First Light for DOIs at ESO

LISA VIII, 6-9 June 2017

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ESO Libraries

Why DOIs?

- Digital Object Identifiers: persistent, globally unique, resolvable
- Can be assigned to publications, data, physical objects
- Example: `10.18727/0722-6691/5000`

  DOI prefix *ESO* *Suffix (arbitrary)*
- Resolvable by prepending https://doi.org/
- Citable (unambiguously)
- As a URL, avoids link rot
- Machine-readable when cited
- Repositories offer (linked) metadata (for humans and machines)

Why DOIs at ESO?

- Initiated by the Library
- Articles in quarterly publication *The Messenger*
  - Produced by the education and Public Outreach Department (ePOD)
- Observing programmes and runs (raw data)
- Data products (reduced/processed data)
  - Produced by the Science Archive
- In particular: for citation

Requirements for DOIs

- A Registering Authority
- A “landing page” for every resource
  - I.e., a DOI cannot resolve directly to a data file or article PDF
- Upload resource metadata to Registering Authority
  - Needs to be formatted in a certain way
- Ten-year promise for persistence

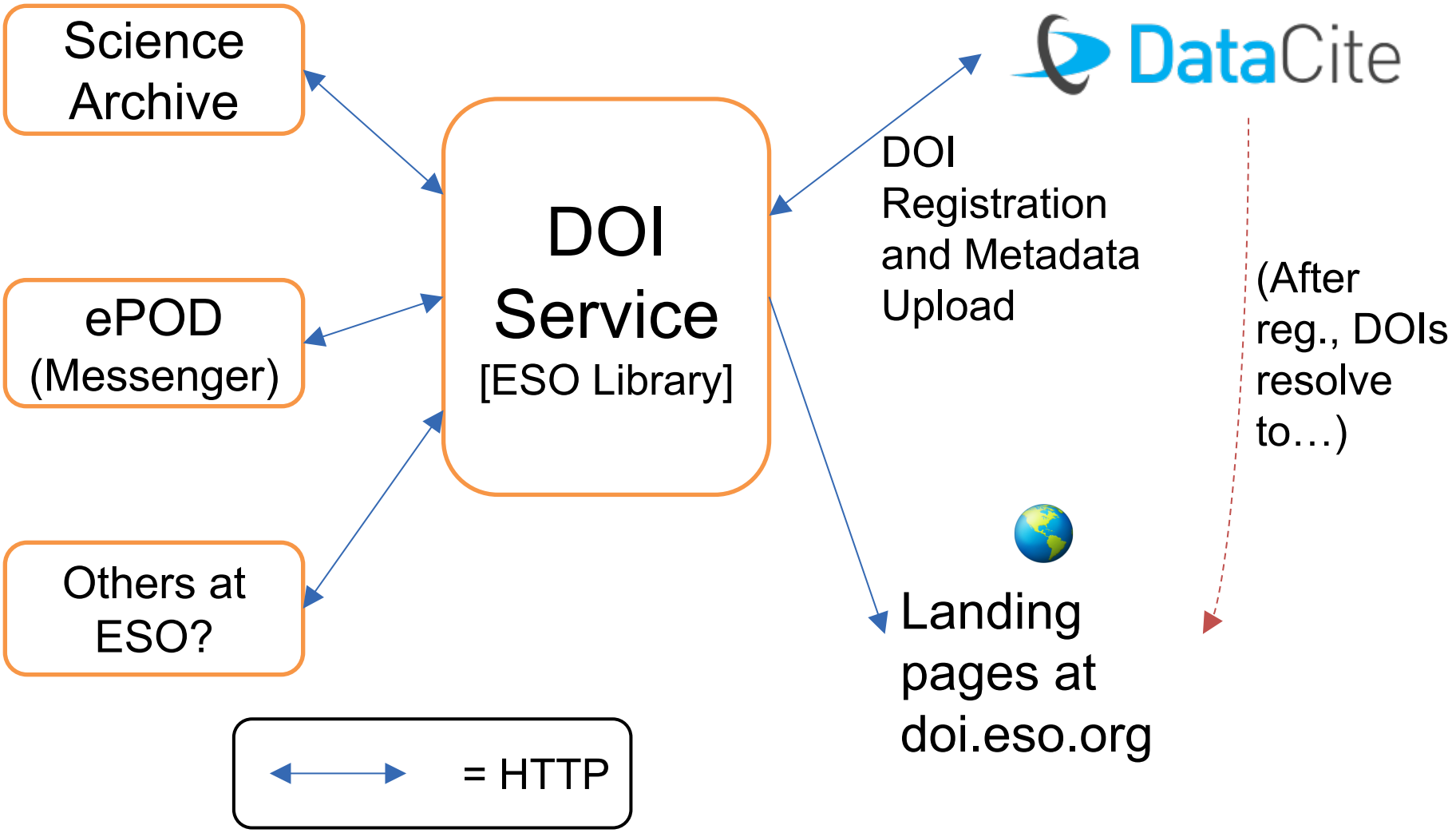
Questions to consider

- Typical project and software questions
  - E.g., choices of language and DB, staffing…
- Multiple departments want to use them, so…
  - Who is responsible ESO-wide for DOIs? (A: Library)
  - Who is responsible in each department?
  - How to deal with diverse technologies and needs among departments?
  - How to translate metadata describing different kinds of resources into a common format?
  - How to make a system that future, unknown clients will also be able to use?

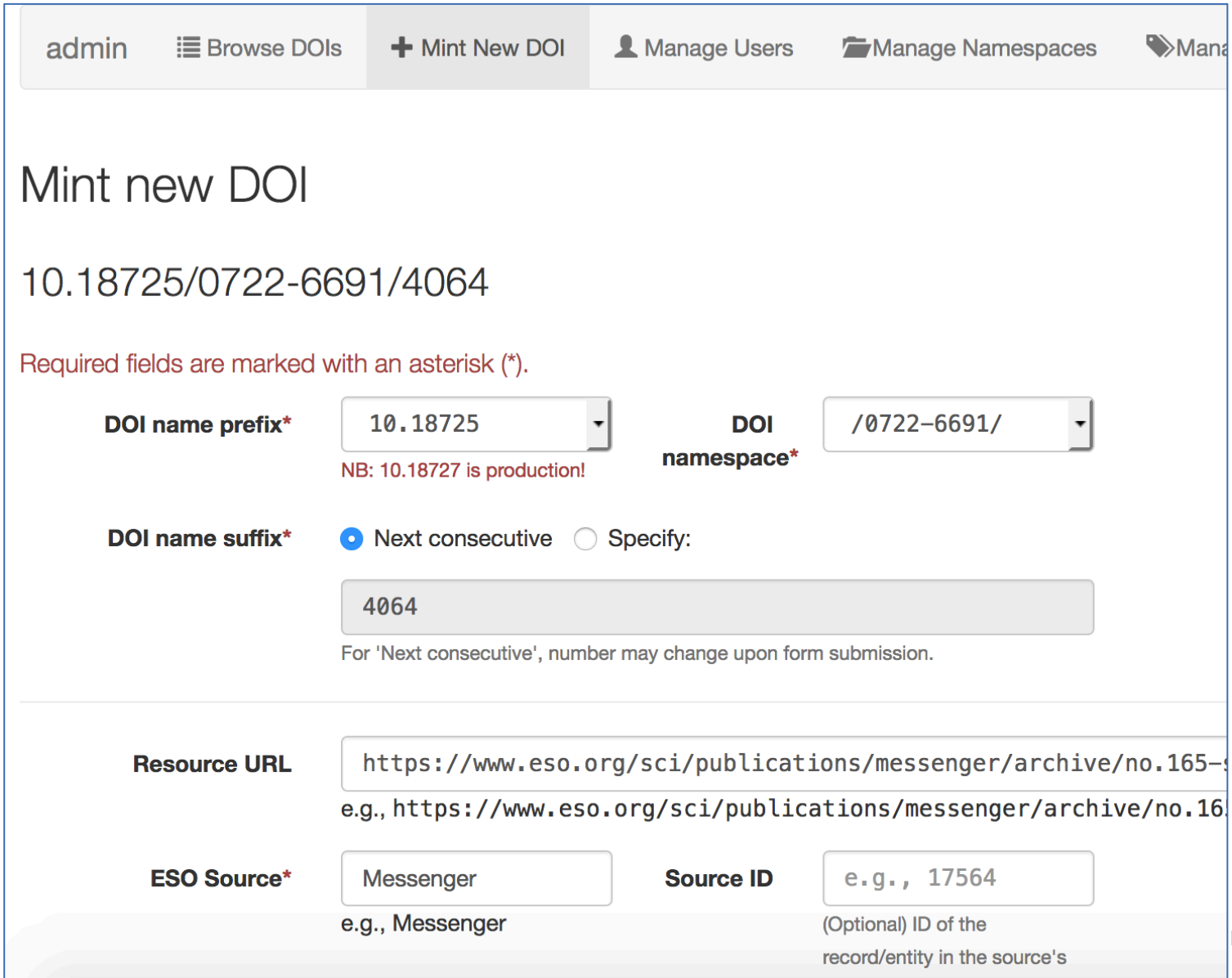
ESO Planning & Timeline

- Mid 2015: began discussions within Library and with Archive/ePOD
  - Which Registering Authority? DataCite
  - Technische Informationsbibliothek (TIB)
- March 2016: contract with TIB
- August 2016: development started
- February 2017: minimum viable product
- March 2017: launched with first DOIs

Architecture & Process



DOI Minting Example



DOI Minting Example

Publisher European Southern Observatory (ESO)

Publication year* 2017

Creators At least one Creator is required.

