

Digital Object Identifiers (DOIs): Management Guide

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1. Purpose

The purpose of this document is to provide management guidelines for the assignment ('minting') and maintenance of Digital Object Identifiers (DOIs) at Griffith University.

2. Context

2.1 Digital Object Identifiers

A DOI is a persistent and unique digital identifier of an object. It permanently identifies content and related metadata for an object over the course of its lifecycle. DOI names resolve to web locations where the objects they describe can be found. Information about a digital object may change over time, including where to find it and who owns it, but its DOI will not change.

The benefits of a DOI include greater discoverability and access to uniquely identified content, accessibility for long-term use and citation of publications and research data for impact analysis.

2.2 Introduction

The Digital Object Identifier (DOI) is the most widely used naming standard for digital resources in the publishing world. DOI is an ISO International Standard and more than 120 million DOIs have been assigned world-wide.

Like other persistent identifiers, DOIs provide a means of referencing a digital resource over time. Unlike a standard web address, persistent identifiers continue to provide access to a digital resource even if its location changes over time. This is achieved through a combination of technical infrastructure and social infrastructure.

2.3 Technical infrastructure

The DOI infrastructure makes use of the Handle System, which provides a means for assigning, managing, and resolving persistent identifiers for digital resources. The underlying system stores identifiers (names, or handles) of digital resources and the information (metadata) necessary to locate, access, and otherwise make use of the resources. Metadata such as the web location of a resource can be updated over time to reflect the current state, enabling the persistent identifier to resolve to the correct location.

A DOI is made up of alphanumeric characters and must be unique. It consists of a prefix and a suffix separated with a forward slash. The prefix always begins with '10' as this distinguishes it from other implementations of the Handle System and then states the registrant code designating the creating organisation or publisher that is registering the DOI. The suffix identifies the individual work and is also known as the 'item id'. It is assigned by the publisher/owner of the DOI.

2.4 Social infrastructure

The International DOI Foundation (IDF) registration authority manages ongoing support and maintains quality and accuracy of DOI names. Registration agencies are appointed to provide service, quality assurance and overall integrity of the DOI system.

Social infrastructure in terms of policy and process is also required at the institutional level. DOIs differ from other persistent identifiers in that they require a minimal amount of metadata to be provided at the point of assigning ('minting') each DOI.

DOIs require a commitment from the provider to maintain the URL associated with the DOI. When Griffith mints a DOI through a registration agency, Griffith becomes responsible for maintaining ongoing access to the digital resource over time and keeping metadata relating to the DOI up to date.

Activities to ensure the persistence of the identifier need to be built into future upgrades, data migrations or product replacements that could break the resolution process. The minting of the DOI does not in itself ensure any kind of persistence and the commitment involved in maintaining the identifier over time is not well understood by those seeking to assign DOIs to their work.

2.5 Registration agencies and associated costs

Griffith currently mints DOIs through two registration agencies, CrossRef and DataCite.

2.5.1 CrossRef

CrossRef (<http://www.crossref.org>) is a global consortium established in 2000, which now has over 5,000 members. CrossRef provides:

a collaborative reference linking service that functions as a sort of digital switchboard. It holds no full text content, but rather effects linkages through Crossref Digital Object Identifiers (Crossref DOI), which are tagged to article metadata supplied by the participating publishers. The end result is an efficient, scalable linking system through which a researcher can click on a reference citation in a journal and access the cited article.

Griffith is a member of CrossRef and can use this service to mint and manage DOIs for only those journal articles published in [Griffith University ePress open access journals](#). The annual cost of membership is US\$275 + US\$1 per DOI.

2.5.2 DataCite

DataCite (<https://www.datacite.org>) is a global not-for-profit organisation formed in 2009 that aims to facilitate the growing culture of data citation.

The Australian National Data Service (ANDS) joined DataCite and in 2011 launched the [Cite My Data](#) service to offer minting of DOIs to Australian research institutions. As an ANDS partner institution, Griffith University can use the Cite My Data service to mint and manage

DOIs for datasets and grey literature¹. Currently there is no direct cost associated with membership or with individual DOIs.

3. DOI management

This section of the document provides guidance on all aspects of assigning ('minting') and managing DOIs. It is intended to inform best practice at the institution.

3.1 Maintaining agency memberships

Persistent identifier services are a key part of the scholarly communications infrastructure. As noted above, the process of minting a DOI for a resource represents an organisational commitment to provide ongoing access to it and maintaining the metadata associated with the DOI. There are direct costs associated with maintaining registration agency memberships and unit costs associated with each DOI that is minted using the service.

