

ELECTRONIC JOURNALS: A DELPHI SURVEY*

By Alice Keller

Summary

This paper presents the results of a Delphi survey on the future development of electronic journals. The international expert panel comprised 45 scientists, publishers, librarians, journal agents and consultants. The survey covered five areas of interest regarding electronic journals: (1) the future role of scholarly journal literature, (2) scenarios for the journal of the future, (3) the serials crisis and the electronic journal, (4) archiving of electronic 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 moving towards a process of substitution wherein other publication and communication channels will increasingly take over functions traditionally fulfilled by journals. Digital "doppelgänger" of printed journals are considered a transitional medium and will be replaced by authentic electronic journals that take full advantage of the new technologies. Electronic journals *per se* won't eliminate the serials crisis, but features and services introduced by new technologies are expected to offer solutions in some problem areas. Archiving will most likely be done by national depositories, possibly in co-operation 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.

Throughout their history lasting over 300 years, journals have never been faced with so many changes as they are expected to see within the next 5 to 10 years.

Introduction

In order to study the future development of electronic journals¹ a Delphi survey was carried out. The aim of the survey was to study the following questions² :

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¹ The survey focussed on scholarly journal literature, i.e. peer-reviewed journals.

- Which will be the role or function of electronic journals in the scholarly information and communication landscape of the future?
- What could the (electronic) journal of the future look like?
- Can electronic journals contribute to the elimination of the serials crisis?
- How can long-term availability of electronic journals be organised?
- Which new cost and access models will dominate in future?
- Which new technological innovations and developments are expected in the area of electronic publishing³.

A clear distinction between electronic and print journals is becoming increasingly more difficult. On the one hand many print journals are available in electronic format, on the other hand many electronic journals are distributed retrospectively in print. Bearing in mind this integration of the print and electronic medium, any survey considering the future development of electronic journals will also cover (at least in part) the future of scholarly journal literature in general.

The Delphi Survey

The Expert Panel

The composition of the expert panel has a very great influence on the validity of the results of a Delphi survey. Due to the complexity of the subject matter, it was of great importance that the members of the panel possessed both competence and experience in the area of electronic publishing and scholarly communication. The expert panel comprised 45 scientists, publishers, librarians, journal agents and consultants from 9 nations (**Figures 1 and 2**). Both the interdisciplinary and international character of the panel were considered important issues for the validity of the results.

Figure 1: Professional background of experts on panel

Professional background	Number of experts on panel	
Scientists (teaching or research)	10	(22,2%)
Publishing	9	(,200%)
Journal agents	3	(6,7%)
Libraries	19	(42,2%)
Consultants	4	(8,9%)
Total	45	(100%)

² The full results of the survey including statistical material will be published by A. Keller in winter 2000/2001. This paper presents a brief summary of the results.

³ These results are not presented in this paper.

Figure 2: Geographical background of experts on panel

Geographical background	Number of experts on panel	
Austria	4	(8,9%)
Belgium	1	(2,2%)
Germany	16	(35,6%)
France	1	(2,2%)
Netherlands	5	(11,1%)
South Africa	1	(2,2%)
Switzerland	3	(6,7%)
United Kingdom	10	(22,2%)
USA	4	(8,9%)
Total	45	(100%)

The Survey

The Delphi survey included 3 rounds of questions starting in February and ending in December 1999. After each round experts were sent a summary of the results of the previous round. This procedure provided the required interaction between the panel members. Questionnaires were distributed in English and German. The questions in the first round were very broad and gave the specialists sufficient scope to bring in their own ideas and thereby influence the emphasis or direction of the survey. In the second and third round questions were much more specific and led to quantitative results. Questions focussed on how desirable or likely certain developments were, or in which year they were likely to occur. The time scale in all questions ranged from year 2000 to 2010.

All answers were dealt with anonymously. Inbetween 86,7 and 93,3% of the questionnaires were returned.

Results of the Delphi Survey

The Future Role of Scholarly Journal Literature

The first set of the questions in the Delphi survey dealt with expected changes in scholarly communication and information. Questions focussed on the current and future significance of scholarly journal literature. Will the journal remain the core element of scholarly communication or will other publishing channels take on tasks traditionally performed by journals?

The answers of the panel show clearly that journals currently fulfil a important role in the scholarly community. All functions originally described by A.C.Schaffner are currently still fulfilled by journals⁴ :

- Building a collective knowledge base
- Communicating information
- Validating the quality of research
- Distributing rewards
- Building scientific communities

However, respondents expect fundamental changes in the nature of scholarly information and communication during the next 5 to 10 years. Despite these changes journals will remain vital for quality control in research. According to the experts the significance of the peer-review-process will gain even more importance in future.

In all other areas experts assume that journals will be at least partly substituted by other communication or publication channels. Especially the distribution of research findings can be achieved much more quickly and effectively by other publication forms.

Preprint archives offer significant advantages over conventional journals and are looked on as very cost-effective alternatives to journals. Although the expert panel would in general welcome the introduction of preprint archives in all areas of scholarly research, many consider the lack of quality control a serious problem. The advantages of preprint archives (speed of publication and maximum availability) are clearly not equally important in all areas of research.

