

Review Article

Digital object identifier: What it is and why it matters?

Himel Mondal¹, Shaikat Mondal²

¹Department of Physiology, All India Institute of Medical Sciences (AIIMS) Deoghar, Jharkhand, ²Department of Physiology, Raiganj Government Medical College and Hospital, Raiganj, West Bengal, India.

ABSTRACT

Digital object identifiers (DOIs) have become essential tools in academic publishing for linking and identifying digital objects. This review examines the structure and assignment process of DOIs, shedding light on their critical importance in scholarly communication. DOIs consist of a unique alphanumeric string, including a prefix and a suffix, which serves as a persistent link to digital objects. By providing a standardized identifier, DOIs enhance the discoverability, accessibility, and referencing of various digital objects, including journal articles. The DOI also plays a crucial role in article promotion. With a DOI, authors, publishers, and researchers can effectively share and promote their articles, facilitating their discoverability in academic and research communities. However, challenges may arise with DOIs, such as non-functional links. This review provides troubleshooting tips for resolving such issues, including checking for typographical errors, validating the source, and seeking assistance from the DOI registration agency or the publisher.

Keywords: Article, Digital object identifier, Journal, Promotion

INTRODUCTION

Digital technology is evolving for healthcare research, development, and delivery.^[1] Research publication has also been shifted from print to digital avenues. Readers must have noticed that the majority of the journal articles are published with a digital object identifier (DOI). It is a credential for digital objects such as research articles, chapters in a book, and datasets on the internet. DOIs provide a way to locate and access digital content easily.^[2] A DOI in an article has a potential for usage in the promotion and dissemination of the article. In this article, we describe briefly about a DOI, its structure, usage, problems with its use, possible solution, and avenues where it can be used for article promotion.

WHAT IS A DOI?

A DOI is a unique and persistent alphanumeric string assigned to a digital object, such as an online article, report, or dataset. The DOI system was created by the International DOI Foundation in 2000.^[2] The aim of the organization is to provide a standardized way to identify and access digital objects, regardless of changes in location or metadata.^[3]

STRUCTURE OF A DOI

A DOI is composed of two parts: a prefix and a suffix, separated by a forward slash (/). The prefix identifies the

organization responsible for managing the DOI, while the suffix identifies the specific digital object. For example, the DOI for a research article might look like this: 10.1234/abcd.absc_1234_12. This DOI can also be presented with the ULR, as shown in [Figure 1]. After the URL, the code “10.1234” before the slash is composed of the directory code and publisher’s code. This is fixed for a publisher. After the slash, the article identifier code is placed. This identifier is set by the publisher to identify each published article.^[4]

HOW ARE DOIS ASSIGNED?

DOIs are assigned by registration agencies, which are responsible for managing DOIs for different types of digital objects. For example, Crossref is a registration agency that assigns DOIs to scholarly articles, while DataCite assigns DOIs to datasets.^[2] To obtain a DOI, journals need to register with a registration agency and follow their guidelines for assigning DOIs to digital objects.

WHAT PROVIDERS ACCESS?

The service provider collects personal information such as name, email address, and organization details (e.g., journal publisher) of individuals who register for DOI services. In addition, the metadata of an article is stored in the system while registering DOI for the article.

*Corresponding author: Himel Mondal, Department of Physiology, All India Institute of Medical Sciences (AIIMS) Deoghar, Jharkhand, India. himelmkg@gmail.com

Received: 18 May 2023 Accepted: 07 June 2023 EPub Ahead of Print: 24 July 2023 Published: 27 October 2023 DOI: 10.25259/IJSA_20_2023

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, transform, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms. ©2023 Published by Scientific Scholar on behalf of Indian Journal of Skin Allergy

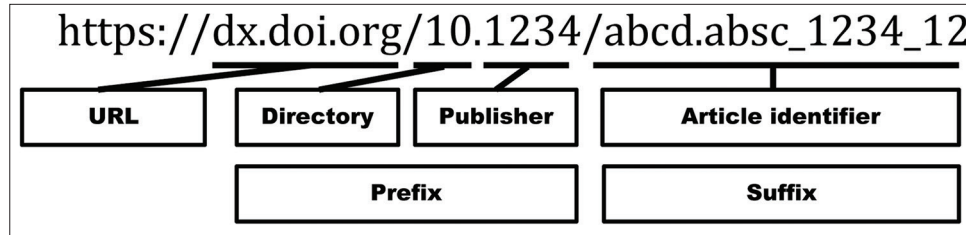


Figure 1: Structure of a digital object identifier.

HOW TO USE DOI

The assigned DOI can be used to retrieve the document from the DOI website. Open the website <https://www.doi.org/>. Scroll down and copy a DOI from any source and paste it into the query box. Click on the “Submit Query” button to get redirected to the article page [Figure 2]. In this query box, the DOI with the URL or without the URL, both can be used to resolve the result. Alternatively, the DOI with the URL can be directly pasted on the browser’s address bar to open the article page.

