Implementing Electronic Access for an Independent Journal: Technical Issues, Business Decisions, Legal Matters

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Abstract

We discuss from the perspective of a typical independent journal the transition from `print` to `print plus electronic`. Besides technical issues concerning implementation of restricted access, decisions on pricing electronic editions and legal matters concerning the license had to be made. The Houston Journal of Mathematics wanted to find a middle ground between its obligation to disseminate knowledge, as freely as possible, and its need to generate enough revenue in order to maintain its independence. As a journal that has been around for about thirty years, the creation of an electronic archive was a natural additional step. I will explain how we integrated access to backfiles in our subscription model. Finally, I will try to justify my positive outlook for independent journals in general.

1 Introduction

The shift from `print` to `print plus electronic` has created for all scholarly journals a host of new and challenging problems. This is especially true when a journal opts for restricted electronic access. Then not only technical problems concerning implementation have to be resolved, but also issues concerning marketing and pricing have to be addressed. The purchase of copyrighted electronic material requires in most cases a license agreement. Because current laws concerning (fair) use of copyrighted material do not apply to electronic files, it is up to the publisher to decide to which extent electronic files can be used. And in case of license violations, in absence of criminal abuse, the publisher has to decide what kind of legal actions, if any, should be taken.

Commercial journals employ specialists for electronic matters, together with people who know about Web design and advertising; and there are business

executives and lawyers. In contrast, independent journals are run by only a few people, often only by one academic person, and a very small staff for secretarial and accounting work. It would seem that independent journals are hopelessly disadvantaged in this electronic age. However, in my experience as the Managing Editor of a typical independent research journal, the Houston Journal of Mathematics, HJM, I can say that this is just not true and the purpose of my article is to support this claim.

First, I am going to describe in simple terms how restricted access can be implemented. Interestingly enough, the technical choices we made have actually influenced the terms and policies of our license.

Currently, copyright and usage issues for documents in electronic format are in a legal state of limbo, with librarians and publishers often on opposite ends. Some librarians feel that they can extrapolate certain copyright laws to electronic issues, despite the fact that these laws were crafted long before the price of copying became a non-issue; and publishers have been accused trying to sell the work of their authors indefinitely, without carrying any further expenses. The HJM license tries to find a middle ground between the interests of subscribers, and our need to protect subscription revenue.

Commercial journals stress electronic subscriptions. For a variety of reasons, a few major US libraries have already decided to subscribe only to the electronic editions of the more expensive Elsevier and Springer journals. This trend may lead to the eventual disappearance of print editions. How will this effect the small academic publishers? Some people predict that future technical developments will be too demanding for smaller publishers and in order to survive, they must band together, or join larger organizations. I will have some thoughts on what kind of future co-operation with other publishers or agencies HJM might consider as beneficial and would support.

2 Starting A Web Site: First Decisions

HJM advanced during the year of 1998 from a print to a print+electronic journal. HJM had already established its Web presence the year before with freely accessible tables of contents, abstracts and a comprehensive index. Thus, in order to complete the process, we only had to provide links from titles to document files. Like most other mathematics journals, we chose the PDF file format for the Web, as well as for printing.

From a business perspective, print and electronic editions share the very same upfront expenses for production of the final PDF files. For print editions one only has to add the costs of printing and mailing, for electronic editions the non-trivial work of updating the Web site.

It should be obvious that in order to create and maintain a full-fledged Web site, a journal needs to have access to a computer network that can accomodate the special needs of electronic journal publishing. For HJM this was no problem because of excellent computing facilities and support within the mathematics department. Thus there was no need for HJM to find an electronic journal

publisher.

However, having the technical means to run a Web site is for a journal only the first requirement to act as its own publisher. The site also needs regular updates. We wanted to have for HJM a complete and very informative site but also one which was easy to maintain. For this reason, our site is pretty much text based. We also tried to minimize the number of internal links. Of course, titles need to be linked to files, but we put abstracts and titles all on the same page. For every issues, this saves us the work of creating about 20 additional Web pages together with their links.

