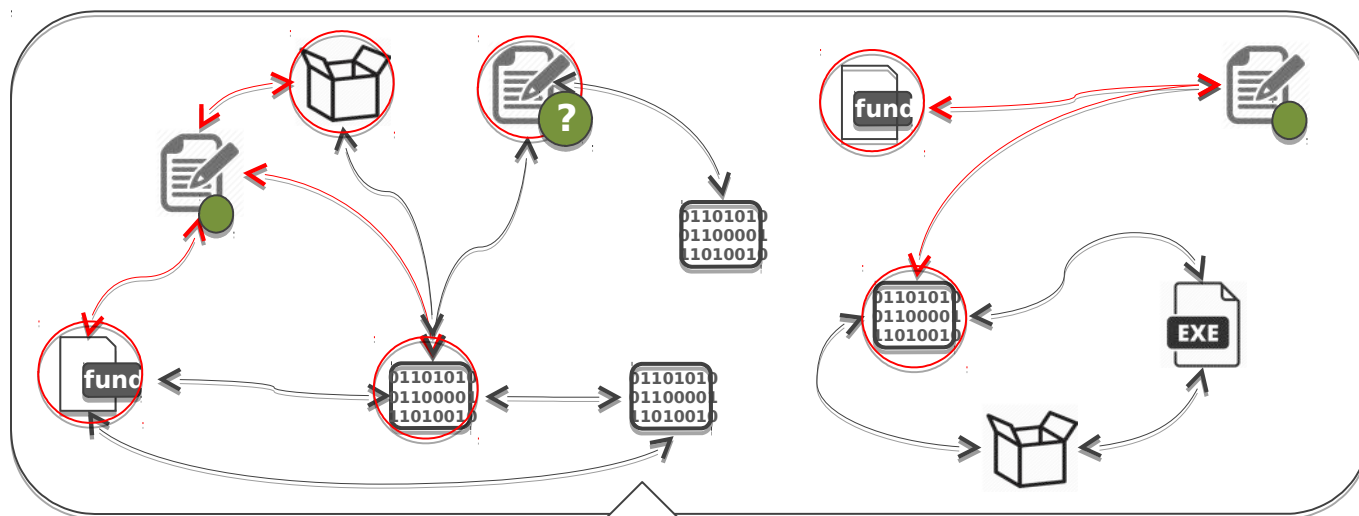
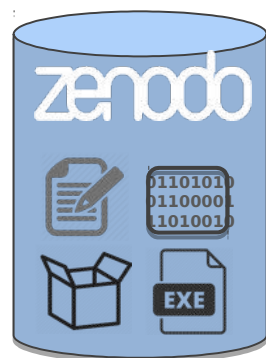


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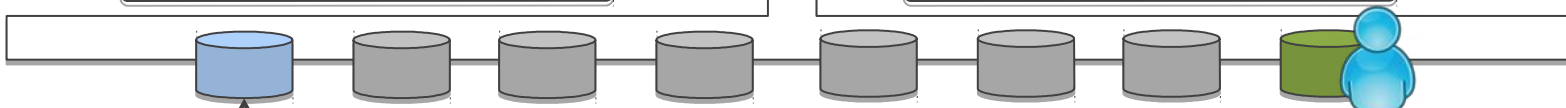


Open Science as-a-Service: Notification Broker for repositories



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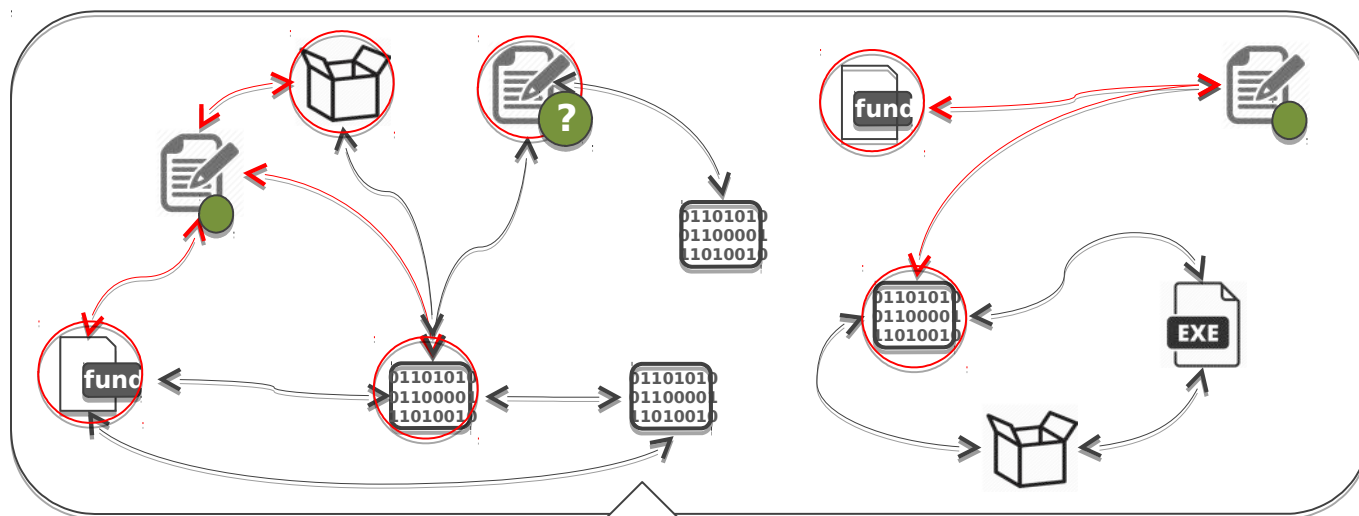
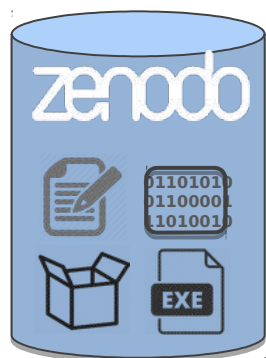
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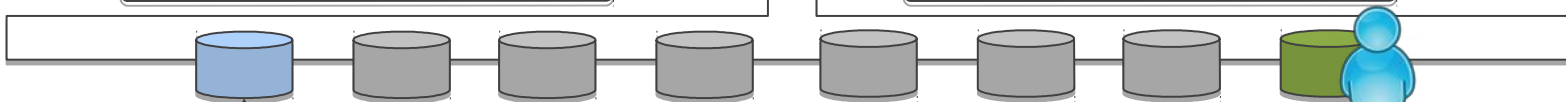
- Notifications
- Mail
 - APIs
 - UIs

