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ICT Solutions for Brilliant Minds

National PID Policy Work - Finland

Strategic webinar on PIDs, Denmark
June 24th, 2025
Josefine Nordling & Lassi Lager, CSC

National PID Policy work in Finland - PID Roadmap

The National Roadmap for Persistent Identifiers for Finland in 2023 (revised English version in March 2024): https://urn.fi/URN:NBN:fi-fe20240325129 10

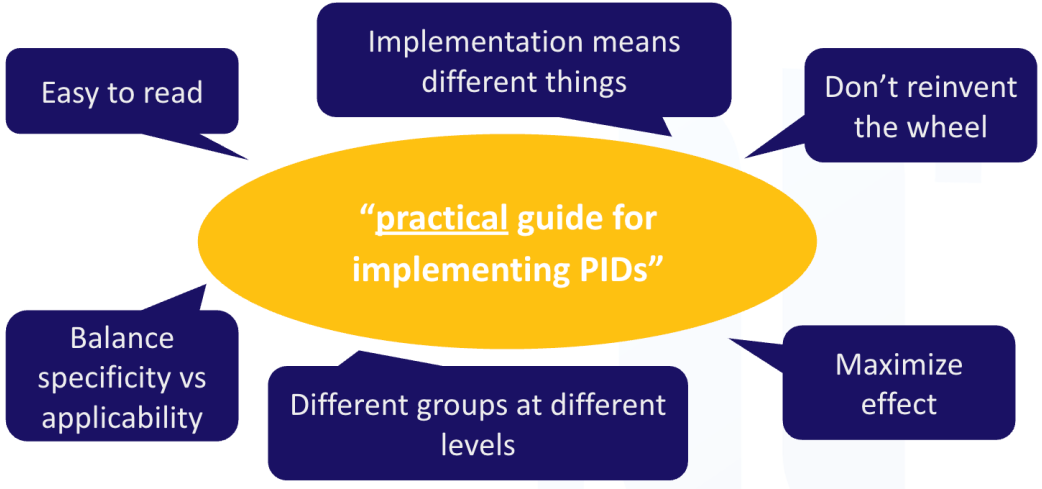
- The roadmap suggested to form a national working group to coordinate the usage and management of PIDs, forming a joint PID policy for Finland. More specifically, the policy is to cover:
  - Recommendations on PID usage for different object types and use cases
  - Different actors and their related roles
  - Guidance for comprehensive utilization across organizational boundaries
  - PIDs as part of the data production process and not as an afterthought
  - Description of identifiers in use and make the entire national field of actors available

National PID Policy work in Finland - PID Working Group

- National collaboration 2024-2025; National PID Working Group
  - Members from Research Council of Finland, research libraries and GLAM organizations, Digital and Population Data Services Agency, Technology Industries of Finland
  - Smaller policy group and workshops for PID Forum Finland
  - Led by CSC - IT Center for Science, in collaboration with the National Library of Finland.
- Scope: not only research, but also GLAM organizations and (to some extent) public administration. 20 different organizations represented
- PID Guidelines/Recommendations or Strategy - yet to be decided
- Anticipated timeline: to be published by end of year 2025

Coverage of policy

- Objective
- Benefits of the PIDs
- Requirements from the legislation
- Guiding principles, separately for different sectors and roles (for example EOSC PID Policy)
- User stories to portray clear examples
- Terminology
- Identifier systems



Source: Nordling, J., Manghi, Paolo, Kálmán, T., van Horik, R., van Lieshout, N., Tatum, C., Cannizzaro, G., Hugo, W., Bingert, S., & Bennett, M. (2025, March 7). F for Findability: Persistent Identifiers and Knowledge Graphs. FAIRfest: Celebrating advancements of FAIR solutions in EOSC (FAIRfest), Den Haag, The Netherlands. Zenodo. https://doi.org/10.5281/zenodo.14988360

International collaboration and benchmarking

Lessons learned from:

- RDA National PID Strategies IG: Review: Case Study Template for National PID Strategies
- Discussions with SND (Sweden), ARDC (Australia), PID Network Deutchland, WDC-ITO etc.
- FAIR-IMPACT and FAIRCORE4EOSC projects (CSC as a partner and mentor in support programs)
- PIDfest 2024 (National PID Strategies track)
- ROR Annual Community Meeting 2025: National PID Policies and Practices (Feb 5)

