

DOI Market Survey Report

[November 2002]

doi: 10.1392/market_survey

1. INTRODUCTION

1.1. Objectives

The market survey was carried out analogously in the four partner countries and the results from these countries have been put together in this report. The objective of the market survey was to determine whether the DOI is already being applied, in which countries and in which sectors it is being used, who is using the DOI and for which applications. A further objective was to identify those market segments which are prepared for a forthcoming use of DOI and those segments which are planning to use DOI in future.

1.2 Development of the DOI

In the mid nineties it was possible to identify two things happening on the internet. On the one hand, since large quantities of content were available free of charge, it was difficult to clearly identify the authorship, the version of a document and the rights holder. On the other hand, trading with digital content was faced with the problem of commercial partners no longer communicating with each other directly, but only through the internet, which made it even more important to clearly identify the respective content to be discussed in order to have a uniform basis for negotiations. This requirement led to the DOI Initiative in 1996 which was launched by the American Association of Publishers. The development of a persistent identifier for the digital content was defined by two goals: facilitating the creation of an e-commerce market for digital content, and facilitating the creation of solutions for copyright protection/anti-piracy in the digital environment. In order to guarantee a clear identification for all communications and transactions, an identifier was required that would accompany the digital content "throughout its entire life": preparation, formatting, publication, syndication, distribution, aggregation, retail sales/ subscriptions, royalty computation, rights/ permissions grants, sales tracking, financial reporting, etc.

It was agreed at an early stage that, at the very minimum, a DOI should be capable of providing some basic structured metadata about the target object, much the same as an entry in a telephone directory. This enables a user to ensure that the entity they have identified is actually the one they

are looking for. The reliability and accuracy of the DOI give it the ability to become a form of 'electronic ISBN/ISSN' but with the added value that the metadata it delivers can focus on publisher issues primarily, rights management and electronic commerce.

Nevertheless, there was a further requirement also accounted for: as there are not only dealers and buyers in the internet, but also the actual content itself, this should also be made traceable in the internet. This is what the DOI provides, because it has behind it a resolution-and-routing system, very similar to the Internet's DNS system which recognizes and routes domain names successfully. Furthermore, the system underlying the DOI was in fact developed by the primary inventor of the Internet itself, Dr. Robert Kahn (and his research organization CNRI, or Corporation for National Research Initiatives), for the express purpose of differentiating published, managed objects from other less valuable or less quality-assured information.

This is where the second objective of DOI development comes in, the enforcement of copyright protection or the Digital Rights Management (DRM). Copyright-management systems are basically databases that contain information about content and, in most cases, the author and other current rights holders. That information is needed to support the process of authorizing the use of those works by others. A copyright-management system thus usually involves two basic modules, one for the identification of content and one for licensing or other rights transaction, such as a full assignment. In many cases, ancillary modules such as payment or accounts receivable are also considered part of the system, but the core of a copyright-management system is content and rights identification and a licensing tool. The identification of the content can be clearly and persistently guaranteed by the DOI and the associated metadata structure. The management and monitoring of the data can also be provided as a service by a registration agency, as these services are very interesting for Content Publishers. It is not only the copyright protection that is of vital importance to the publishers, also the different possibilities of digital rights management offer interesting marketing opportunities. It can enable free previews or samples, but requires payment after a fixed number of previews or a free initial time period. It can allow a "teaser" of limited access (e.g. read-only) but then requires purchase if the customer wants to print, copy/paste (e.g. into their own work product), or forward to others (but possibly only to a predetermined number of people). Finally, it can provide the very effective marketing tool of superdistribution: a legitimate, paying customer is able to forward the content to any number of friends, provided the publisher receives payment when each of them accesses the content. With this kind of viral marketing each customer is turned into a very efficient salesperson, as the user forwards the content to an actual friend who is likely to have an interest in the content or is likely to follow the sender's recommendation.

It therefore becomes evident that the DOI, with its resolution system, forms the basis for commercial trading with digital content and also concerning the rights management of this content. It is not necessary to emphasise that rights management systems are more in demand today than ever before. This is because the first phase of the internet is coming to a close, during which vast and unorganised contents have been available free of charge, which, however, are difficult to use because they lack quality criteria and uniform structure. Now there is an urgent need for uniform structures, simple tracking and simple definition of rights, so that large companies such as Microsoft or Sun are now also demanding developments in these sectors.

