THE USV ANNALS OF ECONOMICS AND PUBLIC ADMINISTRATION | VOLUME 16, SPECIAL ISSUE, 2016

DIGITAL OBJECT IDENTIFIER FOR A BETTER IMAGE OF SCHOLAR JOURNALS

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Abstract:
In the context of continuously increasing number of online scientific and scholar journals, it is quite difficult for authors to select one to publish. It is also difficult for editors of older, well established journals to maintain a reasonable amount of requests for publication as a pool of selection. This paper presents a solution based on the Digital Object Identifier (DOI) concept that could increase the reputation and respectability of a scholar or scientific journal.

Key words: Digital object identifier, scholar journals, registration agency, persistent URL

JEL classification: C43, I23, I29

1. INTRODUCTION

The number of online scholar and scientific journals increased spectacularly in the last few years all over the world. Many of them arise in Asia and carry out aggressive mass email based promoting campaigns (spam). Most of new journals whose name starts with "IJ" - International Journal have a short, couple of years only, history. Some of them disappear in as many years, thus the papers published during journal lifetime are lost.

Beside these new, doubtful journals, authors are tricked also by so called "predatory" journals that are stealing the identity of very respectable journals. Certain fake websites claiming to be the genuine journals become a steady stream of revenue for less reputable institutions. A long list of fake and predatory journals as well as suspected journal is given in [1]. Fortunately, there are concerns about this phenomenon so and one can find on the Internet more comprehensive lists of publications to avoid when sending a scientific article for publication [2][3]. As in the previous case, papers published in the faked and predatory journals are lost because in many universities they are not considered as valuable papers. Moreover, "some universities, research institutes, and ministry of education have blacklisted the scientific journals".

All major publications within any given scientific field use a digital identifier for each electronic published document. It is named Digital Object Identifier (DOI) and can be noticed either on the electronic version of the paper either on the printed version or both, figure 1.

DOI's provide some advantages for publishers and for authors as well. But as almost all good things, DOI has a price. For Open Access journals, where the publication is free of charge or the publication fee is symbolic, subscribing for a DOI may be a problem. We checked over 30 journals from the "blacklist" in [3], in the field of engineering and economics and none of them provides DOI, despite the significant fee most of them charge the authors. On the other hand, it is difficult to differentiate between non-DOIs decent scholar journals and fake journals whose main goal is to make money, even if the latter could afford to pay for DOIs. Table 1 show a list of ten journals whose name starts with "International Journal" and are not products of big publishing houses. Among them there are good journals which don't assign DOIs to the articles they publish, while all journals providing DOI are respectable journals.

a.

b.

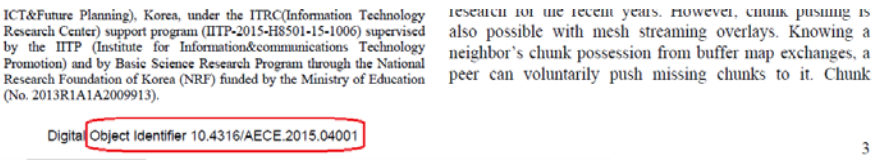


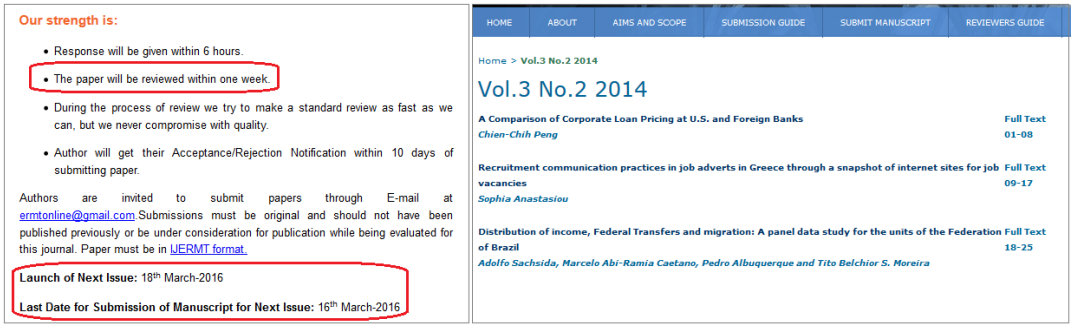
Figure 1. Examples of Digital Object Identifiers