COMMON ERROR IN USE OF DOI

Some people mistakenly use the DOI as a URL by copying and pasting the DOI into a web browser’s address bar. While this may sometimes work, it is not the correct way to access a digital object using its DOI.^[5]

The DOI from any source may be copied with an added space at the end or in between the DOI. This may be due to the typesetting of the material. Hence, it should be checked that there is no space in or outside the DOI or any erroneous punctuation in the DOI.

WHY IS DOI IMPORTANT?

DOI has several benefits, which make it an essential tool for researchers, publishers, and anyone who creates or uses digital objects. Here are some of the key reasons why DOI matters:^[6]

- A DOI provides a unique and persistent identifier for a digital object, ensuring that it can be accessed and cited accurately, even if the location or metadata changes.
- DOI can be used to link digital objects across different platforms and repositories, increasing their discoverability and visibility to potential readers or users.
- DOIs make it easier to cite and reference digital objects, as they provide a standardized way to identify and access the source material. This is very useful for citing ahead of print publication.
- DOIs can be used to track usage metrics, such as downloads, citations, and views, providing valuable insights into the impact and reach of digital objects.
- DOIs can be used to identify and preserve digital objects for future use, ensuring that they are not lost or forgotten over time.

TRY RESOLVING A DOI NAME

Type or paste a known DOI name exactly—including its prefix and suffix—into the text box below and then ‘submit’ to resolve it.

SUBMIT QUERY

DOIs include a prefix (prefixes always start with 10.) and a suffix, separated by a forward slash (/). Prefacing the DOI with doi.org/ will turn it into an actionable link, for example, <https://doi.org/10.47366/sabia.v5n1a3>. Clicking that link will ‘resolve’ it, i.e. redirect to the latest information about the object it identifies, even if the object changes or moves.

Figure 2: The digital object identifier query box in [https://www.doi.org.](https://www.doi.org/)

DOI IN PRINT JOURNAL

The DOI Quick Response (QR) code is available in all published articles to make it easier for readers to access the digital object by scanning the QR code with their mobile devices. This feature is particularly useful for readers who are accessing the article from a printed copy or who are not able to click on the DOI link directly from the online platform where the article is hosted. By scanning the DOI QR code, readers are directed to the digital object’s web page or landing page, where they can access the full text of the article, view metadata, download the article, or share the article with others. This is a quick and convenient way for readers to access the digital object and ensures that they are accessing the correct version of the article, even if the article has been updated or moved to a different location.

DOI IN BIBLIOGRAPHY

Due to the advent of online open-access publications, the majority of the journals are now having electronic version of the journal. For ease of access, the journal now encourages the use of DOI, PubMed ID (a unique ID created for articles that are indexed in Medline or PubMed Central),^[7] or Google Scholar link along with the reference. However, if a DOI is not available for a source, a web link (URL) can be used instead. The aim is to provide an immediate access to the referred article. Figure 3 depicts the reference section of an article published in Indian Journal of Skin Allergy.^[8] The first reference includes the DOI. The DOI is hyperlinked with the text [CrossRef], PubMed ID hyperlinked with [PubMed], and Google Scholar link hyperlinked with [Google Scholar]. However, the second reference had no DOI or PubMed ID. Hence, the Google Scholar link has been used for that reference.

References

1. Turner PJ, Worm M, Ansotegui IJ, El-Gamal Y, Rivas MF, Fineman S, et al. *Time to revisit the definition and clinical criteria for anaphylaxis?* World Allergy Organ J. 2019;**12**:100066. [\[CrossRef\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)
2. Portier P, Richet C. *De l'action anaphylactique de certains venins.* C R Seances Soc Biol. 1902;**54**:170. [\[Google Scholar\]](#)
3. Ishizaka K, Ishizaka T, Hornbrook MM. *Physico-chemical properties of human reaginic antibody, IV: Presence of a unique immunoglobulin as a carrier of reaginic activity.* J Immunol. 1966;**97**:75-85. [\[CrossRef\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)

Figure 3: Reference section of a published article showing the usage of digital object identifier (hyperlinked with [CrossRef]) along with the reference.

In addition to the published article, the DOI is vital in the citation when the article is in press. An article that was finally not published, is available online (as ahead of print) and is cited in a scientific article, in that case DOI plays a vital role. Authors can easily cite the article by mentioning the DOI with the reference.

DOI FOR PROMOTION OF RESEARCH

The DOI can help promote the discoverability and accessibility of a published article. Authors can adopt the following ways to use the DOI to promote an article.

After the publication of an article, share the DOI on social media platforms such as Twitter and LinkedIn to promote the article to a wider audience. This will allow others to easily find and access the article using the DOI.

Authors can include the DOI in promotional materials, such as flyers or posters, to help promote the article. When printed material is used, authors can also make a QR code (e.g., <https://www.the-qr-code-generator.com>) to print. Any interested person can scan the QR code for quick access to the article.

When submitting an abstract for a conference, include the DOI for the article in the abstract, if already available. This will make it easy for conference attendees to access the article. However, if the article is not published and the authors want to disseminate the abstract digitally, they may upload it to any free repository (e.g., <https://figshare.com>) to get a DOI for the uploaded material.