2. RESULTS OF THE EUROPEAN MARKET RESEARCH

2.1. General assessment of the four European markets

The current use of the DOI is very different in the four European countries. Whereas in Italy, France and Spain the use of DOI is not very widespread, it is already being used by several publishers in Germany.

The different conditions are specified in the following:

In **Germany** there are already several large publishing companies using the DOI. In this respect the Springer publishers from the STM sector (=Science, Technology, Medicine) are mentioned in particular, as here there is a personal connection with the development of DOI. The Thieme Verlag, the publishers Urban & Fischer and the Hogrefe Verlag are also publishing companies from the STM sector (all from the medical sector) that use the DOI, also the Cornelsen Verlag from the educational sector.

In **Spain** it is necessary to observe certain national positions into in closer detail.

Generally speaking there is a lack of sensitivity regarding the importance of information flows and consequently the interest in identifying information, using either traditional or digital business models. We should understand this perspective from a wider point of view; the Spanish information markets are well behind in terms of development, in comparison with other economic or social variables, and also compared with other European countries.

As far as the printed information is concerned, we should basically distinguish between the book and the magazine. As regards the book market, in Spain we have a very peculiar ISBN scenario. Historically the ISBN has been run by the Public Administration. Currently framed within the Ministerio de Educación, Cultura y Deporte, it is managed by public administrative workforce and ruled by public law, therefore registering the ISBN becomes compulsory before any book is published in the country.

Apart from the levels of efficiency and reliability that this situation represents, we can outline the following conclusions:

- Publishers have always seen the ISBN from a legal perspective rather than as a commercial tool. Therefore publishers have never showed any particular interest to improve or to maintain the levels of the ISBN efficiency from their end.
- Publishers have usually used other mechanisms to provide their clients with information: (i.e. book distributors, booksellers...) such as their own catalogues or databases.
- As consequence of the above, booksellers have never seen themselves obligated to purchase the ISBN database, neither as hardcopy nor softcopy.

With regards to the magazine sector, the ISSN has always been considered as an identifier registry, similar to a Legal Deposit rather than a commercial approach.

Nevertheless, and contrary to what has just been described, there is some knowledge on the DOI within the Spanish book industry. Maybe not a very deep understanding, but at least in terms of the concept and the acronym's meaning. In general terms it can be said that there is a lack of

awareness about the current and future DOI applications. The DOI is better known as an identifier as such ignoring other possibilities.

Electronic publishing hasn't been very widely adopted in **France** at an early stage. There is a lack of pre-press services linked with DOI when editors are assembling data, and the awareness of the role of IDs in distribution and legal issues is very low among publishers of IP who will have to decide to invest. Some players have established a dominant position on a small market, where their notoriety is attracting most of the prospects: they have little hope to gain a significant growth through the opening of the market to competition. STM publishers, mainly for human sciences (history, linguistics, psychology, ...) who publish mainly in French are more open to accept the concept of DOI. E-book publishers (mainly as syndicators/secondary publishers) are likely to use DOI for their own lists and will advise their suppliers to invest in the technology.

With all partners it has shown that the STM and educational sector are the ones most likely to open up the application of DOI, as today there is already an approach to introduce the DOI and this segment is technically the most suitably designed for the use of DOI. The following applications might be used: Cross-references for journal articles or similar items (see Cross-linking application profile), DRM applications, also in the case of course packages and versioning and authorship control and certification. One of the most important features that the DOI may provide these market segments with is the persistence of the identifier, i. e. the URN functionality.

In the Educational market the most important application is the creation of "learning objects" that schools and other potential clients can access on-line to search, retrieve, select and access e-content for educational purposes.

2.2. Examination of the individual market sectors

2.2.1. Academic and STM publishers

Italy: Italian publishers in this segment proved to be not well informed on the DOI but very aware of the importance of DOI related issues, like identification, persistence, actionability in the Internet, metadata, etc.