For these reasons, registration agency memberships are the responsibility of the Director, Information Management. DOIs should not be minted for Griffith University digital resources through other registration agencies without the approval of the Director, Information Management.

3.2 Business rules for assigning a DOI

A DOI can be minted where the digital object meets the following criteria:

- The resource does not already have a DOI or other recognised global persistent identifier assigned to it.
- Access to the resource is open, mediated or embargoed (with a specified end date). Resources which will not be able to be accessed by interested parties in a reasonable time period (e.g. due to ethical or legal constraints) should not have a DOI assigned to them.
- The resource is a citable contribution to the scholarly record.
- As a contribution to the scholarly record, the resource will be stored and made accessible in the long term (preferably permanently) via a repository, database or system that is
 - managed by Griffith, or
 - managed by a third party with which Griffith has an ongoing contractual relationship, or
 - recognised as a trusted digital repository.
- High quality metadata is available that supports the provision of mandatory elements required for compliance with registration agency guidelines ([see 3.5](#)).

¹ DataCite has adopted the [Online Dictionary for Library and Information Science definition](#) of grey literature as "Documentary material in print and electronic formats, such as reports, [...] theses and dissertations, conference proceedings, technical specifications and standards [...] not readily available through regular market channels because it was never commercially published/listed or was not widely distributed."

3.3 Assigning DOIs to different types of material

Journal articles

DOIs for articles published in Griffith University ePress open access journals are minted using CrossRef.

DOIs for articles published in non-Griffith journals are not assigned a DOI.

Research data

DOIs for research data (dataset/data collection) registered with and/or deposited in Griffith's Research Data Repository are minted using the ANDS Cite My Data Service. The ANDS site (<http://www.ands.org.au/guides/doi>) has further resources on DOIs and research data.

Grey literature

Reports, working papers and unpublished conference outputs

DOIs may be minted using the ANDS Cite My Data Service. Requests will be reviewed on a case-by-case basis against the business rules ([see 3.2](#)).

Creative works

DOIs may be minted using the ANDS Cite My Data Service. Requests will be reviewed on a case-by-case basis against the business rules ([see 3.2](#)).

Theses

DOIs are not currently minted for theses. This will be reviewed as part of a future project to migrate theses to the Griffith Research Online institutional publications repository.

Other materials

Material that does not fit the above categories is not currently assigned a DOI.

3.4 Process for assigning ('minting') a DOI

3.4.1 CrossRef

Griffith University ePress uses the Open Journal Systems (OJS) software. OJS has a CrossRef plugin which automates the minting of DOIs for journal articles.

As there are costs associated with the minting of DOIs this functionality is not turned on for Griffith journals by default. This decision is under review.

Journal editors can arrange to have DOIs for their journal content by negotiation. A request for enabling this plugin is made via email to the ePublishing Support Officer in Library Technology Services (digitalrepository@griffith.edu.au).

3.4.2 DataCite / ANDS Cite My Data

Minting of DOIs for datasets using the ANDS Cite My Data Service can be done in one of two ways.

Web interface

DOIs for datasets and grey literature are minted manually by staff in Library Technology Services.

The ANDS MyDOIs web interface is used for these updates. Access to this interface is restricted to staff members with ANDS Data Source Administrator privileges. Instructions for use of this interface are provided by ANDS: [How to use the DOI Query Tool \(MyDOIs\)](#).

Requests for DOIs for datasets will generally be mediated by other groups; for example, eResearch Services may request a DOI for researchers in relation to datasets that are registered or deposited in Griffith's Research Data Repository.

INS staff can request DOI minting on behalf of academic staff by emailing digitalrepository@griffith.edu.au.

The email **must** include a link to the landing page for the resource in the source system the DOI will resolve to.

The landing page **must** contain sufficient metadata to meet DataCite minimum requirements ([see 3.5](#)); it is not the responsibility of the ePublishing Support Officer to create or edit metadata for the resource in the source system.

A process to enable service requests to be logged rather than emailed will be developed by the end of 2016 during the migration to the new service desk tool.

3.4.2.1 Machine-to-machine interface (discontinued)

A DOI minting script is available at: <https://github.com/gu-eresearch/ANDSDOIScripts>

The staff who can run the script are:

- Arve Solland, eResearch Services
- Gerhard Weiss, eResearch Services.

This process is not currently in use. Should the number of DOI requests grow dramatically, this process may be reviewed and re-implemented.

