

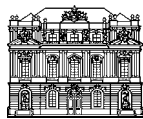
Michael Nentwich

cyberscience

Research in the Age of the Internet

Chapter 9

CYBERSCIENCE: ECONOMIC AND LEGAL ASPECTS



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9 CYBERSCIENCE: ECONOMIC AND LEGAL ASPECTS

This chapter is devoted to two of the classical spheres in which technology assessors would expect an impact of a new technology (cf. already 1.2.4). And indeed, the actual potential shift to E-publishing has both an important economic dimension (9.1)⁸⁰¹ and raises difficult questions in the legal domain (9.2). I have chosen to deal with the two areas together because there are manifold intersections, as discussed in the concluding section (9.3).

9.1 Economics of E-publishing

“The cost per bit of information gets cheaper; yet, the cost per useful bit of information becomes more expensive.”
(Abeles 1998, 608)

The economic aspects of E-publishing are probably the research field with the most contributions in the area of cyberscience, authored both by academics and by practitioners from the publishers and the libraries. First, I shall look at the cost side and compare E- and P-publishing in this respect (9.1.1). Subsequently I shall present the novel charging mechanisms for E-publications and related administrative advantages in digital libraries (9.1.2). Finally, the far-reaching vision of a non-profit academic publishing system will be analysed under the label of “de-commodification” (9.1.3).

9.1.1 Cost comparisons between E- and P-publishing

“Some of the expenses associated with publication may shift from readers to authors.”
(Varmus et al. 1999)

At first sight, E-publishing is less costly than P-publishing. On the one hand, there are three areas, in particular, where E-publishing definitely has an advantage:⁸⁰²

1. *Printing and binding*: Everything to do with bringing the text between two covers can be omitted. This is an entire step in the production chain, which not only involves manpower and machines, but also large amounts of raw material (paper, ink etc.).
2. *Distribution*: Shipping in cyberspace is not done by mailings or freight delivery but via the Internet. Therefore, no freight or mailing costs have to be paid in the case of E-publishing.

⁸⁰¹ Note that in 4.3.2, I have already discussed economic issues of cyberscience related to the efficiency of ICT use in academia.

⁸⁰² For a discussion of the costs of the present system see Odlyzko (1994, 37; cf. also Odlyzko 1997). He includes the implicit costs of intellectually producing the paper as well as estimates of editorial and refereeing work. Little of the explicit costs are in printing and distribution. Other good overviews are Olivieri (1997), Getz (1997) and Okerson (1991a).

3. *Stocking*: The cost of stocking paper (in particular of printed material), e.g. rental fees for depots and manpower, do not apply in the case of E-publishing. These costs account for a considerable share of the total cost.

On the other hand, there are also similarities between P- and E-publishing:

4. *File preparation cost*: Everything before printing and distribution is practically the same in both cases as file preparation today is done on computers anyway (Day 1998, 3). In this context, one may speak of *digital lab cost*, i.e. the cost of preparing an electronic edition after editing and typesetting (Shirrell 1997). While Shirrell argues that this would be something particular for E-publishing only, this is, at the beginning of the 21st century, not the case any more. Today, most printing houses receive files in Postscript or PDF formats – a format also used by E-publishing⁸⁰³ – and do not have to edit it any more: the file simply goes into the printing computer which controls either the laser printer or produces the offset printing plates.

Taking these four points together, E-publishing is bound to be cheaper. However, while this argument holds in principle (see below), it nevertheless needs a number of qualifications. There are a few little “holes in the rainbow” (Regier 1997, 2) to be discussed:

ad 1. *Personal printing*: Today, E-publications are often printed out at the user’s end. While this is generally not accounted for when talking about production costs, they have to be included in a wider perspective. It may even be the case that “(m)uch if not all the savings from having no tangible product will be eaten up in the costs of making it tangible by inefficient methods” (Day 1998, 6). Recently, however, laser printers have come very close to offset and are quite efficient. At the same time, prices for printed books have gone up so that the price per book page is certainly higher than that of a printout. It has been argued that the flight from hard copy to virtual copy will actually increase the amount of paper consumed, the costs of which will be borne either by the individual user or the institution that maintains the user’s computer (Fuller 1998, 138). This argument, however, overlooks the prospect of on-screen reading with the appropriate technology (cf. 2.3.1). But even today, the costs for printing out an E-publication, including paper, are identical to those of copying from a paper original.

ad 2. *Network cost*: While distribution costs for P-publications are not borne by the customer, they are, at least partly, in the case of electronic delivery. The OECD report comes to the conclusion that

“the costs of consuming electronic media are not zero (...) Consumers of science journals are often supported by state-of-the-art networking and computer systems, as well as technical staff. These resources are not free, and many professional users and scientists face difficulties in using electronic media effectively because the social and technical infrastructure of the workplace is underdeveloped.” (1998, 213)

Hence, the savings enjoyed by the publisher are made possible only if the end user, whether a library or an individual, has also invested a hefty sum in making it possible to receive the publication. Hardware purchase and maintenance, Internet connections, software purchases and maintenance etc. has to be considered. Both the scholarly publisher and the end-user alike are dependent upon even greater costs being borne by universities and their libraries (Regier 1997, 2f.). The infrastructure necessary for an E-publishing system, however, exists already, as computers with Internet connection are now standard equipment for researchers. Scholars need them for other purposes, too, in

⁸⁰³ Cf. 7.2.1 and fn. 671.

particular for writing, computing, information gathering and communication. These costs are therefore sunk costs, not additional ones. The infrastructure will only be better used to capacity.

ad 3. *Storing cost*: While it is true that you do not need much stocking space for E-publications, the publisher nevertheless needs the digital infrastructure, that is the server infrastructure to store the digital files. This also includes highly skilled manpower (in contrast to depot workers) that keeps the infrastructure running (system administration). Keeping a server running all the time is not cheap, only uploading another E-publication is (Mueller 2000a, 4). Note, however, that storing the digital files is, in mean time, also standard for print publications, with regard to new editions. Furthermore, this issue is also related to long-term archiving. As it is not to be expected that publishers will guarantee long-term access to their E-publications,⁸⁰⁴ the long-term storing costs will be borne – as in the paper world – by the libraries (see below 9.1.1.4).

Apart from those costs we already know from the print area, there are two types of costs that only appear in E-publishing:

5. *Value adding cost (individual publication)*: E-publications may have different properties as compared to P-publications and some of these properties have to be produced. While it is possible to simply put a text file online on a server, the true advantage of E-publishing is only realised, if these particular properties are added. This means that we have to add the costs of special mark-up and, more generally speaking, of enhancing the text through inserting multimedia, internal and external links, meta-data, content cataloging, translating codes, additional customer service etc. Obviously, the wide range of value-added processes that may be offered with E-only journals “will improve communication, but raise the cost significantly” (Tenopir/King 1998, 22; similar Getz 1997, 4). “Electronic costs” (Whisler/Rosenblatt 1997, 14) may be quite high. If the E-publications “are trying fully to exploit the new capabilities offered by electronic technologies, it seems likely that the additional costs of generating links, specialized formats, etc. will continue to cost as much, or nearly as much, as the cost of printing and binding.” (ibid.) In addition, greater personnel cost have to be added because of new skills demanded for by E-publishing ventures such as project Muse⁸⁰⁵ (Regier 1997, 3ff.).

There are, however, also voices that come to a contrary conclusion. An E-publishing process which uses, from the very beginning, SGML (cf. 2.4.4.1) may actually reduce the typesetting costs, in particular in mathematics, and can offset other additional costs (Shirrell 1997). This method of producing the journal can actually be less expensive than any alternative way of generating the electronic materials needed for the online edition. Modern publishers who offer both online and print products increasingly use SGML.

Obviously, you will have to add costs if you do additional things. A fair comparison between P- and E-publishing would not oppose a standard book with an E-book with full-text search facilities and sophisticated hyperlinks to access the content, but a traditional book with a number of indices, such as name and keyword registers, which are laborious to produce.

⁸⁰⁴ There will be a correlative to “out-of-print” also in the digital world, at least as far as publishers are concerned, cf. 7.4.2.

⁸⁰⁵ <Cyberlink=380>.

6. *Value adding costs (whole system)*: Value adding does not only concern the individual journal article or book, but also the whole information service infrastructure (cf. 2.2.2). There are important economic choices to be made when tagging, for instance, large databases of E-journals with a view to adding value in terms of integration (Getz 1997, 19f.). As Hunter (1998, 2) rightly notes, “intelligent agent’ electronic publishing is expensive”. Furthermore, if we add multimedia and/or gigabytes of raw data, we are likely to get at a bandwidth problem in the future. This could be solved technically for sure (cf. 2.1.2), but at a certain point, E-publishing may become much dearer than it seems now because of the need to provide this new infrastructure (cf. Okerson/O’Donnell 1995, Conclusion).

To sum up, I find that some types of costs are lower or null with E-publishing (e.g. printing), and that there are specific novel costs, which only have to be borne by E-publishers (value-adding to individual publication). Some of the costs are only shifted, at least partly, not dropped (distribution). Hence, we have to differentiate between the publishers’ side and the whole system. The infrastructure (network, value added to whole system, archiving) is developed and maintained collectively by all participants in publishing. As it is a multi-purpose infrastructure, it is not possible to attribute it to E-publishing alone. Furthermore, there are no reliable estimations yet as regards the costs of long-term archiving as opposed to storing paper in libraries (including costs for storage and for preserving paper). Hence a direct comparison is impossible at this point. However, given the technological trend of miniaturisation, on the one hand, and the rising capital costs for storage space, on the other hand, it seems likely that the E-publishing system as a whole will turn out to be cheaper than the print system. In any case, as the infrastructure is in place, there are lower barriers of entry for would-be-publishers, as some of the costs originally to be paid for by them are now in the infrastructure and hence borne by the end-users (or their institutions). By contrast, the additional costs (value adding, storing) are lower than the economised costs (printing, distribution). For the individual publisher, E-publishing is therefore cheaper.⁸⁰⁶

Based on these general considerations, I shall look, in a next step, at the cost issues specifically involved in publishing E-journals (9.1.1.1), E-books (9.1.1.2) and E-pre-print archives (9.1.1.3). Finally, the costs of cybraries and long-term digital archives are analysed (9.1.1.4).

9.1.1.1 E-journals

A number of studies explicitly computed the probable cost reductions for E-only journals as compared to P-only journals. A detailed, though restricted⁸⁰⁷ study compared the costs of journals within MIT Press (Fisher 1997). It finds that direct costs for an issue-based journal are comparable in both worlds, except for the lack of printing and binding costs in the E-world. This study comes to the conclusion that the “overhead costs, however, are higher for the electronic journal because of the addition of \$1,400 per issue in indirect costs incurred for the staff, hardware, and software in the Digital Projects Lab” (ibid., 6). The OECD report similarly⁸⁰⁸ concludes, “that while certain costs, such as printing, fell

⁸⁰⁶ Another important advantage of E-publishing is its potential to rationalise inside the publishing house (Riehm 1988, 16).

⁸⁰⁷ The E-journal compared to a P-journal had only published some ten articles at the time.

⁸⁰⁸ The OECD report seems to quote the same study of MIT Press.

sharply, software costs were substantial; also, they had to engage in greater efforts to market the electronic journals“ (1998, 212).⁸⁰⁹

Many other accounts, by contrast, find that E-journals are less costly than P-journals. A detailed comparison (Odlyzko 1994, 42) comes to the conclusion “that it should be possible to publish scholarly journals electronically for well under \$ 1,000 per article, and probably under \$ 500, without losing much quality” (as compared to his estimate of \$ 4,000 per paper in the print system). When Odlyzko speaks about “losing some quality” he is referring to the lowering of layout quality but points at the “steadily narrowing gap between what an author can produce and what publishers provide”. One editor of both a P+E- and an E-journal, estimates that the savings for E-journals as compared to P-journals will not only be 10-30 % as paper publishers suggest, but “more like 70-90 %” (Harnad 1995, 3). A report on the new online journal JAIR⁸¹⁰ found that it has achieved considerable cost reductions as envisioned by observers (Wellman/Minton 1998, 8).

These results are also supported by the observation that there are many low-budget or no-budget E-only journals published by scholarly associations, which entail practically no direct costs. Only indirect, hardly computable costs for faculty time and for utilisation of free resources available on university servers have to be accounted. With the advances in semi-automated editorial and layout software (cf. 2.4.4.2), faculty time will even be further reduced.

In the case of IMEJ journals with sophisticated multimedia add-ons (cf. 7.2.4.1), the cost of developing them may be high. Such journals are, however, not directly comparable to standard P-journals. A useful comparison could perhaps only be made with high-end journals or even books with lots of high-quality photographs on special paper.

9.1.1.2 E-books

As opposed to journals, there seem to be less direct cost comparisons for book publishing. The tentative conclusion of a short literature survey on cost implications of E-publishing of monographs is, however, is that “for the more simplistic transfer of a printed monograph to an electronic form there may ultimately be savings. For the more sophisticated electronic monograph employing an array of added-value features, there is less certainty.” (Armstrong/Lonsdale 1998, 24) While a 1996 Anderson Consulting Study came to the conclusion that E-publishing is likely to become a strategic cornerstone for economic survival, the former study found in their survey of U.K. publishers that this might not be so in the publishing of electronic scholarly monographs (ibid., 27). A survey among UK publishers found that the main reasons that keep a press from developing an E-publishing program are “cost and funding, staff size and lack of expertise, lack of an appropriate product for an electronic project, and unwillingness to experiment until the benefits of electronic publishing are more apparent” (Siler 2000, 18). By contrast, there are also a number of enthusiastic publishers. None of them indicated that they plan to decrease these programs. Based on general observations concerning product innovativeness, it seems likely that rather newer publishers will be more able to place successful new products such as E-books rather than the traditional publishers.

⁸⁰⁹ Cf. also Whisler/Rosenblatt (1997, 5, 12ff.) from University of California Press who find “no evidence that the emergence of electronic journals will change the fundamental economic problems in the cycle of scholarly communication in the short term, at least with respect to commercial publishers”.