There are some reasons, why this market segments is the most interesting for DOI deployment:

- It is the market where DOI is more used at international level, and this puts pressure on Italian publishers to follow international trends in order to maintain their competitive position
- It is the most mature market in terms of adoption of digital technologies, both from the demand and from the supply side. Therefore, publishers in this market usually have the infrastructure to adopt DOI with relatively low costs
- The value chain in distribution of digital distribution is longer than in other markets, thus the use of standard identifier is more important

In terms of applications, from workshops and direct interviews to academic publishers, the following priorities emerged:

- "Citation" is very essential because requested by authors and readers: to exploit the persistence of DOI is considered as a value from these publishers

- "Cross-linking" is also considered relevant.
- "Deposit" is relevant particularly for publications that are only online. Many publications are issued in parallel editions on print and online, but the number of "only online" publications is increasing. Suggestions about the possible use of such application in "pre-print" publication emerged. In the Italian market, the deposit of digital articles is also important because of legal validity for university job competition. The problem should be studied combining legal and technological issues.
- "Notice and Take Down" would be important but the current stage of the implementation of e-Commerce directive is not so promising in short terms for rights holders. However, it was suggested to take the evolution of the matter into account.

Germany: As already mentioned, DOI use is already established in the academic and STM market in Germany, as it is here that there are several DOI users and several publishers who are planning to use DOI in 2003/2004. The DOI is predominantly familiar amongst the publishers who have online publications.

Success factors are seen in:

- the German-language user interface and the German-language entry of the metadata: this is considered very important for addressing customers and as a means for market expansion.
- Over 90% considered the link to the identified object and its metadata via a resolution system as very important. As a result, the publishers are expecting improved detection of their contents for a wider public and consequently a market expansion.
- 90% of those surveyed attach importance to monitoring of the copyright and the detection of illegally published copies of their content on the internet. This is particularly important because digital contents can be very easily copied without loss of quality. Following this, also the service of Digital Rights Management and sales of licences relating to content published online was considered very important.
- Approx. one half of the contacted publishers considered the registration of intellectual property important, as there is no responsible agency in Germany.
- Advantages provided by the use of the DOI are seen by 80% in the structuring of the metadata in compliance with a uniform standard. As a result of this, the content can be uniformly managed throughout the entire production chain up to the sales and the secondary market. They can also be exactly catalogued and receive metadata allocated to the content in compliance with a standardised structure.

Spain: Although there is not a large production of STM books originally published in Spanish we can find a significant number of Social Science and of course professional publications. Some of these publishers already know about the existence of the DOI but they have not yet decided on its implementation along the commercial chain, probably because of a lack of DOI promotion. From both public and private university publishers the sales of books and publications constitute a growing market within the Spanish book trade sector.

These academic publishers have joined in an association that can bridge the DOI implementation in Spain.

France: France has little activity in (hard) sciences publishing, but a significant one in Human Sciences. This market lacks an electronic distribution platform to start activity but would welcome any initiative offering a French language interface and a list of French titles.

Funding could be found to promote this type of venture ("Défense de la langue française"). Publishers in this field are very cautious about the market of end users; but a service to control distribution of review copies to subscribers would certainly gain attention.

Many companies are not contemplating the introduction of DOI until around 2004. High-valued services must be clearly defined in order to motivate companies to change and adjust their in-house processes. Some of the individual markets are too small, e.g. the market for legal contents, for an electronic distribution to be considered worthwhile. All in all, the assessment of the DOI is very good, the demand for uniform standards is great.

Stable positioning is interesting for high-valued, persistent data, for professional use, if integrity and actuality of digital content are to be checked. Regulations and legal issues for corporate customers are likely to be the area where both publishers and customers would agree to support DOI.

2.2.2. School and educational publishing

Italy: Although Italian publishers did not know the DOI before the meetings, there was a clear interest in the last application. However, any possible development will be determined by the increase of the market for digital learning objects, that is not mature yet. The most important problem in planning activities in such a field is that the development of the market will actually depend on public policies, which are not easy to forecast.

Germany: In Germany there are only a few key players. One key player (Cornelsen Verlag) already uses the DOI, wherein the use of wider-scale services would appear very interesting. Especially because there is an online portal planned in which contents of all key players are arranged, in order to provide a comprehensive range of educational aids and teacher material. In this respect it is required that all parties involved use a uniform standard for mutually settling accounts and management of the entered content, as otherwise, this large-scale project is hardly manageable. Also the uniform structure of the data is a key factor for projects of this kind.

