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DIGITAL OBJECT IDENTIFIER (DOI) AND ITS CREATION AND ROLE IN INFORMATION DISCOVERY

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ABSTRACT

Digital Object Identifier (DOI) is an Internet-based global naming and resolution system that provides accurate identification, retrieval and trading of digital resources in the form of articles, books, images, bibliographies, supporting data, videos, charts, etc. This paper discusses Digital Object Identifier and its creation and role in information retrieval. It looks at the extent of understanding DOI functionality and the benefits of DOI. It also discusses the International DOI Foundation (IDF).

KEYWORDS

Digital Object Identifier (DOI), International DOI Foundation (IDF), Association of American Publishers (AAP).

1.1. INTRODUCTION

A digital object identifier (DOI) is a system for identifying content objects in the digital environment. The Digital Object Identifier Intellectual Content Management System was launched at the Frankfurt Book Fair in October 1997 to integrate and enable the Internet with technology. According to the International DOI Foundation (IDF), it is an organization established to develop and manage the DOI system. DOIs are names assigned to any entity for use on a digital network. They are used to provide current information, including (or information about) where it can be found on the Internet. A digital object's information or where to find it may change over time, but its DOI will not. (Chute and Croe, 2003); digital goods are identified by a (DOI) just as a universal product code (UPS) i.e. a barcode used on virtually every physical product on the market identifies the price of an item or all of its information. Since its introduction, DOI has created a stable and permanent link between content and directories on the Internet to which the content owner wishes to refer to the DOI, rather than a web address or URL, and establishes trust in that item. DOI is also used as an important emerging international standard for identifying content published online. Today, many scientific journal publishers are using DOIs to enable readers to move seamlessly from one place to another on the Internet. Using DOI makes it much easier and more convenient for publishers and their customers to manage digital goods in a networked environment. The uses of DOI are also very wide. Although DOI's applications were first applied to the publishing industry, it will extend beyond the publishing industry, especially for electronic commerce applications.

The Internet environment creates an expectation among users that resources can be linked and that these links should be stable. The DOI system is viewed as a way to connect the reader or content user to relevant content such as classroom exercises, supporting data, videos, or sound clips. In the future, unique and persistent identifiers are envisioned as an enabler for electronic processing of routine transactions over the Internet, such as document retrieval, clearinghouse payments, and licensing. As mentioned above, the DOI system can be used both for internal digital content management within a publishing house and in the developing world of Internet commerce.

After years of development and testing, the DOI system appears to have entered the second phase of prototypes. Based on the experiences of nearly a dozen publishers who participated in the first phase of the prototype, this manual was developed to describe the steps necessary for successful implementation of the DOI system in this phase of the prototype. It also describes the DOI system, its components and its features.

1.2. Origin of the DOI System

In the face of these literary conflicts, the Association of American Publishers (AAP) established the enabling technology that will protect commercial transactions in the 1994 Agreement. It soon became clear that "no single identifier is capable of meeting all objectives" and the committee ultimately decided that its first step should be the introduction of an industry-wide standard identifier that would facilitate control of transactions and other operations, support system interoperability. Between publishers and their clients, they serve as the basis of a workable rights- and permissions-management system.

From the beginning, the committee recognized that many of the Internet's problems were due to the function of URLs, which were never intended to be identifiers, but merely to specify the location of objects. To overcome that problem, the group's first and primary task to date is to design and implement a system based on a persistent identifier, which would be assigned to an object at or before its creation and would conveniently stay with the object for life. (Davidson, 1998).

1.3. What is a DOI?

According to modern technology codes, detailed information about its digital architecture is obtained through the Code Digital Object Identifier (DOI). E.g. Books are identified by ISBN, Car License Platform and Digital Object DOI. A 'digital object' can be an electronic format of an entire book or journal; or an individual issue, chapter or article; or individual abstracts, figures, tables, chemical compositions, references, etc.; Or (more dangerously) an order or information form, a piece of registration. Independently, it can be applied at any hierarchical level, to any less-more-independent situation of your content.

1.4. DOIs and Metadata Standards

Metadata is a structured information source that describes, explains, locates, or otherwise makes an information resource easier to retrieve, use, or manage. It is an element of data that describes data or "data about data". Metadata describes the who, what, when, where, why, and how of a data set. It provides the essential link between information producer and information user. Each DOI is associated with a series of metadata, a set of bibliographic and commercial information about the content including title, author, publication date, copyright, price, etc. Some of this data includes identifiers associated with the entity in the legacy identification scheme, such as ISBN (identifier), name by which the entity is identified (title), primary type of intellectual property (type), sensory mode such as visual/audio (mode) and primary agent etc. When publishers register a DOI, they also register the kernel metadata associated with the DOI. To register this kernel metadata, publishers must locate it in their internal system as they are responsible for protecting this DOI related metadata over time. Digital object identifiers and their associated metadata are key elements in enabling and creating an infrastructure to support cross-publisher databases of journal articles and citations based on a distributed production model. (Wang, 2007).