Experts assume that the role of journals will fall significantly during the second half of the next decade.

Scenarios for the Journal of the Future

Respondents are generally disappointed that the current nature of electronic journals is so strongly dominated by the tradition of print publication. This digital "doppelgänger" is, however, considered as a transitional medium which will be replaced by real, authentic electronic journals that take full advantage of the new technologies.

⁴ Schaffner, Ann C. (1994): Future of Scientific Journals: Lessons from the Past. In: Information Technology and Libraries 13(4), 239-247.

In order to establish a model for the electronic journal of the future, various scenarios that were put forward by experts in the first round were presented for assessment:

- Scenario (1): Journals will represent customised collections of articles, put together according to the users' personal interest profile.
- Scenario (2): Journals as "envelopes" for articles will disappear completely. Articles will be tagged with quality labels and stored in large knowledge environments.
- Scenario (3): Articles will be replaced by a stream of dynamic information objects that represent versions of a paper over time.

The answers of the panel don't give a clear picture as to which scenario is most realistic. Considering the diversity of user requirements and the differences between different subject areas, it is very possible that the journal of the future will not be uniform. We will most likely be confronted with a variety of publication types. This diversity is, of course, made possible and encouraged by the introduction of new technologies.

The Serials Crisis and the Electronic Journal

Many librarians and scientists have been aware of the limits of the scholarly journal system for years. The exponential growth of information and the annual rise of subscription prices are very frequently seen as the main reasons for the serials crisis. The Delphi survey tried to assess whether electronic journals could help eliminate these problems. Although the experts could not agree on whom to blame for this crisis (and whether to call it a crisis, at all), none of them expected that the introduction of the electronic journal *per se* would solve the problem.

However, the introduction of new technologies could offer solutions in various areas of the serials crisis. The following suggestions were put forward:

(a) Alternative access models can improve general access to journal literature. Members of the panel mentioned consortia, electronic document delivery services and pay-per-use access.

(b) New pricing models could lead to a reduction of subscription prices. Experts are especially positive about the SPARC initiative⁵ This initiative promises to publish lower-priced journals as alternatives to expensive commercial titles. Although such initiatives do not focus exclusively on electronic only journals, it is

⁵ SPARC: Scholarly Publishing and Academic Resources Coalition (SPARC): <http://www.arl.org/sparc/index.html>.

expected that the introduction of new technologies can help reduce production costs and lead to lower subscription prices.

© The serials crisis can be seen as a opportunity to re-think the nature of highly specialised, low-circulation journals. These "marginal journals" are expected to disappear or to be published in an alternative – most likely electronic only – format. Respondents would welcome such a change.

(d) Authors are increasingly able to distribute their findings without the assistance of publishers. There are very diverging opinions concerning this form of "self-publishing". It is not clear what significance this practice will have in future, nor whether such a change is desirable or not.

Archiving of Electronic Journals

If you speak about electronic journals you are bound to be asked about long-term availability. This issue remains unsolved. According to the experts the most important issue is not the question of which technology to use, but how to allocate the responsibilities. The Delphi survey tried to establish the general opinion on which institution *will* or *should* take on the responsibility for archiving these journals, of protecting them against changes and of securing long-term availability.

Two models were put forward. Either the required legal, organisational and financial framework will be established on a national level and archiving will be defined as a national task with national depositories (possibly national libraries) taking a leading role. Or it will be done on a co-operative basis whereby national depositories and international subject-specific digital archives will share the responsibility and commercial suppliers may offer certain services. It is not thought that publishers are suitable archiving partners.

The current practice wherein libraries collect print copies of electronic journals for archival purposes is seen as a valid solution for moment. However, experts think that libraries will stop subscribing to print versions of major scholarly journals for archival purposes by the middle of the next decade. Furthermore, this shift will be encouraged by the fact that the average journal article will have so many interactive and/or multimedia features, that printing it will only convey part of the information content.

New Pricing and Access Models

If you consider the characteristics of electronic publishing you will notice that electronic journals offer us a whole range of new opportunities to define pricing and access models. New opportunities cover direct access at article level, the

creation of customised journals (price differentiation) and the possibilities to bundle, unbundle or rebundle articles to match the users' requirements. Main emphasis of the discussion, however, was on the role of pay-per-use access models.

According to the experts, libraries will in future offer unrestricted electronic access to core journals through license agreements (possibly consortial) and pay-per-use access to journals of secondary importance (**Figure 3**). Not all specialists welcome this development. Some recognise the danger that such systems may discriminate certain user groups. According to the librarians users will have to contribute substantially to the costs for pay-per-use access.

Figure 3: Question: "Do you agree that libraries will in future offer unrestricted electronic access to core journals through license agreements (possibly consortial) and pay-per-use access to journals of secondary importance?"

	Number of respondents	
"Yes, I agree"	34	(87,2%)
"No, I don't agree"	3	(7,7%)
(answers not valid)	2	(5,1%)

The formation of consortia will be a widespread phenomenon. According to the results of the survey, librarians are less convinced than non-librarians that consortia will represent a cost-effective access model for the future.

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