

ELECTRONIC PUBLISHING AT THE END OF 2001

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We present the current three models: traditional, alternative, and subversive, with examples and realisations in various disciplines. We also present a short overview of the debate under way about self-publishing and the proposed methodology. We continue with a presentation of library procedures to take advantage of electronic publishing opportunities in terms of enlargement of the literature collections available to readers. In this perspective we discuss both internal library procedures and external licensing negotiation. Then we shall talk about the emergence of the E-book. We end with a presentation of the impact of electronic publishing within the new Web economy and discuss costs and benefits of the new publishing cycle.

1 History of Electronic Publishing

The history of electronic publishing (e-publishing) is very short if compared with traditional forms of publishing, but full of important events. The very first e-publication came in the 1980s in the form of plain text e-mails. They were sent to the subscriber via a mailing list.

Of course plain text was a rather poor style of presentation and no figures or pictures were available. Also tables and formulas were rather complicated and very difficult to handle in a proper way. In addition, users (read mainly libraries) were committed to archiving the issues locally, thus multiplying the efforts on all sites.

This distribution path was abandoned as soon as new tools became available in the late 1980s and early 1990s.

Later CD-ROMs appeared to be a much more effective medium for e-publishing. Excellent quality, pictures, figures, low-cost support, and long life. This kind of publication was rather successful for a number of years and, for particular publications (encyclopaedias, dictionaries, atlases, handbooks.), is still in use. The CD-ROM has a high reliability allowing the use of many different formats.

However, CD-ROMs soon became unmanageable for libraries when each CD-ROM required the installation of a special client (software to read the CD-ROM) for each publication. Libraries invented various tools (CD-ROM LANs) to multiply the access and to avoid the huge maintenance work involved in installing, maintaining up-to-date, and de-installing the clients.

Then finally in the years 1994–95 appeared the very first e-journals. The first e-journal to be distributed was *Electronics Letters Online* by IEE (Institution of Electrical Engineers). IEE distributed the journal via OCLC. OCLC invented a client, called *Guidon*, to be installed on the reader's station. *Guidon* was an excellent tool, with a very rich functionality, unfortunately not Web-based. It became obsolete as soon as the Web was chosen for the distribution of e-journals.

Web distribution started in 1995–96 and was an immediate success. It was possible to use the rich format PDF, Portable Data Format, to embed links in the text and to start to use multimedia tools.

Now e-publications are already prepared for downloading into PDAs, Personal Digital Assistants; it is a sort of e-book device already present in our pockets for other uses.

A long history in a few years.

2 E-publishing Models

We can recognise today three different models for e-publishing: traditional, alternative, and subversive.

All the most important publishers like Elsevier, Springer, Kluwer, IOP, APS, etc. use the traditional model.

Publishers like HighWire, the *European Journal of Comparative Law*, *JHEP Journal of High Energy Physics*, etc. use the alternative model.

The subversive model is used by other publishing initiatives like arXiv (earlier at Los Alamos National Laboratories, now at Cornell University), *Australian Journal of Human Rights*, the *European Legal Research Archive*, etc.

2.1 General Advantages of E-journals

Before discussing in length the characteristics of the three models, it is perhaps useful to summarise the advantages of e-journals over their previous paper editions.

In addition to the fundamental feature of the electronic availability of the full-text, there are a number of other important features that generate added value to the e-edition.

Almost all publishers offer to subscribers to their journal e-editions some or all of these additional services:

- ETOC, electronic table of content and abstracts.

- A pointer direct to the latest issue.
- An alerting mechanism set to receive messages via e-mail for new articles matching a predefined profile.
- A pointer to the list of papers accepted for publication in future issues.
- A pointer to the list of articles currently in press.

The libraries' OPACs, On Line Public Access Catalogues, exploit these new services making all the links available to the readers. The maintenance of these links is a challenging new task for librarians.

3 The Traditional Model

Almost all publishers currently have their journals available in an electronic edition (there are more than 11,000 titles registered including scholarly e-journals) in parallel, or not, to their paper edition.

The preparation of an e-edition is very close to that of a traditional paper edition. In fact most paper editions were already prepared in electronic form for printing.

The e-editions can be distributed basically in two ways: remotely accessible on the publishers' servers or sent (via ground mail (on CDs or tapes) or by electronic file transfer) to the library site where it can be uploaded, stored, and used locally.

This form of e-publishing is in general very well accepted because of the existence of a parallel, well-established paper edition supported by solid quality control, peer review, and legal deposit procedures.

E-publishing technology is now sophisticated enough to offer an excellent level of readability even on the screen.

The e-edition tends not only to parallel the paper edition but can often add its own values (colour, multimedia, dynamic links, software distribution, etc.) using the features offered by the network technology. When the two editions start to diverge one can even ask if the two editions are not actually two different publications.

Several publishers were, at the beginning, afraid of having their publications electronically available because of the ease of transferring files from one place to another in identical copies. So they tried to make access difficult and in any case solidly connected to the paper edition subscription.

