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**“Intellectual Property Rights Issues of Digital
Publishing - Presence and Perspectives”**

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Volker Grassmuck

A. Intro

*„The evolution of print teaches us [...] that what is fundamentally at stake changes very little over time. [...] T]he essential issues remain few: there is control, there is property extended to new objects, and there is lusting for profit. [...] The same remains true of the digital era; the objectives of control do not change, only the tools do.“
(Jean-Claude Guédon, Université de Montréal, In Oldenburg's Long Shadow)*

One week ago the new German copyright law for the digital age came into effect. At its core it is a privatization of copyright law. The balancing of interests until now could be achieved through differentiated exceptions and limitations in a public manner. Under the newly privatized order of law, exploiters are unilaterally setting the rules by means of contract and technology. Especially in the online-realm, all public interest claims have been waived.

Another privatization law is in effect in Germany since February 2002, the law on patenting in universities. Universities thereby gained the right to patent inventions of their employees. Connected to the law is a political program of establishing a patenting system in the public universities, paid for from the proceeds from the sale of the UMTS frequencies (35 million Euro until 2003) :an infrastructure of professional patenting and patent exploitation agencies throughout the federal states. The returns are shared 70% for the university, 30% for the inventor. Until then, only the inventor, a researcher or more likely her professor, had the right to patent and economically exploit an invention. But this, in the opinion of the German government, happened much too rarely –something that from another viewpoint, makes perfectly sense, because basic research is supported as public task precisely because it has no direct economic relevance.

But the minister Edelgard Bulmahn sees it as a mobilization of a potential for innovation that has been lying fallow. Just as in medieval agriculture, fallow or wasteland was the result of the commons, which in turn became the source for private and state property.

The private property model - inventors patenting their own work - in this case failed. So the reform in a sense is a re-socialization of personal innovation based on common means, i.e. the university facilities. But the overall goal is a commodification of research results and the generation of revenues for the universities, with all the property controls attached to it. And yes, there will be public funds for patent litigation as well which is, of course, the central means of controlling intellectual property.

The third story of privatization I want to talk about, is that of science publishing, of the databanks of fundamental science. But before that, some basics:

Robert Merton, the great sociologist of science and completely inconspicuous of party-political communism, based the essentially democratic, egalitarian ethos of science on four pillars: communism, universalism, disinterestedness and organized

scepticism, or in short: CUDOS. I would like to start by quoting from the passage titled „Communism“ written in the 1940s and republished in the seminal collection „The Sociology of Science“ from 1974.

"Communism", in the nontechnical and extended sense of common ownership of goods, is a second integral element of the scientific ethos. The substantive findings of science are a product of social collaboration and are assigned to the community. They constitute a common heritage in which the equity of the individual producer is severely limited. An eponymous law or theory does not enter into the exclusive possession of the discoverer and his heirs, nor do the mores bestow upon them special rights of use and disposition. Property rights in science are whittled down to a bare minimum by the rationale of the scientific ethic. The scientist's claim to "his" intellectual "property" is limited to that of recognition and esteem which, if the institution functions with a modicum of efficiency, is roughly commensurate with the significance of the increments brought to the common fund of knowledge.

The institutional conception of science as part of the public domain is linked with the imperative for communication of findings. Secrecy is the antithesis of this norm, full and open communication its enactment. The pressure for diffusion of results is reinforced by the institutional goal of advancing the boundaries of knowledge and by the incentive of recognition which is, of course, contingent upon publication. A scientist who does not communicate his important discoveries to the scientific fraternity ... becomes the target for ambivalent responses.

„We feel that such a man is selfish and anti-social“ (Huxley).

This epithet is particularly instructive for it implies the violation of a definite institutional imperative. Even though it serves no ulterior motive, the suppression of scientific discovery is condemned.

Publication not only as ethical rule, but demanded by epistemology as well. Truth is what has not yet been disproved by intersubjective scrutiny. It is the whole community's task to confirm, refute, and extend the knowledge in published works. And discovering truth - not helping finance universities - is the *raison d'être* of science.

The communal character of science is further reflected in the recognition by scientists of their dependence upon a cultural heritage to which they lay no differential claims. Newton's remark - "If I have seen farther it is by standing on the shoulders of giants" - expresses at once a sense of indebtedness to the common heritage and a recognition of the essentially cooperative and selectively cumulative quality of scientific achievement. The humility of scientific genius is not simply culturally appropriate but results from the realization that scientific advance involves the collaboration of past and present generations.

The communism of the scientific ethos is incompatible with the definition of technology as "private property" in a capitalistic economy.

When you read Merton and exchange „scientific ethics“ by „hacker’s ethics“ or „spirit of free software“, the statements fit to an astonishing degree. Free Software is the product of social collaboration which is contingent upon publication. It is owned in common by a global community, which strives to advance the boundaries of knowledge, very well aware that they are standing on the shoulders of giants. Recognition and esteem are assigned to innovators. Freedom of free software is ensured not by technology, but by means of a licensing contract, first of all the GNU GPL. In 1985, Richard Stallman created the GNU Manifesto, the FSF and the GPL. Since then the movement has become philosophically self-reflexive, institutionalized, and juridically defensible. It has become a sustainable knowledge and innovation commons.

The similarity to Merton should no be surprising, since free software was born out of the academic culture of free exchange of knowledge. Interestingly, this happened exactly at a point where this free exchange was threatened by commodification. Today, maybe science can learned something back from free software that it had originally taught to it, but has since forgotten. Before I’ll be speaking about this process of forgetting, I would like to open up a third scenario that hopefully will prove instructive for our issues.

Software, just as science is not a consumer good, like Hollywood products, but a tool. Editors for text, image, and sound are means of production for knowledge. Underlying the digital revolution is this special quality of the computer to empower its users to create new things. The special quality of the Internet is to connect people without gatekeepers and intermediaries, to bring the potential of the connective intelligence to bear fruit.

I want to end my introduction with a third example besides science and free software that powerfully demonstrates the paradigm shift.

The idea to let an encyclopedia emerge from the vast pool of interconnected brains is rather old. One such project was Nupedia. Founded in March 2000, it was built on a classical process of encyclopedia making. Entries had to be approved by at least three experts in the relevant field, and professionally copy-edited to ensure a rigorous quality-control. The declared aim was that articles will be „better than Britannica’s“. This *was* an open project. The articles were released are under the GNU General Documentation License, but the editorial process was so strict that many people who would have liked to contribute were frustrated. In March 2002, when funding ran out and editor-in-chief, Larry Sanger resigned, about 20 articles had reached higher level in this multi-tiered process.

Fortunately, before Nupedia died, Sanger was alerted to the Wiki software by Ward Cunningham, a database of freely editable web-pages. On January 15, 2001, Wikipedia was started, the free-for-all companion to Nupedia. In February there were 1000 entries already, in September 10.000 and after the first two years 100.000, and Wikipedia had spawned off countless language versions including a very active encyclopedia in Esperanto.

Different from the expert-based, quality-control model of Nupedia, Wikipedia’s open structure and the community-based self-organization allows to make full use of the power of distributed connective intelligence: Given enough eyeballs, knowledge gets

better. As a wiki, it allows for general public authorship and editing of any page. And it works: when 30-40 people edit an article it does indeed get better.

Nu- and Wikipedia seem to prove the weaknesses of a closed controlled process where people first have to show their credentials before they can participate, and an open process where everyone is trusted until proven otherwise.

