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Digital Object Identifier

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Abstract

The Digital Object Identifier (DOI) system is a managed system for persistent identification of content on digital network. The DOI system is implemented through a federation of registration agencies, under policies and common infrastructure provided by the International DOI Foundation (IDF) which developed and controls the system. The DOI system provides identifiers which are persistent, unique, resolvable, and interoperable and so useful management of content of digital networks in automated and controlled ways.

1. INTRODUCTION

The Digital Object Identifier is a system for identifying and exchanging intellectual property in an interoperable digital environment. It provides an extensible framework for managing intellectual content in any form at any level of granularity and linking customers with content suppliers. DOI facilitate e-commerce. It is enabling automated copyright management for all types of media using DOIs, making managing intellectual in networked environment much easier and more convenient, and all the construction of automated services and transaction for e-commerce.

The development of the DOI system has processed through three parallel tracks.

1. An initial implementation of persistent naming: a single redirection from a DOI name to a digital location i.e. URL, of the entity or information about it.
2. The development of more sophisticated means of management such as contextual resolution, where the result of a redirection is also a function of some additional information such as local holding information.
3. Collaboration with other standards activities in the further development of tools for managing entities in a digital environment.

2. IDENTIFIER CONCEPTS

An identifier is a concise means of referencing something .The term "|identifier" can mean several different things.

1. A "string" typically a number or name, denoting a specific entity e.g. the identifier ISSN 0974-0643 denotes the journal "DESIDOC Journal of Library and Information Technology".
2. A specification which prescribes how such strings are constructed, e. g. The ISO standard ISO 208:2005 is the current specification of ISBN numbering system.
3. "Scheme" which implements such a specification e. g. the ISBN International agency implements ISBN started in an implemented scheme by assigning ISBN prefix to publisher, registering specific ISBN , providing rules on use of ISBN (such as the incorporation of bar code on the cover a book)

4 FEATURES OF DOI SYSTEM

1. Uniqueness
2. Resolution
3. Interoperability
4. Persistence

1. **Uniqueness**

   Uniqueness is the requirement that one string denotes one and only one entity (the referent).Note that the converse is not a logical consequence: it is not necessary that an entry has only one identifier for example: a book may have anISBN and also LCCN.An identifier scheme may even allow multiple identifiers for one entry.

2. **Resolution**

   Resolution is the process in which an identifier is the input to a service to receive in return a specific output of one or more pieces of current information related to the identified entry. For example bar code ISBN in a book shop is scanned by a bar code reader and resolve to some point of sale information, such as title and price, note that resolution depends on a particular application; while bar code in a book shop may resolve to price, the same bar code in a ware house application might resolve to current stock number.

   Another familiar example of resolution is an automated library books are bar coded, bar codes are used for books circulation transaction also the same bar code are used at the time of stock taking of library.

3. **Interoperability**

The ability of different types of computers, Networks operating systems and systems applications to work together effectively, without prior communication, in order to exchange information in a useful and meaningful manner.

DOI Interoperability denotes the ability to use an identifier in services outside the direct control of the issuing assigner, identifier assigned in one context may be encountered in another place or time without consulting the assigner. This requires that the assumptions made on assignment will be made known is someway.

For example a customer may order a book from a book seller or a library system by quoting its ISBN without consulting the publisher who assigned the number.

4. **Persistence**

Persistence is the requirement that once assigned an identifier denotes the same referent indefinitely. For example ISBN once assigned are managed so as to reference the same book always (and are not assigned). Persistent can be considered to be interoperability with the future.