1. Name* Bordelon, Dominic
FamilyName, GivenName

ORCID xxxx-xxxx-xxxx-xxxx

Affiliations European Southern Ob
+ESO

Title* A test record

Additional Title

Title type

Resource type* Text/Journal Article

Language

Size
e.g., 9 pages; 3 MB

DOI Minting Example

Format PDF

e.g., PDF

Version 1.0

e.g., 1.1

Rights Copyright European Southern Observatory

Messenger-specific Issue No. required for other fields

Issue No. 167 **Month** March **Section** Instrumentation **Start Page** 2 **End Page** 5

e.g., Astronomy News

Contributors Recommended; separate affiliations with a semicolon. +

Dates Recommended +

DOI Minting Example

Descriptions Recommended

1. Type Abstract **Description** A description of the article.

2. Type SeriesInformation **Description** Published in The Messenger no. 167, March 2017, 2-5.

Subjects Recommended

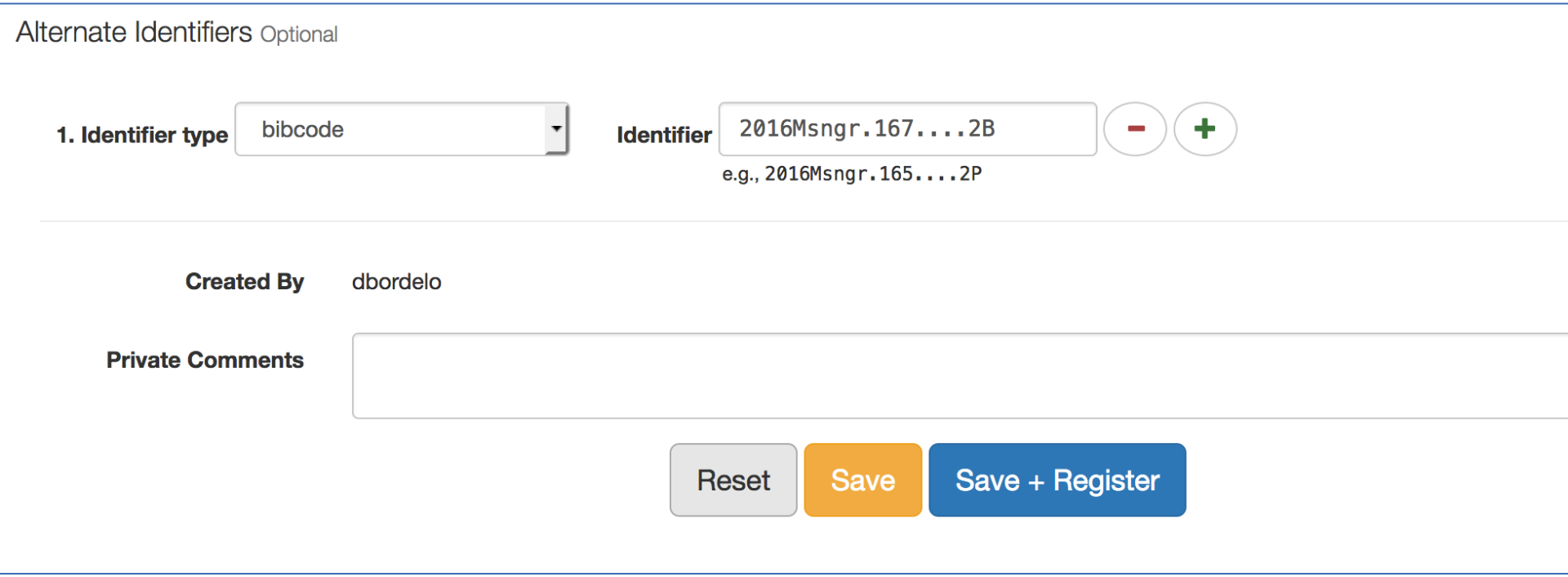
Related Identifiers Recommended

1. Relation type IsPartOf **Identifier type** ISSN **Identifier** 0722-6691

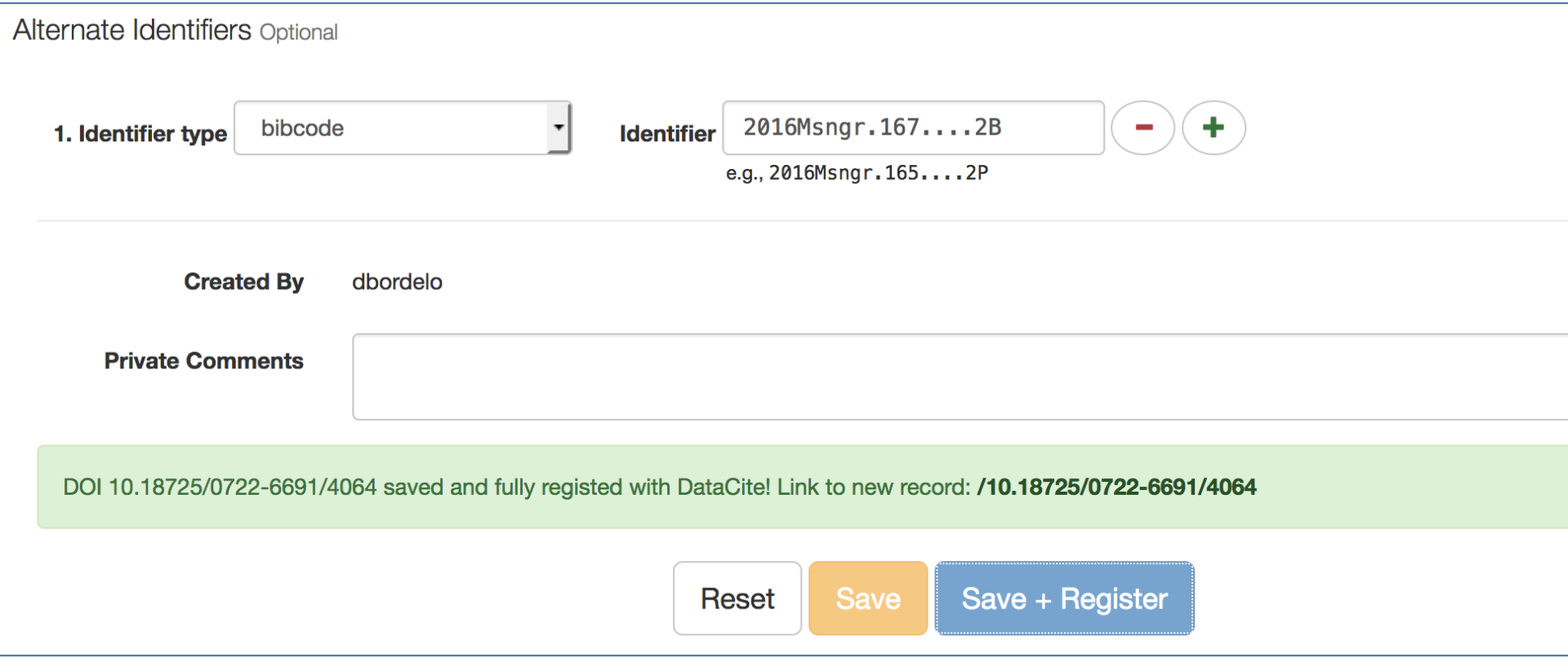
e.g., 0722-6691

Alternate Identifiers Optional

DOI Minting Example



DOI Minting Example



Programming Architecture

- Decoupled from other departments' applications and servers
- HTTP interface
  - DOI Service and a department can be black boxes to one another
- DataCite Metadata Schema (DCMS) as data model