⁸¹⁰ <Cyberlink=457>.

It is perhaps too early to say something definitive about online E-books. In particular in the academic realm, there are only few examples, yet. It seems that the multimedia-enhanced or “heavily hypertexted” E-book would probably cost even more than the traditional book, despite the fact that there is no need to print, store and ship it. Value-added books are, however, the probable destiny of the monographs as discussed in 7.3.1.3 and summarised in 7.3.3. Therefore, direct cost comparisons are not directly possible as we are in fact discussing two different products (similar to the IMEJ journals, [above 9.1.1.1](#)).

By contrast, the offline CD-ROM-E-books share many characteristics with traditional P-books, in particular that they have to be “printed” and distributed. It seems that publisher’s costs will be only marginally reduced and that these benefits may well be overwhelmed by the fall in the number copies sold (Day 1998, 5). Whether the alternative to traditional P-publishing, print-on-demand (PoD, cf. 2.4.4.4), is an economically viable solution for the first printing of a monograph seems less likely, only for additional printings.⁸¹¹ By contrast, others regard PoD as a highly attractive and cost-efficient interim solution at the beginning age of cyberscience because “production and distribution costs are not incurred until an actual sale, and advertising and marketing can be ignored: the global niche of scholars who do [speciality x] can be expected to spread the word among themselves” (Mueller 2000a, 4).

9.1.1.3 E-pre-print archives

Does E-publishing in the form of E-pre-print archives scale up (Okerson/O’Donnell 1995)? If the academy moves from the traditional system to a system of self-publishing, as proposed by Harnad and others, will it still be as cheap as it looks now, from the perspective of limited experiments (*ibid.*)? Given the overwhelming success of these archives, both in terms of submitted papers and download access (cf. in particular 7.1.2), the answer seems to be a definitive yes. Note, however, that the US government (NSF) and various universities around the world (which host mirror servers) directly support the physics archive arXiv⁸¹². Direct public or university funding is also true for probably all other archives around the world. The direct costs are, however, not big because, first, it is a typical network infrastructure product whose cost are borne collectively and distributed world-wide, and second, because authors themselves do everything having to do with production (formatting etc.).

9.1.1.4 Cybraries and long-term archives

Financial aspects at the receiving end will have to be faced, too. I have already mentioned that some parts of the costs of E-publishing are borne by the readers and their institutions (cf. 9.1.1). In particular, the cost for sustaining the network is important, but not only related to E-publishing. The libraries’ current budgets seem “largely insufficient to the tasks required” (Dementi 1998, 3). The changing nature of scholarly communication and the fact that new mechanisms must be employed to insure future access to materials would have to lead to a redeployment of resources (*ibid.*, 4). However, worldwide net gains should be possible, as it is not to be expected that co-ordination costs would eat up

⁸¹¹ Day argues that “(d)espite Nicholas Negroponte’s frequent arguments for sending bytes rather than shipping atoms, actually shipping atoms is not expensive and when time is not of the essence, central production and worldwide distribution of the book still offers the lowest costs” (*ibid.*, 4).

⁸¹² <[Cyberlink=216](#)>.

all economies due to dropping redundancies (meaning that not each and every library would be responsible to hold each item, as it may be made available in the network at distance, cf. 7.4.2). Libraries' costs in the digital age are computed, for instance, by Whisler/Rosenblatt (1997, 7ff.). This study comes to the conclusion that libraries and their parent institutions, universities, should be able to avoid some of the capital and operations costs associated with print-based dissemination of scholarly publications with a view to reallocating these economies to: "capital investments in technology; provision of additional information resources available to the academic community; service improvements within libraries; and restoration of control of the system of scholarly publishing to universities and scholarly societies rather than the commercial sector" (ibid., 11). The administrative advantages of electronic holdings of a library are as follows:

"instead of a library maintaining one copy of a work that can be read by one person at one time, the work can now be read by an entire campus simultaneously;
 instead of having to search for a location and hope that a work is not checked out or misshelved, a user can find the full text at the instant it is identified;
 the work can be read in the context of a large and extensible congregation of journals, including back issues, each as easily accessible as the first;
 the work is capable of being transformed without disturbing an original copy; pages can be copied without being ripped out; students can make copies without complaining that the photocopier is jammed or out of toner;
 the work can be electronically searched; [and]
 there is no worry about misplacing the work or returning it by a due date"
 (Regier 1997, 4).

This suggests that libraries will "spend a little more to be able to offer a lot more content, expanding their holdings geometrically while increasing their costs arithmetically" (ibid.). Note, however, that some of these advantages rest on the assumption that the contractual obligations or technical measures do not forbid or hinder copying (DRM, cf. 9.2.1.2).

Besides the current business of future libraries, the task of *long-term archiving* is even more costly. As opposed to paper archiving, which basically involves the (all but low!) cost of maintaining big enough shelf space surrounded by tempered air, digital archiving generates manifold cost categories. For digital long-term archiving, very little space is needed to situate your computers, but you need the computers, the software and skilled experts to run the system. While you could leave a paper-based archive alone for a long time without much attention, the situation is different with digital archiving. Computers have to be replaced at regular (and rather short) intervals; software needs to be updated and perhaps even newly developed; storage media have to be replaced from time to time for data security reasons etc. All this will involve a lot of human resources, too. In this context, note that also non-profit ventures (like e.g. the journal archiving/digitisation project JSTOR⁸¹³) are still entrepreneurial in the sense that they "face almost all of the same risks as for-profit start-ups and the same tough questions must be asked before moving forward" (Guthrie 1997, 3). The following six basic categories of costs can be listed: production (including quality control), conversion (OCR, meta-data etc.), storage and access, software development (migration of data), user support, administration and oversight. Although a number of projects are under way (cf. 7.4.2), there seem to be no serious numerical estimates yet as regards long-term archiving, at least not in published

⁸¹³ <Cyberlink=322>.

form. However, in the framework of the British CEDARS⁸¹⁴ project, the various cost categories are listed and discussed (Granger et al. 2000). This contribution starts with stating that “there is an accepted or perceived wisdom within the library community that it will be more expensive and more intensive than preservation of traditional library materials” (ibid., 1).

9.1.2 Charging mechanisms for E-publications

In the world of P-publishing, three models of charging the readers (respectively their institution or library) are used in general: they could either buy the individual item (book or journal issue) or subscribe to a whole series in advance (mainly with journals, also loose-leaf); the third alternative is free publications (mainly newsletters, working papers, some types of project reports). While these possibilities are still available in a digital environment, there are additional novel charging mechanisms, see Overview 9-1.⁸¹⁵ Note that all of these mechanisms are possible, in principle, for both books and journals.

CHARGING MECHANISMS FOR E-PUBLICATIONS

- Fixed fee (annual subscription charges)
 - Web site or campus licensing or subnet model (access depending on IP numbers)⁸¹⁶
 - Individual licensing
 - IP number
 - Individual user IDs and passwords
 - (either for site or for software to access/decrypt files)
- Unit pricing (pay-per-view/look): sliding scale of charges according to the degree of information accessed⁸¹⁷
 - Per article, chapter
 - Per number of pages or searches
 - Per access or view time
- Free of charge
 - Addendum to something else (e.g. P-version)
 - Abstract and bibliographic data only
 - With banner advertisement⁸¹⁸
 - Subsidised model (free for users, subsidised by universities or scholarly associations)
 - Article-processing charges

Overview 9-1: Charging mechanisms for E-publications

⁸¹⁴ <Cyberlink=745>.

⁸¹⁵ The following is a synopsis of various contributions to this subject (Armstrong/Lonsdale 1998, 57f.; Getz 1997, 7f.; Whisler/Rosenblatt 1997, 13ff.; Luther 1997; Franks 1993; MacKie-Mason/Riveros 1997; Fishburn et al. 1997; Brüggemann-Klein 1995, 178; Hunter 1997; Guthrie 1997, 5f.).

⁸¹⁶ Cf. 2.3.4.2.

⁸¹⁷ Or: non-linear pricing schemes (MacKie-Mason/Riveros 1997).

⁸¹⁸ Cf. 9.1.3.3, ad (1).

Obviously, publishers are much more flexible and have many more options at hand. In particular, individual access to particular files or access for a specified period only can be granted and charged. This development has been described as “from the paper- to the pay-per-society” (Mittler 1996, 78, quoting an American librarian). Furthermore, the product remains, in general, on the server of the publisher and is only delivered as soon as the reader requires access. This change has been depicted by saying that we move from “just-in-case” to “just-in-time” delivery, or from the “delivery principle” to the “claim principle” (Brüggemann-Klein 1995, 178). In addition, unbundling and re-bundling becomes possible: The publisher may make unusual packages of components of conventional products (for instance, not whole journals, but only the review sections). Bundles could even be user-customised (MacKie-Mason/Riveros 1997).

9.1.3 (Re-)De-commodification of academic publishing?

“The electronic medium will only give greater accessibility if the current commercial model is abandoned for a model that permits all students, faculty, and researchers access if they have a personal computer, telecommunications connectivity, equipment, and software available to them. The physical limitations of paper are indeed an impediment to access, but the single greatest impediment to access to scholarly communication, whether it be via paper or the Internet, is price.” (Morton 1997, 6)

The output of research can be regarded from three sides. Beyond any doubt, its primary function is as a contribution to scholarship on which future research can be based (cf. chapter 7). Second, the output converted into publications plays an important role in the academic career of individual researchers. The so-called “record” often forms the basis of assessments for hiring or tenure (cf. 8.4). From a final point of view, research output in the form of publications can also be regarded as a commodity. This will be looked at in depth here.

For sure, there are considerable differences among the disciplines: mainly in the STM (science technology medicine) disciplines, research is often very close to application and hence particularly marketable. But also in the humanities publications are regarded as trade objects – a view with unintended consequences.

Many academics readily assign the copyrights to the publishers because they do not view their articles as valuable commodities. Others tend to do the same because they want to get published in the prestigious journals and therefore must obey the ‘rules of the game’ as developed over the last decades. As a result, the publishers have gained the right to sell the publications under their own (commercially oriented) terms. This is often in contrast to both the interests of the individual researcher and of the scientific community at large. In particular the interests of the universities need to devote ever-larger shares of their library budgets to buying back their faculty’s material previously given to the publishers.

One option is to frame the issue in terms of an ideological difference between the main intermediaries in the scholarly information exchange process: libraries and publishers. The fundamental ideological question would be “whether specialized academic information should be understood as a commodity, intended primarily for (and judged in each

case by the extent to which it succeeds in generating) revenue – or whether access to scholarly information is a social good that must be freely available” (Atkinson 2000, 62).

This section is structured as follows: first, I distinguish three phases of scholarly communication (9.1.3.1) to set the scene for a description of the current developments. I describe the crisis of the existing system in phase II (9.1.3.2) and then systematise the various initiatives to change the status quo with a view to shaping phase III (9.1.3.3). Against this background, 9.1.3.4 assesses whether these initiatives are doomed. Or do we have to expect either a split system – partly commodified and partly de-commodified – or a uniformly de-commodified one in the medium run (summarised in 9.1.3.5)?

9.1.3.1 Three phases of scholarly communication

Seen from the viewpoint of the relationship between scholarly publications and the market, I distinguish three phases of scholarly communication (Nentwich 2001): the original state of greatest possible distance, the system of commodification and, finally, the present partial counter-movement. Note that these phases are certainly not clear-cut in the sense that one may give an exact point in time when one phase is over and the other has started. For my analytical purposes here, it is nevertheless very useful to contrast these three phases to highlight their main characteristics.

PHASES OF SCHOLARLY COMMUNICATION

- Phase 1: De-commodified system with journals and books supported by the scholarly institutions
- Phase 2: Commodified system with strong commercial publishers
- Phase 3: Re-de-commodified system with non-profit E-publishing sustained by the scholarly community

Overview 9-2: Three phases of scholarly communication

The *first* phase is characterised by the advent of the early academic journals in the 17th century. It institutionalised and generalised the earlier (pre-Gutenberg) system of written scholarly correspondence among individual scholars and exchange of *manuscripts*. The first journals ever were published by the Académie Française in Paris and the Royal Society of London for the Promotion of Natural Knowledge in 1665. The previous form of „letters“ to the Academy or letters exchanged bilaterally among scholars still heavily influenced these publications. The important point to note here is that it was scholarly associations (academies and societies) of the state (the King) which supported this new system. As it is still the custom today, national scholarly societies and academies exchanged their respective series. Scholarly publications were not yet treated as “commodities” but heavily subsidised by the scholarly institutions until the 1960s. Authors sometimes got paid for writing books but, at this time, this was more like a grant system to support researchers, rather than an exchange of goods for money. Scientific societies published most science journals, but some were published by other non-profit institutions such as universities, museums and governments. Commercial publishers were not at-

tracted to the field because there was little potential for profit (Walker 1998).⁸¹⁹ The same holds true for the university presses, which started to print scholarly books only shortly after the invention of printing from movable type in the late 15th century. Oxford University Press, for instance, already started printing in 1478. The presses' explicit goal was not primarily to sell books, but to advance scholarship through making the research results available to fellow scholars.

The *second* phase rests on an increasing role of the "market"⁸²⁰ and so-called trade-publishers since the beginning of the last century. Elsevier Science, for instance, has been in the business for more than 100 years. The great time of these new actors came in the 1960s (Walker 1998) and they proved to be very efficient in turning scholarly output into commodities. For sure, this development has not taken place at equal speeds and with similar success in all academic disciplines. In general, however, a large part of academic publishing is in the hands of the private sector today. The noteworthy characteristic of the present situation is the fact that scholarly authors normally give their to-be-published works away for free, or almost free, to the commercial publishers which, in turn, sell their final products back to the universities and their libraries at increasingly high prices. This has led to the so-called "serials crisis" or "journal crisis" (i.e. ever higher prices while library budgets were continually reduced, see 9.1.3.2) with regard to mainly journals in the STM sector, which stretches to other disciplines and the humanities book market.