B. How is the situation of companies and especially online publishing houses that scientific authors work for?

Brilliant! The three remaining major players have nicely developed the market and divided it up among themselves. Authors and reviewers don't get paid, and they have no choice but to publish or perish. Research libraries across the globe are a guaranteed, „inflexible“ market. They also don't have a choice. When publishers go online-only, they also eliminate the cost of printing and distribution. Whereas raising prices in other markets will lead customers to buy from a competitor, here it leads to competitors raising their prices as well. Whatever they say, companies don't want perfect markets. They all hate the Microsoft and Elsevier - but only because they envy them for their monopolistic position.

How did this „brilliant“ situation come about? It started from what Merton called „*recognition and esteem*“ which ... is roughly commensurate with the significance of the increments brought to the common fund of knowledge.“ How to measure and allocate recognition commensurate with the achievements of a scientist?

Eugene Garfield invented Citation Indexing and set up the Institute of Scientific Information (ISI) in 1958. The Science Citation Index is an ingenious self-referential method for measuring „importance.“ Instead of setting up committees that vote on value and grant reputation, a supposedly objective variable is being measured. Who gets cited frequently must have said something important for the respective discipline. The workings of science themselves produce the rough indicator of what the community deems relevant.

In order to be able to practically handle this counting of citations, ISI defined a single set of core-journals, a few thousand titles, a small fraction of all scientific journals published in the world. Being in or out of the core set is determined by the impact factor, a citation index on the journal-level. And this changed everything.

Scientific journals until then were mostly published by academies and learned societies. They were not very lucrative, were not meant to be, just cover costs. In the early 1960s, commercial interests realized that through ISI's citation hierarchy, scientific journals could be turned into a profitable business.

At the same time - the late 1960s - a wave of new post-war university studies boomed and with them new libraries which became the target of corporate interest. It was the time when the „information society“ discourse started. Information came to be viewed as central to economic growth.

A staggering escalation of prices set it. Chemical magazines cost \$ 9,000 US/year on average. Brain Research was the first to break through the \$ 20,000 barrier. Most of all journals in areas close to industry raise prices. On average, by 200% throughout the last 15 years.

The core set of 5-6.000 journals costs a library about 5 Mio € per year. A „must“ for every serious university and research library. A „cannot“ for all but the richest libraries in the richest countries.

High degree of concentration: EU blocked Reed-Elsevier merger with Kluwer announced in October 1997. In 2001, Academy Press merged with Elsevier. In 2002, an obscure British equity fund bought Kluwer with its 700 journals. In May 2003 the same company acquired Springer from Bertelsman for 1 billion €. Reed-Elsevier now holds about 25% of the market. The new Springer-Kluwer Group has 20%.

At the heart of the reputation economy is still the Institute of Scientific Information. Founded by Garfield on a loan of \$500 it grew rapidly, until in 1992 it was acquired by Thomson Business Information. Thomson provides value-added information, software applications and tools to more than 20 million users in the fields of law, tax, accounting, financial services, higher education, reference information, corporate training and assessment, scientific research and healthcare. The Corporation's common shares are listed on the New York and Toronto Stock Exchanges. A real one-stop shop. An in the basket: the backbone of the reputation system of science.

By the end of the eighties, the new publishing system was firmly in place and its financial consequences had become hurtful enough to elicit some serious "ouches" on the part of librarians. It even attracted the attention of some scientists, such as Henry Barschall, the University of Wisconsin physicist who pioneered some very interesting statistics showing that, between various journals, the cost/1,000 characters could vary by two orders of magnitude; if weighted by the impact factor, the variations could reach three orders of magnitude.

Simply pointing to this 1 to 1,000 range in weighted prices is enough to demonstrate the total arbitrariness of the pricing of scientific journals, i.e., its complete disconnection from actual production costs.

Barshall was sued by one publisher, Gordon and Breach, for allegedly distorting and manipulating the market, not to win but to intimidate.

Scientific excellence, already somewhat skewed into scientific elitism, has by now neatly dovetailed with financial elitism. Only the rich can read up-to-date scientific information. For their part, poorer institutions in some rich countries and all institutions in poor countries have suffered enormously from the financial bonanza made possible by the revolutionary invention of the ‚core journals‘.

Scientific journals since the foundation of the first of a kind, the *Philosophical Transactions of the Royal Society of London* by Henry Oldenburg in 1665, combine five functions:

1. Dissemination of knowledge and
2. Archiving for future use. Both based on its physical form, print on paper. Now being challenged by the digital revolution.
3. They are a public registry of innovation, validate originality, provide proof of priority, „not unlike that of a patent office for scientific ideas“ (Guedon) provide property title.
4. Filtering through peer-review „that guarantees as much one's belonging to a certain kind of club as it guarantees the quality of one's work“ (Guedon) evaluation instrument of individual scientists' performance

5. Branding. For authors being printed in Cell or Nature is proof of recognition. Egalitarian ethics, hierarchical social system. An intellectual hierarchy based on excellence, nobility granted by peers, based on publicly accessible scientific results.

1. Gatekeepers

Among scientists, those who manage to play an active editorial role in the publication process enjoy a special and rather powerful role, that of "gatekeeper". As mediators, they are supposed to extract the wheat from the chaff. Of course, this judgmental role can only be justified if it is cloaked with the integrity (and authority) of the scientific institution. Any hint of systematic arbitrariness or bias would threaten the whole edifice of scientific communication. In this regard, a scientific editor acts a bit like the Keeper of the Seal without which royal prerogative cannot be exerted in the physical absence of the King. The difference lies in one important detail: in science, there is no King: only truth and reality are supposed to prevail. Silently, the journal's editor, therefore, has come to occupy the role of guardian of truth and reality" (Guedon).

If a scientist of some repute is offered the chance to head a new journal, the response will generally be positive, perhaps even enthusiastic. The ability of offering this status-enhancing role to various scientists lies, I believe, at the foundation of a de facto and largely unexamined alliance between a number of key research scientists and commercial publishers.

Seemingly a win-win situation, alas with a losing third estate: the libraries and universities and research centers, governments that finance them. All these players see their budgets flowing inexorably into the pockets of the large publishers.

2. Publishers

In a fruitful alliance with the gatekeeper scientists.

„The presence of a public registry of scientific innovations would help create internal rules of behavior leading to a well structured, hierarchical society“ (Guedon).

3. Authors

Imperative: publish or perish. The new numerical indicator became the measure for reputation and basis for employment, career, and acquisition of research funds. The non-monetary value translates directly into money.

4. Guedon, two modes:

- Scientists-as-readers, in information-gathering mode: conferences, seminars, pre-prints, telephone calls, e-mail. invisible colleges
- Scientists-as-authors: footnoting, from most authoritative sources -> libraries.

Since the 1970s, journals force authors to transfer all their rights to them. This is changing a bit thanks to the open access movement. The licensing agreement of the Royal Society:

I assign all right, title and interest in copyright in the Paper to The Royal Society with immediate effect and without restriction. This assignment includes the right to reproduce and publish the Paper

throughout the world in all languages and in all formats and media in existence or subsequently developed.

I understand that I remain free to use the Paper for the internal educational or other purposes of my own institution or company, to post it on my own or my institution's website or to use it as the basis for my own further publication or spoken presentations, as long as I do not use the Paper in any way that would conflict directly with The Royal Society's commercial interests and provided any use includes the normal acknowledgement to The Royal Society. I assert my moral right to be identified as the (co-)author of the Paper.

5. Libraries

are suffering the most from the „serial pricing crisis“: The transformation of a quest for excellence into a race for elitist status bore important implications for any research library claiming to be up to snuff: once highlighted, a publication becomes indispensable, unavoidable. The race demands it. It must be acquired at all costs.

