DIGITAL OBJECT IDENTIFIER

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What is a DOI?

Digital Object Identifier or DOI is a persistent identifier or handle used to uniquely identify objects. DOIs are in wide use mainly to identify academic, professional, and government information, such as journal articles, research reports and data sets, and official publications though they also have been used to identify other types of information resources, such as commercial videos.

A DOI aims to be "resolvable", usually to some form of access to the information object to which the DOI refers. This is achieved by binding the DOI to metadata about the object, such as a URL, indicating where the object can be found. The DOI for a document remains fixed over the lifetime of the document, whereas its location and other metadata may change. Referring to an online document by its DOI is supposed to provide a more stable link than simply using its URL.

DOI names can identify creative works (such as texts, images, audio or video items, and software) in both electronic and physical forms, performances, and abstract works such as licenses, parties to a transaction, etc. The names can refer to objects at varying levels of detail: thus DOI names can identify a journal, an individual issue of a journal, an individual article in the journal, or a single table in that article. The choice of level of detail is left to the assigner, but in the DOI system it must be declared as part of the metadata that is associated with a DOI name.

The DOI Foundation is a not-for-profit organization. We govern the Digital Object Identifier (DOI) system on behalf of the agencies who manage DOI registries and provide services to their respective communities. We are the registration authority for the ISO standard (ISO 26324) for the DOI system and we are governed by our Registration Agencies.

What is a DOI for?

Assigning a DOI first of all allows the digital object to be identified permanently and unequivocally. Placed in the document reference, it allows direct access to the primary source.

This makes the citations of the document more reliable. In addition, it avoids endless URLs as DOIs are all built using the same short structure:

Crossref, CC-BY 4.0

The prefix identifies the registrant to the registration agency. The suffix identifies the document.

And finally, the Inist-CNRS has published a very clear example of identifier assignment, available here: https://doranum.fr/identifiants-perennes-pid/exemple-attribution-2/

Major content of the DOI system currently includes:

Scholarly materials (journal articles, books, ebooks, etc.) through Crossref, a consortium of around 3,000 publishers; Airiti, a leading provider of Chinese and Taiwanese electronic academic journals; and the Japan Link Center (JaLC) an organization providing link management and DOI assignment for electronic academic journals in Japanese.

Research datasets through Datacite, a consortium of leading research libraries, technical information providers, and scientific data centers;

European Union official publications through the EU publications office;

The Chinese National Knowledge Infrastructure project at Tsinghua University and the Institute of Scientific and Technical Information of China (ISTIC), two initiatives sponsored by the Chinese government.

Permanent global identifiers for both commercial and non-commercial audio/visual content titles, edits, and manifestations through the Entertainment ID Registry, commonly known as EIDR.

In the Organisation for Economic Co-operation and Development's publication service OECD iLibrary, each table or graph in an OECD publication is shown with a DOI name that leads to an Excel file of data underlying the tables and graphs. Further development of such services is planned.

Other registries include Crossref and the multilingual European DOI Registration Agency (mEDRA).[23] Since 2015, RFCs can be referenced as doi:10.17487/rfc....

ISO Standard for DOI

ISO 26324:2012 specifies the syntax, description and resolution functional components of the digital object identifier system, and the general principles for the creation, registration and administration of DOI names (where DOI is an acronym for "digital object identifier").

ISO 26324:2012 defines the syntax for a DOI name, which is used for the identification of an object of any material form (digital or physical) or an abstraction (such as a textual work) where there is a functional need to distinguish it from other objects.

The DOI name does not replace, nor is it an alternative for, an identifier used in another scheme, such as the schemes defined by ISO/TC 46/SC 9. ISO 26324:2012 describes how the DOI system can be used in conjunction with another identifier scheme (for example, to provide additional functionality, such as resolution, where this is not already available), and how the character string of that other scheme can be integrated into the DOI system through the DOI metadata record and/or the DOI syntax.

ISO 26324:2012 does not specifies specific technologies to implement the syntax, description and resolution functional components of the digital object identifier system.