Consequently, in the beginning of the 21st century, it seems that the second phase is giving way to a *third* one. It is not yet clear which shape it will exactly take, but it features, at least partially, what I call "de-commodification" or, with regard to the first phase, "re-de-commodification" since it might reinstate the original, de-commodified situation. ICT have brought about new opportunities, in particular E-publishing in the form of E-journals, E-pre-print servers (self-archiving) and self-publishing (cf. 7.2.4). E-publishing potentially improves the economic situation of non-profit journal publishers (cf. 9.1.1) and opens up the possibility that the academic community re-appropriates the publishing business. In other words, the Internet has the potential of establishing a counter-market to the commercially oriented information market (Frisch 1996, 371).

On the one hand, libraries try to pool their resources and purchasing power in consortia and thus stay within the present paradigm. On the other hand, academics, scholarly associations and libraries set up free E-print-servers and open archives as well as non-commercial E-journals and other free knowledge resources in the WWW. Such central databases owned by the relevant community fall outside the normal circle of economic competition (Bourguignon/European Mathematical Society 1999, 115). In other words, a parallel infrastructure seems to be emancipating itself from strict commercial considerations, facilitating various forms of non-profit knowledge circulation. Some of them appear to be similar to those preceding the advent of strong commercial interests in the academic publishing market. Others are quite different from the original system, due to the new opportunities provided by current ICT.

⁸¹⁹ Rothblatt (1985) gives an interesting account of the beginnings of market influence in 18th and 19th centuries' science.

⁸²⁰ On the notion of science (in general) as commodity see, for instance, the contributions in Gibbons/Wittrock (1985). Here, I shall focus on the publishing system in particular.

9.1.3.2 The crisis of phase II

“The fixed costs of preparing a monograph for publication have always been high and they have always had to be recovered from a small market base.”
(Givler 2000, 3)

The crisis in the scholarly publication system (known as the ‘*serials crisis*’) “has been well-known for almost two decades” (Whisler/Rosenblatt 1997). Increased prices of journals and books lead to cancellations of subscriptions and reduced orders, which lead to higher prices because less subscribers pay less while the production costs stay the same. This, again, leads to cancellations and higher prices (Okerson 1997c; Pew Higher Education Roundtable 1998; Frisch 1996, 362ff.). Another source of this vicious circle is the increased focus of commercial publishers on shareholder value. As some argue, “the partnership between (...) academia and commerce is now breaking down” (Owen 2000, 2). At the same time, library budgets are under pressure. In Germany, the funding of university libraries increased only marginally (nominal 1,3 % from 1991-97), but the prices of journals went up 27 % in the humanities and social sciences and even 77 % in the natural sciences. In the US, the average price of a journal increased by 169 % from 1987 to 1997, much more than the inflation rate. As compared to 1987, all libraries organised in the Association of Research Libraries (ARL) had to pay 124 % more for 7 % less journals in 1997. In the same year, Elsevier made a profit of € 365 million with a turnover of € 910 million (Sietmann 1999, 216; cf. also Bär 1999; Okerson 1997c).

Atkinson (2000, 63) formulates the dilemma in terms of agent-client relationships and argues that the “primary clientele of publishers are their owners – often shareholders⁸²¹. When it comes to making decisions between the two, publishers will inevitably, understandably, and justifiably make those decisions that are in the best interest of their primary clientele.” He rightly points at the possibility of a severe aggravation of what we have observed as the traditional serials crisis⁸²² through information technology, which greatly enhances the control of access to information: “If it is in the primary client’s best interest for the publisher to use that control to restrict access to needed information as much as possible, in order to make such information scarce and to drive up its price, then that is exactly what will happen”. On digital rights management see 2.3.4.2 and 9.2.1.2.

The market only partially fails to provide the services necessary for scholarly communication since, at least, some science journals (still?) sell well and do not rely solely on the academic demand (Thatcher 1996, 201). The market fails in particular outside the natural sciences: in the humanities, books cannot be sold in high enough numbers to make profits (e.g. Wasserman 1998); the same is true for most social sciences. By contrast, a large majority of academic books that are not in the English language have a far too small market and hence only get printed on the basis of print subsidies. But even in entomology, a rather small biological discipline, “the cost of subscription-financed commercial publication was contributing heavily to the serials crisis” (Walker 1998). The above differentiation overlooks, however, that books and journals in *all* fields are in crisis: science because of high prices, humanities/social sciences because of too few sales. There is, however, another danger involved: the “crowding out effect” (Whisler/Rosenblatt 1997, 5): STM journals would eventually crowd out other, lesser-used journals if their prices increase

⁸²¹ Note, however, that some of the large publishing firms are still owned by individuals or families (e.g. Bertelsmann, Springer), not by shareholders. The result is often the same.

⁸²² Which, by the way, has nothing to do with the advent of E-publishing.

more than those of other serials and monographs and if library budgets increase less than serial prices go up. At the end of the day, scholars may publish in “write-only journals” (Denning 1996), i.e. journals they do not subscribe, nor do their institutions and libraries.

It is important to note that the crisis is not only a journal crisis, but also a *book crisis*. In particular in the humanities and some social sciences, the potential readership of specialised books is all but sufficient to sustain their production. The scholarly monograph can be defined as “a book intended for specialists that has no significant course-adoption potential at the undergrad level, and that about 200 libraries will buy” (Wasserman 1998). This means, “if a publisher expects a book to have at least some course use, it is not a monograph” (ibid.). It seems that publishers are turning down more books than ever solely because they would not sell. A detailed analysis of all cost-cutting strategies and of the costs and revenues involved in publishing a monograph as defined above comes to the conclusion that “(t)he revenue we take in through sales is simply too low to cover our costs” (ibid.). Is the printed monograph no longer an economically sustainable form of publication? According to Givler (2000) from the American Association of University Presses (AAUP), the core library market for a research monograph in the social sciences and humanities in the US has shrunk – on average, that is there are specialities with still much lower sales – from still 1200-1500 hardback copies in 1980 to 600-800 in 1990 to only 200-250 in 2000, plus 600 to 1400 paperback copies. “It’s just possible to break even on sales at the upper end of those ranges, but at the lower end they are a guaranteed loss” (ibid., 4)⁸²³, hence “the monograph is indeed endangered” (Darnton 1999; similar Bennett 1994, 244).⁸²⁴

To sum up, this means that near-comprehensive access to the products of academic knowledge production is no longer guaranteed in the sense that raising prices make it less and less certain that a particular item can be found in any one academic library. Document delivery and online full text databases only partially solve the problem as they make it easier to get remote access, if the local repository is not able to deliver, but costs are again a problem. The commercial exploitation of academic knowledge by commercial publishers seems, however, to have reached a watershed. Increasing numbers of academics no longer acquiesce this erosion of the foundations of academic communication.⁸²⁵

9.1.3.3 The developments towards phase III

The transition period between phases II and III is characterised by a number of developments, initiatives and changes presented and analysed in the following. On a general level, the new forms of “Internetonomics” will play a role (1). Furthermore, what one may call the “Open Movement” is of importance here (2). Subsequently, we have to take account of a number of top-down initiatives with the explicit aim to bring about phase III (3), followed by bottom-up initiatives heralding phase III, namely self-publishing, public self-archiving and central, comprehensive digital archives (4). This sub-section will be closed by an analysis of the process of re-definition of roles of university presses and libraries (5) as well as of academic associations (6) influencing the transition to phase III.

⁸²³ Note that for non-English books, the markets are even considerably smaller. Therefore, it became almost impossible to publish, for instance, in the German-speaking academic world without so-called “print subsidies” which relieve the publishers practically from any commercial risk.

⁸²⁴ As to the economics of infrequently used scholarly monographs in general, see also Bennett (1998) and Day (1998).

⁸²⁵ One arena of the ‘battle’ are intellectual property rights issues (cf. 11.2.2.1).

(1) "Internetonomics"

As E-publishing takes place mainly in the Internet, we should not be surprised to see that the emerging novel ways both of doing business ("E-commerce") and of developing software will influence the development of academic E-publishing, too.

While this is not the place to profoundly analyse this fast evolving field, I shall nevertheless make a few comments on the new economics of the Internet age.⁸²⁶ As Getz rightly points out, "the freebie culture that launched the Internet represents only a subset of a much wider range of possible uses" (1997, 2). We can distinguish three "models" of making money in the Internet. In the first model, the Internet is a *shopping window* with the sole purpose of "being present" in this "hip" modern medium. Many firms' homepages worldwide are but advertisement with a contact address. Here, E-mail or web forms are only used to establish first contacts and/or to provide information. Practical business, however, is done outside the Internet via the usual channels. The second is trying to transpose the economic models of *distant selling* businesses to the virtual world. Many enterprises in the sectors of computers, books and music offer their Internet customers the opportunity to order (and in some cases, e.g. with regard to software or information services, to be delivered) in this medium.⁸²⁷ The third model, although also often trying to sell goods and services, lives mainly from *selling advertisement space*, so-called "banners", on Internet homepages. In order to achieve a good price, the page has to be highly attractive and generate much "traffic", that is many surfers should be attracted by the content. In other words, it is neither the information about a business (as in the first model), nor a product or service (as in the second case), which are directly sold. By contrast, the main content of the web site only serves to generate "page hits" which, in turn, are the basis for the core business, which is selling the web space for advertisement.

In all three models, often (parts of) products or services, mainly information about topics of interest are given away for free with a view to attracting people ("gift economy"). The "attention economy" (e.g. Goldhaber 1997; Burg 1999, 122) is not characterised by selling the rare and unique and exclusive because there is too much information anyway, but instead by the need to get attention. There seems no way of telling whether the gift economy model will be sustainable in the long run. From a provider perspective, Lejeune describes "one of the most difficult problems facing any business operating on the World Wide Web today: Users believe that information on the Internet is supposed to be free, no matter how much it costs to put that information online." (1998, 3)

Academia, partially, functions similarly: Scholarly homepages (both of institutions and individual researchers) fit the first model. Their purpose is to distribute information about oneself, not least with a view to being commissioned with research projects. Most publishers are experimenting with the second model, that is, they are trading journals and books via the Internet. There are examples of publishers putting up the full text of (some or even nearly all) their books, in HTML or in page images, making them available without charge, and seeing no drop in sales: "(I)n fact, [they are even] seeing the opposite (the 'selling more by giving it all away' approach). That has been our experience at the National Academy Press." (Jensen 1998, 3)⁸²⁸ Some publishers experienced that mak-

⁸²⁶ See, for instance, the study of Internet economics by the European Communication Council (Zer-dick et al. 1999; see also A. B. 1999).

⁸²⁷ For books, see e.g. AMAZON, the big virtual bookstore (<Cyberlink=795>).

⁸²⁸ Another example is Bartleby.com providing for access to all the E-books for free, while at the same time offering them for sale in print (<Cyberlink=358>).

ing all back issues of a scholarly journal available online for free led to a much smaller decline of institutional subscriptions than other journals which did not implement this policy in the same period (Walker 1998). Finally, some of the information services in the academic realm function according to the third model.⁸²⁹

There is, however, an even more important, rather ideational similarity between the academic publishing system and Internetonomics. The Pew Higher Education Roundtable described the present system as a “gift exchange among a community of devotees bound by a common interest; the giving of such gifts is intended to win the regard of other members of the community” (1998, 3). Some coined the term “Socratic realm of dialogue” (Okerson/O’Donnell 1995, Conclusion), meaning that there is no real market for what is happening in the scholarly WWW. In addition, since the 19th century, “the users and buyers of scholarly information have participated in two different exchange systems, buying information from a market economy but using it within a gift-exchange economy” (Chodorow 1998, 5). To mark the difference between “trade” publishing, i.e. text written to make money, and scholarly publishing, Harnad coined the term “esoteric literature”⁸³⁰. The criteria for this type of publications are as follows:

“(1) (T)he authors are not paid for their texts and (2) the ‘market’, in terms of individual readers per article, is infinitesimally small. To this, one might add that esoteric authors not only do not expect or want to be paid for their words, but they are so eager to reach the eyes and minds of their tiny fellow-specialist readership that (3) they are often willing to pay to do so, by purchasing and mailing reprints of their articles to those who request copies (and some who do not); in some fields they also pay page charges to accelerate the publication of their work.” (1995, 2)⁸³¹

The free-of-charge culture can, however, not be sustainable in each and every respect because, at the end of the day, producing scholarly publications is not cost free (cf. 9.1.1). In the environment of a gift exchange society, the individual producers of knowledge, however, “experience none of the direct consequences of market failure” (Pew Higher Education Roundtable 1998, 3). E-only journals, especially produced outside a commercial framework, “would appear to have a better chance of providing a full service free of charge, but this is misleading” (Hitchcock et al. 1996, 10). While some good journals are being produced at very low cost, this could not scale to support the publication of all scholarly papers. In this view, it is “not realistic to expect the necessary people to work, long term, on these journals at no cost and achieve the required standard or quality”. There are costs (probably substantially lower than the cost of producing paper journals, cf. 9.1.1.1), and ways must be found to cover them. One option is institutional support (cf. also below 4 and 5) “since the College gets considerable exposure for what seems to us a

⁸²⁹ E.g. the online dictionary service LEO, managed by the Technical University Munich (<Cyberlink=767>), or the HighWire full text archive of the sciences and medicine by Stanford University (<Cyberlink=223>).

⁸³⁰ “Esoteric” here (“marginal”) should not be confused with what is understood to be “esoteric” in general (e.g. astrology).

⁸³¹ Fuller strongly opposes this view of scholarly publishing as ‘esoteric’ (1998, 134ff.). He argues that “no social practice can be sensibly defined simply by referring to the intentions of the particular people who engage in the practice” and that indeed there is a market. He seems, however, to speak of a market where money is replaced by citation counts – but Harnad’s argument is exactly about this, namely that this is no commercial market, i.e. no market where the currency is money, but attention.

small cost” (Hamilton/Shory 1997).⁸³² Another option is a small fee for quality service, exemplified with the ACM digital library (ACMDL) project. Denning argues that “given the glut of mediocre material in the Internet, it is not altogether clear to us that making the cost zero would maximize readership; more readers may come and be willing to pay a small fee to guarantee the quality of the material they receive” (1996). Therefore, a “full-service ACMDL with full text searching, user profiles, alert services, brokerage services, editing to assure readability of documents from non-English-speaking authors, and technology transfer services” could be attractive enough for paying customers.

