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Published in:
Learned Publishing: Journal of the Association of Learned and Professional Society Publishers

Publication date:
1996

Document Version
Publisher's PDF, also known as Version of record

LEARNED PUBLISHING Vol.9 No.3 July 1996 pp000–000 © ALPSP 1996

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Paper presented at the 12th International Learned Journals Seminar of ALPSP, 'Electronic publishing: the reality', 12 April 1996, London.

ABSTRACT: Gives an overview of the current situation in the development of the Digital Library at Tilburg University, addressing positive experiences as well as problems, and focusing on the online provision of primary information to end-users, both of journal articles and of papers produced by the institution's own researchers. The first results of the electronic use of our Elsevier journals is described, and the policy of libraries with respect to publishers considered.

The Digital Library Programme at Tilburg University[1] aims to provide for staff and students excellent support facilities for teaching, learning and research. From the outset the programme focused on:

1. The provision of electronic information to the desktop, of both our faculty and students, on campus and at home.
2. A campus-wide implementation of the 'integrated desktop': a single computer, connected to the campus network, that provides seamless access to all important information resources and communication facilities.
3. The development of tools for knowledge navigation in order to support the user in locating and retrieving relevant information in the global information environment.

The concept of the integrated desktop is a cornerstone in our activities. Recognition of the power of electronic communication, the increasing importance of electronic information, and changing opportunities for end-users, who have access to information through their desktop computer, was the starting point for Tilburg University to develop and implement the concept of the integrated desktop. Working on one single computer, the user should have easy and direct access to secondary and primary information, to various software packages, and to communication facilities.

In a university environment, the user is a consumer of information, but at the same time he or she is often also the producer of new information, making full use of the present body of knowledge and enhancing this with new ideas and research

Photograph Eileen Storrie

Hans Geleijnse

results. This process should be supported by the library in close cooperation with the computer centre.

Tilburg University's network connects more than 2400 pcs, each of them providing access to locally and remotely stored information. For the students, 450 pcs are available in the library and an additional 350 in seminar rooms. All 1600 staff have networked pcs on their desktop. The power of the concept of Tilburg University is that all of these 2400 pcs offer the same basic facilities: access to library databases, Internet resources and networked CD Roms, access to management information, to software packages, such as word processing, graphical and statistical software, which are licensed campuswide and to facilities such as electronic mail, WWW and newsgroups.

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In 1995 we started to provide electronic access to the Tiff images of the 120 Elsevier journals we subscribed to.

Experiences and problems

Most of these new services have been available since March 1992. The evaluations so far have been very positive:

1. The library is crowded. Students make extensive use of the library resources. Ninety percent of our students regularly use the integrated desktop computers. The library is a meeting point and working place for university students.
2. Most of the electronic services implemented since 1992 are heavily used.
3. Currently, the 'integrated desktop' is not only a cornerstone of the digital library programme, it is widely accepted as a key element in the strategy of the university. It is the basis for IT innovation projects in teaching, learning and administration.

We have also identified some important problems:

1. The most important problem is that it takes more time to integrate new information services into the educational process of the university than we expected. Individual use by students is excellent, but not enough professors make full use of the opportunities provided by the electronic information environment. Many teachers are, so far, reluctant to invest in an innovative approach to the educational process.
2. New services demand more instruction, more training and more user support.
3. A constant concern is the performance of the various services. It is an important daily task to monitor and maintain the facilities, constantly improve things and solve minor and major problems.
4. The open environment in the library demands more regulations on the use of the computers by students (for that reason a reservation system and a time-out system were developed), security measures and clear policies in order to maintain a proper and correct use of the electronic facilities.

From secondary to primary information

Until 1994 the library focused on the electronic provision of secondary (bibliographic) information. In 1991, Tilburg University started its own local Online Contents database with references to the articles of the 1600 most important journals the library subscribed to. Contents pages were scanned and OCRed, and the information was locally stored in a database.