1.5. Planning Phase

1.5.1. Securing corporate commitment 1.5.2. Allocating personnel

As with the launch of any new product, publishers have found it important to explain the DOI system throughout the organization and build commitment to its use by sharing information about its many benefits. Senior management should be aware of the decision to use DOI, and key personnel from all departments should also be involved because the DOI system provides benefits for production, marketing, sales, editorial, royalty tracking, fulfillment, inventory, and the like. Informing everyone about the system will help gain their commitment and instruction in its use, which will ensure maximum benefits from the team's perspective as soon as possible.

1.5.2. Allocating personnel

To use the DOI system, the organization must designate a point of contact for the directory manager. Many people in an organization can be given access to the system and authorized to assign and change DOIs, but a single directory manager contact will ensure that the system works smoothly and that the directory manager is able to contact an organization. Also, this one person who created the problem will register the organization, receive a prefix and password (see below), and be the focal point for communication with the directory manager. The contact will authorize other users in the organization to submit and modify the DOI.

1.5.3. Identifying equipment needs

Every publisher needs a web server to respond to DOI requests. No DOI requires specific hardware or software. Registering and updating DOIs in the directory can be done using a normal web browser, and DOIs can point to standard web documents or scripts. Many organizations use existing web servers, while others designate special computers for this purpose. Specific configurations all depend entirely on the number of documents, size, other digital objects, and desired performance. This analysis is no different from the analysis done for web servers in general. Of course, the hardware can never be changed without affecting the DOI, which is one of the arguments for using them.

1.5.4. Planning the implementation

DOI use requires a different type of planning than using print products. If an organization uses a DOI system for internal digital object management, it should consider how to incorporate DOIs into its current and planned information management systems. If an organization uses DOIs as an enabler for Internet commerce or marketing, it should consider the vehicle it uses to communicate the product to the public. This can be an existing home page or it can be a separate product-offer screen. An organization may consider how to publicize a Web site that has access to all DOIs. An organization considering how to publicize a Web site with access to all DOIs may consider various other options, such as including DOIs in abstracting and indexing services. This "product offering" or initial screen must be part of the implementation plan. Current on-line catalogs, tables of contents, or internal digital libraries may use DOIs instead of URLs. Note that this may all change over time; One of the main advantages of DOI is the ability to change the location and organization of online content without changing its public context.

1.5.5. Requesting a prefix

The publisher's prefix forms the basis for the DOI number; A DOI should be requested as soon as one decides to use it. Registering to receive a prefix is easy. This includes electronic payment options, as well as a quick pick-up-or-run option. This process requires registrants to provide some basic corporate information to the directory manager. After his initial registration and payment of fees the directory manager will assign a prefix, then verify the information provided by the contact and provide the contact with a DOI system login and password.

1.5.6. Identifying digital objects to tag

The variety of digital objects to which a publisher can assign a DOI is virtually unlimited; However, members of other communities have indicated that DOI would be more useful to them if certain guidelines for DOI assignment were followed. With this goal in mind, representatives from the publishing, library, and academic communities will meet in the second phase of the prototype to discuss the guidelines.

If an organization plans to "tag" 15 to 25 items to gain experience, it may be useful to start with a subset of digital content. But it may be convenient to assign a single DOI, and given how simple it is, to then adopt its wider system.

1.5.7. Determining a numbering scheme

A DOI is a set of numbers, letters and other characters, made up of two elements. The first element is the prefix and the second element is the suffix, which is assigned to specific content identified by the directory manager and the second element by the registrar. A DOI is intended to be a permanent identifier for a particular object so its construction should be carefully considered. The registrant must decide which numbering scheme should be used and if a number with some form of structure or meaning is most appropriate for the digital objects to be identified. For example, a registrant may choose to use an existing internal numbering scheme or an ISO standard SICI code or another image or descriptor such as a product number. The information provider is responsible for maintaining uniqueness within each numbering system, which allows the directory to automatically check for uniqueness when a new DOI is submitted.