Right from the beginning, we asked authors to provide us with auxiliary abstracts which are suitable for Web posting. That is, Web abstracts have to be in plain English, self contained and with all mathematics in UNICODE, and no TEX code whatsoever.

Before issues are sent to the printer, all authors receive the final PDF file for last minute corrections and updating the references. On our Web site, issues which have been posted but not sent to the printer, yet, are termed as "Expected".

Our abstracts do not include a keyword section or subject classification numbers. Major organization that work with these data, like MathReviews, ISI and Zentralblatt have to extract them from our document files which they can download anytime free of charge.

When we designed our Web site we had mathematicians in mind and not organizations that provide content and search facilities for libraries. It has been my experience that such organizations want publishers to submit to them abstracts and metadata in their own format resembling structured library cards. So far, HJM has ignored such requests. Moreover, according to a poll which I conducted amongst HJM authors, for work related search, 55% used MathReviews and Zentralblatt most of the time, 35% Google and nearly 10% ArXiV. There was no interest whatsoever in search facilities provided by Project Euclid, SwetsWise, EJS, or by major publishers. Of course, in fields different from mathematics, outcomes of such polls might have been rather different.

Most commercial, but also some independent journals, have their document files registered with CrossRef in order to obtain DataObjectIdentifiers, so called DOI's. One of the ideas behind the DOI is that it should replace references to URL's of Web pages by stable identifiers. The DOI of a document will remain the same, regardless of changing publishers, broken links, torn down Web sites etc. I have discussed the DOI in more detail in [5]. But I can only reiterate that for journals like HJM there are currently no tangible benefits to join CrossRef in order to obtain DOI's. Our URL's are stable because we are not changing them, and it is unlikely that HJM will ever change ownership. Organizations, that cover the research literature, like MathReviews and Zentralblatt, have been using for decades their own internal identification schemes. Moreover, besides payments to the various organizations behind the DOI, e.g. CrossRef, one must not forget the work involved for creating, proof reading, and registering these numbers. While the DOI eventually might proven to be useful and universally recognized, there is also the real possibility that it may turn out to become

obsolete because other organizations, for example those creating Search Engines, might have come up with better, more efficient, and cheaper solutions.

Laura N. Gasaway [3, p. 5] has outlined a rather grim possibility for referencing material through DOI : *"DOI content providers would not only control the indexing, but also access to the indexing and through the index access to the digital object itself."*

Some journals have added to their electronic editions certain features which don't make any sense for print. Like internal hyperlinks, or live external links to referenced Web sites. On the printed page these links show up in shades of gray, and such PDF files cannot be used for journal printing. Thus one needs two types of PDF files, one for screen view and one for print. The Pacific Journal of Mathematics, for example, went this route.

While hyperlinks are quite easy to implement, however, after some trial runs and consultations with authors, HJM refrained from adding Web specific features to its PDF files. Posting only one kind of PDF files, namely those used for printing, definitely has its virtues. Of course, one should not forget that a computer savvy person who prefers to read from screen, can always personalize his view by inserting to the PDF file bookmarks, links or his own comments. This kind of activity is not unlike adding marginal notes

Nobody can guarantee that electronic editions will be fully accessible to future generations. When we started our Web site, we had Project Gutenberg in mind, see [8], and adopted its philosophy to the best a mathematics journal can do. Later important decisions, e.g., concerning archiving older volumes, were guided by the same principle. I will come to this issue later.

3 Pricing Electronic Subscriptions

Some independent journals with full electronic editions charge subscribers only for print, and make full electronic editions freely available to the public. Other journals apply a moving wall and provide free access only after a specified number of years. Open Access journals want authors to pay for all publication costs and therefore want to abolish the traditional subscription based business model. Springer created with its more recent Open Choice a hybrid of a subscription based and open access operation. For a flat fee, which is currently $3000, an author can have his paper posted on Springer Link, with free access to everybody. But the paper will also appear in print.