(2) The “Open Movement”

Phase III de-commodification is not only driven by primarily economic reasons, but also inspired by another movement which roots in software development and alludes to the general idea of an open scientific community⁸³³. The ‘bazaar method’ (Raymond 1999) of managing large software projects according to the *open source mode* rests on collaboration over the Internet while the source code remains in the public domain and cannot, in principle, be sold. “Science, after all, is ultimately an Open Source enterprise.” (DiBona et al. 1999, 1) The sources have to be shared: the hypotheses, the test conditions, and the results: “Scientific knowledge is often in the public domain; it is one function of academic publishing to put it there.” (ibid., 2) The reason for this is that the open sharing of scientific results facilitates discovery and minimises duplication of effort (ibid., 4). In some sense programming according to the open source model shares an emphasis on reputation with research: “Scientists aren’t supposed to hoard profits from their inventions, they are supposed to publish and share their inventions for all to benefit from.” (ibid., 7) Some even speak of the knowledge communism of the sciences (e.g. Grassmuck 2002, 177).

Although some of the academic enterprise is profit-oriented, some is not. For the latter, the open source model may be a model for the future. There are already projects like OpenBook⁸³⁴, OpenDLib⁸³⁵, OpenTheory⁸³⁶ and the like.⁸³⁷ In its OpenCourseWare⁸³⁸ project, MIT plans to make all teaching material available over the Internet free of charge (for a critical assessment see Hartmann 2001).⁸³⁹ There is already a genuine “open content movement” (Pfaffenberger 2001) which intends to release written documents with a license similar to the GNU General Public Licence (GPL⁸⁴⁰; cf. 9.2.1.1), namely the Open

⁸³² The example of online journals in classical and medieval studies given by Hamilton/Shory (1997) gives a hint of the attractiveness of this option, as in 2002, these journals are still for free; hence we may conclude that the hosting institutions shared their opinion.

⁸³³ Rothblatt (1985) describes the idea of the open community as follows: It “does not suggest competition for goods and services, as does the market model, but the very opposite: insulation from demand, cooperation among peers, the free exchange of ideas, science as a shared system of values (...) a universe in which the whole is greater than the parts and in which knowledge is the supreme attainment.”

⁸³⁴ <Cyberlink=390>.

⁸³⁵ <Cyberlink=895>.

⁸³⁶ <Cyberlink=50>.

⁸³⁷ The Open eBook Consortium (<Cyberlink=318>), by contrast, is a commercial endeavour and tries to promote an open standard for E-books to avoid the present splitting due to commercial considerations (ADOBE PDF, MICROSOFT Reader etc.).

⁸³⁸ <Cyberlink=476>.

⁸³⁹ There are many further examples of “open” projects in the teaching sector, see <Cybercategory=5>

⁸⁴⁰ <Cyberlink=894>.

Content Licence (OPL).⁸⁴¹ The Public Library of Science⁸⁴² is already one attempt in this direction. Related initiatives are BioMedCentral⁸⁴³, ELSSS⁸⁴⁴ and the Budapest Open Access Initiative⁸⁴⁵, all promoting self-archiving and open access journals (see also below (4)).

Summing up, both the similarities of the “attention economy” as partly practised in the Internet with the inner workings of academia (above (1)) and the open source idea influence how the new medium is perceived, also among academics.

(3) Top-down initiatives

Given, on the one hand, the financial crisis of academic libraries coupled with restrictive copyright management, and, on the other, the new opportunities of E-publishing, various initiatives have popped up over recent years to change the dissatisfactory situation. A general motto of these initiatives might be: “The free and uninhibited exchange of academic information – efficient and at fair prices – is the pre-condition of all science.” (Grötschel/Lügger 1996, 9) Some observe an increasing demand for a non-profit publishing model using the new technology” and claim that the conditions would be ripe for scholars to take control of scholarly publishing (e.g. Rohe 1998, 4).

In this spirit, there are various calls for action and initiatives in the (mainly) US higher education (librarians’) scene and beyond (for a good overview on the American scene up to 1997, see Okerson 1997c). These initiatives have been sponsored by a variety of organisations.⁸⁴⁶

To sum up, most of these initiatives mainly aim at *top-down* solutions, i.e. solutions supported by associations and consortia which can be interpreted to be aiming to replace the present with an at least partly de-commodified system. The new system would rest on E-publishing and university or associational publishing, as opposed to trade publishing. In addition to the above top-down solutions, various initiatives exploit the new electronic opportunities *bottom-up* (see below 4).

⁸⁴¹ <Cyberlink=593>.

⁸⁴² <Cyberlink=474>.

⁸⁴³ <Cyberlink=226>.

⁸⁴⁴ <Cyberlink=179>.

⁸⁴⁵ <Cyberlink=808>.

⁸⁴⁶ For instance the Andrew W. Mellon foundation (e.g. Cummings et al. 1992) as well as various individual or groups of universities and libraries, e.g. the CETUS project (<Cyberlink=320>) (CSU-SUNY-CUNY Joint Committee 1997), the Scholar’s Forum by the library of Caltech (Buck et al. 1999; on previous Caltech and similar initiatives see Guernsey 1998; Rowen et al. 2000), the Big12Plus Libraries Consortium (1998), the model university policy regarding faculty publication in scientific and technical scholarly journals (TRLN 1993), or the German Commission for purchase of the German Library Institute (Sietmann 1999, 216; cf. also Bär 1999). Very active in the field are the Association of Research Libraries and the Association of American Universities, with e.g. the ARL serial prices project 1989, the Consortium for electronic publishing (CEP), the International Scholars Academic Network (IScAN) 1997, the Electronic Scholarly Publishing (ESP) proposal 1996, the AAU committee on digital networks and intellectual property, the Joint AAU/ARL task forces on intellectual property rights in an electronic environment (AAU Task Forces 1994), and, well known, the Pew Higher Education Roundtable (1998). The latest initiative is “Create Change” (<Cyberlink=801>), sponsored by ARL and SPARC, providing for resources for both faculty and librarians to cope with the crisis. Among others, this initiative offers templates for letters of referees to decline refereeing for a high-price journal etc.

(4) Self-publishing, public self-archiving and central, comprehensive digital archives

Self-publishing comes in a variety of forms (cf. 7.2.4.2): individuals setting up download pages, research institutes offering electronic working paper series, students running low-cost E-journals etc. Franks (1993, part I) and others call the individual publishing the “vanity press model” and Ullman (1996) comments: “Today, the amateur has returned to the world of research publication.” There are, however, also more organised models of the “new” publishing: E-journals, meta-archives and E-pre-print archives. Most importantly, there are “faculty and research entrepreneurs” (Thatcher 1996, 202; Bennett 1996, 191) or “trailblazers” (Okerson 1991b, 15) who initiate, develop and often run these free services in favour of the research community (cf. 3.4.5.1). These are the new publishing models:

- *E-journals*: Given the low costs of running an E-journal (cf. 9.1.1.1), it comes as no surprise that this has become a quite common bottom-up route for establishing an alternative self-publishing market for academic publications. While it is true that many of the additional E-journals are commercial E-journals paralleling their traditional paper counter-parts, there are many genuine E-only series, mostly offered for free or at very moderate fees because they are supported by the enthusiasm of individuals and their affiliations (cf. 7.1.2). One illustrative example is reported by Sietmann (1999, 218) with a journal’s editors and editorial staff leaving its publisher due to enormous price increases (several 100 % over a short period of time) and successfully founding a new journal, mainly distributed as an E-journal (Evolutionary Ecology Research⁸⁴⁷). Two very interesting E-journal projects have been launched in the life sciences and in economics. Both BioMedCentral⁸⁴⁸ and Electronic Society for Social Scientists (ELSSS)⁸⁴⁹ intend to offer alternative journals to the commercial offer in their fields. While BioMedCentral is already well advanced and offers a series of fully functioning journals, ELSSS is still in the phase of formation.
- *Meta-archives*: Another route are electronic archives making departmental or associational E-publications (mainly working paper series) centrally accessible and searchable (cf. 2.3.4). This helps to overcome the intrinsic weakness of the self-publishing model that access to the various electronic sources is unorganised, unfiltered and hence difficult. Such meta-archives exist in many disciplines (cf. 2.3.4.1 and 3.3.6). Recently, the Open Archives Initiative (OAI)⁸⁵⁰ succeeded in setting a common standard for the meta-data of papers included in these archives. Many archives are expected to gradually implement this. The aim is to make all archives inter-operable worldwide and to promote their establishment by making the necessary software available for free.
- *E-pre-print servers*: Another route is the establishment of discipline-specific electronic pre-print servers. The idea is that papers are “uploaded” individually to a central server before they are published in a traditional or E-journal (cf. 2.3.4.1). Perhaps, the physics server arXiv⁸⁵¹ “is the herald of what will happen in all disciplines sooner or later” (Harnad n.y.; for, e.g., the legal sciences, see Hibbitts 1996a; 1996b).

That the formal exchange of specialised scholarly information “can thrive outside of traditional publishing channels” (Atkinson 2000, 59) has a revolutionary touch since wide-

⁸⁴⁷ <Cyberlink=797>.

⁸⁴⁸ <Cyberlink=226>.

⁸⁴⁹ <Cyberlink=179>.

⁸⁵⁰ <Cyberlink=60>.

⁸⁵¹ <Cyberlink=216>.

spread electronic distribution of pre-prints seems bound to destroy high-cost journals (Odlyzko 1994, 45). Perhaps the most prominent advocate of this route is the brain scientist Stevan Harnad with his well-known Subversive Proposal (1993; 1997; extensively discussed in Okerson/O'Donnell 1995). Harnad summarises his proposal – which is already practised in the CogPrint archive⁸⁵² – as follows:

“All authors should continue to entrust their work to the paper journals of their choice. But if, in addition, they were to publicly archive their pre-refereeing pre-prints and then their post-refereeing reprints on-line on their home servers, for free for all, then the de facto practices of the reader community would take care of the rest ...; library serial cancellations, the collapse of the paper cardhouse, publisher perestroika, and a free for all, e-only serial corpus financed by author-end page charges would soon follow suit.” (Harnad 1998b: 128)

As pointed out by many, the system of public E-pre-print archiving could easily be combined with a journal system in the sense that the archives are for registering priority claims and making information available as quickly as possible, while the renewed journal system would consist of refereeing and certifying. Submitting to the journal would then only mean that the author submits the reference number of the manuscript in the archives (Taubes 1996, 768). The journal could then “freeze the article” by changing the password disallowing the author to change the manuscript with a view to assuring that a paper, which has been accepted for publication, is indeed the same one that readers have been downloading.⁸⁵³ A less far-reaching proposal would redefine the copyright transfer to publishers:

“When the author and the university agreed to give the copyright to the publisher, they would explicitly give non-profit organizations [like universities and libraries] the right to copy the articles in response to specific requests for them. Faculty members would not transfer the copyrights of articles (...) to any publisher unwilling to accept that condition.” (Bennett/Matheson 1992)

The “Subversive Proposal” and similar ideas are, of course, very much disputed, both for general reasons⁸⁵⁴ and in some details⁸⁵⁵. One strand of opposition to the self-publishing models focuses on the cost issue, arguing that the costs of publication are not eliminated, but only shifted (cf. 9.1.1), often hidden in other university budgets and perhaps even increasing overall

“as it is unlikely actually that the work will be done either as well or as cheaply as it would be by professional-publishing people (...) But what is worse is that people who would otherwise be doing research and teaching, or who would otherwise be support staff enabling those crucial activities, are now engaged in the work of publishing to the detriment of the time available for teaching and research.” (Day 1998, 2)

⁸⁵² [Cyberlink=220](#)>.

⁸⁵³ For another version of this idea, see the “Designated Channel” of Atkinson (2000, 67); see below (5).

⁸⁵⁴ Note the extensive debate between Harnad and Varian in Harnad et al. (2000), followed up in much “skywriting” (to use Harnad’s own term) in electronic forums like the September98Forum (<[Cyberlink=487](#)>) and the current online debate in Nature (<[Cyberlink=414](#)>). There is certainly no space to list all the arguments here. Although both agree in principle that online self-archiving is a way to solve the current crisis, they disagree on the reasoning why this is so.

⁸⁵⁵ For instance, Harnad proposes author-end page charges to finance the system (e.g. Harnad 1997, 6; similarly Walker 1998). Tomlins (1998, 147) notes that this “reproduces what has long been traditional practice in the humanities, a model as now beset by precisely those pressures that he thinks it can subvert”.

While there is certainly some truth in this observation, it is not really an argument against self-publishing since, already now, most work involved in publishing has to be done by the scientific community itself (see below (5) and 9.1.3.4).

While the E-pre-print archives only include pre-prints and the meta-archives mainly departmental working papers, a number of initiatives go one step further (respectively take another route) aiming at archives comprehending not only “grey”, but also published literature. The most prominent examples of this are PubMedCentral⁸⁵⁶ for the life sciences managed by the US National Library of Medicine (NLM). Similarly, a famous new initiative by a number of scientists, including Nobel laureates (Roberts et al. 2001) aims to create “public, electronic archives of the scientific literature, containing complete copies of all published scientific papers”. In the beginning, at least, the commercial publishers of STM literature are quite reluctant to give free access to their products via such services. Therefore only a few journals are already available through PubMedCentral. The number is steadily growing, but some think archives such as these will never cover an area completely because of the financial interests involved.

To sum up, E-pre-print servers have the potential either to replace the traditional scholarly publication system altogether or to organise the pre-refereeing phase very differently. In the latter case, quality control would still be entrusted in the journal system, while in the former case quality control would be incorporated in the new pre-publishing system. Their main advantages over the phase II system are their universal accessibility, speed and low cost. How such systems would be financed is still an open question, but it seems that the relatively low costs could be borne by the professional associations. Equally, the various central comprehensive publication database initiatives are a way forward towards free access to academic literature.