Lessons learned

- First version does not need to covering everything
- Keep recommendations at a concrete level
- Rely on existing recommendations and policies
- Highlight the ability of systems to maintain identifiers
- Use cases are likely to increase interest and help work forward
- Consider factors slowing the work down
- Cost-benefit analysis for PIDs might be help in getting buy-in from key stakeholders

Future plans

- Broadening the working group
- Clarifying the goals and timetable
- Further interactions with the PID Forum Finland
- First version of the policy expected to be published by the end of this year

FAIR-IMPACT
Expanding FAIR Solutions across EOSC

PID work in the FAIR-IMPACT project

Funded by
the European Union

FAIR-IMPACT

FAIR-IMPACT
A bird's eye view

Call HORIZON-INFRA-2021-EOSC-01-05

Enabling discovery and interoperability of federated research objects across scientific communities

Expanding FAIR solutions in Europe

Partly following up on FAIRsFAIR

EU funded project

Coordination and Support Action

10 million euro

36 months, starting 1 June 2022

28 partners and affiliate entities

From 10 EU member states: NL, FI, FR, DK, IT, DE, ES, NO, BE, RO

and the UK

Tasks on PIDs

Task 3.1

DataCite

Task 3.2

Task 3.3

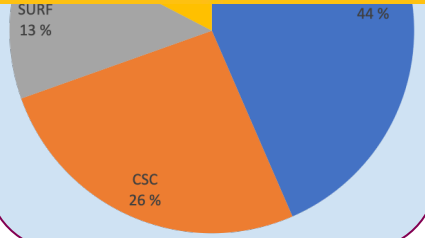
DANS

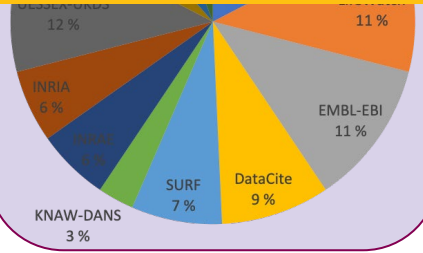
Task 3.4

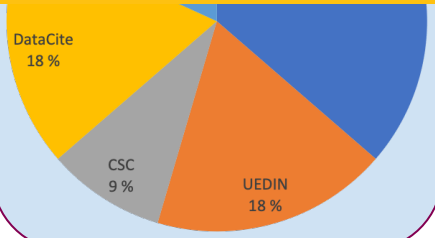
SURF

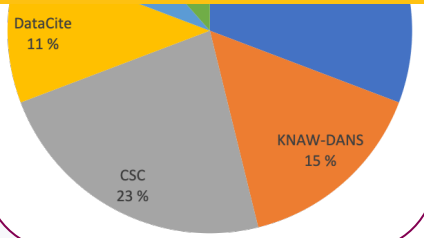
Coordinating, aligning and providing best practices for PID policies and implementation

The ambition of WP3 is to enable and support a sustainable implementation of Persistent Identifiers (PIDs) across EOSC to meet user needs, align with EOSC PID Policy and to promote best practices. Working together with PID service providers, different scientific domains and infrastructures has been vital for meeting the project goals. Interactions with other relevant stakeholders is realised through various workshops providing valuable input and validation for the work on PIDs.









Target group: PID Service Providers

Shared long-term vision for PID service providers in EOSC (M34)

4) Shared long-term vision for PID service providers on PID usage in EOSC

3) Align requirements for onboarding PID providers into EOSC, including emerging PIDs

2) EOSC PID providers coordination mechanism proposed

2) Proposal for an EOSC PID Service providers coordination mechanism

→ Facilitate co-operation between PID Service Providers and EOSC
→ Emerging PIDs to be identified and incorporated into EOSC
→ Ensuring EOSC Compliance by PID Service Providers
→ Channeling needs from the EOSC community
→ Sharing outputs from relevant projects