Finally, Pay-Per-View allows libraries and individuals to download for a flat fee individual articles.

Many newspapers and magazines have free electronic editions. Here advertisements must compensate for lost subscriptions. Research journals with their very limited readership are by and large not attractive for advertisers.

Some journals that provide free electronic access have included a warning that free access would cease in case of not enough subscribers or sponsors. And indeed, very recently some major journals, like Geometry And Topology, have changed their policies of free electronic access and now charge libraries

for electronic subscriptions, or make electronic access dependent on a print subscription.

After considering other options, HJM decided on free electronic access, but only to subscribers of the print edition. That is, we currently do not provide the option of an electronic-only subscription.

Actually, finding the right subscription rate for electronic editions can be quite tricky. It has been suggested that the rate for electronic editions should be set not higher than 80% of the print subscription rate. While this sounds quite reasonable, one must not forget that printing costs depend mostly on the number of printed pages and not so much on the number of copies. Publishers pay in essence only for the first 200 copies, or so. It doesn't make much difference in printing costs whether a publisher orders 300 copies or 1000 copies. But there is a substantial difference whether an issue has 250 pages or 300 pages. Taking this into account, a somewhat paradoxical situation shows up: No matter, whether we are talking about a small independent publisher, or a large commercial organization, any non-trivial discount for electronic subscriptions will cause a financial shortfall.
Here is a quick calculation based on a 10% discount for the electronic edition:

For commercial journals, printing costs are quite low relative to the total subscription revenue. For a typical larger commercial journal which contains about 2000 pages per year, and has about 800 subscribers, the annual printing costs are about $40,000. Let us further assume that the annual subscription rate is $1,000, that is a very reasonable $.50 per page. Then printing costs for this journal make up only 5% of the total subscription revenue. That is, $760,000 remain for other expenditures and profit.

Now, if this journal would offer electronic subscriptions for the reduced rate of $900, then in case that 400 subscribers take advantage of the lower electronic rate, the subscription revenue would fall from $800,000 to $760,000.[1] Moreover, the costs for providing print copies to subscribers would not change much, it would go down by about $4,000. That is, the journal would experience a shortfall of $36,000, that is by the total costs of printing. The situation would get worse with any further increase in the number of electronic subscriptions.

For independent journals, printing costs are a big ticket item. For such journals about 50% of the subscription income is needed to cover printing costs. But again, a lower demand for print copies will not have much effect on printing expenses. Only when print copies totally disappear, then, unlike their commercial counterparts, independent journals would experience a substantial reduction in their operation costs.

As I see it, as long as there is demand for print copies, offering free online access as part of a print subscription is not only a convenient solution, but it even makes good business sense.[2]

[1] We assume here that the total number of subscriptions will remain the same.

[2] The American Mathematical Society, as well as the Society for Industrial and Applied Mathematics, provide free electronic access for subscribers of print editions. However, Indiana University Mathematics Journal offers a 20% discount for electronic-only subscriptions, claiming that they are following guidelines of the American Library Association. In contrast,

Besides regular subscriptions, HJM offers the Pay-Per-View option. As expected, see my article [5], it did not create much business interest so far.

Nobody knows, whether or when print copies will disappear. There might be an intermediate period where libraries will keep printed copies for a limited time, but no longer go through the expensive process of archiving.

At any rate, electronic subscriptions have already become increasingly important; currently about 50% of our subscribers have online access. For new subscribers, online access is especially attractive because it also gives them access to all previously published issues, that is, a complete run of the journal. Naturally, most of our new subscribers want to have online access included.

4 Providing Restricted Access

After HJM had decided to move up to a print+electronic journal, several technical issues concerning restricted access had to be resolved. I was told by our IT staff that they could accommodate any possibility, that is access by IP addresses, username and password, cookies etc. It did not take me long to realize that access by IP addresses would provide for a journal like HJM the most convenient route. But what should constitute "access"? Should access be restricted to the issues of a current subscription or should it include previous issues. Should access cease with cancellation or should it remain for all those subscriptions for which a library had paid for in previous years. Is a subscribing library entitled to download in a systematic fashion every file it has access to or does the library only act as an agent for its faculty. In other words, does the library buy anything of material value together with access?