Last year we closed our scanning department. We now rely on the subset of the national Online Contents database maintained by Pica, from which we can download the data that match with our own holding and which we store locally. The data of this Online Contents database are currently being produced by Swets and Zeitlinger.

At Tilburg University this information is partly enriched with abstracts delivered by Elsevier Science (CapCas information), and will soon be integrated with abstracts of our journals on applied computer science, produced by the library staff.

The provision of the full text of the journal articles to the end-users was a logical next step.[2] In 1995 we started to provide electronic access to the Tiff images of the 120 Elsevier journals we subscribed

to. In order to work efficiently with bibliographic data and full-text images, Tilburg University developed the KWIK software in co-operation with Digital Equipment. This 'KWIK' software is based on the Mercury software, originally developed for Unix workstations at Carnegie Mellon University. At our university it runs on pcs equipped with MS-Windows software. Access to this information will change later this year when Tilburg University implements the results of the EU project DECOMATE (Delivery of Copyright Material to End-Users). This project is coordinated by TU, with the London School of Economics and the Universitat Autonoma de Barcelona as partners. The DECOMATE software will be applicable to various local environments and will deal with materials from various publishers in various formats. Z39.50 will be used for the transactions with database servers. The project decided to adapt the WWW browser Netscape as ~~client software for Windows~~pcs.

The full-text database of Tilburg University will be extended with the PDF files provided by Kluwer Academic and Academic Press, and we would like Swets and Zeitlinger to act as an intermediary in the provision of the full text of valuable journals from smaller publishers, since it is too arduous for a library to negotiate with large numbers of relatively small publishers.

Tilburg University currently uses a locally stored reference database and locally stored full-text journals. Local storage is not imperative. It can also be done by the publisher, by an intermediary organization or by another university. In choosing, it is crucial to have fast response times, an excellent electronic file quality both on screen and in printed form, and a cost effective solution.

Another approach is the Dutch/German WEBDoc project coordinated by Pica which provides access to distributed servers (located at publishing houses and universities) through one central catalogue (WEBcat), with a central authorization and accounting system.

This approach could be profitable as an addition to the local services, but I would emphasize the local user demands, local reference databases and local integration of computing services as a starting point. The global information environment requires open and distributed solutions with a seamless interconnectivity since the use of electronic information and electronic communication are not confined to national borders or to heterogeneous (ware-house) solutions of individual publishers or organizations.

Tilburg University and electronic publishing by researchers

Many libraries discuss whether there is a new role for libraries in the electronic publishing of documents produced by the parent institution. The library and the computer centre at Tilburg University currently support the electronic storage and access of grey literature, of research papers produced by university researchers, particularly of the Department of Economics and of CentER, the university's top-ranking institute for economic research. Faculty members produce their papers in hard copy but also supply their electronic files in Postscript to the library, which takes care of cataloguing in the National Catalogue and in the local reference database. Conversion of Postscript files to PDF is carried out by the computer centre. Library staff provide the papers with keywords and make them accessible through the World Wide Web and the local reference database, Attent.

This initiative is to be expanded to a nation-wide project. All universities with Economics departments will co-operate and make most of the economic research papers produced in the Netherlands available through the network. In most cases these papers will have a follow-up and will lead to a 'formal publication', because most researchers still want to be published in the *European Economic Review* or the *International Journal of Game Theory*.

There is a significant gap between the number of viewing operations of the articles and the number of print-outs.

Electronic use of journals

We currently log events in our databases and can generate more detailed information on the use of our services. The Online contents database is a perfect example of an excellent new service that needed some time to play a prominent role in the electronic library services. The number of sessions over the last three years were:

	1993	1994	1995
Online Contents	26,000	28,618	53,039

The Online Contents database (through KWIK) was used in 1995 by 4,468 staff and students.

It is interesting to see how the use of the full-text articles develops. In the year beginning 2 January 1995, ~~1,563~~ staff and students had used the EASE database containing the full-text Elsevier articles linked to our reference database, the Online contents database. The Elsevier titles in the reference database are linked to the full text. In that period the total number of viewing operations was 13,762 (including operations for testing), but the total printouts only 940.