The reaction of libraries was to join and form consortia, sharing of legal experience and gaining some weight in price negotiations. This did pressure vendors and taking them by surprise. But those were quick to learn: Consortia bargained for full collections. Publishers turned this around, offering package deals. The Big Deal: You have some Elsevier journals already e.g. as part of „Science Direct“, how would you like to pay a bit more and get access to all Elsevier core journals, say for \$900,000 or \$1.5m, depending on client, currency fluctuations etc.

E.g. OhioLINK has contracted a "Big Deal" with Elsevier. As reported in the September 2000 newsletter from OhioLINK, 68.4% of all articles downloaded from the OhioLINK's Electronic Journal Center came from Elsevier, followed far behind by John Wiley articles (9.2%). Elsevier, although it controls only about 20% of the core journals, manages to obtain 68.4% of all downloaded articles in Ohio. A local monopoly. It affects the citation rate, impact factors of the journals, and attractiveness of journals for authors.

Are they [libraries] not being temporarily assuaged by a kind of compulsory buffet approach to knowledge whose highly visible richness disguises the distorted vision of the scientific landscape it provides? In other words, are not "Big Deals" the cause of informational astigmatism, so to speak?

Publishers gain „panoptic vision“: with regard to site licensing negotiations, and usage statistics: Scientometrics specialists would die to lay their hands on such figures; governmental planners also. With usage statistics you move faster and stand closer to the realities of research than with citations. Usage statistics can be elaborated into interesting science indicators of this or that, for example how well a research project is proceeding on a line that might prepare the designing of new drugs or new materials. The strategic possibilities of such knowledge are simply immense. It is somewhat disquieting to note that such powerful tools are being monopolized by private interests and it is also disquieting to imagine that the same private interests can monitor, measure, perhaps predict. They can probably influence investment strategies or national science policies. In short they could develop a secondary market of meta-science studies that would bear great analogies with intelligence gathering.

6. Digitization

If publishers were not paying authors and reviewers, they were still justified in charging for their service of handling print and paper. Not any longer after scientific publishing went online. Scientist's knowledge should release science from the publisher's strangle-hold. The opposite is the case.

Market concentration escalated again through digitization and innovations in copyright law and practice.

At the end of the 1980s, the Internet became a factor. 1991 Elsevier launched the TULIP project: The University Licensing Program, a cooperative research project, testing systems for networked delivery and use of journals together with 9 US universities. Questions of profitability quickly linked up with questions of control, and the technology was shaped to try and respond to these needs.

TULIP was conceived as a licensing system. It was inspired by the software industry, which licensed rather than sold its products, in order to avoid some of the dispositions of the copyright law, such as first sale provisions & fair use. Elsevier extended this notion of license to scientific documents, thus setting a counterrevolution into motion.

- Distributed to each site on a CD-ROM to be mounted on local servers.
- Page images in TIFF files, too big to transmit over modem, printing very slowly.
- Full-text search was offered but without user access to text files.

From this pilot, Elsevier retained only the licensing part and moved away from giving sites a CD-ROM to access on its own servers.

Elsevier managed to invert the library's function in a radical way: instead of defending a public space of access to information by buying copies of books and then taking advantage of the first sale provision of the copyright law, librarians were suddenly placed in the position of restricting access to a privatized space. They no longer owned anything; they had bought only temporary access under certain conditions and for a limited number of specified patrons.

Licensing is „a lawyer's paradise and a librarian's hell.“ The traditional role of librarians, epistemological engineering - organizing and cataloguing information - and long-term preservation, was also made impossible. Publishers don't want to take on the task of preservation, rather unload it onto libraries.

Aside from preservation, the libraries might become superfluous. Once secure transactions and easy payment is there, end-users might access publisher's servers directly. In effect, licensing contracts subvert copyright legislation on all but one basic point: they do not question the fundamental legitimacy of intellectual property

The digital knowledge space - whether scientific, business or entertainment - is ruled by licensing contracts and technological enforcement.

C. What are the legal limits of Digital Rights Management ?

Under the current regime of privatized copyright, there are essentially no limits to DRM.

General laws like data protection and privacy: assumed to apply but no effective control. Enforcement of rights under exceptions and limitations: varies widely throughout Europe, from Spain with possible fines of € 6.000/day for noncompliance to no enforcement at all. Germany: option to sue, but enactment of that provision was postponed by one year.

There are no limits on the effective technological measures being protected, and there are no limits to the purpose for which these DRMs may be used.

DRM is the powers of technology harnessed for controlling intellectual property. DRM deals with objects of (money) economy.

Open Archives is the powers of technology harnessed for fast, highly distributed and massively parallel open knowledge exchanges. OAI deals with scientific objects that need to be dealt with first and foremost by science's own rules.

D. Charges for scientific online publications – hindrance to science or proper business?

Rhetorical question: the monopoly fees that the large publishers are charging have nothing to do with proper business - by whatever standards.

But maybe the question refers to charging authors for getting published, which has become usual practice in print publishing of science books. BioMed Central, a commercial open access archive, implements this model:

We use other business models. Article-processing charges [flat fee of US\$500 for each accepted manuscript, various provisions for getting them waived] enable the costs of immediate, world-wide access to research to be covered. The levying of a moderate and reasonable charge for the costs of peer review and publication has the merit of directly linking the charge with the service to authors and the costs involved. Other sources of revenue include subscription access to commissioned articles, sales of paper copies of our journals to libraries, sales of reprints, advertising and sponsorship, and most importantly the development of a range of subscription-based value added services such as literature reviews and evaluation, personalized information services delivered electronically, provision of editorially enhanced databases, tools that help scientists collaborate, and other software research aids.

\$ 500 is a barrier to publication. Unclear where the money goes.

Faculty of 1000, an expert group rating articles in BioMed Central and other Open Access Archives can be subscribed at € 55/year.

E. Is the Internet a source of danger to the rights of scientific authors ?

Internet is a danger to anyone hoping to become rich and famous through her works, and believes she will fail if she doesn't have total control over the use of her published works. This hope is likely more prevalent among teenagers wanting to

become pop stars than among scientists. But also scientists are perfectly legitimate in expecting recognition for their work.

Endangered by plagiarism: Is that a problem in science? Apparently yes. Is it increasing thru the Internet? Unlikely. Texts can be easily checked through Google.

The real danger: privatization of the databanks of fundamental science and of usage data and scientific communications by corporations which are not accountable for it.

F. Do scientific authors need intellectual property law in an Anglo-American or in a continental-European way to preserve their intellectual property rights?

What are the IPRs of scientists that need preservation? Attribution and integrity. Both inalienable rights in continental European copyright law. Not so in USA and UK where the attribution right explicitly has to be claimed. The Royal Society says: "I assert my moral right to be identified as the author". But then again, as a scientist you don't have much choice.

G. How might a legal framework be adjusted in order to preserve intellectual property rights of scientific authors?

Focus should not be on changing the law, a messy business and maybe unnecessary. Freedom can be regulated by licensing contract, e.g. Creative Commons licenses.

For preserving the possibilities for scientists to fulfill their tasks as information gatherers and as teachers, adjustments are needed to educational limitation of the EUCD and its implementations, see for Germany in particular UrhG § 52a.

H. Is it useful to establish an open source system in the field of academic publishing?

By all means, not only useful but crucial for public science to preserve the justification of its very existence:

- Open source or free software (infrastructure)
- Open source information:
 - data formats (convertibility)
 - information itself:
 - public domain
 - info released under an open license (CC)

The digital revolution doesn't mean we do the same old things only now with bits. „Real changes in power structures and social relations are in the offing“ (Guedon).

Most important innovation is not legal or technical but social: evaluation.

