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DataCite

CONNECTING RESEARCH, ADVANCING KNOWLEDGE

DataCite Insights: Strengthening Open Science and Research Visibility in Africa

Mohamad Mostafa
Community Specialist
mohamad.mostafa@datacite.org

@datacite.org

Open Science

Open Science Pillars

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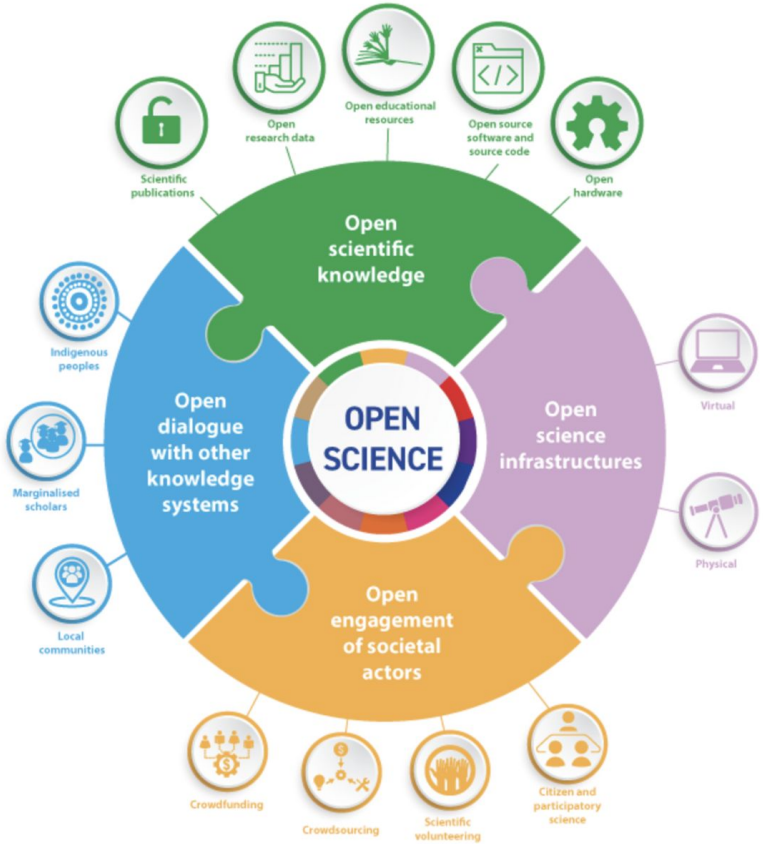


Source: UNESCO Recommendation on Open Science, 2021

https://doi.org/10.54677/MNMH8546

unesco

Open Research Infrastructure

UNESCO defines open research (or open science) infrastructures as "***shared research infrastructures*** *that are needed to support open science and serve the needs of different* ***communities***".

Examples of **open science infrastructures** include major scientific equipment or sets of instruments, and knowledge-based resources such as collections, journals and **open access publication platforms, repositories, archives and scientific data**.

Open research infrastructures are often built by ***non-profit organizations*** and are governed, driven, and **sustained by their *communities***, ensuring long-term sustainability. The goal is to increase **transparency, equity, and fairness**, better serving the interests of the scholarly community and the public by building a trusted research ecosystem.

Source: UNESCO Recommendation on Open Science, 2021
https://doi.org/10.54677/MNMH8546

PIDs & Open Research Infrastructure

DataCite

unesco UNESCO OPEN SCIENCE · TOOLKIT GUIDANCE

BOLSTERING OPEN SCIENCE INFRASTRUCTURES FOR ALL

This document is part of the UNESCO Open Science Toolkit, designed to support implementation of the UNESCO Recommendation on Open Science. Building on the provisions of the Recommendation, the guide was developed in consultation with the UNESCO Working Group on Open Science Infrastructures to build a shared understanding and identify steps for strengthening equitable and sustainable open science infrastructures.

What are open science infrastructures?