The numbers for the use of the reference database are good, the numbers for viewing, encouraging, and for printing, very limited. However, there are some implicit and explicit limitations in the full use of the Elsevier journals:

1. There is still a lapse of four to six weeks between the arrival of the printed version of the journal in the library and the arrival of the electronic files. This lag will disappear in the near future, but is an impediment to the full use. Researchers, used to immediate browsing of the new issues of their favorite journals, complain frequently about it.
2. The critical mass of the electronic information provided is still limited. The Elsevier journals are less than 5% of the journals covered in our local reference database.
3. The content of the EASE database is primarily of interest to economists (accounting for about 40% of the staff of the university).
4. A significant number of staff have not yet installed the software needed for the use of the database and have not picked up their passwords.
5. We have not yet provided printing facilities to our students.

Although it is too early to have a balanced evaluation of this electronic service, I would like to make some initial observations:

1. It is clear that a good reference database is of vital importance. For most users this is their entrance to the full text. They first scan the abstracts and then decide whether or not they want to look at the full text. Some researchers, however, are focused on nine or ten journals that are in their interest, and just want direct access to the most recent issues, bypassing the reference database which is supported too.
2. There is a significant gap between the number of viewing operations of the articles and the number of print-outs. We understand from additional interviews with some of the users that they use the printing facilities in a very selective fashion. But still, many questions with respect to these figures remain. Further research is necessary.

It will be some time before these new facilities are fully mature and adapted by all users. It is clear that the development towards the provision of full-text articles to the desk-top will soon be a normal service. Top researchers who currently make heavy use of our database are very enthusiastic and want us to proceed in this direction.

Library policy regarding journal publishers

The big publishers are now carefully preparing a change of their usual business, to deliver their journals in electronic form as well as the printed version. Publishers are, however, reluctant to drop the system of printed subscription. This is understandable since it is—or perhaps *was*—a high-potential market.

Various licensing schemes for the deliv-

ery of electronic files, in addition to the subscription to the printed journals, are under development and being negotiated. In most cases publishers demand an additional payment of up to 15% for a licence on the electronic files. They also insist—in various ways—on having information on the use of their journals.

Since library budgets are limited, licensing schemes that ask libraries to pay an addition to the normal subscription price (that increases every year with an average of 10%) will not last very long. Such schemes will encourage libraries to see that only heavily used and top level journals will be a part of a licence agreement. In the long run there are other opportunities than the delivery of an electronic version in Tiff image format of the printed journal or producing PDF or SGML-files from a huge publisher's database. Maurer and Schmaranz[3] stressed, 'electronic journals are (as yet) too similar to their paper-based counterparts. They could contain non-printable information such as animation and sound as an explanatory add-on to the text, making them much more attractive to readers'.

Ginsparg[4] criticizes publishers who are not viewing the electronic opportunities as 'a means to alter, improve, optimize, and streamline communication of research in a fundamental manner'. Irvine, co-chairman of Reed Elsevier,[5] indicated that delivery of and access to electronic files are certainly not the end of developments. He emphasized the power of cross referencing and hypertext links that can be made within Elsevier's archive. Users will be able to browse an article, navigate to the references and have an immediate link to other articles used by the author. Other possibilities will be offered by tailor-made current-awareness services which may also be provided by the publisher using his growing database.

These options will become interesting only when they are no longer confined to the products of one single publisher, but are embedded in an open environment with open connections between articles from different publishers. While each publisher provides access to his own database of his own journals the user will not be properly served.

Another question is whether a library could profitably rely only on remote access to central databases maintained by publishers or intermediary organizations. At this moment my answer to that would be: no. Currently, the network capabilities are in many cases still limited, and communication costs are still significant; but this will change soon. At present, a good performance, the control of user accounts and a proper monitoring system of the use demand local storage of the data.