(5) The role of the university: presses and libraries

The crisis of the academic publishing system might not only be solved via self-publishing, but also by those academic institutions which are traditionally in the business of publishing and archiving, namely university presses and libraries (see already in 5.4). Three reasons can be listed:

First, while (groups of) scholars engaging in the business of self-publishing in whatever form are tackling something relatively new for them, the presses are professionals and might be at the core of cyberscience publishing. This is because “(t)he geniuses of this new technology have created the new vocabulary (...) but their brainchild lacks depth. It is a thousand miles broad but only a quarter-inch deep, and we can offer depth.” (Zeigler 1997, 42) University presses may play an important role instead of amateurish “faculty and research entrepreneurs” doing it themselves because they have valuable and cheap skills to offer and that the time of academics is often treated as a free good, but it is not (Thatcher 1996, 202). Presses’ special skills are not only in the technical domain but also in organising the certification and filtering of scholarship (which remains the realm of academics).

Second, the financial crisis is an incentive. It is hardly surprising that a vision of university-based publishing captures the imagination of parts of academia since “(a)bout 90 % of formal academic publications migrate outside the academy before returning home as repurchased monographs and serials” (Okerson 1991a, 3). It is possible to demonstrate

⁸⁵⁶ <[Cyberlink=258](#)>.

that the disassociation of supply and demand⁸⁵⁷ was “the very basis of the rationale for university-based publishing in the first place, not a new phenomenon just affecting us today” (Thatcher 1996, 200). Most university presses, however, principally publish in the humanities (Walker 1995, 38). Consequently, if these presses should play a more prominent or even dominant role in academic publishing, they would also need to capture the hard science market.

Third, academic institutions are sometimes forced to become (again) publishers themselves in many areas since they cannot find a commercial partner, e.g. for the publication of scientific software, databases and the like (Grötschel/Lügger 1996). Hence, it is not only financial reasons which make academics and their institutions initiate moves away from commercial publishers, but also the (perceived) impossibility to market particular categories of academic results (because there is no market, because the costs are too high etc.). In this respect, E-publishing might offer many new opportunities for university presses because universities “have human and computing resources that would offset the factor of market dominance to some degree” (Walker 1995, 40). And indeed, there are already a number of networking initiatives among university publishers (e.g. Gradmann 2002; Hilberer 2001).

Like the self-publishing route discussed under the previous heading, also a potential central role of the university presses in phase III could lead to a nearly de-commodified system of scholarly exchange. While there are more possible ways to solve the serials crisis, like consortial purchase and a new pricing system for information, only exploring schemes to change the information market itself seems promising for many. The aim would be to create a market for scholarly information that preserves the low prices and would be separate from the ‘edutainment’ market. It would remove the middlemen (the commercial publishers) from the academic market. Such a separated market would enable academia to distribute information among themselves in a system affected by costs instead of profits” (Chodorow 1998, 7f.).

In one scenario, the universities would invest more capital resources in university-based information flows and new forms of scholarly publication, and would place increased market pressures on the commercial sector. If universities “were to make strategic capital and staffing investments in university presses during the short term, the presses could be more likely to make a successful and rapid transition to electronic publication” (Whisler/Rosenblatt 1997, 22). At the same time, intensive university efforts (i.e. investments) to recover STM and business publishing from the private sector should be made to reduce the crowding out of university press publications by for profit publishers. This could also be accompanied by libraries placing strong market pressures on commercial publishers through cancellation of journals whose prices rise faster than the average rates for scholarly journals in general. The investments

“could be recovered over time through reductions in capital investments in library buildings. Ultimately, the university itself would encompass most of the information flow in scholarly communication through its networked capability. That information having commodity value outside of the academy could be sold in the marketplace, and the revenues used as a subsidy to the system itself.” (ibid., 22)

There is, however, still a long way to go since the widespread policy of universities to force their university presses to become self-supporting has “resulted in the presses iden-

⁸⁵⁷ I.e. the insufficient demand for scholarly publications in the marketplace (cf. above, 9.1.3.2).

tifying increasingly with – and adopting the values of – commercial publishers” (Atkinson 1996, 261). To counterbalance this trend, universities might funnel more money into the university presses if the money now spent in their libraries could be redirected to university-published journals (Bennett/Matheson 1992). This train was already set in motion at the beginning of the last decade: “The mechanisms are almost in place; the community is energetic and eager; the need is urgent.” (Okerson 1991a, 6)

Given their quandary between trade publishers and demanding faculty, academic libraries are among the most active promoters of phase III. Apart from their activist agenda-setting role, libraries contribute two things: first, they can co-operate among themselves to gain greater market power vis-à-vis the commercial publishers, and second, they may themselves enter the domain of publishing.⁸⁵⁸ Libraries also have a traditional role to play with regard to providing access to the published material. “However, the job of organizing, coding, linking, updating, licensing, and maintaining that wide range of material takes on new significance.” (Wittenberg 1998, 2)⁸⁵⁹

(6) A new role for academic associations

Many argue that it should be the primary task of academic associations to organise the de-commodified phase III scholarly communication system (see already in 5.4). Some of the initiatives have been mentioned in 9.1.3.3 when discussing the electronic archives or pre-print servers; here I shall add some more proposals and initiatives directly engaging the professional associations.

Scholarly associations may ally themselves with the working paper sites, “give the service an official status, and invest in the features (...) to make it more robust and useful. Although freebie (...) services are useful, an enhanced (...) service for a fee (or as part of membership) might be much better.” (Getz 1997, 9) If professional bodies and associations again become more actively involved in publishing, the flow of information will be more directly and quickly delivered from host institution to requester, author or researcher (Johnston 1998, 12). Others favour a centralised system on the shoulders of scholarly associations which would sponsor a ‘super site’ providing “sanctioned stature – a surety that only bona fide scholarly work would be resident” (Morton 1997, 4).

Another important issue at stake here is quality control (cf. 8.2.3). The associations pool all resources necessary to secure quality in phase III on a national or preferably even international level (Atkinson 1993, 210). Various models have been proposed, some of them involving co-operation with traditional journal structures, be they run by commercial publishers or not, others setting in place completely new structures (cf. also 8.3.2). Many argue that the academy should use disintermediation as a tool to reappropriate responsibility for formal scholarly communication (Atkinson 2000, 60f.).⁸⁶⁰

⁸⁵⁸ See for instance the Scholarly Publishing and Academic Resource Coalition (SPARC, <[Cyberlink=222](#)>; there is now also SPARC Europe, <[Cyberlink=807](#)>), High Wire Press (<[Cyberlink=223](#)>), the Cooperative Online Resource Catalog (CORC, <[Cyberlink=224](#)>) (Owen 2000, 3) and recently the German Academic Publishers (GAP, <[Cyberlink=809](#)>) (Gradmann 2002) initiatives.

⁸⁵⁹ The example given is CIAO (<[Cyberlink=393](#)>), a repository and resource portal for researchers in the field of international affairs research.

⁸⁶⁰ His own proposal is called “The Designated Channel” for each discipline. All scholarly work would go into this channel, peer review will certify. This means that “the item does indeed add substantial knowledge” and that academia will guarantee its access over time. There will be “normative meta-data” informing about currently perceived importance of an item in the database and will be indexed based on controlled vocabulary. Use tracking, i.e. access data, will add fur-

Whether or not the scholarly associations will actually support these new systems depends on at least two issues: the relationship to commercial publishers (a) and financial issues (b).

(a) If a scholarly association is already linked with or financially supported by conventional journals that are published by commercial publishers, withdrawing from such links and going entirely the E-way poses serious dilemmas for them since the commercial publishers in many cases hold proprietary rights to the journals. Conceivably, the publishers might just go their own way if associations sever their links, and would end up competing with the new de-commodified (associational) journals. This dilemma may inhibit many associations from going this route.⁸⁶¹ However, associations may be in a quite powerful position, for instance, if subscription to the journal is linked to membership in the association. In this case, the commercial publisher would lose almost all of its subscribers at once while the competing new associational journal would take up most of them.⁸⁶²

(b) As to financing such systems, a number of proposals have been made:

- i. *Author charges*: The authors (respectively their home institutions) would be charged for each article published whereby part of the revenue would finance eventually putting all papers online for free access by users (Walker 1998; similar Varmus et al. 1999)⁸⁶³; the fee could be a lump sum (paper charge) or depend on the length of the article (page charge);
- ii. *Author-side “annual institutional site-gateway fees”* (Morton 1997, 4): These *fees* would not be based on individual submissions, but on the institutional budget or on the number of researchers who potentially could place publications at the (pre-publication and/or journal) site; and
- iii. *Reader charges*: Similar to the present system in which the readers (or their institutions) pay, but unlike it insofar as the providers are not commercial publishers but other research institutions, the Ginsparg (1996, 7) model envisages a reader charge system for research communities “comprised of a relatively small number of authors and a much larger number of readers”. In this model the institutions that support the research (i.e. those which have more authors than readers) assert copyright privilege and disseminate material produced in-house for a fee to those institutions that only consume it. Again, the fee could be based on individual papers or on a site-licence.

While the first two do not only promise to solve the problem of financing the emerging new publishing system, they also implement free access to all research literature. (The success in the latter sense of these systems depends, however, on their universal-

ther information about a paper’s merits (cf. 8.2.2.3). The library’s task would be to create a synopsis, stipulating what is new or unique in the publication which should add up to cumulative metadata forming a sort of encyclopaedia (cf. 6.3.5). Politically, these channels would separate information access from the institutions. The bibliographic value is “one-stop shopping”, e.g. on the basis of the OAI standard (<Cyberlink=60>). Atkinson’s proposal is based on his earlier thoughts about a “control zone” (cf. 8.2.3).

⁸⁶¹ I am grateful to L. Suarez-Villa for suggesting this argument.

⁸⁶² At the moment, ELSSS (<Cyberlink=179>) is creating direct competitors to Elsevier journals; there are also other examples.

⁸⁶³ BioMedCentral (<Cyberlink=226>), for instance, functions like this. In their FAQs, there is an explanation why it has article-processing charges: “Because it does not have subscription charges for its research content, believing instead that immediate, world-wide, barrier-free, open access to the full text of research articles is in the best interests of the scientific community.” At the time of writing the charge was \$ 500 per accepted article.

ity. Only if all academic institutions apply it, would free access to all research literature be guaranteed.) The third model, by contrast, would upset proponents of free electronic access to all publicly supported research material. The rationale behind is that the real risk-takers, namely the institutions that support research by way of investment in salary and equipment, would profit from and protect the products of that investment (Ginsparg 1996, 7). All of these different charging systems are relatively easy to implement in an electronic environment. The big advantage of the author-charge systems lies with the easier administration. As there are already manifold transactions going on between author and publisher, it is only a small add-on to let the author pay for the publication (which could easily be done on an ex-post-yearly basis for a whole institution). Compare this with the many more individual transactions and contracts with all potential readers.

9.1.3.4 De-commodification?

Phase III is, so far, a time of change. It is not clear yet what shape exactly it will take, but it features already, at least partially, what I call here de-commodification. That is, commercial publishers are not dominating the whole scholarly publishing scene. The main driving force is that, with the help of ICT, the core business of academic publishing, in the sense of formal scholarly communication, can, in principle, be done without commercial publishers (below 1). Nonetheless, there will be at least niches for sustained involvement of the commercial sector (below 2).

(1) The case for de-commodification

“Crudely put, it seems that the publisher is superfluous.”
(Okerson/O’Donnell 1995, Intro)

This argument rests on the answer to the following question: What does publishing involve and who can render the services? If it turns out that the traditional system is neither adding evident value nor is in a significantly better position to render the necessary services, and if, at the same time, the alternative system is much cheaper, the latter might ultimately replace the former.

If we look at the various functions to be performed, we can distinguish between four groups: First, the scholarly community as a whole is already performing some tasks in phase II. These include *editing*, i.e. “running” the journal. Managing editorial rules and corresponding with authors, with referees etc. is typically done by an academic anyway (cf. 8.2.4.1 and 7.2.1). *Scholarly quality control*, i.e. finding out whether the submitted article is new, valuable etc., is always done by academics.⁸⁶⁴

⁸⁶⁴ Owen, however, suggests that peer review will be outsourced to the publishers under the responsibility of the academic community (Owen 2000: 6). What exactly do publishers do in this respect? Strong (1995: 2) believes, first, that “what publishers do will become increasingly important as time goes by. (...) Good publishers, by screening this information for quality, and validating it during the publishing process, perform an enormous service.” Second, he argues, “the digital age can be the age of disinformation. (...) So what a publisher can offer is a reliable source for the real thing”. Harnad challenges the claim that publishers deliver quality control by distinguishing between “quality of form” and “quality of content”. The former indeed being delivered by publishers, the latter has always been done by the scholars themselves (1993, 4). Peters argues that “the publisher’s role is far more profound than mere typesetting and printing. It is both the organization (administration and management) and authorization (through peer review) of the proc-

Reputation or branding is certainly a service provided by publishers with their well-known names (Rohe 1998, 2). One may even say that “(w)e do not really pay for *what* is in [the publishers] publications; what we pay for is rather *that* what is in their publications acquires a certain status and attracts a certain attention by virtue of its location in those publications” (Atkinson 2000, 64, *emph. in orig.*). No doubt, scholarly associations or universities could be, as they already are in some areas, the new brand names for scholarly publications. In principle, there is no need for commercial brands, which are mainly targeted at increasing revenues, less at increasing reputation for scholars. The tricky question involved here is, however, whether setting up a parallel infrastructure, run by academia itself, would have the power to attract enough academic authors to break even, i.e. to detract authors and consequently reputation from the commercial system. One proposed route is that universities do not allow their faculty to submit to commercial publishers any more. This could be combined (and in fact is already in some areas) with libraries not buying these journals any longer (also because they are too expensive anyway). This would make them less accessible and hence less attractive. However, an important accompanying measure would be necessary, namely to downgrade the importance of citation indices, at least for the transitional phase. A more liberal alternative would be to make the alternative system more attractive. This could be done for instance by formally upgrading the status of the alternative vis-à-vis the traditional journals when it comes to research assessments. Furthermore, attractiveness could be enhanced by high-quality and all-encompassing search-engines. Commercial publishers due to their competitive policies cannot provide them.⁸⁶⁵ I can only speculate whether the scholarly system and, indeed, the academics themselves are flexible enough to gradually switch to the new system. In any case, there are already a number of powerful prototypes shedding some light on the possible future (see above 9.1.3.3).