As defined in the UNESCO Recommendation on Open Science, open science infrastructures refer to shared research infrastructures that are needed to support open science and serve the needs of different communities. These infrastructures may be virtual or physical.

Examples of open science infrastructures include major scientific equipment or sets of instruments, and knowledge-based resources such as collections, journals and open access publication platforms, repositories, archives and scientific data. They also include current research information systems, open bibliometrics and scientometrics systems for assessing and analysing scientific domains, open computational and data manipulation service infrastructures that enable collaborative and multidisciplinary data analysis and digital infrastructures.

The critical components of open science infrastructures allow unambiguous identification of scientific items by unique persistent identifiers[1]. They provide essential open and standardized services to manage and provide access, portability, analysis and federation of data, scientific literature, thematic science priorities or community engagement. These include, *inter alia*, open science platforms and repositories for publications, research data and source codes, software forges and virtual research environments, digital research services and open laboratories.

Different repositories are adapted to the specificity of the items they contain (publications, data or code), to local circumstances, user needs and the requirements of research communities, yet should adopt interoperable standards, diverse practices and best practices to ensure the content in repositories is appropriately vetted, discoverable and reusable by humans and machines.

Additional examples of open science infrastructures that provide common access to physical facilities, capabilities and services include open innovation testbeds, incubators, accessible research facilities, open license stewards, as well as science shops, science museums, science parks and exploratories.

Open science infrastructures are often the result of community-building efforts, which are crucial for their long-term sustainability and therefore should be not-for-profit and guarantee permanent and unrestricted access to the public to the greatest extent possible.

Infrastructures are key to the sustainability of open science

In the Recommendation, open science infrastructures are defined as a pillar of open science, alongside open access to scientific knowledge, open engagement of societal actors and open dialogue with other knowledge systems.

For maximum efficiency and impact, open science should build on long-term practices, services, infrastructures and funding models that ensure the equal participation of scientific producers from less privileged institutions and countries.

Open science infrastructures should be organized and financed on a primarily not-for-profit and long-term vision, which enhance open science practices and guarantee permanent and unrestricted access to all, to the largest extent possible.

[1] Examples of unique persistent identifiers (PIDs) include ORCID iDs for people, digital object identifiers (DOIs) for publications and grants, DataCite DOIs for

The critical components of open science infrastructures allow unambiguous identification of scientific items by ***unique persistent identifiers****.*

Source: UNESCO, Bolstering Open Science Infrastructures for all, 2022
https://doi.org/10.54677/QZPQ1991

Check out the UNESCO recommendation to adopt DataCite DOIs in the footer of the first page.

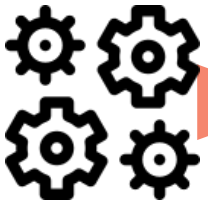
unesco

Introduction to PIDs

PIDs

What is a persistent identifier (PID)?

https://doi.org/10.34848/GJO6SY



https://research-data.urosario.edu.co/dataset.xhtml?persistentId=doi:10.34848/GJO6SY

Unique alphanumeric string referring to a digital resource.

Always points to the same resource (a metadata representation)