In order to tackle in a realistic way this large array of possibilities, one first has to have some idea how restricted access by IP numbers actually works. In principle, this is a straight forward process where only some details depend on the server and its software. The UH mathematics department is on Linux and uses the Apache. As one might expect, all files for which access is restricted are in one directory, called "restricted". This directory can have any number of subdirectories together with its folders. Access is governed by a particular type of files, called .htaccess. These files contain registered IP numbers or domains. It became obvious to me that HJM can maintain only one of such access controlling files. Thus a request for a file for which access is restricted is honored in case it comes from a computer with an IP number which is listed in the .htaccess file.

This technical decision has as an immediate consequence that access is granted only to current subscribers. With cancellation, all privileges have been lost. I had discussed this delicate issue with various librarians, and the consensus was that our cancellation policy constituted the most reasonable approach:

Duke Mathematical Journal charges $1,520 for print and $1,515 for electronic, that is print and electronic differ by less than 1%. However, for print+electronic Duke charges $1,685, that is a surcharge of about 11% compared to print alone. Commercial publishers have developed all sorts of pricing schemes. Springer has been especially creative offering "enhanced" versions for print as well as for electronic subscriptions.

A subscribing library gets print copies for indefinite use while electronic access should be considered as a bonus included with a print subscription. As one librarian had put it: "With the print copies, the library got what it had paid for, and if it cancels it has nothing to complain about."

It is now commonly understood that access to digital material does not provide ownership of anything. However, buying digital material in form of CD's could be a different matter. However, it looks like libraries are not overly interested in buying electronic material. And major publishers are not eager to sell.[3] At any rate, the idea of digital libraries has more or less evaporated. Publishers (or in some cases their vendors) provide access to digital material but don't sell content.

If a library wants online access then it has to sign a license. A license is a contract and once signed, both parties must adhere to its terms. Carrie Russel who is the Copyright Specialist with The Washington Office of the American Libraries Association (ALA) spelled out the situation quite clearly, see [10]: *"Licenses are private contracts between two parties.....Once a license agreement is signed, the agreement takes precedence over any rights libraries or users may enjoy under the federal copyright law."* I guess this applies to current as well as future copyright laws. In other words, an agreement is an agreement.

While the `HJM` license addresses all the usual points, like authorized users, permitted sites, disclaimer of warranties etc.., of real importance are only two clauses:

1. The license holder must inform `HJM` about cancellation in order to have its access numbers removed.

2. Files cannot be used for Inter Library Loans.

(1) assumes that a library operates under some sort of honor code. A violation of (1) may be considered as theft of service.

Allowing ILL's for digital material is a hotly disputed issue. Of course, violations of (2) are nearly impossible to trace but certainly quite common. A remarkably small number of librarians wanted to negotiate our ILL's restriction, that is the copyright clause. A few librarians had called me, only to make sure that they had understood our copyright restriction. In all such cases, after some discussions they had no problems with our exclusion of ILL's.

I consider the `Pay-Per-View` option as a fast and convenient alternative to a slow and potentially illegal ILL process. Our charges are low, $10 per article for individuals which is close to what "lending" libraries charge for fulfillment of an ILL request.

So far, there has been only one case where a library asked for online-access but where an agreement could not be reached. In this case, the library faxed an

[3] Duke Mathematical Journal has made its first one hundred volumes available for sale. A library can either "rent" access for $250 per year or outright purchase the whole collection for $4,000. An additional $1,000 would buy a maintenance contract for 20 years. Thus renting and buying amount to the same sum of $5,000 for the first 20 years; certainly not an incentive to buy.

amendment which among other things would have allowed them to sell files for ILL's. I showed no sympathy for that, especially because the request came from one of the largest libraries in the country which also has been mentioned as one of the few Digital Mathematics World Libraries. Most the time, libraries which feel that they should be entitled to use files for ILL's, usually argue that in case they use a printout of a file, then to that paper copy, existing copyright laws apply. Especially when they agree to use for transmission only paper based fax technology.