Another major factor for market expansion is seen in improved locating of the digital object in an extensive multilingual European DOI database. Also the link of all learning objects to a European catalogue ("Learning Objects Catalogue") is a novelty on the market which will be much appreciated for reaching new market segments. In this respect the sphere of activity is differentiated between school contents and teaching contents for adult education, because the syllabi of schools differ from state to state in Germany and the publishers have to comply with the political decisions adopted. A growing market is however seen in the activities of adult education, whether in the private or vocational sector or directly in the companies, meaning that this sector can also benefit from a European database.

Educational publishers are particularly emphasising the multilingual feature of the German user interface of the European database, as the user circle of teachers and pupils are not as used to

handling terms and search masks in English as the target groups from the STM and Academic-Publisher, which is mainly for researchers and students.

Spain: Although this is an emerging sector is still not very active in the Spanish book industry. Only a few large publishers like Santillana or other non-publisher companies are investing on e-learning and multimedia training materials. The research tells that these companies are definitely interested on tracking the use of those materials.

France: Educational publishers are not considering electronic publishing as offering added value to their activity. Initiative is coming mainly from departments of the French Ministère de l'Education, and local initiatives of Centre Régionaux de Documentation Pédagogique. In the meantime, small companies dedicated to multimedia products are entering the market and are supporting the idea of creating a market place for e-learning objects. Quantities are very small but dramatic growth might be triggered by national decisions. In this respect, similar claims have been put to the applications as in the STM market („Citation" and Copyright/DRM), however, in this market the problem of the small margins in pricing must be considered.

2.2.3. Public information publishers

Italy: It is a promising sector because of the importance of e-government in the European and thus Italian political agenda. It is a common view of interest parties in Italy that applications should not be different than in the private sector. It is particularly important to exploit the persistence of the DOI in order to allow citizens to reach in a consistent way documentation produced by public bodies. On this concern, the "citation" application seems to be the key one.

Some facilities related to the "versioning control" of publications are also important, because of the changing nature of much content produced by public sector.

Germany: Public institutions such as the Federal Agency for Statistics work with internal numbers for digital contents. They are very interested in the sector for copyright protection, Digital Rights Management and especially versioning control, because in the public information sector there are always different versions of a publication and it is most important to mark the latest version.

Spain: Although a fast reaction from the Spanish public sector towards the DOI is not expected, the participation of the European Publication Office might result as an incentive in terms of encouraging the local sector.

France: Authenticity and actuality of documents published by French administrations are important features for users. Standardisation and digitisation rules are promoted at a national level. Links with services and facilities to maintain documentation, update documents and quotations would be a field where DOI could offer added value. Awareness and costs are difficulties that need to be dealt with.

2.2.4. Photograph archives

Italy: Photograph archives are very advanced companies in using technologies for e-commerce of rights, so they provided us with useful ideas about the possible application of the DOI in DRM applications or such.

The possibility to combine the DOI functionalities with the watermarking technologies is another theme that has been considered as promising.

Metadata is a key issue, particularly considering the huge amount of items to be identified and described: it is impossible to oblige anybody to reclassify their archives.

The only metadata that are commonly used are those embedded in digital file as IPTC. There is some possibility to recoup IPTC metadata to be re-used in DOI context. However, the IPTC scheme is very poor and difficult adaptation work is required.

Archives are interested in the "Deposit" application with the purpose of creating presumption of rights holding. US Library of Congress already provide a similar service (on paper and expensive) and some Italian publishers deposit books at LoC to protect all photos printed.

Anti-piracy is a key concern. DOIs could be embedded in image files (in the different, prevalent web formats) and the network should be explored in search of unauthorised copies.

Notice and take down is also of great interest, for the same reasons. Both archives and agencies have great experience in notifying web-sites about unauthorised publications of their photos. An efficient service of NTD will be useful for them.

Germany: The most urgent problem is copyright protection which is even difficult to handle in off-line media (photoprint, slides). In the digital sector watermarking technologies are used which, however, are not satisfactory for various reasons. New solution proposals are much desired.