I. Free Access Science Movement

„Whatever may be the outcome of the political battle that is heating up in the United States, it is easy to imagine how a system of open archives, with unified harvesting tools and citation linkages

constructed in a distributed manner, can threaten vast commercial interests“ (Guedon).

First experiments with electronic journals came from a few exceptional scientists and scholars (e.g., Jim O’Donnell at Penn, Stevan Harnad then at Princeton, etc.). The motives were:

- to reduce publishing delays
- to decrease publishing costs (by at least 30%)
- to lower startup costs of journals
- to open up the possibility of free journals.

In 1991, Paul Ginsparg started his physics preprint server at the Los Alamos National Laboratory: arXiv.org. - to my knowledge not yet as a consciously anti-publishing initiative. It just seemed the right thing to do. Started in high-energy physics, it later transferred to Cornell. Currently hold a quarter of a million articles.

It is today the primary source for large parts of physics. Darius Cuplinskas, Budapest Open Access Initiative, reported on the case of a graduate student in Prague who put an article on spring theory onto arXiv, within 3 days had responses from leading theorists in the field. Got a scholarship. Without any filters and gatekeepers.

The SPARC initiative (The Scholarly Publishing and Academic Research Coalition) launched in June 1998, and then „create change“ movement, attempting to reintroduce competition, by creating or supporting journals that compete with the expensive major journals. SPARC works with learned societies and university presses to position free or comparatively reasonably priced journals head-on against their oligopoly equivalents. It is successful in providing alternatives and to some degree keeping prices of the major journals down (Elsevier’s *Tetrahedron Letters*, already at \$5,200 in 1995 appeared poised to reach \$12,000 in 2001, leveling off at \$9,000 in 2001, because of *Organic Letters*, at \$2,438 by far the most expensive of SPARC journals.)

Also raising awareness, networking, helping editors negotiate better deals, supporting learned societies retain control over their journals. „A dozen SPARC-labeled journals is wonderful, but, let us face it, it may appear to many as more symbolic than anything else“ (Guedon).

Growing sense of crisis led the whole editorial board of the Journal of Logic Programming to resign en masse from this Elsevier publication and found a new journal, Theory & Practice of Logic Programming (Cambridge University Press). Professor Maurice Bruynooghe even won a prize for this courageous move. In February 2001, Elsevier launched the Journal of Logic & Algebraic Programming, 25 with a new editorial board. „For one Professor Bruynooghe, there may be ten others eager to enjoy the opportunity to act as gatekeepers“ (Guedon).

At an October 1999 Meeting, the Santa Fe Conventions were formulated: distributed e-print server with common metadata that can be harvest and searched easily.

This initiative has been taken over by OAI.

The principles are: interoperability, simplicity, distributedness. OAI refuses to design any utopian SOE (standard of everything). As they say of the Internet, "implementation precedes standardization."

Public Library of Science started in October 2000. The Petition was signed by 30,000 scientists asking commercial publishers to release their articles 6 months after publication for inclusion in an open access archive. It only managed to convince a few. In summer 2001, PLoS decided that setting up their own journals is the only way, in December 2002 it received a grant from the Gordon Moore Foundation.

In December 2001, on the initiative of Darius Cuplinskas from the Soros Open Society Institute, the Budapest Open Access Initiative was started, also promoting establishing of university-based open access archives and self-archiving.

Software & Information Industry Association (SIIA) complained that it competes with private sector publishers. PubScience counts several important commercial publishers on its side: Kluwer, Springer, Taylor & Francis, etc. In short, the PubScience initiative appears to be dividing the publishers, according to an interesting fault line that ought to be explored further—namely, that between publishers involved purely in publishing and publishers also involved in the bibliographic indexing kind of activities. House of Representatives removed all budgetary provisions for PubSCIENCE, but the Senate restored them.

CogPrints, an electronic archive for self-archive papers in any area of Psychology, neuroscience, and Linguistics, and many areas of Computer Science, Philosophy, Biology, Medicine, Anthropology, as well as any other portions of the sciences that are pertinent to the study of cognition.

Networked Computer Science Technical Reference Library (NCSTRL), a collaboration of NASA, Old Dominion University, University of Virginia and Virginia Tech. migrated to OAI in October 2001.

GNU EPrints was developed at Southampton, Stevan Harnad, for creating an OAI compliant archive.

ARC, A Cross Archive Search Service, used to investigate issues in harvesting OAI compliant repositories and making them accessible through a unified search interface.

German Academic Publishers (GAP), partner of FIGARO, supporting publishing by University Presses, Research Institutions, Learned Societies and SMEs. Joint project by universities in Hamburg, Karlsruhe and Oldenburg, funded by the DFG.

Commercial open archives: BioMedCentral, HighWire Press, Bepress, and BioOne stand somewhere between a commercial outfit and a cooperative.

BioMed Central is somewhat different:

BioMed Central was created in response to the partial failure of the NIH-led PubMed Central project: under the impulsion of Nobel prize winner Harold Varmus, and then NIH director, PubMed Central sought to encourage journals to free their content as quickly as possible, possibly from day one. There again, the journal level was targeted by PubMed Central, but it behaved a little too idealistically: Journals, especially commercial journals, were not ready to give the store away, or even parts of it, and they strongly criticized the PubMed Central venture; in the end, the NIH-based proposal was left with very few concrete results, as could have probably been expected from the beginning.

By contrast, BioMed Central, a part of the Current Science Group, locates itself squarely as a commercial publisher; at the same time, it sees itself as a complement to

PubMed Central. It invites scientists to submit articles which are immediately peer reviewed; once accepted, they are published in both PubMed Central and BioMed Central. Most of PubMed Central "successes" actually come from BioMed Central!

BioMed Central offers about 350 free peer-reviewed journals, and is working on methods for citation tracking, calculating impact factors and other methods for evaluating articles. The reasons given by BioMed Central to induce scientists to publish with them deserve some scrutiny:

1. The author(s) keep their copyright;
2. High visibility
3. Long-term archiving

J. What is changing? From journals to archives.

The interest of commercial publishers is to keep pushing journal titles, and not individual articles, as they are the foundation for their financially lucrative technique of branding individual scientists.

“For scientists, print publication are related to career management, while publicly archived digital versions deal with the management of intellectual quests” (Guedon). But journals are not the only way of evaluation. Elsevier is experimenting with archive evaluations on its Chemical Preprint Server.

If archives are open, mirrors can be established with little hassle and, as a result, the archive has more chances to survive. Frequent replication and wide distribution, not hardened bank vaults, have long been used by DNA to ensure species stability that can span millions of years. We should never forget that lesson! Vicky Reich's LOCKSS project at Stanford University appears to have taken in the implications of this "dynamic stability" vision for long-term preservation of documents. The model should be discussed, refined and extended if needed by librarians. If openness can be demonstrably and operationally linked with better long-term survival, it will have gained a powerful argument that will be difficult to counter.

What needs to be done? Technology: yes, but not DRM which is a complete waste of time, money and environmental quality. But...

K. Evaluation: An Open Panoptic Space

...to print means to select. In the digital world no preselection is needed. A self-selection of contributors choosing a suitable archive for their works is sufficient. Anyone is allowed to publish. There are no more economic, technical, skill constraints.

In the digital world, selection and evaluation through usage becomes the dominant mode. The peer review process tends to extend to the whole community almost immediately.

Ginsparg knew well what information could emerge from the use statistics of his server, but he refused to release them for ethical reasons and political prudence. If

evaluation were ever to rely on his archives, it had better emerge as a conscious, collective move stemming from the whole community of scientists.

In the end, the access to large corpora of texts, laid out in open archives, and cross-linked in various ways, in particular through their citations, will open the way to many different and useful forms of evaluation. It will also help monitoring the crucial growth areas of science while placing this bit of intelligence gathering into the public sphere.