As we all understand it, a loan is a transaction that consists of a lending and of a borrowing part; and where the borrowed object has to be returned to the lender. Loans of books and paintings work that way. It is also understood that an object on loan is not available by the lender. ILL's deviated over the years from these basic principles but various Copyright Acts, e.g., (USC 108,109) granted libraries exemptions. But as long as copying and faxing is done from hardcopies, the lending party experiences at least some inconveniences, for example copies have to be found and re-shelved. If files are allowed for ILLs then a click of the mouse is all that is needed. Thus some libraries have come up with the idea that files should be allowed for ILL's in case they are used only indirectly, namely to provide printouts of requested material. Then these printouts should be faxed but afterwards destroyed. `HJM` certainly disagrees with this line of thought. Making the ILL process artificially complicated doesn't make it legal.

Of course, we honor any reasonable request for exemptions, like a more flexible definition of authorized user and of permitted sites. We also allow IP numbers of proxy servers. But by and large, we have developed very much a "take it or leave it" attitude. We charge all libraries the same rate but then the same concise license should apply to all.

Our license has been scrutinized by dozens of libraries and their legal departments and underwent quite a bit of polishing over the years. Our license has been largely influenced by the "Terms and Conditions" of the Online License Agreement Form used for `AMS` journals. In contrast, I disliked the "Standard License Agreement" promoted by Yale University Library, see [13], mainly because of its Inter Library Loan clause.

As I have already mentioned, we do not ask subscribers to renew on line access on an annual basis. Only cancellations have to be reported. Naturally, there have been violations. If a violation has occurred that warrants termination of access, like illegally maintaining access, then the dean of the library will receive a letter from `HJM` approved by the UH legal department, that online access has been terminated and that a future subscription no longer entitles the library to online access; it would be subject to further negotiations. If applicable, a copy of the termination letter is also sent to the library's subscription agency. Some violations have been quite blatant. Such as cancelling the subscription shortly afterwards online access had been established. Of course, `HJM` is not the only publisher which has seen dishonest behavior by certain libraries. There is not much a small publisher can do, but I always inform the board of editors about terminations, so the word might spread.

HJM gets nearly all of its subscriptions through agents. Because online access is based on a separate contract between subscriber and publisher, not all agencies are overly interested in promoting electronic access. Swets has been the exception. But online access is becoming more popular and agencies are increasingly getting involved.

Currently the two largest agencies, Swets and Ebsco, are already content vendors for a number of publishers. However, I would prefer a system where agencies could sell and control access but where publishers share content only with a third party, preferably a non-profit organization. I think for electronic subscriptions this kind of business model would be most natural.

5 Adding an Archive

Scanning paper documents to obtain files has opened the door for digitized archiving. While in theory, libraries could digitize their own periodicals, they certainly would face legal challenges if files would be made available to other institutions. Only copyright owners are entitled to digitize paper documents and use files without any restrictions. For practical and economical reasons, some larger publishers have commissioned organizations like JSTOR for scanning documents and distributing files.

From a business point of view, the opportunity to combine current subscriptions with access to backfiles should publishers give enough reason to do their own archiving. It should be obvious that for a library starting a new subscription makes much more sense if it entails a subscription to the "full" journal, and not to one where only current issues are included. Only publishers who own their archives can offer this new type of complete subscription.

One might argue that publishers cannot be trusted to preserve and maintain the research literature. Archiving should be left to libraries, or to non-profit organizations like JSTOR. But this approach will, or has already, created monopolies of content holders. By what I have learned from librarians, subscriptions to JSTOR aren't exactly cheap; and some recognized world libraries got entangled in lawsuits because of alleged copyright infringements or unauthorized sale of copyrighted material.