It was common practice to subscribe to an e-journal contract with a three-year rolling window. The access was guaranteed in e-form for three years and

afterwards the reader had to rely on the paper edition. Luckily, publishers eventually became more confident and abandoned the concept of the rolling window moving, at a different pace and in steps, towards the idea of a 'permanent' e-archive of their publications.

More recently, October 2001, Elsevier announced the full electronic availability of their retrospective collection of 1200 journals for December 2002. A giant step towards a fully electronic reader environment. APS and IOP, among others, already reached such a result some time ago. This is an extraordinary event for the scientific information world.

For the publishers not yet able to make all their retrospective publications electronically available, two different projects, JSTOR in the USA and DIEPER in Europe, are ready to create the conditions to make electronic versions of selected journals. Currently the number of titles converted is not very large but it could increase rather quickly.

As all published articles become electronically available, there are new ways to manage them. We can consider the articles as a large database and search them via their metadata and, recently, also via their full-text. We can also imagine moving all the articles into a large unique pot and transforming all the references into electronic links. The reader's environment will be enhanced at a much better access level. This expanded linking capability can be reached using new tools made available by the CERN Library and also by the non-profit organisation CrossRef.

The above articles' reorganisation is called the journals' de-structuring. This is opposed to another new possibility called re-structuring.

Re-structuring is the possibility to select and reuse the published articles in new journals with different coverage. There are now new journals totally composed of articles already published in other journals. The new journals, generally freely available only in electronic edition, are called overlay (or virtual) journals. In this new category there were several announcements made by APS/AIP (four new free titles) and IOP (one new free title) in September 2001.

3.1 The Disadvantages of the Traditional Model

The main disadvantages of the publications using a traditional approach to the electronic edition are the increased costs for the libraries. At the beginning (1995–98) the e-editions were sold with the addition of three different fees to the normal price of the paper edition.

- *The electronic content fee* was a percentage (5–15%) of the paper edition price to account for the increased value of an electronic publication.

- *The platform fee* was a lump sum depending on the size of the library's reader community; this sum compensated the cost of the use of the publisher's server and electronic facilities.
- *The attrition fee* was the most difficult to understand. It was a sort of penalty for libraries with multiple paper subscriptions to the same journal. The fee was applicable to those libraries that, acquiring a licence for the e-edition of that journal, dared to cancel the multiple subscriptions!

In addition, publishers are not easily inclined to make discounts for those few libraries willing to buy the e-edition only.

Of course all the above costs were rather unacceptable for libraries because they were charged with additional costs without any increase in literature coverage while maintaining all the very resource-consuming tasks (check-in, handling, claiming, shelving, binding, re-shelving, etc.) related to the paper editions of their journal collections.

In the last period (2000 and onwards) we have observed a substantial simplification with the e-edition subscription contracts. Platform and attrition fees tend to disappear merging into a unique electronic content fee. The model of platform and attrition fees should evolve in a more objective measure: real usage. They will be completely replaced when real usage statistics are standardised.

The platform fee remains in the form of the recurrent question: "How many professional users has your library?"

The attrition fee remains visible when publishers are not ready to accept cancellations when a library joins a consortium.

4 The Alternative Model

This model is based on the availability of the e-edition only, with the quality level comparable, for the validation and peer-review process, to that of the traditional model.

In general, these publications are based not in commercial houses but in universities or research laboratories where authors, peer-reviewers, editors-in-chief are present and willing to participate in the new way of publishing and where the e-publishing technology is already present as a by-product of the normal documentation and telecommunications procedures.

The Journal of High Energy Physics, JHEP, based at the SISSA laboratory in Trieste is the best example of the alternative model. JHEP is now, a few years after its start-up, *the* journal in HEP theory.

The alternative e-publications face several difficulties.

The most important is to find a self-sustained business plan. Some projects (HighWire Press) opt for a traditional subscription at very reduced cost, others prefer to stay free on the Internet and ask for support from a few big organisations (JHEP^a at SISSA and PRSTAB at the APS). Others explore old and new self-sustaining ideas such as authors' fees (New Journal of Physics) or Web advertising (Encyclopaedia Britannica) with differing degrees of success.

Other difficulties are linked to the need for a reliable legal deposit and long-term e-archiving. The solutions explored are based on CD-ROM or even paper back-up editions and plans to migrate from current technologies to the next ones with safe format conversion.

As a general policy, it is extremely opportune to encourage authors to submit their papers to not-for-profit journals of the alternative model, the freedom to choose any journal is now an unaffordable luxury.

The alternative model works also for e-proceedings, in general they were previously published in (generally very expensive) monographs or journals. Today more and more frequently conference proceedings are published in electronic form only. There are several tools and services available for the deposit of e-proceedings in some specialised places (e.g. JHEP, SLAC and CERN libraries for Physics conferences).

