

OpenCitations

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Topic: Policies supporting open science, Research data

Implementation scale: International

Responsible agents: Researchers, Research managers

Location: Italy

Keywords: open access, open data

Start and end date: 2010 -

Sustainability: Yes

Summary

OpenCitations is an international initiative that makes open data on scholarly citations and references available so that anyone can access and reuse it at no cost. It is an open alternative to major commercial indexing services and is currently managed by the University of Bologna.

Promoting organizations

OpenCitations is managed by the Research Centre for Open Scholarly Metadata at the University of Bologna, and was founded by David Shotton (University of Oxford) and Silvio Peroni (University of Bologna).

It is supported by an international network of institutional members, including the French National Fund for Open Science, European university libraries (such as KU Leuven and FinELib), and research centers like the Hungarian Academy of Sciences.

It is part of the Initiative for Open Citations (I4OC), alongside organizations such as PLOS, eLife, and the Wikimedia Foundation, and has received funding from the Wellcome Trust and the French National Fund for Open Science.

Objectives

The main goal of OpenCitations is to openly publish bibliographic citation data in RDF and to make citation links as easy to follow as web links.

The initiative also aims to provide open bibliographic and citation data, along with related services, to as many users as possible, allowing anyone to reuse these data for any purpose.

To achieve this, a range of tools and services have been developed:

- A data model
- The SPAR ontologies (Semantic Publishing and Referencing)
- Open-source software for searching, browsing, and providing REST APIs over RDF triplestores
- Open Citation Identifiers (OCIs) and the OCI resolution service
- The OpenCitations Corpus (OCC), a downloadable open bibliographic and citation database
- Open citation indexes, the most important being COCI, which includes all open DOI-to-DOI citation links available from Crossref

Beneficiaries and stakeholders

The main beneficiaries are:

- Researchers and authors: especially those affiliated with universities that cannot afford subscription-based commercial citation indexes like WoS and Scopus.
- Bibliometricians: can openly publish the research data underlying their findings.
- Librarians: can better support their users by providing free access to citation data.
- Funders: can better assess the impact of scientific work and decide which researchers, ideas, and projects deserve funding.
- Academic administrators at research centers and universities: can more easily track the academic productivity and influence of their members
- Research managers: have open citation data available for integration into their CRIS (Current Research Information System), including those using
- CERIF (Common European Research Information Format).
- Data repositories: benefit from open bibliographic citations between their datasets and the articles describing them.
- Publishers: gain more readers accessing their online journals through open citation data, which in turn attracts more article submissions.
- Computer scientists and software developers: can leverage the availability of citation data to build new applications and visualizations.

Results

The initiative has brought together a wide range of stakeholders, including libraries, consortia, projects, organizations, companies, and, in particular, funders.

OpenCitations has developed several citation indexes using openly available data from third-party bibliographic databases. In recent years, numerous researchers have already used OpenCitations data for studies based on proprietary citation index data.

OpenCitations data have also been used by various tools dedicated to visualizing citation graphs and other academic networks.

By the end of 2021, OpenCitations had expanded its coverage to over one billion citations and collaborates with several academic projects related to the management of bibliographic and citation data.

Challenges

One of the main challenges is the waiting time users experience while OpenCitations systems pause to receive responses from external API services and retrieve metadata for the bibliographic resources involved in a citation.

Another issue is the expansion of OpenCitations' coverage within the global citation landscape, as it is technically unsuitable to manage and maintain everything (metadata, citations, reference lists, abstracts, etc.) within a single repository. It is necessary to organize each specific type of data across a set of complementary and interoperable repositories.

Interest and transferability

Throughout 2020, the OpenCitations website—including both its services and pages—was accessed over 3.1 million times by more than 68,000 unique visitors.

The APIs introduced in 2018 have become the primary service used to query the citation data available from OpenCitations.

In terms of geographic distribution, the countries with the highest number of requests were Italy, Poland, and the United States, followed by Brazil, France, the Netherlands, and Spain, and then China, Germany, India, and the United Kingdom.*

** Geographic access data updated in 2020.*

To build a sustainable long-term infrastructure aligned with the core principles of open science, OpenCitations has fully adopted the “Principles for Open Scholarly Infrastructures,” which emphasize three key values: Insurance, Governance, and

Sustainability.

OpenCitations meets the requirements of these principles: its work is guaranteed to survive even if OpenCitations were to cease to exist, as its software is open and released under a permissive free software license. Additionally, OpenCitations does not own nor seek patents for any of its products.

The project focuses on citation data covering the full spectrum of academic research domains, and all its applications are designed to be of general utility and reusable by the community, even in scenarios unrelated to bibliographic or citation data.

So far, OpenCitations and its products have been funded through grants from various sponsors, and it intends to continue applying for funding for specific projects. As its coverage of the academic domain continues to expand—offering an alternative to the citation data provided by WoS and Scopus—it has the potential to attract financial support from university libraries and academic institutions at a significantly lower cost than current subscriptions to commercial citation indexes.

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