DOIs for research outputs and resources
https://doi.org/10.5281/zenodo.3630248

ORCID iDs for researchers
https://orcid.org/0000-0001-6622-4910

ROR IDs for research organizations
https://ror.org/01y2jtd41

ROR IDs for Research Organizations

DataCite

https://ror.org/035d9jb31

Busitema University

ORGANIZATION TYPES

Education, Funder

OTHER NAMES

Acronyms

BU

LOCATIONS

Tororo (GeoNames ID 226110), Uganda

WEBSITE

https://busitema.ac.ug

OTHER IDENTIFIERS

GRID grid.448602.c

ISNI 0000 0004 0367 1045

Crossref Funder ID 501100009900

Wikidata Q5001978

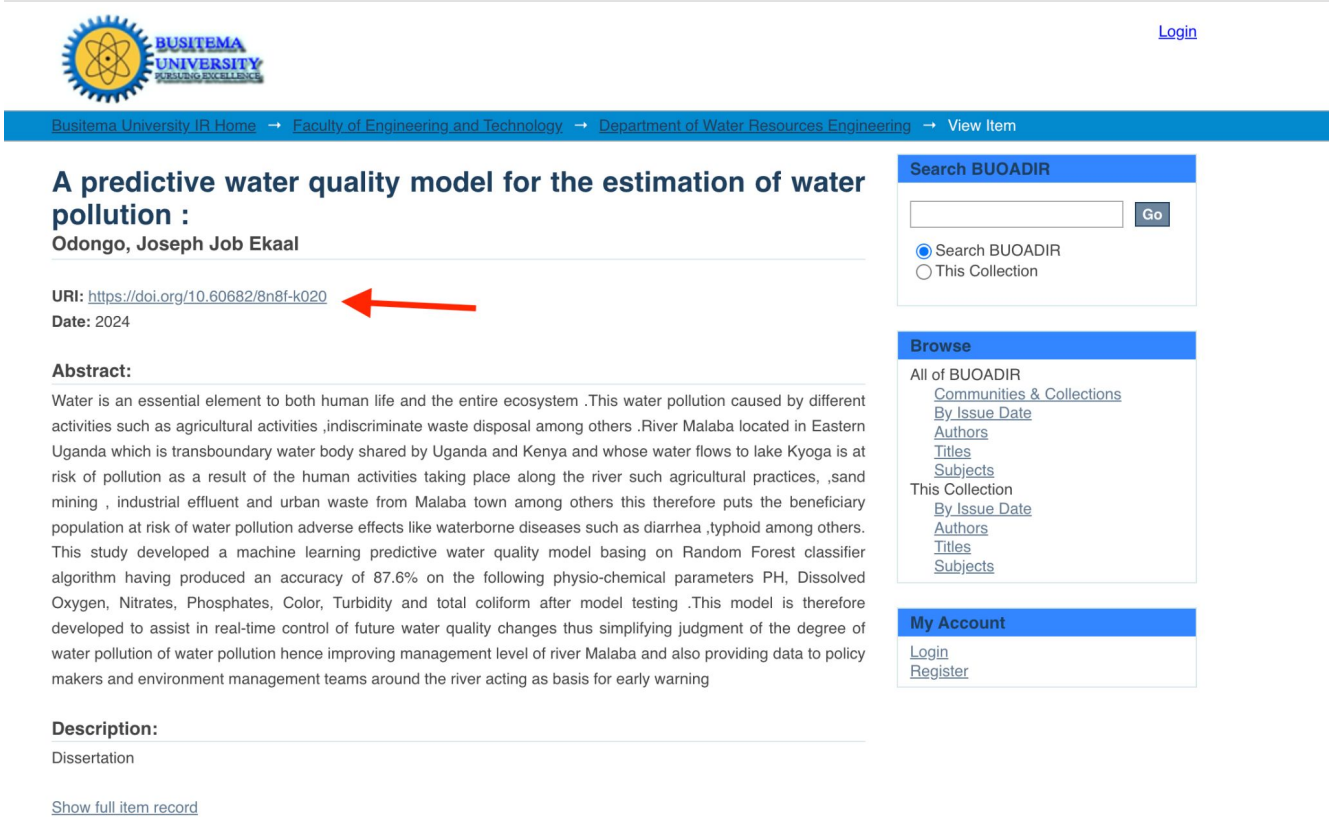
RELATIONSHIPS

Related Organizations

Mbale Hospital

DOIs for Research Objects

DataCite



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Busitema University IR Home → Faculty of Engineering and Technology → Department of Water Resources Engineering → View Item

A predictive water quality model for the estimation of water pollution :