1) Joint value proposition by relevant PID providers

DataCite
CONNECTING RESEARCH, IDENTIFYING KNOWLEDGE

Direction icons created by Prosymbols Premium - Flaticon

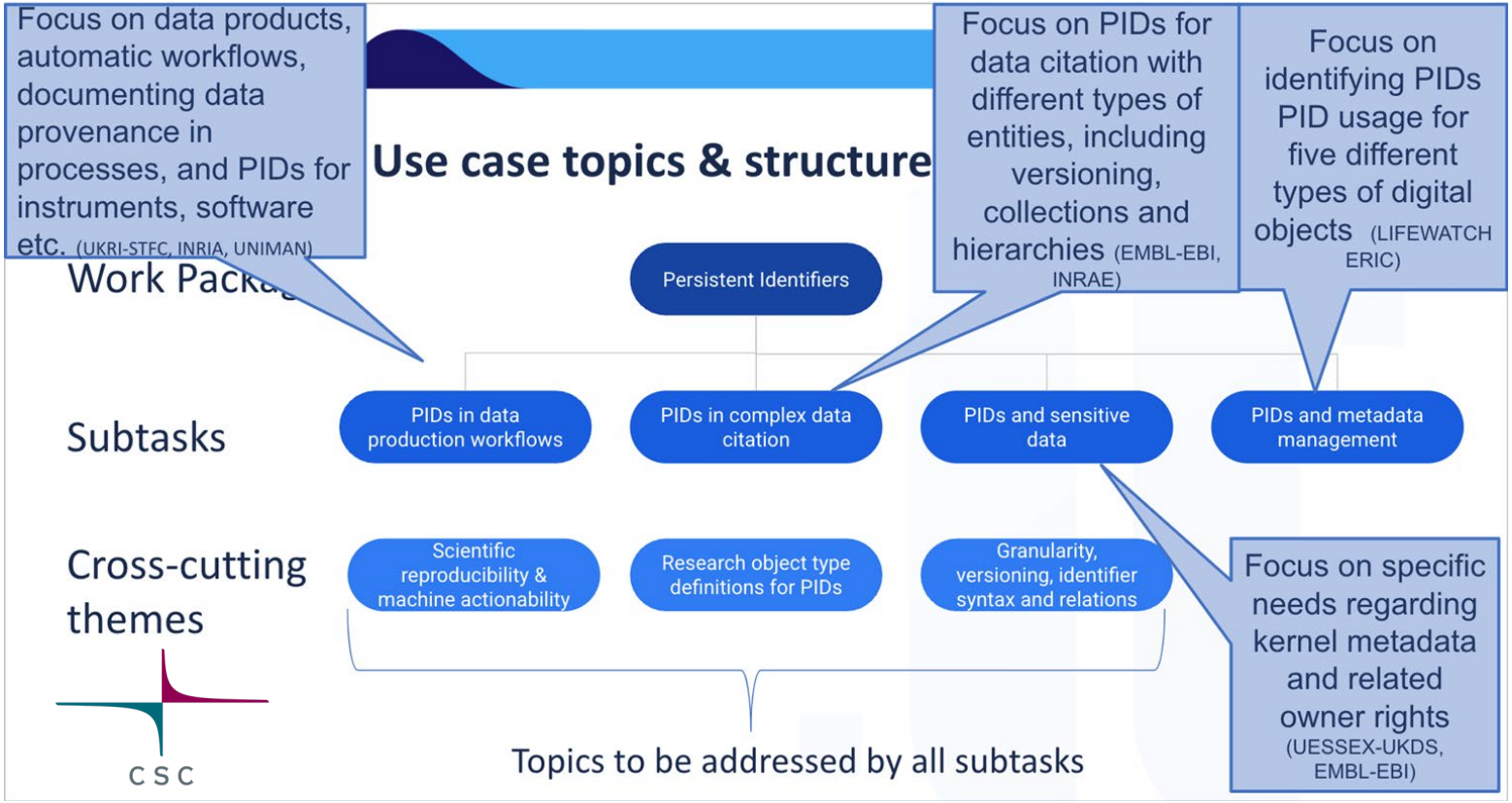
Shared long-term vision for PID service providers

- Survey among PID service providers to get a better understanding of the perspectives of PID service providers on their wishes and needs in terms of EOSC

Recommendations for implementation:

- Coordination mechanism
- Encourage adoption of community governed sustainable PID infras
- Fund and enforce adoption of existing, EOSC PID Policy aligned, PID systems
- Include the CAT and KB as part of the onboarding process for PID providers into EOSC Nodes
- The EOSC PID Policy is fundamental for the long-term integration of PIDs across EOSC and should be officially adopted by EOSC