The evaluation process will have to be torn out of the publishers' grip and that of gatekeepers, i.e., colleagues! Ways to tear this detrimental alliance apart while relying on the real expertise of these gatekeepers must therefore be sought. It is not an easy problem to solve, but it should clearly be on the agenda of learned societies, university administrators, and, of course, librarians.

Guedon speculates that commercial open archives like Elsevier's: „Chemical Preprint Server" (CPS) are there for testing ways to reconstruct a firm grip on the evaluation process of science in the digital context.

If we imagine that a significant fraction of scientific knowledge should circulate through open archives structured in the OAI spirit, it is easy to see that tools to evaluate all sorts of dimensions of scientific life could also be designed and tested. These tools might be designed as public good, by a combination of specialists in scientometrics and bibliometrics—an ideal outcome in my opinion. This would amount to creating an open panoptic space—a marvellous project for librarians. But ... some of the main players will try either to destroy or control what they do not already own, but, if suitably forewarned, scientific and library communities backed by lucid administrators do pack a certain amount of firepower. Unlike consortial battles, fraught as they are with many ambiguities, these are not unclear battles.

In short, with the digital world, the evaluation process stands ready to be reinvented in a clear, rational way by the relevant research communities themselves. With a well-designed principle of distributed intelligence, with the help of scientists self-archiving their work, with the help also of selections that do not rest on the prior reputation of a brand, but on the actual quality of each selected work, librarians hold the key to developing a total, global mapping of science. The vision, in itself, is dizzying, but it is not new; somewhere, it has lain in the background of Garfield's (and Vannevar Bush's) thoughts and quests; we may just begin to have the tools and the social know-how (distributed intelligence again) to do it all now. Let us do it!

L. Literature:

Jean-Claude Guédon (Université de Montréal), „In Oldenburg's Long Shadow: Librarians, Research Scientists, Publishers, and the Control of Scientific Publishing“, held at ARL May 2001 Membership Meeting „Creating the Digital Future“, Last Updated: October 26, 2001, <http://www.arl.org/arl/proceedings/138/guedon.html>.

Willms Buhse:

The difficulty I face here is that Digital World Services (DWS) as a Bertelsmann company is not working in the field of academic publishing. So, what I will do is, I

will briefly explain what my company does, and then I switch over to what I am doing that is more similar to academic publishing – I will talk about some findings of my research thesis about Digital Rights Management. I took some findings from the music industry and from my analysis. I hope this combination will be helpful for your conclusions.

DWS is part of the Arvato Group – the media services division within Bertelsmann, which means that we are a service provider just like a printing facility or a facility that manufactures CDs. We are a system provider, so we are building technology. We have developed a platform, that is able to handle music, software games, video publishing, and it protects these bits and distributes them to a number of different end devices including PCs and mobile devices. The central part of this is something that is called clearing house, which is very often mentioned as the core part of the DRM system.

DWS believes that Digital Rights Management is central and critical to the success of the digital content business. It is important to stress the word “business” as the media industry has to rely on revenue streams in the digital age. DWS started about five years ago and during that time we came to a couple of conclusions. We realised that DRM is not just a technology, but it is actually a strategic business enabler. For example, we are working in the field of mobile content distribution. If you distribute games to your cell phone, then we actually have a DRM technology to protect these games for certain types of cell phones. This is a strategic business enabler, because otherwise many content providers would just not allow publishing this type of content in a digital format. They would just stick to traditional means of distribution.

For them it is crucial to generate content revenues. Nevertheless, as a little disclaimer it is not the only way of generating revenues. Of course, there are many others.

The technical, legal and business frameworks are coming together to facilitate DRM - I will come to that a little later. Leading content providers and distributors are currently building these platforms. If you look into certain systems, for example for the online distribution of music, e.g. I-Tunes and Pressplay, they are all using DRM systems. Another DRM standard that is evolving and being used across the wireless industry is one provided by the Open Mobile Alliance (OMA), which is in fact an open standard. That means that any company can actually join the OMA and help to develop technical specifications. And the OMA has already successfully released specifications for DRM last year. Today there are about 40 cell phone types currently in the market, which have this kind of DRM technology implemented. It was released about a year ago, so that is a big success, that in such a short timeframe this technology has become implemented by many different network operators and especially hand set providers.

What trends do we see, when it comes to DRM? First of all, why is DRM so relevant?

On the one hand you can see how we used to have closed networks such as the cable networks. These cable networks or telecommunication networks are now opening up. As they are opening up, there is an increasing need for DRM systems. DRM used to be only relevant as some sort of a billing mechanism, as some sort of a pay-per-view.

Then you have the open internet which is uncontrolled and full of illegal content from the perspective of music industry. It is becoming more and more controlled, as we see certain technologies appearing, such as Liberty Alliance and Passport. Then there are

certain security measures, TCG as an example but it certainly will take a while - a couple of years.

We will get to some trusted gardens, something that is open, but still there is the possibility to establish trust. We see this as the ideal environment for DRM.

On the other hand you can see the content suppliers certainly asking for a DRM infrastructure to be in place, but also they are making content licences available. This is certainly true for the music industry. The music industry currently licenses music to a number of companies. That wasn't the case five years ago, where they were extremely sceptical towards the new distribution channel.

On the environment side, there is a growing political support for IP protection and a growing education, a growing discussion in this field. At least people realize that it is an important area to work on. And more and more legal aspects are being solved in this area. I think it is something companies can rely on. They know which environment, which business environment they are working on.

From a technological perspective, DRM is certainly an extremely complex technology but fast developing. There are number of things that are coming together. DRM is something that can always be hacked – but there are developments when it comes to security updates.

On the consumer side, they are demanding access to rich media content and they have increasing access to bandwidth.

We see all these factors are coming together so that DRM actually has its place in the value chain of digital content distribution.

As I promised earlier, I would like to present some ideas, which do not necessarily reflect the opinions of my company. They are the results of my doctoral thesis at Munich University, but I thought it is a good idea to share this with you.

Regarding the agenda, we take a quick look at the cost prospective. Then I would like to look at some uncertainties in supply and demand, and I would like to introduce you to the digital distribution matrix - four scenarios for academic publishing and a conclusion. Again this refers a lot to online music.

Regarding the cost perspective, there are differences between first copy cost and variable cost per unit. And when you look at how those costs are distributed within the music industry, you actually can see that there is little you can do about production, first copy cost, manufacturing cost and label cost. At least from the music industry perspective the real potential of 50 percent lies in marketing and distribution cost, which is in the end similar to the publishing process. There you can have impact on the cost structure. As a result, that is actually something that really revolutionizes an entire industry.

So, what are the uncertainties on the demand side? Where do the revenues actually come from? Different sources, direct and indirect sources. There is a limited willingness for the end consumer to actually pay for digitally delivered content. There is a number of factors associated with that. It is very hard to explain to a consumer who burns a CD by himself for probably 50 Eurocent why, if he bought it, it would cost him 15 Euros. To explain this difference to him is extremely challenging. I think some might actually apply to the academic world. Why should I buy a book for 100 Euros, if I can actually download it for a very, very small portion of that cost and even print it for a fraction of that? So what will be the business model behind that?

That's from the demand side. On the supply side digital goods can be public or they can be private. Most of digital goods today are public to the extent that you can find them on the internet, even though copyright is associated to many of them. It almost seems as it is a sort of looking at the "Darknet" as it was quoted from researches from Microsoft. It is very difficult to control, and that is an essential part of privatizing digital goods. Music might become non-excludable. So what is the copy protection behind that?