The author, not the publisher increasingly performs the second group of functions (see already 5.4.1). For instance, “*typesetting*”/*formatting*/*page-composition*/*layout*/*tagging*, including the HTML or, later on, XML coding, is done to an ever increasing degree by the author with the help of auto-formatting editor software, too.⁸⁶⁶ As to *proofreading*, there will be no differences to the status quo: the author him/herself proofreads. In any case, professionalism in the academic publishing process, in general, and with a view to typesetting and copy-editing, would have to be upheld. But these are functions, which could also be supervised by people within academia (e.g. in the university presses or scholarly associations). There seem to be two alternatives (Odlyzko 1994, 43). The first alternative is that no manuscript editing is done any more. This is conceivable given the fact that formatting capabilities have become better and better in academia. However, in this model, copyediting by an expert will not be done at all. (Already today we are approaching this state of affairs, as many publishers cannot afford to do expert copyedit-

ess” (1996, 2). It remains however unclear why peer review should be a publisher’s task since, in practice, it is all done by scholars, even the co-ordination of referees is done by members of the academic community, i.e. the editors.

⁸⁶⁵ For sure, the journal portals of the big players (Elsevier, Springer etc.) are already highly encompassing and attractive, as market concentration is already well under way. In some fields, one or two publishers publish the great majority of all sources. Hence, the supply in these fields is quite good. This is, however, not the case in all fields. As is highly unlikely that at the end of the day only one super-publisher will survive, a truly encompassing search-engine cannot be expected to be established under market conditions.

⁸⁶⁶ Fisher notes that in an early, but MIT-Press-run E-journal, the managing editor also did the tagging and “typesetting” (1997, 3). The same is true for many other E-journals and E-series.

ing.) The other alternative is a modest version of editing, either by publishers/scholarly associations or by the authors' institutions (both alternatives lead to subscription respectively authors' fees). The majority of scholars seem willing to pay for services that are truly helpful to them, but not too much. Therefore a system in which authors and editors themselves will not do all of the typesetting and proofreading is likely to emerge.

A third group of tasks in academic publishing are typically outsourced. These can as well be done by phase II/III non-profit publishers, such as university presses and/or the university or research institutions itself. This includes *language editing* which, in most cases, is already done by the scholars themselves. Also *copyediting*, i.e. the part of quality control that relates to formal necessities, such as a complete and coherent bibliography etc. is either included in the typesetting/tagging or still outsourced as done now with most books. Furthermore, ever more sophisticated software is spreading among researchers which does much of the job of a copyeditor in advance and automatically. For instance, new bibliographic software makes sure that the reference list is accurate and comprehensive as well as in the desired format.

A fourth set of tasks will be increasingly handed over to specialised software and could be simply or nearly superfluous in phase III. For instance *linking*, i.e. fitting the articles into a web of knowledge, making them retrievable etc. could be done by the publishers (Hunter 1998: 2). However, there are already first examples of linking tools which do the job automatically on the basis of input by authors and editors. The reader or the library will do the *printing* locally. *Distribution* is, in the E-world, done via the Internet. No packaging, shipping etc. is necessary (cf. 9.1.1). Financial transactions, if at all necessary, are being automated. *Marketing* is trickier, but how much marketing is actually done by scientific publishers? Is it not mainly the authors who promote their books in conferences, by referencing in journal articles, refereeing books for journals etc.? In an E-world, marketing could be turned into an information service, eventually via centralised access points with E-mail subscription services and/or accessible by knowbots (personalised knowledge robots). Even if "(g)ood scholars are good at research, not at finding readers" (MacKie-Mason/Riveros 1997: 2), finding readers could be organised in a more refined and probably more efficient way. Furthermore, *copyright management* would be almost superfluous in a de-commodified scholarly world (cf. 9.3).

Last, but not least, the publishers claim to bear the financial, *entrepreneurial risk* of publishing. However, given the high prices, the small editions (of books) and the often considerable print subsidies required for a book to be actually printed (borne by the authors, their institutions or research funds), this risk does not seem to be important. But what is more important, it can as well be taken by academia itself (see already the university presses). The advent of E-publishing also helps, as it is cheaper to make, for instance, PDF files from a book than printing it (cf. 9.1.1.2). Consequently, the financial risk is actually diminishing.

The shift of the main responsibilities of these various tasks involved in academic publishing is depicted in the following Table 9-1:

Looking at this list of arguments, the result is that there is no particular need for commercial publishers in the system of scholarly communication (similar Okerson/O'Donnell 1995, Intro). This view is, however, not undisputed. The main counter-argument is that authors are not in the best position to take over the publishing business (e.g. MacKie-Mason/Riveros 1997, 2; Walker 1995, 39; Jensen 1998, 3; Rowland 1994; Day 1998, 2). But as already mentioned, universities or scholarly associations could easily invest in hiring professionals, and still save money, in phase III.

Table 9-1: Shifting main responsibilities for publishing tasks

Tasks	Main responsibility				
	Scholarly community	Publisher	Author	Outsourced	Internet or software
Editing/running	x				
Quality control	x				
Reputation/branding	x ←	x			
Typesetting etc.		x →	x	→	x
Proof-reading			x		
Language editing		x →		x	
Copyediting		x →		x	
Linking etc.		x →			x
Printing/distribution		x →	x	→	x
Marketing		x →	x	→	x
Copyright management		x →	x		
Entrepreneurial risk	x ←	x →	x		

Most authors, therefore, sustain that the phase II system will be replaced by a new set up.⁸⁶⁷ Many leading scholars are convinced that either scholars will simply create their own purely E-publishing systems⁸⁶⁸ or a collaborative solution will be reached, with P-publishers “retooling themselves” to perform those of their services that will still be required in purely E-publishing.⁸⁶⁹

(2) Niches for sustained commodification

For sure, commercial publishers will not leave academic publishing without trying to reverse the trend. Although they are wealthy and well-established institutions, the development of a free-ware opposition culture and the technological developments suggest that their role will be significantly smaller already in the medium term. At the same time, a number of niches may persist where commercial publishers possess specific know-how that cannot easily be paralleled in academia. I shall outline a few such potential niches:

Even in the case where most of the academic papers were be accessible for free via the Internet, commercial journals could still play a role. Journal editors tend to argue that “quality information worthy of appreciation requires more effort than most scientists

⁸⁶⁷ With regard to the book market, for instance, Mueller, a humanities scholar, argues that already by now, the decision of whether or not to publish no longer depends on the prognosis of the number of sold copies: “In such an environment, the publisher has a reputation to protect, but incurs no particular costs: editorial costs are pushed to the author, the cost of approval by peer review is borne collectively by institutions, production and distribution costs are not incurred until an actual sale, and advertising and marketing can be ignored: the global niche of scholars who do [a particular speciality] can be expected to spread the word among themselves.” (2000a, 4)

⁸⁶⁸ E.g. BioMedCentral (<Cyberlink=226>) or ELSSS (<Cyberlink=179>).

⁸⁶⁹ Harnad (1993, 4); Atkinson (1993, 210); Hibbitts (1996b, 2.16f.).

could muster, even if able” (Bloom 1998b). One possibility is, therefore, that they would specialise in completely new services, such as *providing added value* in comparison to the standard web databases. The reason for buying and reading journals would be less that they contain original papers but rather that the editorial boards provide the readers with analysis by *putting new papers in context*. Editorials and comments sorting information (Graetzel von Graetz 2000) and “selecting research that is important to their audiences and presenting it in as exciting and as relevant a way as possible” as well as “digesting and synthesising research, beginning to turn it from information to knowledge” (Delamothe/Smith 2001) may become the heart of a journal.

Furthermore, *popularising academic output* and entertaining (Delamothe/Smith 2001) could be particularly attractive to commercial publishers, and is traditionally put aside by academics (cf. 6.4.4.3). In addition, the added value could also consist of “*quality re-printing*” important research in a more fancy way than perhaps downloads from the Internet, printed with a standard black and white printer.

Apart from very special journals of a new type, commercial publishers may also further develop their *proprietary search-engines* specialising effectively in particular academic subjects. Both the users of such a service and those E-journals and E-series wanting to be in such a database would have to pay.

Another area for potential continued commercial involvement in scholarly publication is the production of *interactive student textbooks* and *E-monographs* (cf. 7.3.1.3). Easier access, visual processing, enhanced intellectual content, electronic linking, provision of moving images etc. are all laborious tasks which require special skills and time and might hence be provided by publishers. The same is true for multimedia publications (Odlyzko 1994, 46; similarly Götze 1996, 70).

Hence, the new role for commercial publishers might be that of a very specialised service provider. While it is impossible to know in advance which niches actually will persist, these examples suggest that one should expect such niches for commercial publishers, even if phase III takes place in the form sketched above.

9.1.3.5 Phase III in the making

In this section I argued that, most probably, there would be a mixed system – partly commodified, partly de-commodified. Phase III of the evolution of the system of formal scholarly publication has not yet fully taken shape, but will – in contrast to phase II which was the age of increasing commodification – most likely be characterised by a strong de-commodified core with some niches for commercial publishers. The core will probably be a publishing system run by scholarly associations where scholars upload their E-“prints” on central servers (“E-pre-prints”). These papers may undergo subsequent quality control, either by being submitted to the editorial boards of E-journals or by some other innovative rating process organised by scholarly associations. Although the shift from phase II to phase III is gradual and evolutionary, as soon as it is completed, the outcome will be fundamentally different from the status quo ante. If my analysis holds, it will be more than the search for a new balance of power between the major players (commercial publishers, university presses, libraries, universities, scholarly associations, cf. 5.4.2), but instead a considerable upgrading of the role of all players except commercial publishers.

Among the possible reasons for this development, I have mainly focused here on those at the economic – the system crisis of phase II and how the academic community is about to react to this challenge – and the technical level – the new opportunities of the ICT,

which have already taken over many of the functions performed by the private sector. In addition, I have presented ideational developments, which herald phase III – the growing conviction that almost free access to scholarly work on the Internet is a good idea, and the open source perspective which could slowly develop normative power and delegitimise phase II arrangements.

Important additions to such a lens are, for sure, further institutionalist concerns. Issues of path-dependency and sunk costs should not be underestimated. Commercial publishers as well-established actors of phase II should not simply be expected to vanish, and they certainly will try to develop strategies with a view to avoiding marginalisation. For instance, document delivery services, on-demand publishing, and various archives are already well under way. The “battle” between the dominators of phase II (the “incumbents”) and phase III has only just begun.⁸⁷⁰ In addition, we need to take into account that even the various actors within academia have different interests. Corporate research universities play a different tune than under-funded state universities so that institutional competition could be a significant impediment. Also disciplinary differences, in particular the varying proximity of the research to the market in general, are an important factor (cf. 3.4.3.1). Finally, re-appropriation requires “deep-seated cultural adjustments within the academy” (Atkinson 2000, 64). However, there are already new institutions and new ways of doing beyond for-profit publishing, hence stability seems challenged and new pathways on offer. In section 11.2.2.4, I shall discuss how regulatory policies may be devised to support this transition, which is necessary to counter-balance the obvious partial market failure.

9.2 Legal aspects of academic cyber-publishing

“But experience has shown that networks will not flourish as a means of formal scholarly communication or deliver the economic benefits they seem to promise *until questions of copyright have been resolved*. The low growth of electronic-journal publishing demonstrates this.”
(Bennett/Matheson 1992)⁸⁷¹

E-publishing raises important questions in the field of intellectual property rights (9.2.1) but also touches upon the obligations of academic institutions as providers (9.2.2). Furthermore, archiving may need a secure legal regime (9.2.3). In the following, I shall present and discuss a selection of legal issues of interest to academics, with particular emphasis on open and controversial questions. Given the international dimension, the great variety of legal regimes and the inherent dynamics of the legal evolution (statutes, contracts and court judgements), it would be the task of a further extensive research project (most likely involving scholars with different legal backgrounds) to give definitive answers to the questions raised below. The purpose of this section is therefore mainly to point out some of the most obvious and pressing issues regarding the new environment for academic publishing.

⁸⁷⁰ See, for instance, the documentation of the first “combats” between the commercial publisher ELSEVIER Science and the “dissidents” in economics founding counter-journals (ELSSS) at <Cyberlink=798>.

⁸⁷¹ Emph. added.

9.2.1 Intellectual property law

Although this is often not paid much attention, academic publishing is reigned by intellectual property (IP) legislation.⁸⁷² Two aspects are crucial. First, by the creative act of writing, the academic author obtains an exclusive right to authorise or prohibit reproduction, communication and distribution to the public of the work. In general, the right to use it is transferred to the publishers of the journals or books by means of a contract. They, in turn, sell licences back to the academic libraries so that academics are in a position to use the published material. Second, where the academic work entails the use of the work of others (inside or outside academia), their intellectual property needs to be observed. This concerns in particular those sub-disciplines that edit works of fine art (paintings, music, literature, photographs etc.).

While copyright is, at least in principle, medium-independent (Harnad 1998b, 127),⁸⁷³ the advent of the digital media has raised a number of questions with regard to the applicability of the traditional legal regimes. Uncertainty regarding the legal rights, obligations and constraints among academics is certainly one of the most important factors playing against rapid diffusion of E-publishing. For the most part, this seems to be a matter of lacking information, as there is/was always a legal solution to particular questions (as regards copyright transfers, the legitimacy of digital quotes or links, the protection of ones own works against fraud etc.). However, as is often the case when old legal regimes meet new technologies, some of the solutions following from the present rules are not adequate or cannot accommodate all interests involved.