Target group: End-users - guidelines for PID usage and implementation



Facilitating end user implementations of PIDs - Recommendations

Versioning

- ➔ Develop a versioning policy/procedure of PIDs
- ➔ Clearly communicate the boundaries constituting a minor or major change

Data Granularity

- ➔ Make a conscious choice that best serves the needs of potential re-use
- ➔ Assign a PID and new metadata to the subsets of a dataset used in an analysis

Source: https://www.freepik.com/

Sensitive Data

- ➔ Take a lifecycle perspective on sensitive metadata issues for PIDs
- ➔ Evaluate any pre-existing provenance history of custody

Complex Data Citation

- ➔ Only assign one PID of the same type for each unique digital object for consistent citations

https://fair-impact.eu/best-practice-recommendations-end-users-pid-usage-implementation
D3.2 User guidelines on EOSC PID implementation

4.5 Complex Data Citation Practices

Accurate and consistent citation is crucial for research transparency, particularly when handling complex data. To maintain consistency, only one PID of the same type, such as a DOI, should be assigned to each unique digital object. Assigning multiple PIDs of the same type can lead to fragmentation and errors in citation matching. It's also essential to properly credit contributors using systems like the Contributor Role Taxonomy (CRediT) to ensure clear attribution within research teams. Dynamic citations, such as those using tools like Zotero or OpenCitations, allow for flexibility in citing evolving datasets and resources. By incorporating versioning and linking multiple identifiers to the same object, researchers can track the history of the data and ensure they are referencing the correct version, enhancing accessibility and reproducibility. Additionally, linking research objects when multiple identifiers exist ensures better discoverability and citation consistency, especially when datasets are updated or modified over time.

Recommendation - What?	**Problem statement - Why?**	**Stakeholder affected - For whom?**	**Keywords - About?**	**Source - From where ?**[90]
E: Complex Data Citation Practices				
E1: Only assign one PID of the same type for each unique digital object to allow consistent citations.	If several PIDs of the same type (e.g., DOIs) are assigned per record, they become less likely to be matched correctly. Fragmentation of citation records undermines the effectiveness of PIDs, which are designed to ensure accurate and consistent referencing.	• Researcher	• Data citation	A [91]
E2: Use Contributor Role Taxonomy (CRediT)[92] to cater for proper accreditation within a research group or project.	Proper citation, no matter how complex, ensures research transparency. This makes it easier for researchers to be as accurate as possible in identifying the datasets or partial datasets used in their research. Clearly defining roles at the start of a research project and making adjustments as needed throughout can help streamline the process, reducing confusion and minimising the risk of disputes during the reporting and writing stages.	• Researcher	• Data citation • Contribution roles	G
E3: Make use of dynamic citations in cases where the source or reference material might change or be updated over time, e.g., by making use of Zotero[93] or OpenCitations.[94]	Collections are living objects, i.e., they change depending on needs. A dynamic citation is flexible and adaptable, typically used in contexts where the source or reference material might change or be updated over time.	• Researcher	• Dynamic citation	G
E4: Cite dynamic data dynamically via query: data + timestamp or TMS (time management system) when it follows a versioned history.	Using the query to identify the dataset provides valuable semantic information on how the dataset was constructed, rather than just having a raw data dump. Additionally, scalable dynamic data citation enables users to re-execute the query with the original	• Researcher	• Dynamic citation • Query	G

Target group: PID Managers

Guidelines for creating a user tailored EOSC Compliant PID Policy

16 Guidelines for PID Managers

The Guidelines for creating a user tailored EOSC Compliant PID Policy (D3.3) formulates 16 guidelines for helping PID Managers to formulate an EOSC compliant PID policy.

The main source for the guidelines are the outcomes of the compliance assessment of the EOSC PID policy. Other sources of best practice are a review of national and institutional PID policies, outputs and recommendations of the Research Data Alliance (RDA), review of PID Stack documentation and published use of PIDs in workflows and specific use cases.

"When selecting an appropriate PID service, it is important to understand what your expectations are with respect to uniqueness, persistence and resolvability, and what methods and services are available to perform and control this selection process."