Electronic publishing

It seems that some researchers are more eager than others to integrate new technological potentials in their work and start making full use of new electronic publishing facilities. The role of publishers is being threatened, as more and more authors are able to communicate with other researchers all over the world electronically about their papers and articles, and to distribute their information through the network.

In universities discussions on the irrational aspects of the information chain are becoming more common. Not only librarians are discussing these issues, but also executive managers of the universities and—in some areas—important authors are discussing the role of the traditional publishers. As Lancaster[6] indicates, 'the academic community has lost control over its research output since the published results of its research are not disseminated by the universities but by the journal publishers'.

The current situation is that researchers produce articles in their employers' time without the employer having any control over the results. Researchers present their products voluntarily and gladly to the publisher and transfer their copyrights.

Publishers organize peer reviews using the efforts and time of other distinguished members of the academic community. The universities must then buy this information back again. So the academic community pays three times.

licensing schemes that ask libraries to pay an addition to the normal subscription price will not last very long

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Tenopir[7] stressed, 'not everyone agrees that publishers should be eliminated in the electronic publishing chain. The advantages and commitment that formal publishing brings are historical and far-reaching. They touch all parts of the publishing process, including the soliciting and evaluation of quality manuscripts; supervising the refereeing function; editing and advising authors of needed changes; copyediting final drafts; disseminating issues on a regular schedule; and protecting copyright. The formality and regularity of the process brings legitimacy and constancy to scholarly journals'.

Tenopir identified two primary motivating factors of scholarly authors:

'(1) recognition for career advancement, including tenure, promotion, and salary increases; and (2) the desire to contribute to the body of knowledge in a field or to the archive of scholarly knowledge in a field and to be recognized for their contribution by their peers.'

These objectives could also be achieved through new ways of networked publishing. Conditions for that are that the electronic journal should be:

1. edited by researchers with international reputation;
2. reviewed by others researchers with international reputation;
3. published regularly;
4. regarded by the academic community as equal to the traditional printed journal.

I agree with Roes[8] when he writes: 'As to the function of quality control, the initiative is with the scholars themselves as they already perform this function in the present day information cycle. If the awareness among scholars grows that the serials pricing crisis is not just a problem for librarians and that the Net offers the potential for transforming the information cycle, then a basic condition for transition will be fulfilled. Libraries today can stimulate this awareness by showing the potential of electronic journals and incorporate them into their information infrastructure ...'.

Access and ownership

At the same time a careful policy of libraries with respect to the high priced journals can be expected. An important aspect is that libraries can get more management information on the real use of journals than ever before. The electronic environment will give libraries (but also publishers) a lot of information on the use of the journals. We can identify which journals are of importance and also might find out that some of the journals are not being used at all. This would provide us with a powerful new management tool. We can—with full confidence—ask the publishers to deliver value for money. We shall certainly find that some high-priced journals are hardly read and are of importance only to a very limited number of users. Management information will be an important input for decisions to take only licences which will be cost-effective and to rely on document delivery at low cost for other journal articles.

In a sensational article, *Forbes Magazine*[5] announced in 1995 that Reed Elsevier would be the first Internet victim because of the increasing importance of networked publishing. Forbes emphasized another threat to publishers, reporting, 'two years ago Louisiana State University's library canceled subscriptions to 1,569 scholarly journals that cost $446,000, of which $88,427 went to Reed Elsevier. In return, LSU's library guaranteed copies of individual articles that any professor or graduate student wanted within two days. Over the next year teachers and students requested 2,092 articles from 936 publications not in the LSU library. The library was able to procure these articles for just $25,000 in copyright and delivery fee', saving $420,000 in one year.

Chuck Hamaker from Louisiana confirmed this Forbes information to me. 'Out of all the cancelled journals LSU ordered articles from in 1994–95 only *one* title showed that we would have been even on the cost if we subscribed, and we ordered 100 articles from that journal!'