I took these two questions, these two uncertainties, and combined them to a scenario matrix, which you can see here. Still I would like to go briefly into the demand side again, how to pay for digital content. There are different ways. Either you can pay directly or indirectly for digital content. On the left side there is a little empirical example, the willingness to pay for one song: three quarters of the people were saying, no, I am not willing to pay for this. This is a Jupiter survey from some time ago. These numbers have slightly changed, but still it is very tough to charge for digital goods.

What are the business models ? If you come from the direct side, you can charge for usage related, sort of for single transactions. This might be a charge for a single track. You might even charge on a time based, that is you charge for an academic title and you read it once or you print it once or you read it for 24 hours or something like that. So, you get transaction based access to this.

A mix is some sort of a non-usage related charging, which might be a single fee, a licence fee, device purchase or set-up fees or repetitive, which is a subscription fee. For example you pay to access a data base a couple of Euros a month, you can rent it, or even broadcasting fees are this kind of non-usage related fees. You can do this via corporations - that means advertising - that means data mining with a huge challenge of privacy issues, which are associated with that, certain commissions, cross selling, even syndications. Or via certain institutions. That refers to fees and taxes for example on end devices or on storage media.

How does this digitalized solution matrix look like? You have on the top supply side online music as a public good or as a private good and you have on the demand side a revenue model, which is indirect, or it is direct, and you go from scenario one to four.

The first scenario is the promotion. The reason to publish is fame. The publisher is even willing to give it away for free.

The second scenario is a music service provider. In this case there is a direct charge, still you pay not because of the content, but because of the service, so it might be for example high quality access, very good search tools or personalisation tools.

The third scenario is a subscription scenario with some sort of a light-weight-DRM, some sort of access control. People are willing to pay for the content directly.

Nevertheless, you still might apply from scenario two some technique in scenario three, so that it motivates people to join this subscription. But the idea is that actually people pay directly for the content in the sense that they pay indirectly for an access fee.

And in the fourth scenario, which is called Super-Distribution, which means, that actually every single item, digital item, be it an article, be it a book, is encrypted and consumers pay for access to this digital item. People can forward it amongst each other via e-mail, MMS etc. But still, whenever somebody wants to read it, rules apply

and it can be charged for. Super-Distribution certainly also faces the challenge of fair use rights. There are certain questions how to solve this. If you want to listen to music for example and you buy this music, you can listen to it in your car, even when you bought it for your PC.

Let's apply these scenarios to academic publishing:

In scenario one, revenues are based on economies of attention, hence the promotion scenario. What is the impact on academic publishing? Well, it is an author-sponsored building-fame model. It can be done through promotions of peer to peer file sharing, can be done for example through sponsoring or public funds or grants.

Scenario two, the service provider business model. As this is the service model it is a question of connectivity. How do I get access to the type of content I really want to get access to? In the case of music, it has to do with personalisation, recommendation or bundling. This also can be done with academic research. Here you are paying for the service that you do not have to look up, "when was the book published", and so on and so on, and write that into the reference table. It is about hosting and aggregation, it is about a community service for chats and message boards for example. It also can be done through a peer review fee, so that a system is established that allows for a faster peer review process for example.

Scenario three, the subscription case. Revenues are based on a light DRM. It is like an access and account management. You do not necessarily encrypt every digital item, but you have a restriction when it comes to access. What is the impact on academic publishing here? It can be the scenario of providing updates, providing some sort of continuous publishing, so that, when you are part of this subscription service, you will always have access to the most actual version that is out there. It can be a service and this can be controlled through some sort of a light DRM version that automatically identifies older versions for example. It is a question of quality control. You can make sure, that an article that was published by somebody is definitely published by this person and not by somebody else. If you have an Open Source system, that is very hard to control. It is more about reputation and branding, so you can actually build this with these kinds of subscription systems and you can obviously charge for example via monthly subscription fees.

Scenario four is the Super-Distribution case, where revenues are based on DRM protection - that is where DRM becomes the business enabler. With music you could imagine that system via MMS. You forward music clips and you can watch that clip once for free, but if you want to buy it, you have to buy the right to do it. Those technologies are being currently implemented. And I think this is exciting and it allows for more flexible business models. Especially in this case standardisation is extremely important. It is mandatory that the same system has to be by all the participants. And that makes it extremely challenging, because obviously a company providing these kinds of systems might become some sort of a gatekeeper and that has to be closely watched. The impact on academic publishing is that for example peer to peer collaboration could be possible with that; a controlled version management could be possible and even more interesting, the sale of individual articles, chapters and books.

After this bouquet of different scenarios as a conclusion, it is my opinion that all these four scenarios will coexist. It is not that you pick and choose and only the promotion scenario and the open source scenario will be around. I am sure that those four

scenarios will be around for a long, long time. In case of the music industry those scenarios on the left probably apply in 99.5 percent of the cases today - if you consider how many people use Kazaa-like systems compared to how many people legally buy music currently on the internet. I think the music industry has started a lot of initiatives and they are trying to migrate more and more people from this “Darknet” to legal users.

From an academic publishing perspective, authors and publications might actually develop from scenario one to scenario four, meaning if you are at the beginning of your research, you might have a huge interest in getting your work known. You are actually willing to publish your articles without charging for it; probably you even would be willing to pay for its broad distribution.

As a next step, you are probably going to a service provider, because you can see a number of downloads that were done and he integrates your content into his huge database and there is cost for that in the hope in the end he can charge for some sort of access fees. Then you might actually move into a subscription scenario, where you are part of a bigger journal or part of a bigger publication. And in the end an author might actually be able to individually charge for his articles as mentioned in the last scenario.

It is always a question: “what do you want as an author?”. Do you want to earn money or do you want to get known in the world. And I think these four scenarios allow for both cases. In my opinion it should be up to every individual to decide whether they want to charge for their articles or not and so both systems should be coexistent.

Willem Grosheide:

A. Preliminary observations

I would like to stress that in my approach to e-publishing in its broadest sense, I endorse the so-called Zwolle Principles 2002 (ZP) with regard to copyright management(http://www.surfine/copyright/keyissues/scholarlyimplementation_zwolle_principles_pdf).

As you will know these principles are set within the framework laid down by the Tempe Principles and accompanying documents stemming from the American Association for the Advancement of Sciences (AAAS).

For reasons of convenience I would here like to quote the Objective of the ZP:

“To assist stakeholders – including authors, publishers, librarians, universities and the public – to achieve maximum access to scholarship without compromising quality or academic freedom and without denying aspects of costs and rewards involved.”

In pursuing this objective the ZP promote the development of an appropriate copyright management, taking into account the various, at times coinciding or diverging, interests of all stakeholders involved by allocating specific rights to them.

It follows that I favour an approach towards e-publishing from the academic community in cooperation, not in antagonism, with the community of scientific and

educational publishers. The foregoing is said under the assumption that there are no conflicting interests within the academic community, i.e. no differences of opinion between scientific authors and scientific institutions. It appears that different schemes are here applied worldwide.

As is well known, in recent years conflicts have arisen with regard to the ownership of copyrights created for scientific work which has been created within academic institutions. Who owns the copyrights in such a situation; the individual academic or the institution?

Finally, although so-called moral rights aspects can easily come into play in the context of e-publishing, e.g. with regard to the integrity of the content, I confine myself in this statement to the economic aspects of copyright law as the ones that prevail in the context of this workshop.

B. Issues of general interest

E-publishing in whatever form should only be taken up by the scientific community itself if what it can offer to authors and public adds - in terms of formats, quality, cost-saving, remuneration and the like - something to what scientific and educational publishers can offer. As a consequence the academic community should abstain from diving headlong into e-publishing activities executed adequately by scientific and educational publishers.