Odongo, Joseph Job Ekaal

URI: https://doi.org/10.60682/8n8f-k020

Date: 2024

Abstract:

Water is an essential element to both human life and the entire ecosystem .This water pollution caused by different activities such as agricultural activities ,indiscriminate waste disposal among others .River Malaba located in Eastern Uganda which is transboundary water body shared by Uganda and Kenya and whose water flows to lake Kyoga is at risk of pollution as a result of the human activities taking place along the river such agricultural practices, ,sand mining , industrial effluent and urban waste from Malaba town among others this therefore puts the beneficiary population at risk of water pollution adverse effects like waterborne diseases such as diarrhea ,typhoid among others. This study developed a machine learning predictive water quality model basing on Random Forest classifier algorithm having produced an accuracy of 87.6% on the following physio-chemical parameters PH, Dissolved Oxygen, Nitrates, Phosphates, Color, Turbidity and total coliform after model testing .This model is therefore developed to assist in real-time control of future water quality changes thus simplifying judgment of the degree of water pollution of water pollution hence improving management level of river Malaba and also providing data to policy makers and environment management teams around the river acting as basis for early warning

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Dissertation

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https://doi.org/10.60682/8n8f-k020

DataCite

About DataCite

We are a global community that shares a common interest: to ensure that research outputs and resources are openly available and connected so that their reuse can advance knowledge across and between disciplines, now and in the future.

A **non profit organization** registered in Hannover, Germany since 2009.

Our Community

DataCite

1737

Organizations

69

Countries

114m+

DOIs

1B+

Resolutions in 2025

(February 2026)

Our services

DataCite

Create DOIs

Enable the creation and management of persistent identifiers

Connect research

With rich metadata for diverse outputs – from samples and images to data and preprints

Integrate services

to improve and enhance research workflows

Facilitate discovery and reuse

of research outputs and resources with flexible state-of-the-art tools and technology

Types of
Outputs, Resources & Activities

DataCite

DataCite DOIs are suitable for a wide range of outputs:

1. Research datasets and collections, associated workflows, software, images, and models

2. Grey literature such as theses, dissertations, reports, unpublished conference papers, newsletters, preprint journal articles, technical standards, and specifications for which the institutional repository is the primary publication point.

3. Physical objects such as samples, prototypes, artworks, etc.

4. Research activities such as awards/grants, and projects.

Resource Types in DataCite Fabrica

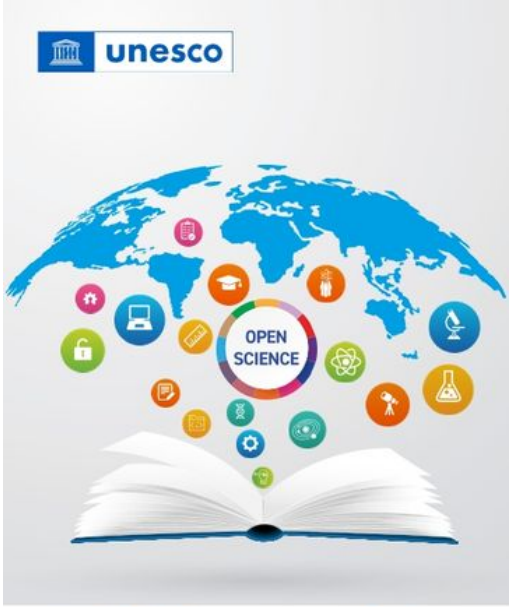
DataCite

Dataset	50,112,296
Text	16,837,047
Physical Object	16,385,168
Image	9,365,129
Other	3,154,379
Journal Article	2,550,021
Preprint	1,586,990
Collection	1,177,462
Software	731,231
Audiovisual	630,231
Dissertation	441,668
Conference Paper	283,587
Report	273,692
Book	175,684
Interactive Resource	173,879
Study Registration	169,354
Project	140,332
Event	124,842
Book Chapter	115,101
Sound	72,506
Journal	71,296
Model	37,161
Conference Proceeding	32,767
Peer Review	26,378
Data Paper	18,176
Standard	10,091
Workflow	9,184
Computational Notebook	8,623
Award	8,096
Output Management Plan	7,789
Service	557
Instrument	401