3.5 Metadata

Registration agencies maintain guidelines for the metadata that needs to be deposited as part of the minting process:

- CrossRef documentation:
http://help.crossref.org/depositing_using_a_web_form
- DataCite documentation:
<https://doi.org/10.5438/0010>

There are a number of mandatory metadata elements:

Agency	CrossRef:	DataCite:
Schema	http://help.crossref.org/elements	https://schema.datacite.org/
Mandatory elements	<ul style="list-style-type: none"> Journal: full title, journal abbreviation, ISSN or title-level DOI and URL Issue: issue, publication date (year) Article: titles, first author, publication date (year), DOI and URL for the article 	<ul style="list-style-type: none"> Creator(s) Title Publisher Date Identifier/URL [web address] Resource type. [Currently recommended but becoming mandatory in the next schema release.]

While only this minimal metadata is required, Griffith will provide as many optional elements as possible.

3.6 DOI landing page

A DOI should resolve to a landing page that contains metadata describing the collection, not to the object itself.

The landing page should be part of a system that is

- managed by Griffith, or
- managed by a third party with which Griffith has an ongoing contractual relationship, or
- recognised as a trusted digital repository.

Where more than one landing page is available, the DOI should resolve to the source system used for long-term management of and access to the digital object.

3.7 Level of granularity

A DOI can be assigned at any level of granularity. In the Griffith context, a DOI is likely to be minted at the item level (for publications and grey literature) and at both the collection level and item level for data collections containing multiple datasets.

If material within a collection is made up of a series of files with different landing pages, and it is considered useful for citation purposes to have a specific link to each file, then a DOI can be minted for the landing page of metadata describing each file in addition to a collection level DOI.

3.8 Citation

The DOI should be included in any citation displayed on the metadata landing page for the collection (or item within the collection, as applicable).

3.9 Versioning

Some resources will be subject to change over time.

High level changes include:

- metadata changes that would lead to a change in the citation, e.g. the addition or deletion of an author / contributor or a title change;
- in the case of a dataset, the deletion or addition of data, e.g. a new wave of data from a longitudinal study.

A low level change would be correction of a spelling error in a description or addition of a keyword.

If a DOI is minted for a resource that is later subject to a high level change then a new DOI will be minted for the later version of the material. In this case, Griffith will maintain both versions, each with a separate DOI. The descriptive metadata for the resources should reflect the versioning that has taken place: the 'RelatedIdentifier' element can be used to refer to previous versions.

If a lower level change is required, then a new DOI does not need to be minted.

3.10 Collaborative data collections

If resources are produced as a result of a collaboration with external parties, then those involved in producing the material need to decide who mints the DOI and which landing page the DOI will resolve to.

Considerations might include:

- Who is the primary researcher or author?
- Who is the lead institution?
- Who provides access to the material?
- Who is going to maintain access to the material in the long-term?
- Which institution has the capacity to mint a DOI?

Where another trusted institution (e.g. another university or CSIRO) has already minted a DOI for a jointly-produced resource, then that DOI should be stored and displayed in Griffith metadata records rather than minting a new DOI. This is applicable even where the DOI landing page points at the other institution.

3.11 Updates

When the location of a landing page changes or breaks, the DOI Identifier metadata element needs to be updated by Griffith, so that the DOI continues to resolve to the resource.

3.11.1 Bulk updates

The work involved in updating DOIs should be factored into upgrades, redevelopments and new system implementations for any repositories or similar systems that contain Griffith digital content for which DOIs have been minted.

In these cases, use of machine-to-machine interfaces for updating via an XML upload may be required rather than manual updates.

3.11.2 Manual updates

For small numbers of edits, manual interfaces are available:

CrossRef Web Deposit: <http://www.crossref.org/webDeposit/>

ANDS My DOIs: <http://ands.org.au/support/doi-query-tool.html>

Requests for updates should be assigned through using the same process as initial requests (see [Appendix A](#)).

3.11.3 Link checking maintenance

The ANDS MyDOIs web interface contains a DOI link checker that provides a report on request. Library Technology Services will run this report twice-yearly and liaise with contributors to make updates.

3.12 Takedowns and withdrawals

Where a resource has been taken down or withdrawn (for whatever reason) and that resource has been issued with a DOI, the landing page that the DOI links to should be maintained.

The landing page should include reference to the withdrawn material so that users who click on the DOI can still find information about the resource.

This is part of the commitment to maintain persistence through use of the DOI infrastructure.

