

Looking at E-Journals and Beyond

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Abstract

This paper presents the results of an international and interdisciplinary Delphi survey on the future development of e-journals. The expert panel comprised 45 scientists, publishers, librarians, journal agents and consultants. The survey covered five areas of interest regarding e-journals: (1) future role of scholarly journal literature, (2) scenarios for the journal of the future, (3) serials crisis, (4) archiving of e-journals, and (5) new pricing and access models.

The Delphi survey studied changes expected within the next 5 to 10 years. The results indicate that we are caught in a substitution process wherein other publication and communication channels increasingly take over functions traditionally fulfilled by journals. E-journals alone will not eliminate the serials crisis, but trends and services introduced by new technologies are expected to offer solutions in some problem areas. Archiving will most likely be performed by national depositories, possibly in cooperation with international subject-specific digital archives. Experts expect to see a coexistence of different pricing and access models, with (consortial) licensing and pay-per-use systems taking an increasingly predominant position.

This article is a summary of the doctoral dissertation of Alice Keller¹.

The Delphi Survey

The Delphi technique was chosen as the appropriate method for making forecasts on the future development of e-journals. The major issues discussed in the survey can be summarised as follows:

- ▶ What will be the future role or function of e-journals in scholarly communication and information?
- ▶ What could the (electronic) journal of the future look like?
- ▶ What contribution could e-journals make to alleviate the current serials crisis?
- ▶ How can long-term availability of e-journals be guaranteed?
- ▶ Which new pricing and accessing will gain greatest acceptance or be most commonly used?

Which new technological innovations and developments are expected in the area of electronic publishing?

Having in mind that these changes affect all areas of scholarly communication and take place within a

global market, the expert panel needed to be both interdisciplinary and international. The panel comprised 45 members (10 scientists, 9 publishers, 3 journal agents, 19 librarians and 4 consultants) from Germany (16), Britain (10), the Netherlands (5), the United States (4), Austria (4), Switzerland (3), Belgium (1), France (1) and South Africa (1).

All the questionnaires were dealt with anonymously, and panel members were given comprehensive feedback between the rounds. Of the three questionnaires sent out to all panel members, between 86.7% and 93.3% were returned.

Results of the Survey

These are reported according to the six questions listed in section 1 above.

General Developments in the Field of Scholarly Communication

Looking back at the journal system of the last 50+ years it can be said that journals traditionally fulfil the functions of (1) priority stamping, (2) building a collective knowledge base, (3) distribution and communication of research findings, (4) enabling citation of articles, (5) quality control, (6) reward and recognition, (7) building a community of interest².

Answers from the first round show that experts still allocate journals a key position in scholarly communication. However, it is assumed that in future some of these functions may be taken over by other publication or communication channels.

When these functions are studied in detail, it becomes clear that **quality control** – achieved by peer-review – represents the most important feature of journal literature. The expert panel does not expect the importance of journals in regard to quality control to diminish over the next 10 years. Some even assume that the aspect of quality control in general in scholarly communication will become increasingly more important in the future.

It is widely recognised that journal publication is of great significance in the tenure process. Tenure, which is achieved by **reward and recognition** in academia, is essentially linked to the publication activity of scholars and the quality standard of journals. Therefore, as long as journals remain the main indicator for quality control, scholars will be forced to publish in high-quality journals in order to enhance their career

Experts recognise that **distribution and communication** of research findings can be achieved more quickly and effectively by other services. Journals are renowned for being expensive and slow to publish results.

The Changing Role of the Journal in Scholarly Communication

Most scientists and librarians regard the journal as the most important document type in formal scholarly communication. The journal may, however, lose this leading position if the substitution process described above continues. The panel was asked to consider the following statement: *Peer-reviewed journals (in whatever form) will be the most important form of formal scholarly communication. Is this correct for the years 2002, 2005 and 2010?* The response of the expert panel to this statement is shown in fig. 1.