(Sep. 2025)

Benefits of DataCite DOIs

- Improve **visibility** and **discoverability**
- Boost **citations** and increase the institutional **impact**
- Increase **recognition** for research outputs beyond journal articles
- Connect research outputs and resources with the **global ecosystem**
- Promote **Open Research** practices and make research outputs **FAIR**



UNESCO Recommendation on Open Science

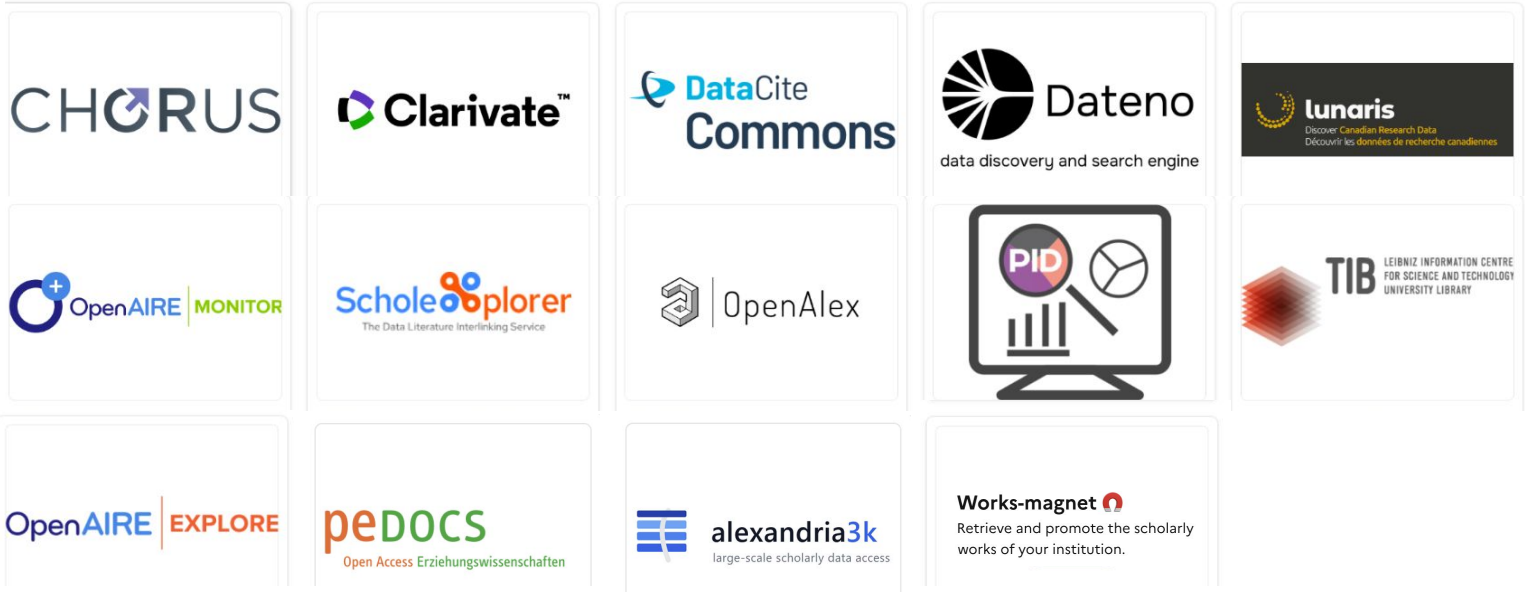
https://doi.org/10.54677/MNMH8546

Example: https://doi.org/10.82419/199

Wider Reach of DataCite Metadata

DataCite

Research with DataCite DOIs is indexed by many scholarly platforms, including OpenAlex, OpenAIRE, Clarivate Data Citation Index, Google Dataset Search, Dimensions, and many others