Authors can share the DOI with colleagues and other researchers in the field through digital media such as e-mails or messenger applications to help promote the article and increase its visibility. Keeping a status in social messenger (e.g., WhatsApp status) may also bring some new viewers to the article.

IF DOI DOES NOT WORK

In some situations, the DOI in a published article may not work even after waiting some days for the update in the servers. If this happens, first of all, the authors need to check if the DOI is correctly written without any unwanted spaces or punctuation. If it is correct, then the authors can contact the publishing organization (e.g., the journal) about

! REPORT AN ERROR

DOI:
10.4103/jehp.jehp_358_18

URL of Web Page Listing the DOI:
<https://www.jehp.net/article.asp?issn=2277-9531;ye>

Your Email Address:
himelphy@icloud.com

Additional Information About the Error:

SUBMIT ERROR REPORT

Figure 4: Reporting a non-resolved digital object identifier.

the error. If this fails, try searching the DOI in <https://www.doi.org>. Moreover, the search result would show “DOI not found” and a form for reporting the error [Figure 4]. Authors need to provide the DOI, the link to the article, and the email (to get the update) in the online form for reporting the error. The organization would rectify it and let the reporter know it through email.

HOW TO GET DOI FOR YOUR WORK?

If both of the methods fail and the article is published under a Creative Commons license (anyone can share the article without commercial gain), you may think of uploading a copy of the article to an online free repository such as <https://zenodo.org> or <https://figshare.com> to get a DOI from the repository. In our personal experience, we have faced eight such cases where neither the publishers corrected it from their end nor the DOI website took any action. Hence, the free repositories that provide free DOI for uploaded article may be a good option in such cases.^[9] The repositories can also be used for uploading supplementary materials of a published article like a questionnaire, or auxiliary tables and images.

CONCLUSION

DOI is an essential tool for identifying and accessing digital objects, ensuring their persistence, and increasing their discoverability. With advantage and flexibility, this number can be used by researchers in many ways to promote their articles. In addition, we describe how some errors can happen and how to solve those. We hope this article would help researchers to understand and optimize utility of DOI.

FIVE MULTIPLE-CHOICE QUESTIONS

- What does DOI stand for in the context of academic publishing?
 - Digital Object Identifier
 - Document Object Identifier
 - Data Object Identifier
 - Domain Object Identifier.
- Which of the following statements best describes a DOI?
 - It is a standardized file format used for digital preservation
 - It is a protocol for secure online transactions
 - It is a unique alphanumeric string assigned to a digital object, such as a journal article or a dataset
 - It is a type of encryption algorithm used for data security.
- What is the primary purpose of a DOI?
 - To track and monitor usage statistics of digital objects
 - To provide a persistent link to a digital object, ensuring its accessibility and longevity
 - To encrypt and protect sensitive information in digital objects
 - To verify the authenticity and credibility of digital objects.
- Which of the following is a benefit of using a DOI for academic publications?
 - It ensures that the content of the publication is free from errors and plagiarism
 - It facilitates easy citation and referencing of the publication
 - It allows authors to track the geographical distribution of readership

- It provides a platform for collaborative editing and peer review.
- Who ensure assignment of DOIs to academic publications?
 - The authors of the publication
 - The International DOI Foundation (IDF)
 - The academic institutions associated with the authors
 - The journal or publisher hosting the publication.

Answer to the questions

1) (a), 2) (c), 3) (b), 4) (b), 5) (d).

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

REFERENCES

- Wincup C, Ahmed S. Digital health in rheumatology. *Indian J Rheumatol* 2022;17 Suppl S3:363.
- Liu J. Digital object identifier (DOI) and DOI services: An overview. *Libri* 2021;71:349-60.
- Young S. Harness the power of the DOI: Digital object identifiers and what they can do for you. *Campbell Syst Rev* 2019;15:e1063.
- Carter-Templeton H, Wrigley J, Owens JK, Oermann MH. Digital object identifier: The DOI. *Nurse Author Ed* 2021;31:58-61.
- Xu S, Hao L, An X, Zhai D, Pang H. Types of DOI errors of cited references in Web of Science with a cleaning method. *Scientometrics* 2019;120:1427-37.
- Boudry C, Chartron G. Availability of digital object identifiers in publications archived by PubMed. *Scientometrics* 2017;110:1453-69.
- Mondal H, Mondal S. Check indexing status of a journal. *J Family Med Prim Care* 2020;9:3166-7.
- Manchanda Y, Das S. Anaphylaxis-a must know for all. *Indian J Skin Allergy* 2023;2:8-13.
- Mondal H, Mondal S. Reply to "Letter to editor" written in response to "Perspectives on poster as a presentation mode in conferences". *J Curr Res Sci Med* 2018;4:128-9.

How to cite this article: Mondal H, Mondal S. Digital object identifier: What it is and why it matters? *Indian J Skin Allergy* 2023;2:77-80.