While contemplating a few other options, HJM decided that it should pursue its own digitizing project consisting of the first 24 volumes. For getting bids, I contacted several companies with experience in the commercial as well as academic sector. Generally speaking, digitizing consists of two parts. The physical act of scanning printed pages and then the management of resulting files. Because HJM had already a complete index of all published issues on its Web site, I expected the digitizer to utilize the data provided by the index for naming and hyper-linking. I decided to choose a company, Princeton Imaging, that had carefully analyzed our Web site and offered a bid that included creation of tables of content, according to our style, together with hyperlinks to anticipated directories on our Web server.

For the scanning process we had to make a few choices. With respect to

choosing a file format, PDF was the only serious contender. Incidentally, our digitizer is a firm believer in DjVu, but in our case of a relatively small project with no color graphics, Princeton Imaging recommended PDF as the better format. With respect to resolution, we decided on 400 DPI as the best compromise between file size and desired screen/print quality.

Our archived issues are not more than scanned copies of the paper originals; we wanted them to be exact digital replicas of the originals. While our PDF files allow for OCR based search, nothing has been added. For academic reasons, titles and bibliographical entries of current as well as archived editions are not linked to MathReviews or Zentralblatt.[4]

I don't think that moving walls are a good idea. Especially for the very inexpensive journals, like HJM, it makes more sense to have with a current subscription access to all backfiles included. However, as a service to the mathematical community, all special issues and surveys have been made freely available.

We no longer maintain a large inventory of hard copies. Only a few copies of every issue are kept. For digital holdings, it has become increasingly important to have them stored at different locations. Currently, HJM is mirrored by the mathematics department of the University of Zürich. Besides diverting Internet traffic, this mirror site safeguards our files in case of catastrophic events.

There has been very little interest in purchasing hard copies of our special issues, even of the very important and highly regarded ones. This seems to be a clear indication that if an issue is (freely available) in electronic form, not much demand is left for obtaining hard copies. For periodicals in general, one might conclude that in the future, electronic editions, and not print, will be considered as the permanent and official version.

6 Final remarks

I feel that by and large, technical issues related to electronic publishing and archiving have been resolved. Authors of mathematical articles are using exclusively LaTeX for producing their work, and PDF has become the defacto standard for online publishing, and for digital archiving of any type of documents. For the Internet, HTML is the universal language. HTML is quite unstructured and supports visual but not logical design. Certain variants of HTML are better suited for mathematics and stress the logical structure of a page. However, some of these contenders which are meant to replace HTML are still not supported by all browsers, for example not by the widely used IE; and the success of Google is in part due to the fact that Google doesn't have to be told that a refrigerator is an appliance or two a number. CrossRef wants to see URL's replaced by DOI's. While the DOI is widely accepted by commercial publishers, it also seems to be the case that with a few exceptions, commercial publishers are the only ones using it.

[4] The board of HJM editors agreed unanimously that a publisher should not provide links from papers to reviews. Links from reviews to papers are a different matter and not objectionable.

The legal situation of electronic publishing is a much more complicated matter. Because digitized information is not covered by current copyright laws, for every new subscription publishers and subscribers have to go through the legal process of agreeing on a license. I feel that licenses designed by professional societies are best suited to meet the interests of academic libraries and of non-profit publishers. Our copyright transfer form does not in any way impede the author's right to promote his own work, say by posting files on his homepage, or on ArXiv, sending files to colleagues, etc. Transfer of copyright to HJM means that the author agrees that only HJM can distribute his work actively in a systematic fashion, e.g., through sales to libraries. Our Online Subscription Agreement continues in the same spirit. The license does not imposes any restrictions which could cause for an authorized user a conflict to use HJM files for his work, but libraries can download files only on behalf of authorized users and not to serve the interests of clients of other libraries.

HJM had no problems with creating its own archive. Thus we are able to offer electronic subscriptions with full access to all perviously published volumes.