It is a fallacy to believe - as is done by some - that copyright law is being washed away through the digital colander. On the contrary, both on an international and a national level copyright law has been substantially strengthened to adjust it to the digital environment. See TRIPS Agreement 1994, WIPO Copyright Treaty 1996, InfoSoc Directive 2001, DMCA.

As a consequence the prerogatives of the right owner have been extended towards an access right, the enforcement of copyright law has been articulated, e.g. by providing that the so-called three-step-test has to be applied by the courts, and the legal protection of technological protective instruments has been introduced.

It is true to say that particularly the advent of technological devices to protect copyright content, e.g. various forms of encoding, makes it possible to dispose of copyrights by way of contract law, e.g. digital rights management. It is of note here that the strengthening of the international and national copyright regimes is mainly induced by economic considerations promoted by the so-called copyright industries, and they are not necessarily beneficial to the interests of individual authors such as academics.

This not to say that copyright law in its actual form can not serve the interests of individual academics or the academic community at large.

This may also be true for the electronically making available (i.e. transmission, distribution) on the Internet of text, either in the form of an e-book, in an e journal or in any other digital format. Taking the notion of e-book as the terminus technicus with regard to electronic publishing in general, according to a recent study of the Association of American Publishers (AAP) and the American Library Association (ALA)[AAP/ALA, White Paper -What Consumers Want in Digital Rights Management, March 2003 (<http://dx.doi.org/10.1003/whitepaper1>)] no less than the following three different interpretations of an e-book are used within the publishing,

library and users communities: the content file (digital file), software application (the electronic wrapper/envelope) and hardware device (the e book reader device).

Other definitions can be found in the e-book industry, such as literary work in the form of a digital object (AAP), the content itself (netLibrary), or any full-text electronic resource designed to be read on a screen (University of Virginia E-text Center).

What is common to all these interpretations and definitions is their reference to the metaphor of a book made of paper and cardboard. However, as e-books evolve, reference to a book in its traditional form is expected to fade as comparisons to products in print become less necessary.

It appears that today the notion of the traditional book is challenged by computer technology and the variety of ways in which new products, designed to achieve the same ends, are being developed (Karen Coyle, Stakeholders and Standards in the E-book Ecology or It's the Economics, Stupid, Library Hi Tech, Volume 10, No. 4, p. 314-324). So, if e-books are different the general question to be answered may be if the applicable law should then also be different and should different forms of business models then be used with regard to the dissemination? It seems that the general answer to this question must be: It all depends.

With regard to the applicable law, the following issues, amongst other things, may be taken into account are the relationships that are at stake. First the upstream relationships between authors and exploiters. What counts here from the perspective of the academic community are interests such as the broadest possible dissemination of scientific content amongst other authors and consumers, integrity of the content and reasonable costs and fair remuneration. This requires close monitoring of exploitation contracts, i.e. no unrestricted application of the principle of the freedom of contract with regard to, amongst other things, balancing proprietary claims of copyright owners against access to information claims by authors and consumers (e.g.: are exceptions and limitations to copyright law merely reflecting market failure?) and considering transfer of rights clauses with respect to their legal nature (assignment or license?) and their scope (general or purpose-restricted?).

Also the downstream relationships between authors and consumers such as the relationships between exploiters and consumers have to be monitored. It is obvious that, although the same legal instruments are available for authors and exploiters acting as copyright owners, their application may differ since there may be a divergence of interests here. For example, access to information may be more valued amongst scholars than amongst scientific publishers.

With regard to the different forms of business models, again the same formats such as particularly DRM, are available to both authors and exploiters but their use may differ depending on who makes use of them. This may be particularly true taking account of the different products that can be produced electronically, ranging from e-books, e-journals to e-platforms. Whereas scholars will focus on rapid and broad dissemination of their works and will have no concern with regard to exploitation in the sense of profit making, the latter is crucial for scientific publishers.

C. Issues of special interest

I. How might a legal framework be adjusted in order to preserve the intellectual property rights of scientific authors?

It does not seem that the position of scientific authors is in any way different in this respect from the position of literary authors, artists, composers or other creative people. Preservation of intellectual property rights, i.e. copyright, in a digital context can be attained by a combination of legal and technological measures; further, the possibilities of enforcing the law are of the essence.

It is of note here that in recent times, next to the traditional so-called personal copyright, the entrepreneurial copyright has emerged.

Entrepreneurial copyright should be understood as, amongst other things, the bundling of copyrights in large industrial conglomerates, the so-called copyright industries, e.g. Bertelsmann or EMI and particularly with regard to scientific publishing e.g. Elsevier Science or Wolters/Kluwer. Obviously, these copyright industries try to pursue their own commercial interests which do not necessarily coincide with the interests of the (scientific) authors which they represent on the basis of an assignment or a license of their copyrights. So, if the copyright industries refer to themselves as right owners this reference can under these circumstances be misleading.

It follows that while with regard to the adjustment of copyright law to the digital environment, the available options such as the introduction of an access right and, at the same time, restricting the use of exceptions and limitations via an extension of the three-step-test, all this together with either compulsory licenses, levies or DRM or a combination of those instruments may be valued differently from the perspective of scientific authors than from the perspective of scientific publishers.

What measures should be taken is primarily a policy issue, depending on how the respective interests are balanced against each other.

II. Charges for scientific online publications - a hindrance to science or a proper business?

A simple positive or negative answer to this question is not possible since charges can be of various kinds, e.g. reimbursement of costs, remuneration of authors or profit making. Neither is a simple answer necessary. It seems likely that the best answer will be given on a case by case basis, e.g. the requirements for e-book publishing and the publication of an e-journal are not necessarily the same.

III. Do scientific authors need intellectual property law in an Anglo-American or in a continental European way in order to preserve their intellectual property rights?

This question is self-evident: there are no intellectual property rights without intellectual property law. Further, it indeed makes a difference which legal system applies: the perspective from the principle of the Anglo-American law work-made-for-hire rule has different consequences than the contractual arrangement which applies under continental law. However, in practice contracts may have more or less the same effects under the continental rule as the work-made-for-hire rule due to extensive assignments of copyrights which are usually made.

IV. Is it useful to establish an open source system in the field of academic publishing?

Since there is no established concept of open source it is difficult to say whether the academic world will benefit from a system of open source. If open source stands for establishing platforms for scholarly discussion, the beneficial effect is quite obvious.

V. What are the legal limits of Digital Rights Management?

In principle there are no legal limits to DRM other than those limitations which can be found in positive law.

It is of note here that a distinction should be made between the management of digital rights and the digital management of rights. The former comprises the technologies of identification, metadata and languages, whereas the latter deals with encryption, watermarking, digital signatures, privacy technologies and payment systems.

For example, if DRM makes it impossible for authors or consumers to make a copy for private use this is not a violation of copyright law under the regime of the InFoSoc Directive applicable in the EU (WIPO, Standing Committee on Copyright and related Rights – Current Developments in the Field of Digital Rights Management, SCCR/10/2 (Geneva August 2003)).

VI. Is the Internet a source of danger to the rights of scientific authors?

Again, scientific authors do not have a special position in this respect compared with other authors. Further, the Internet is both an opportunity and a danger, if the latter means that legally and technologically unprotected scientific works may be easily plagiarized, corrupted and exploited without the authorization of the author.

VII. How is the situation of companies and especially online publishing houses that scientific authors work for?

This question cannot be answered because of a lack of adequate information.