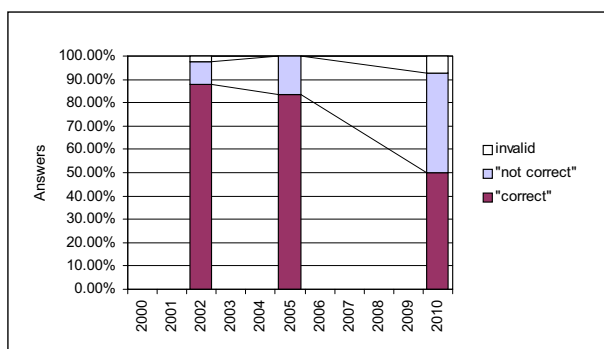


Fig. 1: Peer-reviewed journals (in whatever form) will be the most important form of formal scholarly communication. Is this correct for the years 2002, 2005 and 2010?

Scenarios of the Electronic Journal of the Future

The definition of “electronic journal” put forward by the participants can be summarised as follows: **an electronic journal is a collection of peer-reviewed articles on a related topic which are published periodically and distributed in digital form.** One question in the first round of the survey explored the journal of the future. The panel was required to suggest scenarios. Of the many scenarios put forward, the four most commonly mentioned suggestions were discussed more closely in the second part of the survey. These four scenarios can be described as follows:

- 1 The electronic journal of the future will incorporate multimedia and interactive features and will offer a substantial added value in comparison to today’s journals.
- 2 E-journals will represent customised collections of articles, put together according to users’ personal interest profiles.
- 3 Journals as envelopes for articles will disappear completely. Articles will be tagged with quality labels and stored in large knowledge environ-

ments.

- 4 Articles will be replaced by a stream of dynamic information objects which represent versions of a paper over time.

The panel was asked to assess how likely and desirable each of these four scenarios was. Although nearly all respondents agreed to the first scenario, scenarios (2), (3) and (4) did not show any clear trends. This result may indicate that these scenarios will coexist alongside each other.

The Serials Crisis and Alternative Journal Models

As to be expected, the deficiencies within the current journal system were discussed extensively in the first round. Some experts call it a serials crisis, others a library crisis. Some refuse to use the word **crisis** – because of its negative connotation – and insist on calling the current situation a **revolution**. Some blame publishers for increasing journal prices, others emphasise the underlying problem of information overload and the pressure on scholars to publish. These problems are very complex, and that there are no easy or obvious answers. Despite these very diverse opinions and points of view, respondents agree that **e-journals as we know them today will not eliminate the deficiencies within the journal system.** The experts suggest four areas in which e-publishing and new technologies could offer solutions to the serials crisis, as follows

- 1 **Alternative Access Models in an Electronic Environment:** E-journals offer new opportunities for co-operative licensing, and the experts generally welcomed the opportunity to negotiate journal prices and make co-operative deals. The most important new access model to scholarly journal literature is, of course, the pay-per-view system.
- 2 **New Technologies Support Innovative Pricing Models:** Two models were repeatedly referred to by the panel: the initiative SPARC (Scholarly Publishing and Academic Resources Coalition) and the *New Journal of Physics* (NJP). SPARC launches new, low-priced journals in direct competition to high-priced commercial titles. Although SPARC does not focus solely on online-only journals, the aim is to use new technologies in order to help improve the publishing process and reduce production costs. The *New Journal of Physics* covers its costs by article charges to authors and is available free of charge on the Internet.
- 3 **The Future of Marginal Journals:** As the total number of journals increases steadily, journals become more and more specialized, often addressing only a very small readership. These highly specialized journals are described here as *marginal journals*, in contrast to the heavily used *core journals*. The discussion in the first round indicated that **these marginal journals will be among the first to move to an entirely digital environment.** When asked in which year such a change may

occur, respondents gave the year 2005 (median).

4 **Do-It-Yourself Publishing:** The concept of DIY publishing is based on the realisation that the traditional roles of authors, publishers, librarians and readers are changing in the electronic environment. New technologies, and especially the Internet, make it very easy for all participants to write, publish, distribute and archive articles: anyone can in theory perform all parts of the publication process. There was no consensus whether DIY publishing is desirable or not. One expert reminded us that the purpose of scholars is not to be a publisher, but to concentrate on doing research.

Archiving Electronic Journals

The first round revealed that the specialists have different opinions *about who or which institution should be responsible for archiving electronic journals*. The panel also feared that digital preservation would be more cost-intensive than the maintenance and storage of printed journals. Naturally it is difficult to allocate responsibilities before more is known about the exact costs and long-term implications of digital archives. Many experts mention the necessity of defining international standards for electronic journals (e.g. SGML, PDF, DOI). The adherence to such standards is an important prerequisite for long-term availability and readability of any electronic document.