The results provided by the report are relevant for all actors in the PID Ecosystem, such as PID Service Providers, PID Owners, PID Authorities and PID Standards Bodies. The main target group, however, are **PID Managers,** who have the responsibility to maintain the integrity of the relationship between entities and their PIDs. PID Managers may include a provider of a data repository, a data catalogue, or a research workflow system.

This deliverable was open for the external community review until 2024-10-31

https://fair-impact.eu/guidelines-creating-user-tailored-eosc-compliant-pid-policy
https://zenodo.org/records/14092489

How can we define 'EOSC compliant PID policies for PID Managers'?

PID Managers have responsibilities to maintain the integrity of the relationship between entities and their PID. Central to the work are the following questions:

- ➔ How can we determine the quality of the EOSC PID policy and - in collaboration with all stakeholders - how can we implement a user tailored PID policy?
- ➔ What principles, roles and criteria can we distinguish when it comes to the use of PIDs in the EOSC?
- ➔ What should a PID Manager do to formulate or evaluate an EOSC compliant PID policy?

16 guidelines for PID Managers

FAIR-IMPACT, in close cooperation with the FAIRCORE4EOSC project and the team developing a Compliance Assessment Toolkit (CAT), have formulated 16 guidelines for supporting PID Managers in formulating an EOSC compliant PID policy. The main source for the guidelines are the outcomes of the compliance assessment of the current version of the EOSC PID policy.

→ *"When selecting an appropriate PID service, it is important to understand what your expectations are with respect to uniqueness, persistence and resolvability, and what methods and services are available to perform and control this selection process."*

Target group: National stakeholders - PID implementation program

van Lieshout, N., Ramezani, S., van Horik, R., Horton, L., Turner, D., Davidson, J., Marjamaa-Mankinen, L., Lager, L., & Nordling, J. (2025). MS3.8 Technical EOSC PID implementation guide & program. Zenodo. https://doi.org/10.5281/zenodo.14779609

Support offer #2: Creating EOSC compliant Persistent Identifier (PID) policies

Goal: *Develop a better PID policy/strategy, demonstrated through improved compliance with EOSC PID Policy using the compliance assessment toolkit (CAT).*

Basis stats:

Ran from May to Sept 2024
Part of Work Package “PIDs”
11 organisations
10k € offered to each team

eosc | FAIRCORE4EOSC
Core Components Supporting a FAIR EOSC

eosc | FAIR-IMPACT
Expanding FAIR solutions across EOSC

FAIR implementation stories: https://fair-impact.eu/implementation-adoption-stories

Knowledge Exchange report: PIDs & related risks and trust elements

Knowledge Exchange

Knowledge Exchange partners

DFG German Research Foundation

Jisc (United Kingdom)

DeiC Danish e-infrastructure Cooperation

SURF (Netherlands)

CSC IT Centre for Science (Finland)

CNRS Centre national de la recherche scientifique (France)

Six national organisations within Europe, responsible for the national and international development of infrastructure & services to support the use of ICT within HE & Research

People involved

The Task & Finish Group for PIDs Risk and Trust

The activity is led by KE representatives Frank Manista (Jisc) and Josefine Nordling (CSC). The Task & Finish Group for this activity consists of experts from across each of the six KE partner countries:

- Rene Belsø (Expert Lead), DeiC, Denmark
- Martin Matthiesen (Expert Co-lead), CSC, Finland
- Pascal Aventurier, IRD, France
- Nathalie Fargier, CNRS, France
- Gaëlle Béquet, ISSN, France
- Jessica Parland-von Essen, CSC, Finland
- Clifford Tatum, CWTS, Netherlands
- Laurents Sesink, Leiden University, Netherlands
- Gül Akcaova, SURF, Netherlands
- Stephanie Palek, Deutsche Nationalbibliothek, Germany
- Jürgen Kett, Deutsche Nationalbibliothek, Germany
- Britta Dreyer, Technische Informationsbibliothek, Germany
- Adam Vials Moore, Jisc, UK
- Hilda Muchando, Human Made / ALTIS, UK
- Kirsty Wallis, University College London, UK

The Consultants

A team of consultants were appointed by KE to support this work:

- Ulrich Herb (https://orcid.org/0000-0002-3500-3119)
- Pablo de Castro (https://orcid.org/0000-0001-6300-1033)
- Laura Rothfritz (https://orcid.org/0000-0001-7525-0635)
- Joachim Schöpfel (https://orcid.org/0000-0002-4000-807X)

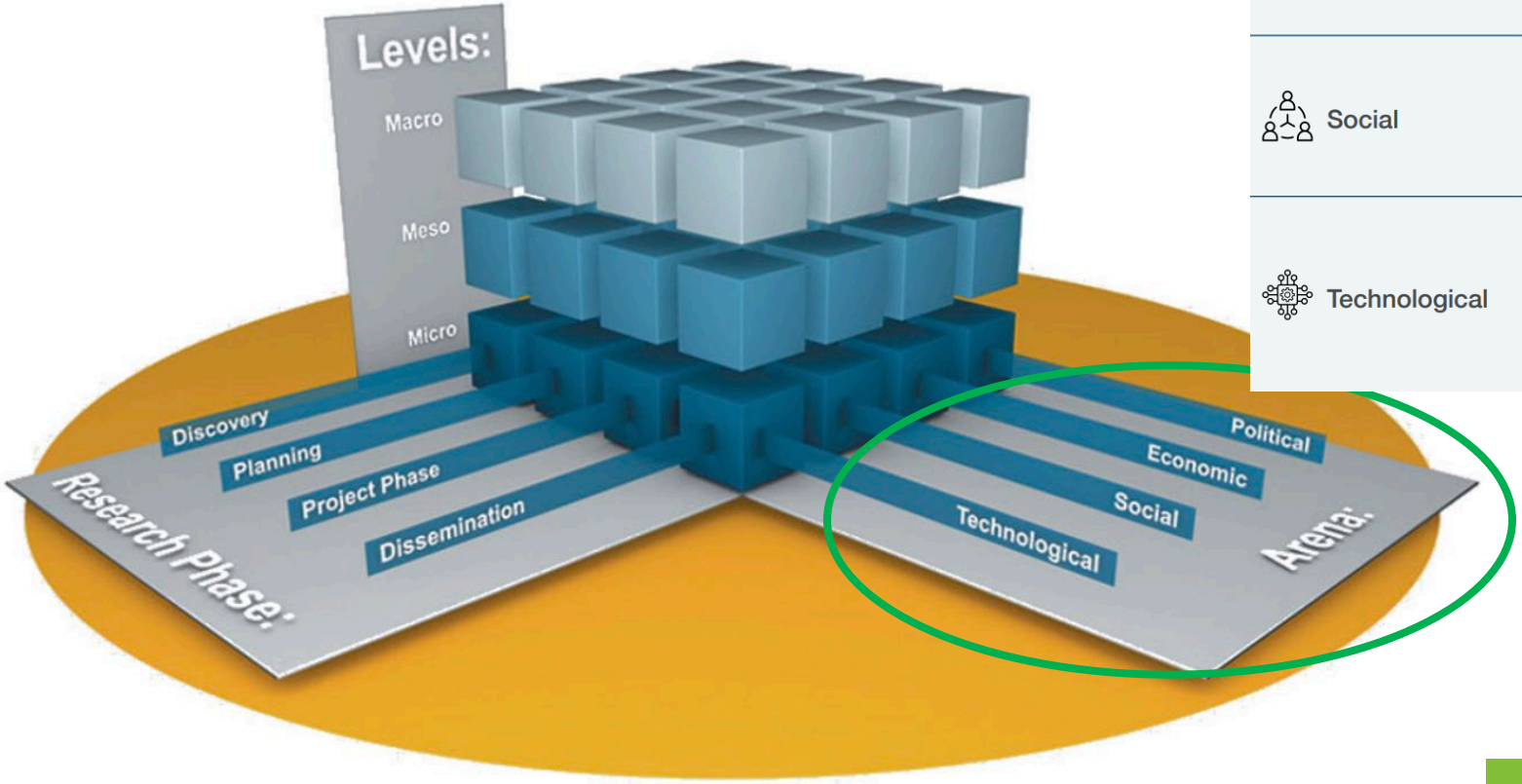
Setting the scene

- The report describes what is needed to build and exploit a well-functioning PID infrastructure for research, with risk & trust elements included
- The approach and results aim to identify, through analysis, and recommendations, what could be the best possible strategic and operational paths to achieve this goal
- The success (quantitative adoption and reliability) of PIDs depends largely on
  a) the added values they provide (e.g., rich metadata, interoperability)
  b) the trust in their ability to contribute to accountability, reproducibility and credibility
  c) the lack of risks associated with them