There are a number of reasons why I don't support the idea of moving walls. Moving walls create additional work on our side but serve only the interests of non-subscribing libraries. One also should not forget that freely available material is sort of unprotected. Services may pick up free material and bundle it up for sale. I have seen whole journal issues offered by an agency in India. It seems that this is legal because a service has been sold and not freely available content. I guess that publishers which provide older issues for free had a service to the public in mind, and not the creation of shady business.

It has been suggested that independent journals should band together in order to avoid being crushed by commercial powerhouses. Unfortunately, all proposals HJM has received so far did not contain a clearly defined, or attractive, business plan. On the other hand, HJM is very open to the idea to grant to an organization for a fixed lump-sum the right to sell electronic access to any number of customers it could find. I feel that such an organization should not be allowed to buy content, but only the right to sell and serve an unlimited number of electronic subscriptions. It has been said that whoever holds the content becomes the publisher. Independent publishers have to be very careful about joining larger establishments, whether commercial or non-profit, otherwise they could run the risk of being placed under guardianship; and then might have to suffer from bad decisions where they had no say about.

I have always been very optimistic about the future of independent journals, especially in this increasingly electronic era. There are many reasons for me to stay optimistic. However there are also strong negative forces. But let's first start with some positive facts and trends:

The present state of affairs looks pretty good for independent journals. Like HJM most academic journals have seen an explosive growth in the number of published articles. In the past, researchers had only limited information about editors, scope, and content of smaller journals. The Internet has changed that. Now everybody operates in the open and independent journals have become more visible

Independent journals are very inexpensive and not under pressure to increase annual subscription rates just because investors are expecting higher profit margins. Independent journals that are published within academic departments increase their rates only to offset inflationary pressures, primarily of non-negotiable costs like printing and mailing, and not so much for pay increases of their small personnel. Thus independent journals should experience an ever increasing price advantage.

Publishing is not high-tech, no publisher has to maintain an R&D department. This was certainly the case in the old days; I am not aware that publishers have been involved in the development of printing technologies. The digital era certainly did not change the situation. In the old days, only commercial publishers could afford expensive and difficult to use typesetting equipment; independent academic journals relied on electric typewriters with exchangeable ballheads, and it showed. Because of LaTeX now all mathematics journals have the same professional look and where authors have done the major part of the typesetting work. Moreover, most LaTeX implementations allow for direct compilation into PDF files which are the basis for printing and Web posting. So "*Where does all the money go?*", this question was raised 1999 by Michael Barr [1] who contemplated about the high prices of commercial journals. We still don't know, but we know for sure that more money is flowing into the pockets of fewer mega-publishers.

High prices of commercial journals are probably the strongest enemy of independent and societal journals. Through highly inflationary behavior, commercial publishers have been trying to claim an ever increasing share of library budgets. A few years ago, some highly regarded libraries started cancelling a large number of their Elsevier holdings in order to save subscriptions for societal and independent publishers, see the widely circulated article in Nature [6]. While not all libraries followed this trend, some certainly did.

In order to distinguish themselves and justify their high prices, commercial journals stress impact factor, membership to CrossRef and nowadays usage statistics.

Advertising the impact factor might actually backfire. It's for most math journals not impressive anyway and it can fluctuate a lot. Quite recently, various mathematical societies within the EMS have been openly critical about the SCI and the Impact Factor, see the illuminating open letter [9] by the Royal Flemish Academy et. al. Incidentally, the impact factor of HJM has seen a substantial increase over the years but it would be unwise to make too much out of this.

Usage Statistics has become the latest craze. In a forthcoming article by John Ewing [2] , the AMS will express its concerns about the misuse of impact factor and usage statistics. Whenever librarians are contacting me about usage statistics, I tell them that they should ask their math faculty about our journal.

The situation of high journal prices is considered in some circles as so serious that they want to see the subscription based business model abandoned and replaced by "Open Access". Michael Held [11] and the group behind "Open Access Now", see for example [7], represent opposite sides of this highly controversial movement. I think that "Open Access" is an extreme remedy to solve

a crisis which has been caused by a few commercial publishers. I believe that free market forces will eventually provide a better solution. It looks like some commercial upstarts, like Hindawi and International Press, have already been quite successful.