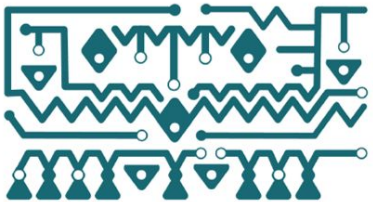
https://datacite.org/datacite-metadata-harvesters/

Benefits of adopting DOIs for your research data

DataCite

- Make your research datasets **FAIR**
  - **Findable**: Researchers can easily locate outputs through searchable metadata linked to PIDs.
  - **Accessible**: PIDs resolve to a landing page, giving public access to metadata and, where possible, the resource itself.
  - **Interoperable**: PIDs integrate seamlessly with other identifiers and data systems (e.g., ORCID for authors, ROR for institutions).
  - **Reusable**: PIDs enhance the ease of reusing research by linking to detailed metadata and ensuring longevity

Support for Indigenous Knowledge With Local Contexts



CARE Principles for Indigenous Data Governance

There are four Notices:

- TK (Traditional Knowledge) Notice recognizes that there could be accompanying cultural rights, protocols and responsibilities that need further attention for future sharing and use of this material.
- BC (Biocultural) Notice recognizes the rights of Indigenous peoples to define the use of information, collections, data and digital sequence information generated from the biodiversity and genetic resources associated with their traditional lands, waters, and territories.
- Attribution Incomplete Notice is attached to a collection or at an item level where there is incomplete, inaccurate, or missing attribution. This Notice indicates to the public that the record and/or metadata is incomplete.
- Open to Collaboration Notice indicates that an institution is committed to developing new modes of collaboration, engagement, and partnership with Indigenous peoples for the care and stewardship of past and future collections and data.

There are two types of Labels, and many specific Labels within each type:

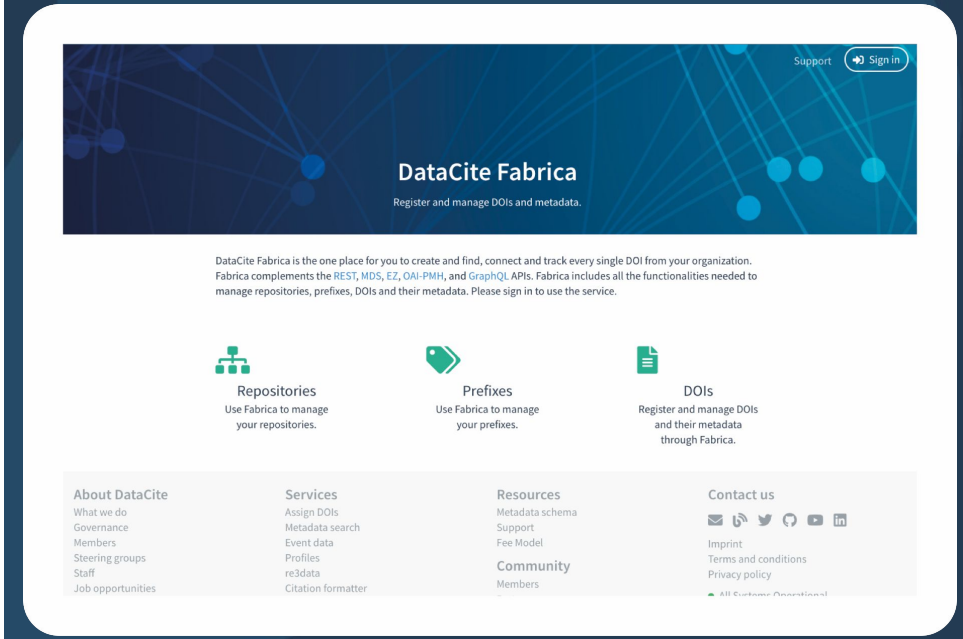
- Traditional Knowledge (TK) Labels define attribution, access, and use rights for Indigenous cultural heritage
- Biocultural (BC) Labels define community expectations and consent about appropriate use of collections and data

https://support.datacite.org/docs/local-contexts-notices-and-labels

DOI Fabrica
web interface

One-stop service to create and manage DOIs for your organization

1. Tools to create, manage, and find DOIs and metadata
2. Statistics on DOI activities
3. Link checker information
4. Maintain organization information