Copyright (the Anglo-American term) or creators' right (in the tradition of continental Europe) protection is a densely regulated area both at the national and international levels and it has recently seen further development with regard to coping with the new media. This is not the place to give a complete overview of copyright or "creator's right" legislation, a few hints will suffice for my purposes here.⁸⁷⁴ On an international level, the various conventions of the World Intellectual Property Organization (WIPO) are the basic agreements, particularly by the (Revised) Berne Convention for the Protection of Literary and Artistic Works⁸⁷⁵ and the WIPO Copyright Treaty⁸⁷⁶. Regarding trade-related issues the TRIPS⁸⁷⁷ agreement of the World Trade Organization (WTO) plays an impor-

⁸⁷² A readable introduction to authors' rights in the Internet is given by Zimmer (2001, 177ff.).

⁸⁷³ As to the legal situation in Germany which provides a good example for the global legal situation, one may say that a document is considered to be 'published' ('veröffentlicht') as soon as it is made available in public with the consent of the entitled person; it 'came out' ('erschieden') as soon as, again with the consent of the entitled person, enough copies are offered to the public or put into circulation (§ 6 German UrhG). Therefore, a document offered via FTP or WWW for download is without any doubt an (electronic) publication, with all rights and duties for the creator/author and the user which are based on the statute on copyright (Brüggemann-Klein 1995, 172; Schlitt 1996; Gerling 1996 who covers all aspects from data protection to press law).

⁸⁷⁴ For legal studies, see among many others (e.g. Büchele 2002; Banse/Langenbach 1999; Plöckinger et al. 2002; Lehmann 1997b; Lessig 2001; Mann 1998; Dreier 1998; Barlow 1994; Armstrong/Lonsdale 1998, 41ff.; Fisher 1993; Laga 1998); note, however, that to date, there seems to be no comprehensive legal study focussing specifically on IP law issues of academia. In the following, I shall attempt to partly fill this gap, at least by listing all relevant questions and areas of debate.

⁸⁷⁵ In the version of the Paris Act of July 24, 1971, as amended on September 28, 1979 (<Cyberlink=814>).

⁸⁷⁶ Adopted in Geneva on December 20, 1996 (<Cyberlink=815>).

⁸⁷⁷ Trade-Related Aspects of Intellectual Property Rights; the TRIPS Agreement is Annex 1C of the Agreement Establishing the WTO, signed in Marrakesh, Morocco on 15 April 1994 (<Cyberlink=816>).

tant role. In the US, it is foremost the so-called Digital Millennium Copyright Act⁸⁷⁸ that forms the basis of copyright in the digital arena. On the EU level, a number of directives have been issued, in particular on software⁸⁷⁹, databases⁸⁸⁰ and, most recently, on copyright in the information society⁸⁸¹. The latter needed to be implemented in national law by the end of 2002.⁸⁸² Despite these international harmonisation activities the respective laws are still diverse, hence a truly international regime is not (yet) in place (e.g. Dreier 1998). Therefore, the international dimension of copyright questions is not at all trivial.

The main impetus for the new generation of intellectual property legislation worldwide comes from the commercial music and software sectors. They have high stakes as novel computer equipment (scanners, CD burners) and novel organisational, networked solutions (the “Napster” model⁸⁸³) are endangering the traditional ways of doing business. On the one hand, the “rights industry”⁸⁸⁴ will find a more harmonised legal environment worldwide for its business, which now clearly states that intellectual property also extends to the digital world. Furthermore, the new regimes allow for and support restrictive and protective measures such as digital rights management (DRM; see 2.3.4.2). On the other hand, the previously existing exemptions for specific uses (libraries, schools, non-commercial academic purposes, archiving, journalism etc.) are either diminished in scope or abolished or turned ineffective as restrictive technical solutions, such as DRM, may be implemented despite the existing statutory exemptions. This is a good example of what Lessig discusses with the notion of the power of the (software) code (Lessig 2001, 219ff.). Hence the legal constraints and rooms to move might present important factors involved in the evolution of the research system.

Parallel to this legal development, the academic publishing sector has been commodified over the last decades (see already above, 9.1.3). In the case of patents on inventions by faculty members, US universities at least typically followed a dual strategy. They provide the technical help their faculty needed to acquire and market their discoveries, while at the same time insisting that they had a financial stake in the returns on research conducted in university facilities by fully-employed university personnel. By contrast, no such strategy is being followed so far in the case of copyrights (Pew Higher Education Roundtable 1998, 4). By this token, copyright – an instrument originally developed to be an incentive to creative activity, by rewarding the creator for his/her work – has become “the fuel for the engine that drives the profits of the journal publishing industry” (Morton 1997, 5).

We can distinguish between a number of general IP law questions (9.2.1.1), more specific issues with regard to fair use and academic exemptions (9.2.1.2), and finally the topic enforcement (9.2.1.3).

⁸⁷⁸ From October 1998 (<Cyberlink=893>).

⁸⁷⁹ Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs, OJ L 122, 17/05/1991 p. 42-46 (<Cyberlink=817>).

⁸⁸⁰ Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, OJ L 77, 27/03/1996 p. 20-28 (<Cyberlink=818>).

⁸⁸¹ Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society, OJ L 167, 22/06/2001 p. 10-19; this is often called the “info directive” (<Cyberlink=819>).

⁸⁸² See, for instance, the Austrian amending law proposal <Cyberlink=820>; many member states did not implement in time, however.

⁸⁸³ Napster is (was) a partly distributed, free “stock exchange” for digital music files.

⁸⁸⁴ The music, film, software and publishing companies which own the copyrights or having been licensed by the authors/creators.

9.2.1.1 General questions

As already mentioned above, there is no reason to doubt that IP law is applicable in principle to everything happening in cyberspace.⁸⁸⁵ However, a few general questions deserve special attention in our context here. They concern new ways of publishing, such as multi-authorship, multimedia and databases.

Multi-authorship and “interactive-sequential innovation”

The Internet provides, as an interactive and dynamic environment, the opportunity for “interactive and sequential innovation” (Bessen/Maskin 1997), e.g. in interactive forums or through subsequent versions of software, developed collaboratively, or, eventually, when filling a hyperbase (6.3). Arguably, the conventional IP model is centred on the idea of a single creator. Attribution of creator-ship to single persons is crucial for all legal consequences. In the interactive environment this is not always possible and hence the traditional copyright system deters from “creative imitation” which is not simply copying because it adds value. In such a situation, tighter intellectual property rights seem inappropriate. For instance, transcripts of extended online discussions could hardly serve as the material for subsequent publication, if copyright-related issues arise: ownership of the messages, editing, acknowledgement and privacy (Harasim/Winkelmans 1990, 398). Here, academia (and the legislators) will have to strike a balance between the support for intellectual creativity regardless of ownership of ideas (an IP question), on the one hand, and the attribution of merits to individual participants (a question of academic credentials; see already 8.4.2), on the other hand.

Multimedia publications

It is to be expected that academics will increasingly use digital publishing with a view to taking advantage of the new opportunities of multimedia (6.2.2). As a rule, the multimedia author will use not only multimedia material, which s/he has created her/himself, but also include third party material (from photographs to audio and video sequences). While it seems clear that the final multimedia products are protected under IP law (Götze 1996, 72), a careful check of all IP rights during the production process is needed. Only in very specific cases, one of the usual exemptions for academic quoting (see below 9.2.1.2) will be applicable. In particular, the distinction between academic and non-academic products will not be easy in all cases (Hoeren 1997b). Frequently, the multimedia author will have to negotiate with hundreds of right owners, perhaps even worldwide, as there are no “one-stop-shopping” regimes in place yet. Only for specific categories of works and not in all states and circumstances, so-called collecting societies may represent the multitude of right owners. Often they are not (yet) competent for digital rights (Hoeren 1997a).

⁸⁸⁵ Note that while providing the label © or “(c)” (to declare the copyright ownership) is not necessary, neither under European law nor in the Anglo-American context, it is nevertheless widespread because it was compulsory in the US until a few years back. In addition, it has a symbolic and declarative value.

Protection of databases

Databases, in particular online accessible databases, are a new object of IP protection as they were not included as collections of information per se because they lacked any creative elements. The new IP protection is based on the consideration that it may be quite onerous and expensive to compile them and to make them accessible in a structured manner. To protect this investment, the European Union issued a respective directive⁸⁸⁶, meanwhile implemented in all European states. Similar developments are under way in the US and on an international level (Lehmann 1997a).

There are fears that IP protection of databases may also affect the international flow of scientific data, if the special needs of libraries, educators and researchers are not taken into account (OECD 1998, 205, quoting National Research Council 1997). At least under the EU regime, exemptions for research are possible.

Note that *software* is now also protected under IP law. This can be relevant for the many little pieces of non-commercial academic software available through sharing servers and individual homepages (e.g. in economics and mathematics). Most academic software authors, however, choose to publish under the so-called GNU-GPL license⁸⁸⁷, which allows users to use and amend the software as long as the original author is named and the code is not commercialised.

9.2.1.2 Fair use and applicability of exemptions for libraries and academic research

If certain conditions are met, academic (non-commercial) research, libraries and archives are exempted from IP protection in the sense that they may quote and copy without the author having a right to claim royalties. Although expressed in different terms in the various countries,⁸⁸⁸ the aim is the same. This serves the interest of research very well. In principle, these academic privileges are applicable in the digital world, too. Nevertheless, a number of questions arise in practice,⁸⁸⁹ in particular as the new possibilities of the digital media (the world-wide availability of digital copies) arguably reach the limits of what might reasonably be considered fair use. One case in point is document delivery where it is doubtful whether academic libraries are allowed to co-operate widely (e.g. Götze 1996, 71). Another issue is electronic student reserves. Furthermore, recent technical (DRM) as well as legal developments (see the new EU copyright directive) put into question the statutory rights of academic users (including their role as producers/authors) as they widely allow for the superimposition of contractual restrictions over statutory rights.

Specific issues in this context discussed below concern licensing agreements; archiving and digitisation; digital quotes and links; the use of information in the open domain; and the limits of use of one's own text, including public self-archiving.

⁸⁸⁶ See above fn. 880.

⁸⁸⁷ <Cyberlink=894>.

⁸⁸⁸ The US Copyright Act introduced a general principle of "fair use" while most European legislators, including the EU, deploy the language of specific exemptions for different purposes.

⁸⁸⁹ Even the two-year Conference on Fair Use (CONFU – <Cyberlink=420>) failed to reach consensus on practical guidelines in 1997.

Licensing agreements

Contractual agreements between publishers and users (mainly libraries) may be described as an alternative to the copyright regime (Okerson 1997a, 2). Licensing agreements have in common with the copyright regime that both accept the fundamental idea of the nature of IP but they differ in the vehicle by which they seek to balance the rights of the various actors. Licenses represent a market-driven approach to this regulation, through deals between buyers and sellers. The problem with them is that these markets are not a level playing field of equally strong actors, but that they are rather distorted in favour of the big players (publishing houses). Therefore, complaints about terms of licenses concern important issues such as, in particular, the potential loss of knowledge because at the end of the licensing period prior investment can become worthless as the access ceases; and uncomfortable license restrictions on users' rights as well as on the type of users allowed to access (cf. Okerson 1997a, 4). DRM systems are intended to give full control to the publishers over the specific uses of their licensed material.

Archiving – digitisation

Although there are statutory privileges for archiving that allow making copies for libraries and archives in some contexts (e.g. in most of Europe, for details see Peters 1998), it is not yet clear whether and how this will extend to digital resources. First, there are practical difficulties, such as DRM restrictions, which may not allow for saving the digital material on another medium. Second, the digitisation of, for instance, academic journals with a view to archiving is to be considered as an act of copying and is therefore only allowed on the basis of either a license or a statutory provision (Peters 1998). The problem with licensing is that, on the one hand, the publishing house (if it still exists) is not in a position to grant the license since, in general, it will not have acquired the digital rights – something not yet known before the end of the 1980s. On the other hand, seeking the approval of the original authors or their heirs is impractical (consider the hundreds of authors who have contributed to the print volumes of journals over the years).

This is not only a problem for libraries, but also for those academic specialities that are in the business of compiling editions of, for instance, old manuscripts, photographs, works of art etc. The lack of an explicit exemption for the digital use of these items for academic purposes may hamper this type of academic endeavour considerably.

Digital quotes and links

E-publishing offers novel ways to simplify the construction of new works that rely on other works – something typical for academia. Two fundamentally different ways of digital “incorporation” of the material of others may be distinguished:

1. *simple referencing*, for instance in a footnote or in brackets without actually incorporating the material as such, but accompanied by a digital link to the external source which may be or may be not followed by the reader; and
2. quotes of text that incorporate the material of another creator (shorter or longer pieces of text, images, audio sequences etc.) in one's own E-publication without re-typing it or copying the image into the environment of this E-publication. Instead, the author uses the capability of the WWW to put together the document shown to the reader-user from various dispersed sources (so-called *inline linking, or framing*). The user may not even be aware of the fact that s/he is seeing something that is not all coming from the same source.

While there seems to be growing consensus that variant (1) is permissible per se under IP law⁸⁹⁰ – because it is only a slight but very user-friendly extension of the current practice of “footnoting” (Denning/Rous 1995) and because the copyright owner is not hindered to restrict access to his/her material to only those who pay royalties (or sit in an institution which pays) – the situation seems to be different for variant (2). Most legal regimes allow, however, at least up to now⁸⁹¹, for quoting of “not too extensive” parts of text and even figures and graphs etc. from others’ works provided that it is done in a scholarly context and the source is well documented and acknowledged. While the legal situation certainly differs and is under constant evolution, it seems that also in digital variant (2) quotes should be possible as long as the use of the third party material does not amount to plagiarism, that is, as long as the source is correctly given and is identifiable.