How to get a DOI?

The publisher requests it for its publications. There are currently about ten DOI registration agencies in the world.

The centre Mersenne works with Crossref for the allocation of its DOIs.

How to create your DOIs?

A DOI must be unique and contain only alphanumeric characters plus some special characters These include the dash '-', the underscore '_', the full stop '.', the semicolon ';', the parentheses '(' and ')' and the slash '/'. In addition, the suffixes are case insensitive: aif.3395 and AIF.3395 are considered identical.

Tools exist to help create unique suffixes. For example, Crossref offers a suffix generator, Datacite provides Fabrica, a tool for managing DOIs.

For more information on DOI creation rules and best practices:

https://www.crossref.org/documentation/member-setup/constructing-your-dois/

https://doranum.fr/identifiants-perennes-pid/exemple-attribution-2_10_13143_yws5-0q51/

Citing and Using a Digital Object Identifier (DOI)

Citing an Article Using a DOI Link

Digital Object Identifiers (DOIs) can be used to cite and link to electronic articles. A DOI is guaranteed to never change, so can be used as a persistent identifier to permanently link to an electronic article no matter where it is stored. An example of a citation using a DOI is the following:

A. Fring, N. Manojlovic. G2-Calogero-Moser Lax Operators from Reduction. Journal of Nonlinear Mathematical Physics, 13 (2006), 467-478. doi:10.2991/jnmp.2006.13.4.1

Finding an Article Using a DOI Link

When you see a DOI reference to an article online, you can usually just click on the DOI to access the article (provided that - if applicable - you have the required access rights to the platform where the article is located).

In cases where you see a DOI in a printed document or if the online DOI is not clickable for some reason, it is possible to access the article as follows:

Copy the DOI of the article that you want to access (e.g.: 10.2991/jnmp.2006.13.4.1).

Go to http://dx.doi.org, enter the DOI in the text box provided and click 'Go'.

The document that matches the DOI you entered will display in your browser window.

The DOI scheme is administered by the International DOI Foundation and is based on a linking scheme known as Crossref. For more extensive information on DOIs, please refer to the Crossref DOI Guide.

Features and benefits of DOI

The IDF designed the DOI system to provide a form of persistent identification, in which each DOI name permanently and unambiguously identifies the object to which it is associated (although when the publisher of a journal changes, sometimes all the DOIs will be changed, with the old DOIs no longer working). It also associates metadata with objects, allowing it to provide users with relevant pieces of information about the objects and their relationships. Included as part of this metadata are network actions that allow DOI names to be resolved to web locations where the objects they describe can be found. To achieve its goals, the DOI system combines the Handle System and the indecs Content Model with a social infrastructure.

The Handle System ensures that the DOI name for an object is not based on any changeable attributes of the object such as its physical location or ownership, that the attributes of the object are encoded in its metadata rather than in its DOI name, and that no two objects are assigned the same DOI name. Because DOI names are short character strings, they are human-readable, may be copied and pasted as text, and fit into the URI specification. The DOI name-resolution mechanism acts behind the scenes, so that users communicate with it in the same way as with any other web service; it is built on open architectures, incorporates trust mechanisms, and is engineered to operate reliably and flexibly so that it can be adapted to changing demands and new applications of the DOI system. DOI name-resolution may be used with OpenURL to select the most appropriate among multiple locations for a given object, according to the location of the user making the request.[26] However, despite this ability, the DOI system has drawn criticism from librarians for directing users to non-

free copies of documents, that would have been available for no additional fee from alternative locations.

The indecs Content Model as used within the DOI system associates metadata with objects. A small kernel of common metadata is shared by all DOI names and can be optionally extended with other relevant data, which may be public or restricted. Registrants may update the metadata for their DOI names at any time, such as when publication information changes or when an object moves to a different URL.

The International DOI Foundation (IDF) oversees the integration of these technologies and operation of the system through a technical and social infrastructure. The social infrastructure of a federation of independent registration agencies offering DOI services was modelled on existing successful federated deployments of identifiers such as GS1 and ISBN.

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