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# Desperately Seeking Copyright -- Digital Object Identifiers: Just an Idea or an Innovation of Value?

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is causing an immediate problem of gathering data to support decisions about how best to use these expensive electronic resources. Librarians are flying blind.

There are a number of people who have written and discussed aspects of the question of measurement of electronic library materials. **Project Counter (Counting Online Usage of Networked Electronic Resources)**,<sup>23</sup> **ARL's eMetrics project**,<sup>24</sup> and the **International Coalition of Library Consortia (ICOLC)**<sup>25</sup> are all working on aspects of deciding which variables to collect and how to report them. These efforts involved librarians and vendors. From the presence of vendors in these efforts and at the meeting at **ALA**, it occurred to me the vendors might be interested in prototyping a data exchange format to be used after the variables are decided on.

Everyone needs more data, and the vendors are trying to find a means of making the data available through these efforts. But, a word of caution. Two problems will not be changed by an agreement between the vendors and librarians. First, these are the early days of the process of finding which variables are of most use, and so these data have not gone through the iterative process I discussed earlier that is necessary to improve data. People want data now and they are impatient to get data about electronic resources but good data are not built in a day. Second, is the matter of format. How will we merge all these data from the different vendors in the future — even if we all agree on what data we need and they can supply?

I believe the formatting question presents an opportunity to start the creation of a data exchange format using **XML** to facilitate the interchange of data dealing with electronic resources, and it would be complementary to **NISO's** work and the work of these other groups, perhaps a bottom-up development that can prototype an **XML** library data exchange format for this specific area.

Arriving at the format and putting the data in it would require effort, as would developing the infrastructure to make the format useful to librarians.

Currently, as the reader is aware, librarians get reports on electronic resources from different vendors in a variety of non-compatible formats that cannot be easily merged. If an **XML** format were in widespread use, the data would be in a compatible and easily merged format.


Then what? If appropriate utilities were written to take the reports from the vendors and "parse" them and "transform" them, in the language of **XML**,

they could be merged and put directly into whatever format was desired by the librarian, say, a spreadsheet or a Web page or **PowerPoint**. It would make the support function more useful to have different data from different vendors in one report.

If an interested group of people had similar support data, it would spur an illuminating conversation in how best to use them and the data would get the scrutiny necessary to improve data, as has happened with the ongoing development of the **ARL** data.

Such a prototype, though, would only be a step in the journey. These resulting data would be new data dealing with a new subject and subject to the problems all such

new data have. The data are not a magic bullet to solve everyone's problems, but with work and time, the data will improve. For instance, **Paul Metz** and **John Cosgriff**<sup>26</sup> describe a method for working with the difficulties with the data they had. The article presents a transparent methodology for their comparisons of the various non-comparable data items they had. If you disagree with their weightings, you can adjust them to your purposes.

I will be working on a prototype and will be contacting some of you for data. I hope to present a preliminary report at the **Charleston Conference 2002**. 

## Desperately Seeking Copyright — Digital Object Identifiers: Just an Idea or an Innovation of Value?

by **Edward Colleran** (Director, Publisher Relations, Copyright Clearance Center, Inc.) <ecolleran@copyright.com>

The global groundswell for the adoption of yet another numbering system would appear to be underwhelming at best. After all, we already have **ISBNs**, **URLs**, **EAN/UPCs** and a plethora of other numbers. Why, indeed, should we invent another?

But an unusual convergence of interests among librarians, researchers and publishers has, in fact, already propelled the new **Digital Object Identifier (DOI)** in a few short years from an abstract concept to an operational numbering system for identifying and locating intellectual property in digital format.

**DOIs** have rapidly claimed a major role in the **STM (Scientific, Technical and Medical)** publishing world and are poised to venture forth to other publishing sectors and media formats as well. The first four

**DOI** registration agencies already have issued five million **DOI** numbers identifying mil-

lions of individual articles in 6,500 journals. In addition, the **Library of Congress National Digital Library Program** and the **Defense Advanced Research Projects Agency (DARPA)** virtual library for the **Defense Department** use the same underlying technology. Recent announcements include a major Asian adoption and a large-scale multinational European **DOI**

initiative. And a dynamic plug-in for **Adobe's Acrobat** has been developed which brings the power of **DOI** to pdf files. That's a lot of traction in only two and a half years!

What exactly is a **DOI**? **DOIs** are unique, permanent numbers assigned to specific objects (for example: digital articles, images, music or video), which remain unchanged (in effect, move with them from Website to Website, or publisher to publisher). For a simple analogy, **DOIs** are like cell phones which owners take with them wherever they go. **URLs**, in contrast, are like home or office phones in fixed locations; they are of limited usefulness when you are not at that location. Note that **DOIs** themselves are not an encryption or locking technology; they merely identify digital content as registered and provide a mechanism for the publisher to offer multiple viewing and payment options.

**DOIs** are enormously helpful to researchers, especially in hyperlinked footnotes, because they transport researchers directly to the article, irrespective of its location, rather than driving them to Websites that no longer exist. **DOIs** also are helpful to those librarians who need to track and control the materials that researchers purchase.