Open Science as-a-Service: Notification Broker for repositories



Deduplicate
Harvest

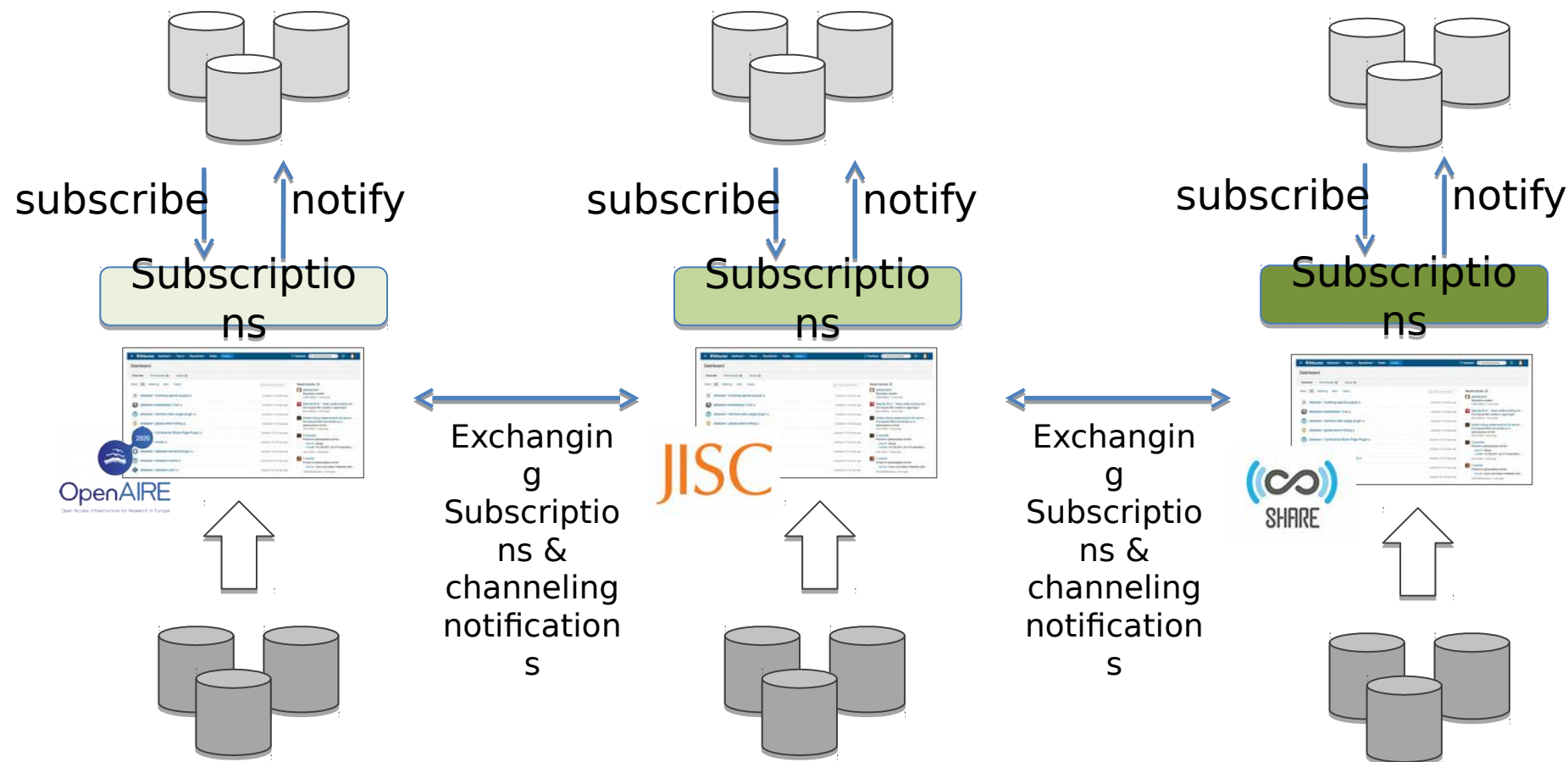
Inference
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Repositories of publications, datasets, projects, methods, ...

Enabling a Network of Research Communication Brokers

Consumers of events



Producers of events

Repositories: Open Science benefits

Extending repository metadata models to Open Science

- Enabling addition of links to artefacts of any kind

Keeping their **collection up-to-date: enrichments and additions**

- “Almost real-time” exchange of information: notifications about links to other artefacts, missing properties, and missing artefacts

Fostering notification-based and federated dissemination of knowledge

- Enabling repositories to be notified of content of interest, enabling construction of research-focused aggregators by notifications

OpenAIRE towards Open Science

Research Community Dashboard Repository Notification Broker



Served on-demand according to the OSaaS approach



Customizable by different disciplines and providers, each with different practices and maturity levels



Framework aligning communities and repositories on practices addressing **transparent evaluation** and **reproducibility**

Questions?

***Off-line questions are most
welcome:***

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