Of the respondents, half think it “very likely” and 31% think it “likely” that *national depositories, including national libraries*, will assume responsibility for archiving electronic journals. (Not all, however, consider that national depositories are equally suitable for this task.) The second most likely option is that *international discipline-specific archives* will accept responsibility for digital preservation (26.2% “very likely”, 35.7% “likely”). Hardly any respondents consider that publishers are either likely or suitable candidates for this responsibility. Even fewer assume that authors themselves or authors’ institutions will take an active part in preserving e-journals.

The vast majority of current e-journals are digital representations of printed journals. Only roughly 11% of e-journals can be considered online-only titles³. Although it is very important that a solution for the preservation of these 11% is found as soon as possible, the situation seems less urgent for the remaining 89%. *The expert panel does not seem to be basically dissatisfied with the current practice, wherein libraries hold printed versions of e-journals as archival copies*. However, this may change in the near future. Electronic issues offer more features and functionalities than their printed counterparts, and also increasingly include supplementary material which is not part of the printed version.

The survey explored whether this practice of holding print issues as archival copies would con-

tinue, or not. Experts were asked: *In which year will libraries stop subscribing to printed versions of major scholarly journals for archival purposes?* The panel expects that this change will occur in the year 2007 (median), with only 2.6% of the respondents answering “never”.

New Pricing and Access Models

Electronic journals offer a whole new range of possibilities on how to price and distribute articles. You will soon no longer have to subscribe to a whole journal in order to get the few articles that really interest you. Articles can be delivered electronically, individually or in packages, customised to match requirements of different user groups, and possibly with add-on services if required.

Answers from the first round indicate that subscribers and readers will in future be offered a variety of pricing and access models. An analysis of these answers led to the formulation of a scenario that was presented to the panel. The scenario assumes that libraries *will offer unrestricted electronic access to core journals through license agreements (possibly consortial) and pay-per-use access to journals of secondary importance*⁴. When asked whether they agreed with this scenario, 87,2% of the specialists answered “yes”.

The advantages and disadvantages of this scenario were discussed in detail. An interesting question is how often scholars will have free and unlimited access to journal articles, and how often they will need to refer to pay-per-view systems to access their required journal articles. The expert panel was asked to give an answer to the following question: *Consider article access from the point of view of a research scientist in a large university. How many percent of required articles will he have to access through pay-per-use models? (In the year 2003, in the year 2010 and ideally).*

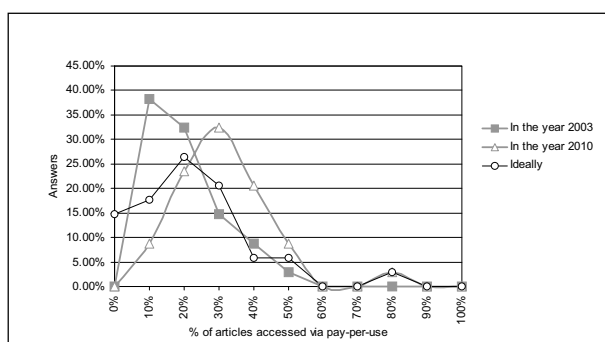


Fig. 2: Consider article access from the point of view of a research scientist in a large university. How many percent of required articles will he have to access through pay-per-use models? In the year 2003, 2010 and ideally?

As the results indicate in fig. 2, scholars will access considerably more articles through pay-per-

use systems in the year 2010 than in 2003. Respondents expect that roughly 30% of the articles required by scholars will be accessed via pay-per-use models by the year 2010. Interestingly, the ideal percentage is estimated to be lower than the expected situation for 2010.

Consortium Agreements

The panel is convinced that more and more licensing will be done in consortia. However, **not all members of the panel are equally enthusiastic about the benefits of consortial agreements**. Many librarians have reached the conclusion that consortia do not solve their financial problems, and publishers are worried about losing print subscriptions and income through such agreement. The panel members were asked to give their opinion on the following statement: *Consortia provide libraries with much more information for their money's worth*. The survey shows that librarians are more critical about the actual benefit of consortia than non-librarians (fig. 3).