Table 1. Ten International Journals of comparable quality with DOIs availability

No	Full Journal Title	Web	DOI
1.	International Journal of Teaching and Learning in Higher Education (IJTLHE)	www.isetl.org/ijtlhe/	N
2.	International Journal of Education & the Arts	www.ijea.org	N
3.	International Journal of Dentistry	www.hindawi.com/journals/ijd/	Y
4.	International Journal of Financial Studies - Open Access Journal	www.mdpi.com/journal/ijfs	Y
5.	International Journal of Business and Economic Development	http://www.ijbed.org/	N
6.	International Journal of Clinical Medicine	www.scirp.org/journal/ijcm/	Y
7.	International Journal of Research Studies in Education	www.consortiacademia.org/index.php/ijrse	Y
8.	International Journal of Food and Agricultural Economics	http://www.foodandagriculturejournal.com/	N
9.	The International Journal of Applied Economics and Finance	www.scialert.net/current.php?issn=1991-0886	Y
10.	International Journal of Economic Practices and Theories	www.ijept.org/	N

Inspecting several websites of suspicious journals we may find additional information about the journal quality. Thus, a journal with an unusual short period of reviewing process or with inconsistent statements regarding the processing time of the articles and the last date for submission is, perhaps, a dubious one, figure 2a. Also, a journal publishing three article per issue is certainly not a valuable journal, figure 2b.

As almost all open access journals with an assigned DOI have good reputation and those who have not DOIs are divided into respectable and less respectable, it may be a good idea for publishers to make an effort for acquiring DOIs for their journals.



a b

Figure 2. A Journal who ensures the paper review in one week and allows two days between the last date of submission and the date of publication (a) or publish less than five papers per issue (b) may be not a serious one

2. WHAT IS DOI?

DOI is the acronym for Digital Object Identifier. As the name itself suggests, the role of a DOI is to digitally identify any object. DOI system was developed by International DOI Foundation, with the purpose to "provide a framework for managing intellectual content, link customers with publishers, facilitate electronic commerce, and enable automated copyright management". It consists of a unique alphanumerical string that begins with 10, followed by a prefix and a suffix, separated by slash. Number 10 designates the DOI directory manager. The prefix is a unique number of four or more digits assigned to organizations that uses the DOI system. In the case of publications, such journals, the suffix is assigned by the publisher and is designed to be flexible with publisher identification standards. The assignment of prefixes is done by several registration agencies, acting on behalf of International DOI Foundation. A very popular agency in the scientific publishing sector is CrossRef (http://www.crossref.org). Other common registration agencies for publishing industry are: Data Cite, mEDRA (Multilingual European DOI Registration Agency) and OP (Publications Office of the European Union).

2.1 WHAT IS DOI GOOD FOR

A DOI is a link providing three features: it is *actionable*, it is *interoperable* and it is *persistent*. We can explain these features starting from the remark that digital content changes owners or location very often during its useful life. It happens to almost everybody to find that a link pointing to an article doesn't work. That is mostly because the address of the article has been changed as a result of software or ownership changes. DOI offers a type of link (that means it is actionable) which is independent of these types of changes (it is persistent). Persistency is possible because the DOI system uses a central directory. When a user clicks on a DOI, the request is submited to the central directory which looks up for the address associated with that DOI. The directory responds to the user's browser with a redirect message to the address it found. When the object (article) changes, the change is recorded in the directory such all subsequent readers will be redirected to the new site. The DOI remains the same, only the associated address changes in the directory and the change is easy to make.

Interoperability is given by the DOI data model. Beside the identifier, DOI uses o lot of metadata that may include names, descriptions, types, classifications, locations, and any other kind of information related to a Referent. Because there are many Registration Agencies (RAs), all of them must use the same metadata model in order to ensure that the DOI name is available for use in services provided by other RAs.

Figure 3 shows the flows of metadata within the RA Network. Each Resource provider (such publishers) provides metadata for the RA as requested by that one. In the same time RA must

provide some level of output or service metadata to support DOI system services. These two requirements can be accomplished by using minimum the elements of DOI Kernel model.