Socio-technical approach to risks & trust of PIDs

- The study includes:
  - A literature review on the main characteristics of PIDs
  - An analysis of interviews with a variety of actors; PID Authorities, PID Service Providers, PID Managers, PID Owners and PID Users
- For whom:
  - Policymakers and persons with strategic management functions at RPOs and RFOs, who will find the quintessence for a practical exploitation of the project results in the recommendations (Chapter 3)
  - Professionals in charge of providing PIDs for their own content (e.g. publishers, text/ data/ software servers) or other PID experts, e.g. from PID service providers

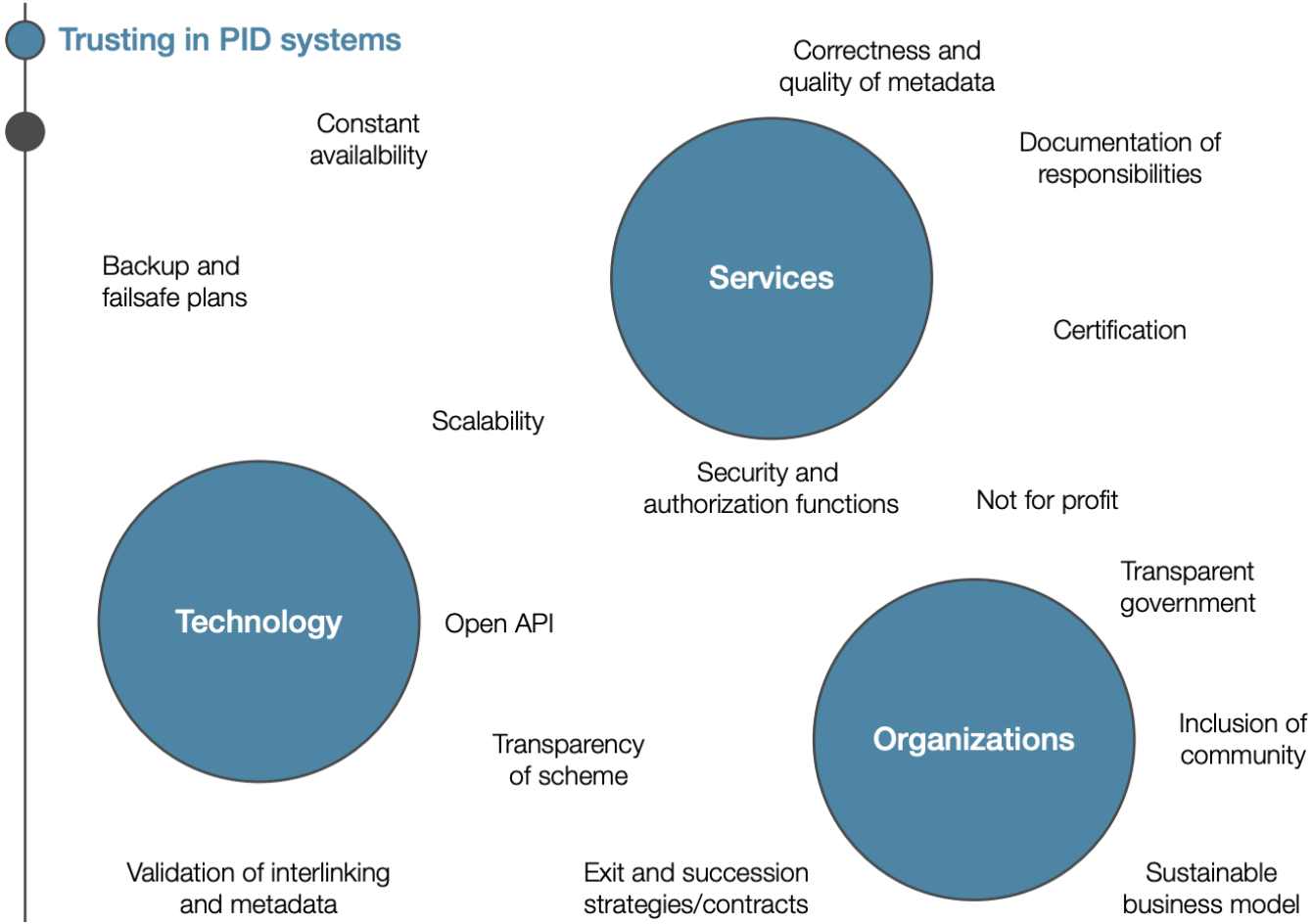
PID risks – KE Open Scholarship Framework