The advantages of the alternative model are of course the limited costs and the large support offered by funding agencies (EU, NSF and SPARC) for new projects and developments in this area. The disadvantages are the difficulties involved in finding solutions to guarantee a long-term life for e-publication. In general, academia is not always ready to support this model of publishing; it is still considered, wrongly, not so valuable as the traditional one.

5 The Subversive Model

This model has the objectives to further cut costs and put pressure on the commercial publishers. There is embedded in the subversive idea also the consideration that the traditional peer-review process is no longer necessary in its present form.

^aJHEP announced in November 2001 a new type of partnership with IOP. The journal will remain free on the network for the year 2002, but will be distributed via a subscription of \$900 from 2003 onwards.

At the same time new forms of validation are being explored (number of contacts, number of downloads, on-line notes, etc.) to speed up the publication process and to continue to avoid loss of time for the readership by not proposing useless articles.

The subversive model takes advantage of the fact that technologies for e-publishing are today available to all authors and readers as discussed in the following paper <http://www.tours.inra.fr/tours/doc/comsci.htm>.

In this model authors are encouraged to self-publish their articles submitting them to publicly available e-archives. Therefore all the articles are first distributed as grey literature.

The editorial boards of 'subversive' journals go to these e-archives and fish for papers to feed their journal content, with or without peer-review (or other types of validation).

These journals are composed only of a TOC, table of contents, with pointers to the selected articles that remain publicly available in the e-archives. Of course, the e-archives offer the possibility to manage multiple versions of the same article.

The advantages of the subversive model of e-publishing are:

- The costs are reduced almost to zero.
- The delay between the availability of a document and its world-wide distribution is reduced to a few days or even hours.

The disadvantages of the subversive model are:

- Long-term availability is at risk (e.g. arXiv moving from LANL to Cornell University).
- There is still a common and unjustified scepticism from academia.

6 The Library Process

In the bubbling e-publishing environment libraries continue to prepare the ground for further advances in access to scientific documentation.

Research libraries continue to collect, process, and distribute a large growing quantity of grey literature (preprints), documents prepared for publication in scientific journals but not yet published.

Almost all modern libraries have prepared paperless circuits composed of electronic submission (from authors and collaborations), electronic processing (upgrading and completing metadata), and full-text distribution via their OPAC, On line Public Access Catalogue.

Libraries maintain the preprint metadata by inputting the so-called publication note. This field describes where and when the preprint has been published. All these library tasks add considerable value to the catalogue. Using different procedures, libraries can also make the electronically published articles available via metadata. Using that service, readers can have access to the preprint full-text as submitted by the authors and, if they have access to the journal, to the published version too.

At the same time libraries can expand their electronic literature coverage via collective contracts prepared within geographical or thematic consortia. This type of contract offers a unique chance to negotiate fair agreements with the commercial e-publishers.

7 Emergence of the E-book

Another form of electronic publication is the electronic book or e-book.

It is necessary to distinguish between the e-book content and the e-book device. The e-book devices are a larger form of current PDAs with extended reading features, both hardware and software. The e-book device is not yet available in convincing, cheap, and practical configurations.

The e-book content can be delivered in various forms: via the Internet, via CD-ROM or via special dispensers in bookshops and stores. For the moment the e-book content is rapidly progressing via the Web only. The other forms are not yet really popular.

The combination of a suitable e-book device with e-book contents should be a very interesting application for professional books like maintenance manuals (cars, aircraft, computers, ...), handbooks in medicine, encyclopaedias, dictionaries, even schoolbooks. Surprisingly publishers are rather pushing for the use of e-book devices for novels where they do not add any advantage (except, perhaps, the weight) over the traditional printed book^b.

8 E-publishing and the Web Economy

We believe that e-publishing is a very interesting facet of the Web economy; it is certainly one of the few that continues to progress even after the disappointment of the Web economy in general.

E-publishing is in a healthy situation and there are still areas to be fully investigated and plenty of room for further progress.

^bRandom House quietly dissolved its e-book company in November 2001.

The benefits offered by e-publishing over the Web are positive for readers, authors, and publishers. The benefits are also enhanced by the decreasing costs in the basic services related to the Web economy: telecommunications, computer processing power, disk storage space, large availability of free software tools, etc.

The main benefits generated are:

- (for readers) easier and greater access, quicker delivery, enormous navigational freedom among linked documents;
- (for libraries) reduced paper processing, shelving, re-shelving, binding, storing, risk of damage and losses;
- (for publishers) enlarged audience, simplified editorial tasks.

9 Conclusions

It is rather challenging to express conclusions in such a shifting environment. However, our day-to-day life spent in scientific libraries in dealing more and more with e-publishing and its usage, leads us to say that:

- There will be more emphasis on the role of pre-publishing (grey literature self-archiving).
- There will be a dramatic contraction of traditional scientific publications available in paper editions. In the future only a few weekly widely diffused journals will remain available, in research environments, also in a paper edition.
- There will be an exponential growth of non-commercial e-publications (e-journals, e-book contents, e-proceedings) particularly where the authors are available (large research labs) and where the e-publishing technology is already in use.