1.6. Use of DOI in Library

Publishers today are investing in the linking technology provided by CrossRef to make DOI linking efficient when they search journal literature using DOIs. Reliable in that. Publishers such as Science Direct, Wiley Interscience, Blackwell Synergy, Springer Link, and others have linked their documents via cross-refs. A demonstration of these linking articles can be found at http://www.crossref.org/03libraries/18gallery.html. As a reference-linking network for scholars and professional publishers, Crossref linking enables the user to navigate the literature, moving from an article or idea to journals and publishers. CrossRef is the full-scale implementation of DOI to date, with coverage primarily of scholarly and professional research materials, journal articles, books, conference proceedings, etc. According to Amy Brand, CrossRef's director of business development, CrossRef "is a publisher membership organization. It is used for collaborative technology and official DOI registry agencies and cross-publisher citation-linking networks. To date, more than 2300 publishers and institutions have participated in CrossRef's collaborative service, adding value to millions of articles from thousands of journals. As of this writing, more than 24 million DOIs with more than 15,000 journals have been registered in the Crossref system since the beginning of 2000.

On October 30, 2006, CrossRef announced the launch of a freely available plain-text query service to facilitate DOI look-ups for researchers and publishers. Libraries should take advantage of CrossRef and provide more efficient services for their patrons. For example, a library can retrieve DOIs and metadata to create persistent links to full-text online works and use DOIs for online reserves by embedding them in reserve URL.

1.7. The DOI as article identifier

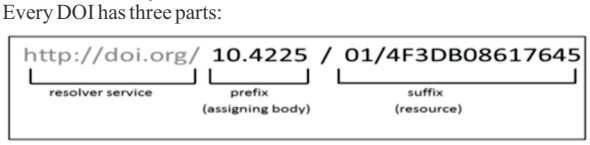
A DOI is a unique alphanumeric string assigned by the International DOI Foundation registration agency to identify content and provide a permanent link to its location on the Internet. A publisher assigns a DOI when your article is published and available electronically. All DOI numbers start with 10 and consist of a prefix and a suffix separated by slashes. The prefix is a unique number of four or more digits assigned to the organization and the suffix is assigned by the publisher. Its assignment is designed to be flexible with publisher identification standards. We recommend that when a DOI is available, you include it for both print and electronic sources. The DOI is typically located on the first page of an electronic journal article, near the copyright notice. The DOI can also be found on the database landing page for the article.

1.8. The linking functions of DOIs

The DOIs in the reference list function as links to the content you are referencing. The DOI may be hidden under a button labelled Article, CrossRef, PubMed, or another full-text vendor name. Readers can then click on the button to view the actual article or to view an abstract and an opportunity to purchase a copy of the item. If the link is not live or if the DOI is referenced in a print publication, the reader can simply enter the DOI into the DOI resolver search field provided by the registration agency CrossRef.org and be directed to the article or a link to purchase it. Locating the article online with the DOI will give you electronic access to any online supplemental archives associated with the article.

1.9. The Anatomy of a DOI

Every DOI has three parts:



Source: http://www.ands.org.au/online-services/doi-service/doi-policy-statement. CC-BY

1.9.1. Resolving Web Address

Like web addresses (URLs), DOIs enable research output to be discoverable and accessible. Online publishing and digital archiving have made them almost a necessity for scholarship, and they have become the de facto standard for identifying research output.

1.9.1.1. Prefix

The prefix is the beginning of a unique, alphanumeric ID that irrefutably represents a digital object, and as such it creates an actionable, interoperable, persistent link to the work. The prefix is almost always associated with the entity or organization, and can allow users to trace the digital material back to its source.

1.9.1.2. Suffix

The final part of the alphanumeric ID is unique to its assigned object. Integrity of DOIs is guaranteed because they do not rely alone on URLs and the web's DNS (Domain Name System) servers for resolution. A DOI, then, is both an online location and a unique name and description of a specific digital object.

CONCLUSION:

A Digital Object Identifier (DOI) system not only provides a unique identifier for digital content, but also provides a way to connect users to the appropriate content through an automated digital environment. Persistent, unique and reliable identifiers with resolution systems provide a perfect solution for managing intellectual content in the digital environment. DOI brings publishers and technology together and appears to overcome significant barriers to managing electronic content. At the same time, libraries should be able to take advantage of this opportunity to benefit their patrons and users. Some scholars argue that in the near future the value of a publication will be determined by its number of links. Widespread adoption of DOI will not only benefit the scholarly community but also expand the e-commerce market for their digital asset management. Although DOI is a very useful system, there are still many problems with it, including metadata standards for assigning missing links in DOI, copyright protection for DOI, education and marketing on DOI, encouraging the development of new applications, and whether DOI fits into the emerging web infrastructure, Must continue to ensure.

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