It is also here that the IPTC Standard is used, however the users do not consider this standards as sufficient. A working group of the Federal Association of Press Photo Agencies and Photo Archives is currently working on a basic thesaurus for the description of photographs. The requirement for a common standard is considered most urgent. However, the generation of metadata poses a problem: an agency has on average over 200,000 300,000 pictures, wherein the agency is not able to make a new entry or expand the metadata for every image. A key factor here is again expenditure and the costs.

Spain: In Spain there is not a tradition of publishing art books like for instance in Italy, therefore this is not, in theory, a top priority sector. Nevertheless we can find in Spain very important photographic archives, in an historic sense (i.e. Agencia EFE). There is a great need for a registration agency to protect copyright information.

France: Photograph archives could benefit from services that would allow buyers to access documentation for a lower cost. Demand for non-proprietary, unified access will come from buyers more than from the archives. Publishers are less interested in carrying IDs for elements in their (compound) products.

2.2.5. e-Books and Audiobooks

In all countries it was found that these markets are still in the development stage and have less than a 5% share in the market to date. Nevertheless, an e-book sector is being operated by many publishers due to image reasons. Bestsellers are predominantly produced in the light literature sector (the second most successful sector being non-fiction). Expectations say that 10% of sales of the print edition will be made again with the e-book. In Germany this year a portal has been established for audio books, the service of which is seen in providing each title with exact metadata, this is because the metadata provided by the publishers are not adequate for the audio book. In this respect a directory of available listener books is planned, where the DOI can be useful as a uniform standard.

2.2.6. Individual studies on various market segments:

Following the studies on the main market segments described above, the partners studied different smaller markets which according to their assessments and the national circumstances appeared interesting.

- Book trade

Italy: During the discussion with publishers a need of standardisation of the bibliographic information flow between publishers and the several organisations that manage such information emerged. Therefore, AIE contacted different key players in this market: the ISBN agency (Editrice Bibliografica), book distributors (Messaggerie Libri and Casalini), the Italian teleordering system (Arianna), an Internet bookshop (IBS), a book portal (365 giorni in fiera, by the Turin book fair), etc. The result of this survey makes clear that DOI can play a role in this field fostering the adoption of ONIX as standard for metadata describing books and providing applications based on multiple resolution to allow final users to access relevant information on books.

In terms of identifiers, book trade should cope with a new challenge derived from the revision process of ISBN, i. e. the key identification system adopted by publishers since 30 years. It is very relevant that the new definition of ISBN scope include very clearly "digital monographic publications", which make clear the relationships with DOI.

At the same time the emergence of ISTC (International Standard Textual work Code), the new standard for abstract works independent from manifestations, requires publishers to modify their approach on standard issues.

Finally, publishers have the need to adopt ONIX to describe bibliographic items through appropriate metadata.

Since DOI provides a common framework for publishing standards, it is possible to use it to facilitate the process, creating a sort of "one stop shop" for publishers in the four countries involved. Furthermore, it is possible to make existing (ISBN) and emerging (ISTC) standards interoperable and actionable in the Internet, providing specific value added applications.

Publishers emphasised the importance of having a single instrument to manage metadata on publishing items (including books). This tool should allow publishers to communicate bibliographic

information to different organisations that use such data: ISBN agency, distributors, sales managers, book catalogues, Internet bookshops, vertical portals, libraries, etc.

The possible DOI application is to allow final users to reach from a single point all the relevant information about a book existing in the Internet under the control of the publisher. The key element for the success of such application is the alliance with users of bibliographic data in order to make directly compatible their information systems with the output provided by a metadata editor.

- Distribution facilities

France: Distribution facilities, gathering information from different sources and managing multi-platform notices or items are strongly supporting standardisation initiatives. They are to be considered as the main force on the market to promote or even require public IDs.

Germany: There is much need to manage the contents in a simple and proper manner and equip them with adequate metadata. Some large companies are currently revising their content management systems and have a very positive attitude towards the DOI.

- Newspapers and Magazines

Spain: Equivalent to the rest of Europe, press publishers are a very proactive sub-sector regarding online publishing on the Internet. Several meetings with the Association of Spanish Press Publishers outlined the rising attention for DOI and its applications, especially after the fact that the most important electronic newspapers are at this time charging for accessing the information via Internet.