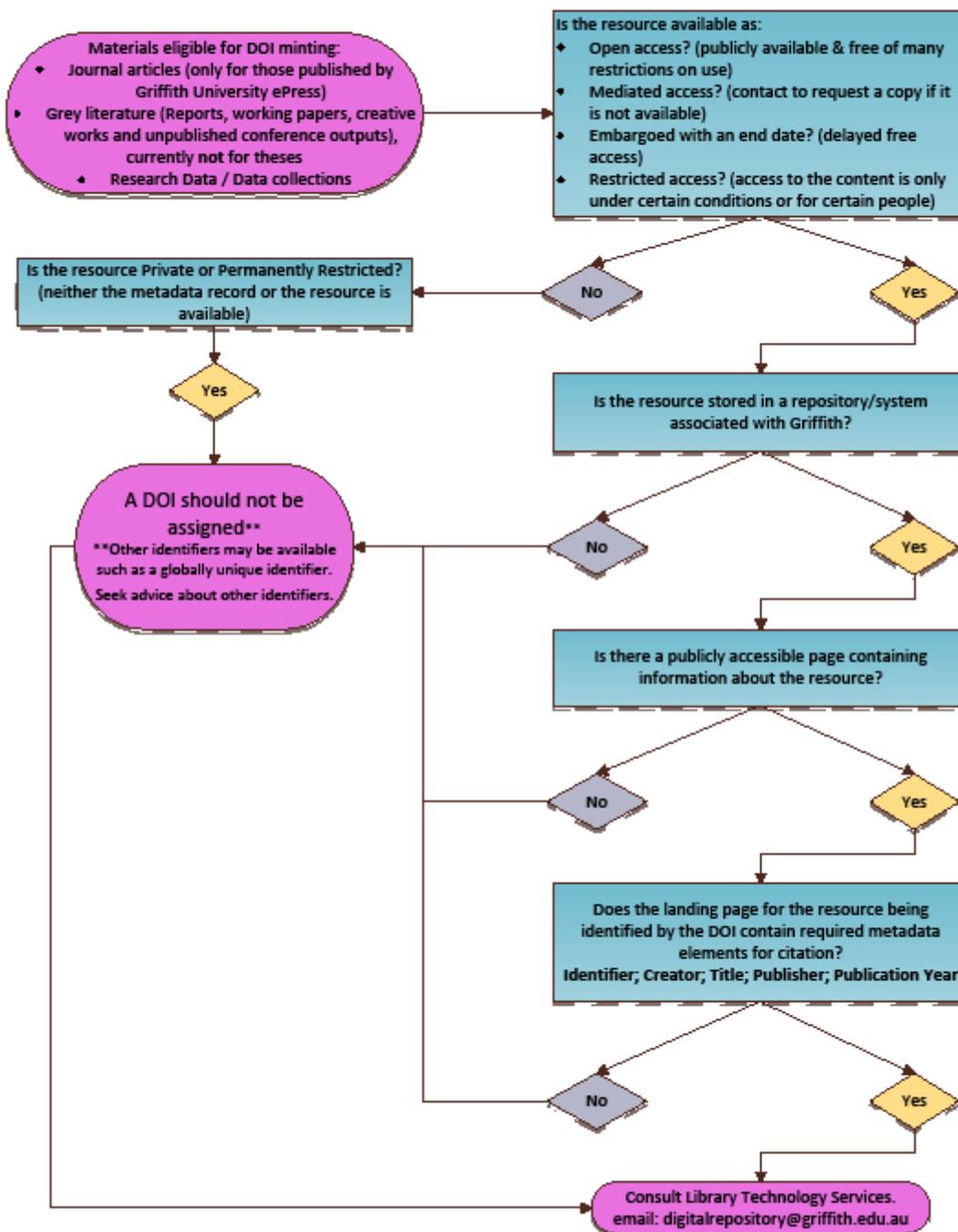
3.13 Feedback

We welcome any feedback regarding these guidelines or queries on the DOI minting process for Griffith. Please contact digitalrepository@griffith.edu.au.

Appendix A: Decision tree

Identifier Decision Tree* Is your resource eligible for a DOI?

The Digital Object Identifier (DOI) is a unique alphanumeric string assigned by the International DOI Foundation to identify content and provide a persistent link to that content including the location and associated metadata.



* This tool is to be used in conjunction with the *Digital Object Identifiers (DOIs): Management Guide (version 1.0)* by Griffith University. This is a high-level decision tree for INS staff consulting with researchers.