  - E.g.: *Messenger* author and Archive PI both become "creator" in DCMS
  - Crosswalks between departments and DCMS are necessary
  - DataCite XML is the system's most important output
- "DOIs as a service" for ESO departments

Features

- Example record: https://doi.org/10.18727/0722-6691/5001
- Namespacing within ESO's DOI prefix
  - Serve custom landing pages (e.g., per department)
  - Next-consecutive-integer DOI minting
- Machine-readable metadata embedded on landing pages (view source)
  - schema.org/JSON-LD for discovery (e.g. by Google)
  - `<meta name="DC.{field}" …>` tags for reference managers

What's next?

- Improve automation among departments
- Science Archive's implementation
- "On-the-fly" DOI's? (like STScI)

Conclusions

- How to deal with diverse technologies and needs among departments?
  - **Decoupled architecture + HTTP interface**
- How to translate metadata describing different kinds of resources into a common format?
  - **DCMS as data model + crosswalks**
- A system that future, unknown clients will also be able to use

Conclusions

Machine-readability (e.g., using DOIs) is needed for Big Data;

DOIs are integral for an effective Open Science ecosystem.

Thanks

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- Uta Grothkopf, Head Librarian
- Silvia Meakins, Library Technology Specialist
- María Eugenia Gómez, Librarian (Chile)