For a full understanding of the impact of this decision, it might be helpful to

Asking a copyright fee for document-delivery services on a commercial basis or for document-delivery to commercial enterprises, seems a reasonable proposition.

note that LSU still keeps about 8500 journal subscriptions.

The overall picture is that libraries no longer consider the subscription to many journals as completely logical and undisputed. Publishers seem reluctant to drop the succesful system of journal subscription, but various publishers are now prepared to offer various solutions including direct end-user access to their electronic ware-houses. Above all, they seem determined to win the battle of electrocopying and have revenues in the business of electronic document delivery.

~~Document-delivery services on a commercial basis, or document delivery to commercial enterprises~~, seems a reasonable proposition. Universities, however, will claim that the current copyright regulations which in general permit the occasional production of copies for purposes of research and individual use to students and researchers of other academic institutions will also be applicable to electronic copying.

Library strategy

Libraries will identify their own strengths and weaknesses and decide on their strategy with respect to the ownership and the access to documents according to their own specific situation.

I would like to recommend that university and research libraries should focus on four strategic issues:

1. To provide access to an excellent reference database with bibliographic information and abstracts.

There is no need to make a distinction between printed information and electronic information which will be of increasing relevance. Libraries should focus more on electronic resources which are available on the Internet, making users aware of it, cataloguing and classifying this information. Although various databases can be used, a seamless access to heterogeneous databases can be achieved by using the Z39.50 protocol.

2. To have campus wide licences on heavily used and highly validated journals.

Local storage of these electronic versions of the journals is not imperative. The storage can also be done by the publisher, by an intermediary organization or by another university.

The choice between these options could be determined by the need for:

1. fast response times, since users do not accept a wait of more than a few seconds;
2. a cost-effective solution;
3. keeping control of the management information. A licence agreement without control of the management information by the library is not acceptable.

If journal articles are being used extensively, for instance in an electronic course, I hardly can image that remote access would be a profitable solution at this moment. Perhaps part of the available copyright material should be customized to special local demands and needs.

3. To make careful decisions for which journals the library can rely on document delivery.

Decisions on the storage location of the electronic files are trivial compared to the decisions that libraries will have to make about subscribing to journals, having campus-wide licences on electronic files of these journals, or relying on inter library loan and (electronic) document delivery. The electronic environment can provide much information on the use of the journals. We can demand—with full confidence—value for money.

An increasing number of libraries will found consortia in order to make fair licence agreements with the publishers and to organize shared collection development and electronic document delivery in a cost-effective way.

4. To support in-house publishing. This will be of growing importance because we cannot leave the whole business to the publishers.

Universities should be more aware of the value of their intellectual output This development is inevitable since universities in the next century will develop into

libraries no longer consider the subscription to many journals as completely logical and undisputed

institutions with more cost awareness and more market orientation than ever before.

References

1. Geleijnse, H. and Grootaers, C. ed. *Developing a library of the future: The Tilburg experience*. 1994.
2. Geleijnse, H. Journal articles on the desktop. Elsevier and Tilburg experiment, *Managing Information*, 1994.
3. Maurer, H. and Schmaranz, K. J.UCS—The next generation in electronic journal publishing, *Computer networks and ISDN Systems* **26**, 1994.
4. Electronic discussion: Reply to Subversive Proposal, July 1994.
5. Reed Elsevier—The Internet's first victim?, Forbes, *Business and Finance*, 156 (14), 1995.
6. Lancaster, F.W. The evolution of electronic publishing, *Library Trends*, 43, Spring 1995.
7. Tenopir, C. Authors and readers: The keys to success or failure for electronic publishing, *Library Trends* 43, Spring 1995.
8. Roes, Hans. Electronic journals: a survey of the literature and the Net, *Journal of Information Networking*, 2 (3), 1995.
9. De grensverleggende bibliotheek, De innovatie van de Nederlandse wetenschappelijke informatievoorziening, een verkenning tot het jaar 2000, Rapport van de werkgroep UKB/CvDUR ten behoeve van IWI, mei 1995.

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