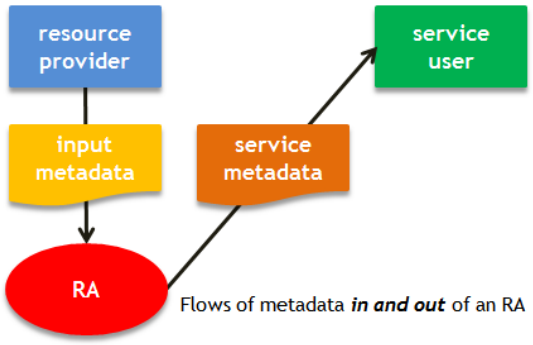


Figure 3. The flows of metadata within the RA Network. Source: International DOI Foundation
http://www.doi.org/doi_handbook/4_Data_Model.html

2.2 DOI METADATA KERNEL

The "DOI Kernel" contains a minimum metadata set having the role to provide recognition and interoperability. In this context *recognition* stands for the ability of the metadata to clearly identify what kind of thing DOI refers to, avoiding the ambiguity. If the DOI Kernel is not sufficient to ensure disambiguation, additional information may be added to the Kernel. Actually, the DOI Kernel consists in a XML message which contains the minimal set of elements that must be transmitted to the Registration Agency. For a journal, the XML file contains two parts: the first one identifies the journal issue and the second one identifies each article in that journal issue. As an example, figure 4 reproduces the first part of XML file for issue No.2/2015 of the *Journal of Applied Computer Science & Mathematics*, published by Stefan cel Mare University of Suceava, in printed and electronic format. The structure of XML file is that requested by CrossRef Register Agency. A full documentation of XML data structure, also called deposit schema, covering conferences, books, dissertations, reports and journals may be found on the CrossRef website. Basically, all registration agencies have their own deposit schema that must be followed by the registrants.

New versions of deposit schema occur from time by time and the publishers are encouraged to use the newest versions as long as the older ones may be not supported anymore.

The deposit schema is quite complex and it is impossible to edit manually the XML file. It is always generated by a computer program using the information in the database of the publisher. For non-professionals, some registration agencies provide web based interfaces in order to help registrants add metadata.

```
<?xml version="1.0" encoding="UTF-8" ?>
- <doi_batch version="4.3.0" xmlns="http://www.crossref.org/schema/4.3.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://www.crossref.org/schema/4.3.0
    http://www.crossref.org/schema/deposit/crossref4.3.0.xsd">
  - <head>
      <doi_batch_id>20152</doi_batch_id>
      <timestamp>2016229112004</timestamp>
    - <depositor>
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      </depositor>
      <registrant>USVRO</registrant>
    </head>
  - <body>
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          </journal_volume>
          <issue>2</issue>
        - <doi_data>
            <doi>10.4316/jacsm.2015.02</doi>
            <resource>http://www.jacsm.ro/archive/index.php?year=2015&issue=2</resource>
          </doi_data>
        </journal_issue>
        <!--  ============  -->
```

Figure 4 A fragment of XML file corresponding to the journal issue

3. GETING DOI FOR A JOURNAL

The first step for achieving a DOI for a journal is contacting a RA which services best meet the needs of the journal. The complete list of RAs may be found on International DOI Foundation website. For scholar journals the most suitable are CrossRef and CiteFactor. Working with an RA does not imply to be a member of the International DOI Foundation.

The next step consists in establishing the services to purchase with the chosen RA. The cost of registering new DOIs depends on these services. When a publisher registers with one RA, it gets a DOI prefix. For example, CrossRef charges the publisher with an annual fee depending on the *total publishing revenue* for each registered name. Since the scholar journals are generally non-profit publications, they fit into the first category "under 1 million USD", that means an annual fee of $275 USD. Beside this fee, for each DOI assigned to a paper, the publisher pays an additional fee of $1 USD.

The third step is to generate the XML file for each issue of the journal, according to the requirements of the Registration Agency which services have been purchased. The XML file should be uploaded in the system of RA using the interface provided. Some RAs also provide a verification facility of XML file, before uploading it.

Each time the location of paper changes, from different reasons, in order to ensure the persistency of DOI name, the XML file must be generated again, according to the modifications, and uploaded in the RA system.

4. CONCLUSIONS

As it was designed, DOI system provides a form of persistent identification, in which each DOI name permanently and uniquely identifies the associated object. By associating metadata with objects, DOI provides users with relevant information about the objects and their relationships. The

DOI name is not based on any changeable attribute of the object as its physical location or ownership. Information about the object is encoded in metadata and not in the DOI name itself.

Despite the fact that the DOI system does not provide a central search capability, most web search engines will show DOI names in the results of a search by title, by name, or by topic or related terms. The reverse will also work; a DOI name search in the search engine will show you what item that DOI was assigned to. Thus, a work having a DOI name became more visible and will be accessible for long-term, irrespective of its physical location.

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