France: Business models for e-publishing are actively experimented in this field. The first results show that subscription models and proprietary sites are a reasonable solution to explore the present opportunities. Management and exploitation of archives might be the first domain where publishers of this segment would accept third party distribution, with DOI identification.

- Large multimedia companies

With large online portals there is, on the one hand, the problem that the contents are very fast-moving making any extensive structuring of the metadata not worthwhile. On the other hand, a very urgent problem is the rights exploitation and granting of rights, and also in this connection, the copyright protection. In order to find an adequate solution, however, it will be necessary to combine the application with the versioning control, because, for example, national press agencies tailor their contents to suit the respective customer target group and the customer may pass the contents on in a slightly modified form. Therefore, in this context, the versioning control must be linked with the applications of the copyright protection and the digital rights. There is a strong interest for solution proposals. As the contents are very short-lived, expenditure and costs of course play a significant role.

- Music publishing

The music industry is generally more reserved regarding initiatives coming from outside. In addition to this, the standardisation for data exchange in the multimedia sector is determined by the current

activities of the MPEG 21 Framework. The working group set itself the task of combining all developments, work and standards in an open multimedia framework, in joint cooperation with the other partners. The key issues of this framework are, apart from the object being dealt with (e.g. a video), the producer and the consumer as players on equal footing. In this way, an open, flexible market is to be created which makes it easier for both sides to handle multimedia contents. These activities are based on the ISO and will continue to be monitored by mEDRA in order to establish connecting factors with the DOI.

3. CONCLUSION

In the sector of content producers, who have digital contents on the internet, the market research showed widespread interest in the use of the DOI. It also became clear that several market segments are better prepared for the use of the DOI and could immediately benefit from greater advantages through this use than others.

Generally, the publishers from the sectors STM, University and Educational Publishing are the best prepared for employing the DOI. In Germany there are already several publishers from this sector using the DOI for their digital journals.

The market of educational publishing frequently has to rely on political decisions, meaning that a certain amount of caution is recommended concerning forecasts on the market development. In the sector of adult education and vocational training in companies or in the private sector the situation is different; this is a market that is growing very rapidly.

Other promising markets are the audio book market and the e-book market, whose share in the total sales of the publishers is continuously growing, based on an increasing sales trend. In this sector the DOI is interesting for the harmonisation of metadata, and as uniform ID, which can also support the marketing, in order to make available coverscans, lists of contents or reading and audio tests in a uniform standard, and make them easier to distribute. A further advantage is that these market players have a positive attitude towards digital distribution.

It has shown that companies that solely deal with digital content, or have been working with digital editions of their content for a long time, sometimes have a better understanding regarding the possible use and advantages of the DOI, than traditional publishers who often make a clear distinction between digital publications and publications in traditional media. Traditional publishing sometimes needs clarification of differences between DRM services, security issues and ID functions to assess their needs.

There are basically two main service themes for the content producers: On the one hand, the issue of dealing with rights management concerning the content: this starts with the licence management in the production process e.g. for image rights and also concerns the copyright protection and the rights management in sales, as well as in the secondary market: For this purpose transparent service packages must be offered which can flexibly cover as many different needs as possible.

The other point of issue is the support of sales and marketing through uniform IDs and adequate metadatabases, as well as through distribution of the ID on issues accompanying the content, such as lists of contents, reading tests, audio tests, press releases, viewing samples etc., which can be linked to the basic product respectively.

In addition to the publishers, the distributors also play a major role in the propagation of uniform standards, because distributors have to cope the most with non-uniform IDs and inadequate metadata in their work. It is here that there is a requirement for uniform directories on all issued DOIs.

The development of digitalisation in Europe is currently undergoing a phase of restrained and deliberated reorientation. Now that the first phase of the internet has come to an end - which brought us an huge flood of digital content free of charge, and which then made everyone think that highly qualified content must be free of charge as well - the general attitude is now different. Today the user is prepared to pay for high quality content using simple accounting models. This means that content producers and content managers requiring comprehensive models for content management. In this respect, the clear designation and management of the content is equally important as the management of rights. For this purpose mEDRA will offer intelligent and simple solutions for reaching market penetration in the many different market segments. We shall continue to pursue these goals.