The management of content on digital networks requires identifier to be persistent, unique, resolvable and interoperable .As an example: URL does not identify content but a location: using them as a substitute for such an identifiers is not sustainable for reliable automation.The content may be removed or changed. There have been a number of efforts to address the need for such reliable identifier, notable among URN and URI specification: however these do not of themselves provide an implemented managed scheme and registry for specific content sector applications. Such full schemes requires more : A model for identifier and their management ; shared standards based, persistent identifier, management infrastructure, supports for adoption of persistent identifier and services and plan for sustainable shared identifier and infrastructure. The Digital Object Identifier (DOI) system is such a managed system for persistent identification of content on digital networks using a federation of registries following common specifications. The capitalized term “digital object identifier” refers to one specific system defined and managed by the International DOI foundation which provides an infrastructure for persistent unique identification of entities on digital networks deployed in a number of content related applications.

5. **DOI System**

DOI is an acronym for Digital Object Identifier. The DOI system provides for unique identification, persistence, resolution, metadata and semantic interoperabilityof

content entities i.e. Objects. Information about an object can change over time, including to find it, but its DOI name will not change.

The DOI systems brings together.

1. The syntax specification, defining the construction of a DOI name.
2. The resolution component, providing the mechanism to resolve the DOI name to data specified by the registrant.
3. The metadata component, defining an extensible model for associating descriptive and other elements of data with DOI name.
4. A social infrastructure, defining the full implementation through policies and shared technical infrastructure in a federation of registration agencies.

6. SCOPE

The Digital Object Identifier (DOI) system is an abstract framework which does not specify a particular context of its application, but is designed with the aim of working over the Internet. A DOI name is permanently assigned to an object, to provide persistent link to current information about that object, including where it, or information about it, can be found. The principal focus of an is to content related entities ; that term is not precisely defined but exemplified by text documents, data sets, sound carriers, books, photographs, serials audio, video, and audio visual recordings, software, abstract work, art work, etc. A DOI name is not intended as a replacement for other identifier schemes, such as those ISBN, ISSN etc. If an object is already identified with another identifier string, the character string of the other identifier may be integrated into DOI name syntax, and or carried in DOI metadata for use in DOI applications.A DOI name may be assigned to any object whenever there is a functional need to distinguish it as a separate entity. Registration agencies may specify more constrained rules for assignment of DOI related services.

7. SYNTAX

The DOI name is the string that specifies unique object within DOI system. The DOI syntax (Standardized as ANSI / NISO Z39.84-2005) prescribes the form and sequence of characters, comprising any DOI name .The DOI syntax is made up of a “Prefix” element and “Suffix” element separated by a forward slash. There is no defined limit on the length of a DOI name or its prefix or its suffix elements. The DOI elements are case insensitive and many incorporate any printable characters from the Unicode standard.

Example

A DOI name with the prefix element “10.1000” and suffix element “123456”: 10.1000/23456.

The DOI prefix has two components: A "*Directory*" indicator followed by a "*Registrant*" Code separated by a full stop e. g. (10.1000). The directory indicator always "10"and distinguishes the entire set of character strings (Prefix and Suffix) as DOI, within the wider handle system used for resolution. The registrant code is unique alphanumeric string assigned to an organization that wishes to register DOI names once DOI name is assigned the string should not be changed.

8. DOI HELP

1. The classification and categorization of the publication should be user friendly.
2. The navigation should be simple and user friendly.
3. A well organized content in electronic format benefits of archival and easy retrieval.
4. DOI support to improve decision support.
5. Documents can be accessed anytime from anywhere.
6. DOI integration adds benefits to resource planning systems.

DOI foundation is closely involved in the development of the *OpenURL*, A mechanism for transporting metadata and identifier describing publication for the purpose of context sensitive linking. The DOI system is now widely implemented using *OpenURL* by many libraries.

9. CONCLUSION

The Digital Object Identifier system provides a system for the identification of digital content on networked environment. It provides interoperability facility. The DOI system is not designed as a single application, but to provide generic framework of identification, resolution, metadata and policy that can be applied to all digital objects in a networked environment. The development and deployment of the DOI was also designed to enable automated copyright management, which should offer additional copyright protection, preserve data, integrity and help to prevent piracy. IDF is involved in development of *OpenURL*, hence DOI and *OpenURL* widely implemented in many libraries.

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