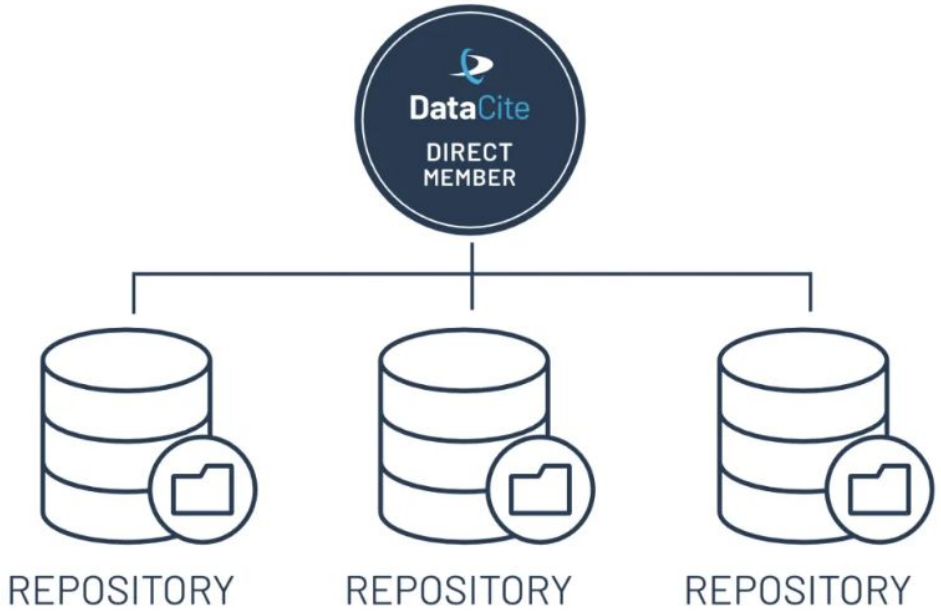


https://support.datacite.org/docs/doi-fabrica

DataCite Membership

Direct Member

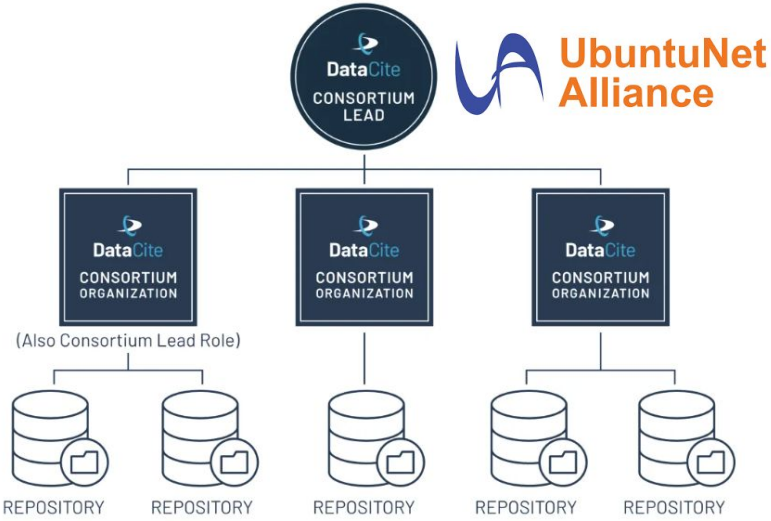
This type of member supports DataCite's mission and is an organization that works with one or more repositories within their organization. The repositories are under the same administrative structure as the organization.