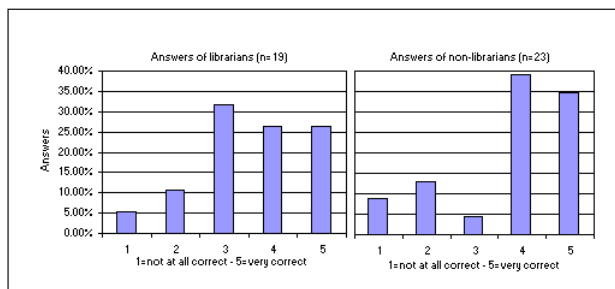


Fig. 3: Consortia provide libraries with much more information for their money's worth. Is this correct or not?

Conclusions

In many areas respondents have very similar expectations and estimates concerning the future developments of e-journals. The panel agrees on the following issues:

- Other publication channels will increasingly prove to be more effective than journals in certain areas. Especially communication and distribution of information – traditionally performed by journals – can be achieved faster and more efficiently by other publication channels.
- Peer-review and quality control remain the most important contributions of scholarly journals.
- The status of the journal as key element in formal scholarly communication will fall noticeably in the second half of the decade.
- Electronic versions of printed journals represent a transient medium. In the medium term they will be replaced by authentic electronic journals, which make full use of the new technologies.
- Electronic journals alone will not solve the serials

crisis. The implementation of new technologies can, however, alleviate the situation in many areas.

- In many cases libraries currently hold printed versions of e-journals as archival copies. This practice will be discontinued during the second half of the decade. As electronic issues often include features and supplementary material not available in their printed counterparts, it is assumed that print versions will no longer be an adequate archival medium.
- Pay-per-use access will become increasingly more important. Libraries will offer unrestricted electronic access to core journals through license agreements (possibly consortial) and pay-per-use access to journals of secondary importance.

On various issues the experts do not agree. They are:

- There is no consensus what the electronic journal of the future will look like. E-journals of the future may be (1) customised collections of articles, put together according to the users' personal interest profiles; (2) simply individual articles tagged with quality labels and stored in large knowledge environments; (3) articles may disappear entirely and be replaced by dynamic information objects that represent versions of a paper over time.
- It is very likely that the journal of the future will not be uniform: we expect increasing product variety and diversification.
- It is not clear who will take the responsibility for archiving e-journals. Two scenarios are possible: archiving can be seen as a national task (national depositories or libraries) or as a co-operative task (with national depositories and subject-specific archives taking the lead and special commercial providers offering certain services).
- The consequences of a widespread introduction of pay-per-use access to journal articles are not yet clear.
- The benefits of consortium licence agreements remain controversial.

If it is considered that there is a variety of possibilities offered by new technologies and diversity of users' requirements, it seems very likely that we will be confronted with a wide range of different publication formats, access systems and price models. From this point of view it would have been wrong if this Delphi survey had only offered one scenario for the future. Librarians will in future be required to choose which titles, services and add-on functionalities they want to offer their patrons. Evaluating these offers and choosing the right option will be a library's greatest challenge for the next five or six years.

An English language summary of the Delphi Survey is given in: Keller, A.: Future development of electronic journals: a Delphi survey. In: *The Electronic Library*, vol 19(2001), no 6, pp. 383-396.

- 1 The full version of the doctoral thesis is available on the internet: Keller, A. D.: Zeitschriften in der Krise: Entwicklung und Zukunft elektronischer Zeitschriften (<http://www.ethbib.ethz.ch/pub/pub2001.html>) or as a commercial publication: Keller, A.: Elektronische Zeitschriften im Wandel: Eine Delphi-Studie. Harrassowitz, 2001.
- 2 See also: Schaffner, Ann C.: Future of Scientific Journals: Lessons from the Past. In: Information Technology and Libraries 13/4 (1994), pp. 239-247.
- 3 This data is taken from the e-journal directory "Elektronische Zeitschriftenbibliothek", <http://www.bibliothek.uni-regensburg.de/ezeit/> (January 2001).

- 4 Each library will, of course, have to decide for itself which titles belong to the core collection and which ones are of secondary importance.

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