Use of information in the open domain

Data released into the public domain via openly accessible databases would be usable for everyone, at least in the framework of (even extensive) academic quoting and linking as discussed above. Telling examples are genome sequencing data from the HUGO project or Hubble Space Telescope data. Both the originator of a particular entry (or set of entries) in such a database and all other originators and users have an interest in releasing the data as soon as possible in the interest of the advancement of science. The originator should, however, be protected in the sense that his/her name is associated with the data, despite its release into the open domain (see Rowen et al. 2000 for a proposed policy).

While there is the contrary tendency to restrict the public domain through restrictive laws and contractual regimes (Pfaffenberger 2001), there are also a number of initiatives such as the two just mentioned aiming at making information freely available. Similar to the open source movement as regards software, there is also an open content initiative, which is, however, not restricted to academia. It released the Open Content License and the Open Publication License (OPL)⁸⁹² with a view to promoting the open sharing of content over the Internet. The OPL would be particularly suitable for publicly financed research output.

Limits of use of one’s own texts (public self archiving)

As reported above, the “fair use” regime and similar systems in the European legal systems allow researchers to use published works for teaching and quoting etc. within certain limits. This also concerns their own publications. However, contractual restrictions may restrict the kinds of use even further (Pew Higher Education Roundtable 1998, 4). At the extreme, university teachers may have pains using their own articles as course material (Bennett/Matheson 1992, B1). While the publishers are seeking to limit “leaks” and introduce sophisticated clauses which grant the publishers all “E-rights”, even in formats/media that have not yet been invented (e.g. Strong 1995), others argue that the authors of scientific works based on government-supported research “should be free to

⁸⁹⁰ See, however, the possible restrictions under competition law, [below 9.2.2](#).

⁸⁹¹ There are doubts as to the interpretation of the leeway for the national legislators in Europe as regards the implementation of the Info Directive.

⁸⁹² <[Cyberlink=593](#)>.

distribute those works as they see fit, via journals, electronic postings, and other new models that may appear” (Bachrach et al. 1998).

One of the main areas of this clash of interests between academic authors and publishers is what the former is allowed to do with his/her manuscript, that is the working paper version, before and after submission for publication in a journal or book. Here the new opportunities of digital publishing have indeed made a difference in the publishers’ perception of the issue. While previously, issuing a manuscript before submitting it to a journal as a working paper was no big threat for the marketing chances of the later published journal article or book because paper-bound working paper series had only very limited reach (and limited layout qualities, too). Today, a pre-publication series in the WWW potentially reaches the entire relevant readership, in particular if the series is part of some distributed database system, which allows searches in all connected series⁸⁹³.

The same holds for so-called *public self-archiving*, that is the uploading and registering of a manuscript in an E-pre-print archive⁸⁹⁴. Despite the fact that these new digital opportunities have already existed for some time now, there are still huge differences in the perception of the legitimacy of pre-publishing and self-archiving. While in some fields this is considered perfectly legitimate (e.g. physics, cognitive science, economics), the online availability of a paper in whatever form is treated as a serious hindrance for later publication, at least in the top journals, in other fields (e.g. biology, medicine). In many fields of the social sciences and humanities, it seems that uncertainty regarding the stance of the publishers has created a grey area. While some individuals would not hesitate to submit previously archived or pre-published material (not least with a view to establishing a desired practice), others are hesitant as long as there are no explicit rules available. In this context, the “Transition from Paper” Working Group of the American Academy of Arts and Sciences has put forward the proposal that no exclusive licences be given away from publicly funded authors, but that copyright remains with the author. The reactions to this proposal were split (Bachrach et al. 1998). Some “have adamantly opposed authors’ posting of their own articles on Web pages or e-print-servers”, whereas others “have considered such distribution consistent with, and even advertising for, their own journals”. (Note that the split is *not* trade publishers vs. not-for-profit professional societies, but that some of the former liked the idea as well).

This grey area could either be cleaned by customary law (practice),⁸⁹⁵ contractual clarification, or legislation (either statutory or on the associational level), that is by establishing an explicit exemption.

9.2.1.3 IP law enforcement issues

In a publishing environment such as the Internet, enforcement of the rules discussed above (even if partly only slowly emerging) seems crucial to ensure trust and smooth operation (OECD 1998, 215). How can copyright be protected in a global digital environment? Two issues are salient here: the international dimension and the problem of authentication of the digital material.

⁸⁹³ E.g. RePEc (<[Cyberlink=214](#)>).

⁸⁹⁴ E.g. CogPrints (<[Cyberlink=220](#)>).

⁸⁹⁵ The ePrints.org initiative aims at making self-archiving a widespread practice. On their website, the promoters answer the rhetoric question “Is self-archiving legal?” (<[Cyberlink=812](#)>) in the affirmative and give some details hints as to the limits of this general statement (in particular relating to copyright transferrals to journals).

As regards the first point, a forceful trend is the worldwide harmonisation of the respective legislation in order to create a level playing field (see above in the introduction to 9.2.1). Note, however, that even a perfectly harmonised IP law, plus mechanisms of mutual enforcement in one or two parts of the world, cannot solve the problem of “leaks”, that is publishers or authors exploiting different schemes in states outside the harmonised zone. It is, however, unlikely that this will be a major problem for academia as there are well-established rules against fraud and plagiarism to deter “regime-hopping”. Nevertheless, the big players seem not to trust statutory solutions of legal enforcement. They plan to enforce their licensing contracts via DRM.

How to validate authorship and date of publication is the other crucial issue for IP right protection (OECD 1998, 215). In the paper world, the “original” has a unique meaning. By contrast, in a digital environment, it needs special measures to ensure that a digital copy (which is identical to all other copies and which can be manipulated) represents the true state of affairs with regard to priority claims and copyright protection. This is mainly a technical and organisational problem with a number of solutions, from encryption to digital time stamping and the assignment of unique identifiers (Armstrong/Lonsdale 1998, 47f.). One system already well under way, is the document object identifier (DOI)⁸⁹⁶ project. Unique numbers are being assigned to each digital object which then serve as a “digital ID for intellectual-property trading” (Davidson/Douglas 1998, 9); a central database stores the information of the current URL and rights’ holder (for in-depth descriptions and discussions see Davidson/Douglas 1998; Rosenblatt 1998). DOI plus digital time stamping could be a practical and secure route to document authority and identification (Armstrong/Lonsdale 1998, 48). Davidson/Douglas (1998) report the concerns involved in this commercial and copyright protection oriented solution. Small publishers and non-commercial institutions like libraries or other non-traditional publishers, e.g. scholarly associations, are not (yet) included. Therefore the DOI (and CROSSREF⁸⁹⁷) world is far from being universal, hence the usefulness to the individual researchers is hampered. Alternative systems may be developed for this sector which is indeed much larger (and growing).

9.2.2 Academic providers: link setting, liability and data protection

Universities, research institutions and individual researchers are heavily involved in the cyberworld as providers, both of access (mainly the universities) and content (all academic actors). Three issues are of specific interest here:

(1) *Link setting*: While link setting is probably no problem under IP law (see above 9.2.1.2), it may be an issue under competition law (Duursma 2002): whether it is permissible to set links depends, first of all, on the non-commercial character of the link-setting site. In general, free academic link collections like CYBERLINKS will pass this test. Link collections forming part of an academic book may, however, lose this non-commercial character. A further condition (for the applicability of competition law) that will only be rarely fulfilled in the academic context is that the link is set for the purpose of competitive action. This, in turn, presupposes a direct competitive relationship between link-setter and linked company.⁸⁹⁸

⁸⁹⁶ <Cyberlink=78>, see 2.1.2.

⁸⁹⁷ <Cyberlink=376>, see 2.3.4.3.

⁸⁹⁸ For details from an Austrian/German perspective, see Duursma (2002).

(2) *Liability for content*: The academic providers, too, may be held liable for (1) copyright infringements on their sites (e.g. on student homepages) as well as possibly for (2) “flaming” (insults, defamation), e.g. in academic discussion fora or their archives (Heidrich 2003). A pre-condition for this type of liability is that the provider knows (or had to know) of the infringement of insult. How intensively a provider has to check content on its site is an open question.

(3) *Data protection/privacy issues*: Most academic homepages also publish personal data of the people working there. In principle, these data are protected by privacy and data protection legislation. In general, however, the researchers agree, at least in an implied manner (e.g. by transmitting the data), to the publication of their personal data. Furthermore, it has become quite common internationally to have such a “show case” listing the accomplishments and records of the research unit that is comprised of all individual contributions. For sensible data such as photographs, however, explicit approval will be necessary.

A somewhat common thread of these three issues is that academic actors often act at the borderline between “pure” scholarship and research, on the one hand, and the “world outside”, on the other. Hinting at the academic context cannot legitimise everything academia is doing.

9.2.3 Legal rules for archiving E-publications

As already mentioned in 7.4.2, one option to solve the archiving problem (or rather to start solving it) would be a legal deposit rule, similar to the existing rules regarding paper publications. Such a rule is, however, all but easy to formulate and implement because of

- the *international dimension*: issues to solve are the scope of the designated libraries; the definition of what is published “in the territory”; whether the rules should be harmonised; whether international exchange should be allowed (or even be part of the system) etc.; and
- *access*: questions to answer are: who should have access and when? Only for local use? The latter would be somehow anachronistic in the digital world. However, as long as the original publisher is still in business and offering licensed access to the material, the archiving libraries would be competitors.

The other option is less passive (from the part of the designated libraries) and involves active systematic collection. In this case, it is less a matter of assigning responsibility, but of deciding the question who should be allowed to archive public content. See for instance the case of the Swedish Royal Library, which fights for a legal provision allowing it to collect Swedish websites and to make them publicly available within the library (Lidman 2002). Without such a legal permission, a library would have to seek consent by all IP rights owners – which would obviously be unmanageable.

9.3 Conclusions

This chapter has shown that the economic and legal side of E-publishing are strongly interwoven. The main reason is that in the present stage of academic publishing, commercial interests are centre-stage. The law, in particular intellectual property law and contractual law, has been the main instrument to structure this market. While the technological set-up – the freely accessible Internet – seemed at first a menace to this commodification process, technology has proven to have the power to turn academic publishing into a perfected market where access to all items is strongly controlled and hence perfectly exploitable. The IP privileges assigned to the academic world (in particular for access, copying and quoting) may be overruled by contractual restrictions, which are enforced by technological barriers.

Furthermore, the worldwide trend to place universities and research institutions “in the market”, that is both allowing and forcing them to become financially more independent from state resources, represents another danger: many of the above mentioned privileges can only be enjoyed by non-commercial enterprises. To cite but one example, the US fair use rules do not apply to commercial research enterprises⁸⁹⁹. The more commercially oriented research institutions (universities) become, the more difficult it will be to rely on these privileges.

It is doubtful whether, in the academic world, the challenges of the digital media can be adequately solved with IP regimes and licensing. Many argue that the scholarly communication system needs free access and no restriction whatsoever to the material published by other academics. Let me take a look at the two general justifications for copyright that is supposed to be (1) a source of income (through licensing) and (2) a protection against fraud and plagiarism.

(1) There is no doubt that those who invest in the publication chain should be adequately paid for it. But the currency of copyright does not seem the adequate means, neither for academic authors nor for academic publishers. Rather, the value added by publishing houses through layout, typesetting, technical mark-up and managing the publishing process should have a price to be paid out of university and research budgets (see already 9.1.3.4). Academic authors are, in general, not primarily interested in generating additional income with their academic publications (unlike other publications, e.g. popular science books, student textbooks etc.). Their main aim is to contribute to an academic topic and thus to generate respect among their colleagues (via citations). It is only in very special cases that there is a perceived direct link between publication and income generation since most academics are paid through other channels (by their institutions or research grants). Receiving a few Euros a year for the sale of a number of copies of one’s latest journal article is not the primary incentive, in any case. Hence, copyright is no relevant factor but dispensable if that favours academic work.

(2) For sure, there is a need to avoid copyright infringements in a non-technical, content-oriented sense. In academia this problem is traditionally tackled without copyright. If someone uses material, text or results without due acknowledgement, then this is normally sanctioned by standard academic fraud procedures (see 8.1.2), not via copyright infringement cases.⁹⁰⁰ Note that the availability in digital form even improves the chances

⁸⁹⁹ Texaco ruling 1992, commented e.g. by Hoffman (1993).

⁹⁰⁰ This situation is certainly to be distinguished from the case of copyright for software, trade books and the like.

that fraud and plagiarism will be detected (cf. 2.4.8 and 11.2.2.2). Hence, the chances of being exposed as a dishonest, non-professional researcher are higher and should both deter would-be-plagiarists and make copyright procedures even less likely. Furthermore, the cumbersome and needless business of getting approvals for using academic building blocks found in previous literature (such as graphs and figures, as opposed to pure text) adds another argument against the excessive use of copyright within academia.

To sum up, it seems conceivable in academic communication that copyright may play a much lesser role than hitherto argued from the part of the publishers. In other words, one may understand publishing academic works not as a business, but as a service from the academic community to the academic community. It does not need to be a free service, but the new system could avoid the obstruction of scholarly communication looming if it is no longer allowed to distribute electronic (or, for that matter, print) publications freely. As argued in [section 9.1.3.5](#), de-commodified academic publishing (“phase III”) is possible and not unlikely. Phase-III-publishing can only take place in a sort of “copyright-free zone”. While IP laws would still be in force, they would not be enforced: academic authors would not care about them – and perhaps use the Open Publication Licence (OPL). What is at stake here, is the choice between two potential worlds of cyberscience: the one would be ruled by statutes (copyright), contracts (licensing) and techniques (DRM) developed for the commercial sector; the other would be community-oriented, de-commodified and guaranteeing free access to and use of knowledge. While the first option will most likely lead to a cyberscience world in which the technological potentials are not fully exploited, the second option gives cyberspace a fair chance to develop into an adequate and improved environment for science and research. The new and much cheaper E-publishing opportunities may be an incentive and an opportunity at the same time. It would, however, need almost a revolutionary approach in many respects and by many participants. Although academia has much to gain from a financial and a practical point of view, whether this transition will take place, is dependent on many further factors. In particular, whether it will indeed be possible to leave traditional paths, to overcome institutional inertia, and to bypass the established incumbents has to be left open in this study.