Arena	Possible event
Political	PID owners decide to stop maintaining metadata, loss of organisational government
Economic	Financial sustainability is no longer given, financial support is lacking
Social	Key players in the PID system change or end their involvement, lack of community uptake
Technological	Technology the PID relies on is changed for any reason (e.g., vendor lock-in), or ceases to support new requirements.

Risks related to PIDs

Figure 3. Framework of the analysed risk and trust variables



Recommendations

A. National-level stakeholders
B. Research funders
C. PID Service Providers
D. Institutions (Research-Performing Organisations, RPOs)
E. Researchers in their institutional context
F. Publishers (including Diamond OA publishers)
G. A possible PID Federation
H. Knowledge Exchange

Recommendations – National level

A. National-level stakeholders

There is a wide range of relevant players at a national level, all of whom should ideally be on the same page with regard to a national-level PID strategy. These include National research and education networks (NRENs), national organisations for research e-infrastructure (the likes of SURF or Jisc, sometimes overlapping with NRENs), research funders, institutions and also projects such as the Open Knowledge Base (OKB-NL) in the Netherlands or (on a wider scope) the EOSC-funded FAIR-IMPACT or FAIRCORE4EOSC.

The key recommendation for national-level stakeholders could be summarised as **"Put your house in order" - Establish a national PID roadmap**. All items listed below can loosely be considered part of this high-level advice.

A1. Identify the key stakeholders at a national-level in your country and explore the feasibility of bringing them together to discuss the PID implementation strategies. These stakeholders may include – but are not limited to – research funders, national libraries, research-performing organisations and large cross-disciplinary research supporting infrastructures. Some frontrunner countries may serve as best practice examples for the purpose.

A2. Explore the feasibility to discuss national PID implementation strategies with relevant stakeholders. The purpose is to design a PID strategy with input from the various relevant stakeholders in the country. This strategy should ideally state which PIDs ought to be prioritised in the gradual development of a comprehensive PID layer at a national level.

A3. Form national-level governance instruments. As per the emerging best practice examples, these could include a PID Advisory Board with the key stakeholders represented in it. The possibility of drafting a PID policy that underpins the agreed strategy forward should also be considered

A4. Be aware of the socio-technical solutions in place for various PIDs. Although a consensus is quickly emerging, sometimes there are competing solutions in place for the same PID – such as for instance for Organisation IDs. The case studies produced in the course of this work may help in providing an up-to-date insight on the current PID landscape. This landscape is however quickly evolving and it's worth keeping up with the various ongoing international initiatives.

A5. Do not reinvent the wheel. Before even starting to implement a national PID strategy, familiarise yourself with the challenges faced by and the solutions adopted in other countries. An effective way of doing this is by joining – even as an observer – international coordination initiatives on the design of national-level PID strategies such as the dedicated WG within the RDA[6].

A6. Design an awareness-raising communication campaign highlighting the relevance of this domain for the progress of research management and administration. This effort should mainly target institutions, while keeping in mind that researchers largely remain the key end-users of PIDs. Parallel top-down and bottom-up communication strategies should be considered in this design.

KE PID reports

- Main report:
  - Building the plane as we fly it: the promise of Persistent Identifiers
- Seven case study reports:
  1. Adoption of the DAI in the Netherlands and subsequent superseding by ORCID/ISNI
  2. The gradual implementation of organisational identifiers (OrgIDs)
  3. Persistent identifiers for research instruments and facilities: an emerging PID domain in need of coordination
  4. IGSN - building and expanding a community-driven PID system
  5. RePEc Author Service: An established community-driven PID
  6. Failed PIDs and unreliable PID implementations
  7. The role of research funders in the consolidation of the PID landscape

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