Full details: https://datacite.org/fee-model/#Direct-Member

DataCite Consortium in Côte d'Ivoire

1. **Sustainable Solution** – Ensures long-term accessibility.
2. **Cost-Effective** – Reduces financial barriers for researc organizations to participate in global scholarly communication.
3. **Higher Adoption Rates** – Encourages widespread institutional engagement and integration.
4. **Trusted National Infrastructure** – Enhances visibility a discoverability of research outputs at a national level.
5. **Open Science in Action** – Facilitates real-world implementation of the UNESCO Open Science practices at scale.



Examples of DataCite African Consortia

DataCite

UbuntuNet Alliance

eKoNNECT

المركز الوطني الجامعي للتوثيق العلمي والتقني

cnudst

Centre National Universitaire de Documentation Scientifique et Technique

www.cnudst.rnrt.tn

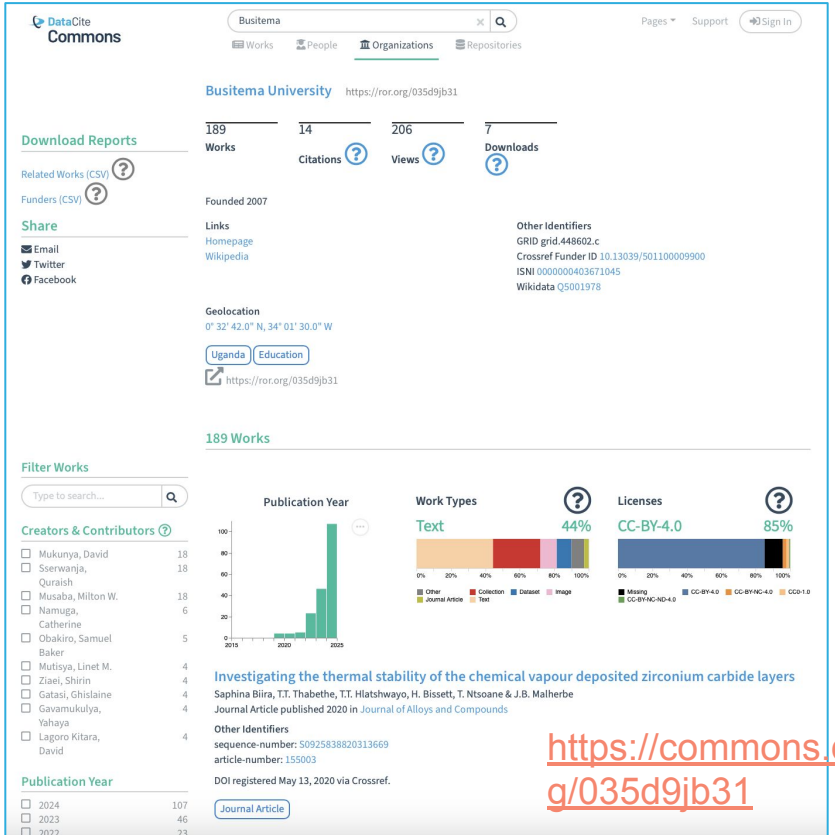
MAREN

Malawi Research And Education Network

DataCite Adoption Stories

Case Study – Uganda
Busitema University

- Busitema University is a multi campus university in Uganda.
- Busitema is one of the GAF awardees of DataCite.
- The institution wish to host their journals and other research outputs while ensuring these are trusted, discoverable and accessible.
- OJS and Dspace were implemented.
- They are working at fulfilling other factors to improve their indexing.
- All their research outputs in their repositories now have DataCite DOI.
- They have access to metrics to check their research outputs impact.



https://commons.datacite.org/ror.org/035d9jb31

Thank you!

DataCite

"Open Science is not an option — it's our collective responsibility to ensure that knowledge serves all of humanity."

— UNESCO Open Science Recommendation

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