The **DOI** has two components. The prefix is the naming authority, assigned to a publisher, for example; and the suffix — added by the publisher — identifies the specific article, image or media as well as its metadata (that is, data about data, such as the underly-

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ing information about works, rights, etc.). Together these guarantee a unique assignment to a piece of content. Naming authority prefixes are assigned by **DOI Registration Agencies** — the **STM** community's **CrossRef** initiative is one such — each of which is free to offer its own business model to its relevant community. (**CrossRef**, for example, operates on the basis of a fee structure detailed on its Website, [www.crossref.org](http://www.crossref.org).)

So what's the big deal about **DOIs** anyway? Why should librarians and publishers care about them? First of all, **DOIs** have the ability to link to large quantities of metadata about a digital object; for example, bibliographic data required to cite the article in another journal, or information needed by librarians or retailers. That metadata can be dynamically updated by the assigner, yet becomes instantly available to users. It may include not just basic data such as the ISBN number but much more information, such as an author biography, for example.

Secondly, a **DOI** is tremendously powerful because of its multiple resolution or routing capabilities. Unlike a URL hyperlink that connects only one site to another, a **DOI** can call up a menu of hyperlink options simultaneously. A **DOI** could, for example, include hyperlinks to multiple servers where the same object is stored, or display a range of user options, such as reading an abstract, viewing an article or purchasing it in part or in its entirety.

Ultimately, **DOIs** could be used just like a bar code to track digital content through an entire digital distribution chain from the earliest stages of creation and production through distribution and final delivery to end user.

The technology backbone of the **DOI** network is the **Handle System**.<sup>®</sup> Created by Internet co-founder **Robert Kahn**, the **Handle** resolution process transports **DOI** requests to the **DOI** directories where the **DOI** identifiers are stored and resolved to appropriate data such as URLs. The **DOI Foundation** has now added to this another technical component, the structured metadata approach pioneered by the **indecs** (interoperability of data in e-commerce systems) initiatives and which now forms the basis for developing an international standards effort for rights management. Currently, the **Handle** system processes **DOIs** from five registration agencies: **CrossRef** (U.S.), **Content Directions Inc.** (U.S.), **Enpia Systems** (Korea), **CAL** (Australia) and **Learning Objects Network** (U.S.).

The impetus for the **DOI** began back in 1994. It was sparked by the **Association of American Publishers (AAP)**, which was attempting to address the issue of online copyright management and protection, especially


in anticipation of eBooks and future e-commerce opportunities. An **AAP** committee subsequently created the **DOI** as a numbering system to identify copyrighted content on the Internet; however, **DOIs** remained pretty much a theoretical concept until 1998 when an international collaborative venture set up the **International DOI Foundation** ([www.DOI.org](http://www.DOI.org)). **CrossRef** became the first registration agency at the end of 1999.

The **DOI** numbering system can become an even more powerful control tool for researchers and budget-conscious librarians alike who use library automation systems such as **ExLibris's SFX** context-sensitive reference linking. For example, **SFX** enables librarians to create customized links to appropriate content within the library's e-collections regardless of where the information is hosted. In this way a library-specific local resolution tool complements the **DOI** global resolution tool.

Because **SFX** links can identify content that is already included in an electronic license, it provides full access to researchers who might otherwise be charged for an individual article, unaware of the library's periodical subscription. This is a major boost for

librarians because it helps them restore control over their budget. The ability to avoid double payment is particularly welcome with the escalating cost of electronic subscriptions, which are consuming an ever-larger share of library budgets.

In conclusion, the establishment of a unique numbering system for identifying creative content fulfills the promise of digital rights management that encryption firms pledged when they adopted the name but fell short of delivering. Digital rights management is too complex to be solved by just a locking mechanism. Encryption itself can't begin to address such questions as: Who owns what rights? How much should different uses cost? How many uses should be licensed? And other thorny issues.

But encryption and a digital numbering system can, together, truly open up broad access to information while ensuring that creators are paid for their work — a fundamental concept upon which the continued progress of the world depends. That's why I predict that **DOIs** are here to stay — and sure to spread. 



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## Adventures in Librarianship — First Draft

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by **Ned Kraft** (Ralph J. Bunche Library, U.S. Department of State)  
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### DRAFT RESPONSE - PLEASE EDIT BEFORE SENDING TO THE DEAN!

To: Dean Horkner, Darkmound University  
From: Dr. Samuel Prudent, Fraught Memorial Library  
Subject: Space Planning

The Library's Space Planning Committee met on 1 January to review the University's proposed ~~demolition?~~ renovation of the library.

The proposed new office configuration for the technical services division, described by the architects as a "flexible and innovative approach to right-sizing the work flow," ~~Anyone want to guess what that means?~~ is certainly eye catching if you are colorblind and easily bewildered. However, we believe it may violate several municipal codes. Four-by-four might be too small for a cubicle, no matter how rich the wood grain.

Though we appreciate your suggestion that the library include a sports bar televising the University's basketball triumphs ~~by last count, those triumphs numbered two~~, we suspect that the rare book room is not the appropriate place to offer such a service. We wonder, in fact, whether that service might duplicate the sports bar already established in the student union building.

The staff enjoyed meeting Mr. Harrison at the reception. We appreciate his skill in the business world and his willingness to fund the renovation. We hope, however, that you will find some delicate way to decline his offer to microfilm all of our monographs ~~without making the lunacy of the idea too obvious~~. Again, there may be some legal

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