For all publishers, the illegal copying of electronic material is of greatest concern. This is because we are dealing with a limited market for products where the price is essentially inversely proportional to the number of buyers. Whether the current situation justifies Patricia Schroeder's rather sarcastic statements about librarians, cf. [12], is a different matter. Of course, Open Access would alleviate the situation but would also create a very large number of maybe even much more serious problems.

Journals have to be produced individually where different issues have very little in common with each other, and where not much in the production process can be automated. Thus, for a publisher, producing more titles does not necessarily lower the production costs for any particular title. Computers and the Internet have made it possible to produce journals of highest technical quality with minimal expenditures of space and personnel. This fundamental fact concerning journal production is probably one of the the main reasons that small academic publishers have become tremendously competitive, a fact that is probably not to change anytime soon.

References

[1] Michael Barr, *Where does the money go?*, Newsletter on Serials Pricing Issues, NO 229 - July 13, 1999.

File available at:

`http://www.lib.unc.edu/prices/1999/PRIC229.HTML`

[2] John Ewing, *Measuring Journals, On the misuse of the impact factor and usage statistics*, to appear in Notices of the AMS.

File available at John Ewings site "Shared Material" at:

`http://www.ams.org/ewing/`

[3] Laura N. Gasaway, *Values Conflict in the Digital Environment: Librarians Versus Copyright Holders*, Article based upon a speech given by Professor Gasaway at the 2000 Horace S. Manges Lecture, delivered on March 7, 2000 at the Columbia University School of Law.

File available at:

`http://www.unc.edu/~unclng/Columbia-article3.htm`

[4] Klaus Kaiser, *The Web: Challenge and Opportunity for an Independent Journal*, Electronic Information and Communication in Mathematics, Lecture Notes in Computer Science, **2730**, Springer Verlag, 2002. (ICM 2002 International Satellite Conference Beijing, China, August 29-31, 2002).

File available at:

`http://www.math.uh.edu/~hjm/china_talk.pdf`

[5] Klaus Kaiser, *Some Recent Issues on the Business of Journal Publishing: An Independent Point of View*, New Developments in Electronic Publishing of Mathematic, FIZ Karlsruhe.

File available through EMIS, The Electronic Library of Mathematics at:

`http://www.emis.de/proceedings/Stockholm2004/kaiser.pdf`

[6] Jonathan Knight, *Cornell axes Elsevier journals as prices rise*, Nature **426**, 217 (20 November 2003); doi:10.1038/426217a.

[7] Open Access *now*, *Sabo bill*, August 25, 2003.

File available:

`http://www.biomedcentral.com/openaccess/archive/?page=features&issue=3`

[8] Project Gutenberg, *History and Philosophy of Project Gutenberg* at:

`http://promo.net/pg/history.html#thepgphil`

[9] Royal Flemish Academy of Belgium for Sciences and Arts, the Royal Academy of Belgium and Belgian Mathematical Society *To whom it may concern: SCI and Mathematics*, Open Letter, Brussels, October 2003.

File available at:

`http://bms.ulb.ac.be/documents/scieng.pdf`

[10] Carrie Russel, *Libraries in Today's Digital Age: The Copyright Controversy*, ERIC digest published by the US Federal Government.

File available at:

`http://www.michaellorenzen.com/eric/copyright.html`

[11] Society for Scholarly Publishing, *Held's editorial on Sabo bill*, August 23, 2003.

File available at

`http://www.sspnet.org/custom/news/details.cfm?id=143`

[12] Linton Weeks, *Pat Schroeder's New Chapter, The Former Congress Woman is Battling For America's Publishers*, Washington Post, Wednesday, February 7, 2001; Page C01.

File available at:

`http://www.washingtonpost.com/ac2/wp-dyn/A36584-2001Feb7`

[13] Yale University Library, *Standard License Agreement* available at:

`http://www.library.yale.edu/~llicense/standlicagree.html`