Alexander Peukert:

Intellectual property rights issues of digital publishing - this issue was exactly the core question of an expert opinion a colleague of mine and I prepared for the Heinz Nixdorf Center for Information Management in the Max Planck Society. The background is that the Max Planck Society launched a so called eDoc Server and wanted to know in how far copyright could be an obstacle to its plans.

According to the official website of the eDoc-Server, it aims to:

- build a comprehensive resource of scientific information produced by the Max Planck institutes, providing a stable location for its preservation and dissemination,
- increase the visibility of the intellectual output of the Max Planck Institutes in all the forms it takes in the era of the Internet
- strengthen the Society and the scientific community in negotiations with publishers about the ownership of scientific research documents at a time

where sky-rocketing journal prices and restrictive copyright undermine their wide dissemination and persistent accessibility.

- contribute to a world wide, emerging scholarly communication system, which exploits the full potential of the Internet and the digital representation and processing of scientific information.

I suppose that these are typical purposes for parallel activities of other research institutions (like the MIT or the Swiss Federal Institute of Technology in Zurich) and that they are one of the reasons for our workshop today.

In the following minutes I do not want to bother you with details of our findings. Basically, we had to tell the Max Planck Society that copyright law has severe implications for a project like the eDoc Server. After all, the results of our study summarized in the following show the complexity of today's digital publishing in the scientific domain.

Since the general standards of copyrightability are very low, basically all scientific articles are subject to copyright protection. Article 9 paragraph 2 of the TRIPS agreement makes it clear that Copyright protection shall extend to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such. This so called idea-expression dichotomy preserves the public domain and fosters the dissemination of knowledge. Scientific ideas as such are not subject to copyright protection. Nevertheless, this limitation of the scope of copyright does not help much when it comes to digital publishing. Courts have generally been generous in granting copyright protection to scientific writings, illustrations of a scientific or technical nature, such as drawings, plans, maps, sketches, tables and three-dimensional representations. Besides, the growing importance of the legal protection of databases has to be considered in this field.

Statutory limitations to this broad copyright protection do not apply to digital publishing of whole articles or even books on the Internet, even if this is a non-profit publication for educational or scholarly purposes. This assessment particularly relates to a new limitation in the German copyright act as amended on September 13th, 2003. § 52a German CA proclaims that it shall be permissible to make available parts of a printed work, works of minor volume or of individual contributions published in newspapers or periodicals for persons that form a clearly defined group for their own research activities. Obviously, this limitation does not cover a worldwide publication on the Internet. It only applies to small groups of researchers that may share their research results amongst them using computer networks. Moreover, digital publishing on the Internet involves possibly all national copyright laws because this exploitation takes place worldwide. Therefore, every national law would have to contain a broad limitation of copyright in this respect. Otherwise, the right holder who did not agree to the use of the work on the Internet could bar this use of the work invoking one particularly far reaching national law.

To sum up, the publisher has to acquire the rights necessary for his envisaged exploitation. And here we are in the middle of the whole problem: Who owns the rights in scientific publications?

Under German law, copyright initially vests with the author. Even if scientific authors are employed at universities or other research institutions, these employers or commissioners have to contractually obtain rights in the work. German copyright law does not follow the concept of works made for hire. Moreover, the employment

contract between the researcher and the university is not deemed to contain an implicit transfer of rights.

Therefore, the Max Planck Society has to acquire rights for digital publishing just as commercial publishing houses have to do. By the way, at this point it should be obvious that the Max Planck Society actually appears as a publisher and that this behaviour causes legitimate concerns in the branch of commercial publishers.

However, this is not the whole picture. The one who is missing yet is the commercial publisher. According to current standard contract forms used by publishers of scholarly works, these publishers normally gain comprehensive rights in the respective work that an author submits for publication in a scientific journal. This transfer of rights covers the whole copyright term, all countries and every exploitation right of commercial value, especially the right of making the work available to the public. Admittedly, a number of publishers nowadays accept electronic preprints on publicly accessible servers, including the author's own home page. However, authors are not allowed to update public server versions of their articles to be identical to the articles as published. This means that articles may be freely accessible, but only in a format that makes it difficult for others to quote the article. Moreover, it is unclear whether this quite recent policy of some publishers also relates to prior publications never been published online before and whether publishers accept a comprehensive collection of all publications of an author on a server like eDoc.

In my view, this exemplary situation shed light on some fundamental issues about digital publishing in the field of scholarly communication: The three parties involved are the author, the university and the commercial publisher. Since nowadays most of the creative output of the scientific community is published in journals that are edited by companies doing this for commercial purposes, it is the publisher and not the author who decides about whether or not copyright is installed to impede the free flow of information. Research Institutions like the Max Planck Society are trying to change this situation by becoming publishers themselves.

One at least theoretically conceivable way to solve these problems would be to abolish copyright protection in the field of scientific publications or to limit copyright protection to certain moral rights, especially the right to claim authorship of the work and to object to any distortion, mutilation or other modification of the work. In this case, the financing of these works would totally depend on public funding because neither authors nor commercial publishers would be able to exclusively exploit works of this kind. Note that in June the "Public Access to Science Act" was introduced in the legislative process in the U.S. This proposal actually precludes copyright protection for scholarly works that were created with public funding.

However, this proposal will not likely be implemented in the U.S. code anytime soon. The reasons for this are manifold. Above all, international conventions on copyright regulate the mandatory protection of every production in the scientific domain (see for example Art. 2 of the Berne Convention).

Thus, we all will have to deal with copyright protection of scientific works.

Moreover, the implementation of technological protection measures poses a threat to the vision of unrestricted dissemination of knowledge over the Internet. Commercial publishers that use the Internet as a platform to distribute their products will certainly rely on DRM systems in order to charge their customers. Without technological measures, free riding will be the rule, not the exemption. And just as works in the

scientific domain are protected by copyright, DRM systems are legally protected against circumvention. These rules are also laid down in international conventions on copyright, notably the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty of 1996, which makes it particularly difficult to change the law. Therefore, we have to face the fact that DRM systems are part of the commercial use of the Internet, also with regard to digital content of interest for the scientific community.

Nevertheless, it seems to me that this factual and legal background does not compellingly put an end to the vision of globally accessible and shared information. The reason is - and here I can come back to my prior statements - that not everybody is interested in implementing DRM-systems to protect digital content against certain uses. Those right holders who primarily publish articles because they want to make money will more likely impose electronic fences around digital content than will scientific and academic authors who receive a regular salary and normally do not depend upon revenues from publishing their works. Scientific authors are - above all - interested in disseminating their works worldwide in order to earn as much reputation as possible. Digitization and the Internet are the technical features that make this aim cost-efficiently achievable for universities and institutions like the Max Planck Society or even for the author himself. I believe that this differentiation is the key for future copyright policies in the field of the scientific domain: publishers acting for commercial purposes on the one hand and authors and research institutions on the other hand. Legislators should provide measures to preserve for authors of scientific works the control over their creations, because this group of right holders is less likely to employ copyright to restrict access to their works.

Some aspects of this policy could be:

- Initial ownership of copyright should vest with the author.
- National legislators should think twice before applying the concept of works made for hire in favour of universities and other publicly funded research institutions because it is not impossible that universities as the future right holders would evolve into commercial publishers that would again impose technical measures restricting the access to digital content.
- Implementation of DRM systems must not be obligatory.
- It should be acknowledged that the exploiter is not free to implement DRM systems as he sees fit, but that he has to acquire the right to do so from the author.
- Publishers should not be granted a neighbouring right for their economic performance (such a right is currently under debate in Germany).
- Copyright contract law should protect the author against overly broad transfers of copyright.

Applying this approach will help authors to control the use of their work without necessarily driving commercial publishers out of business. What commercial publishers have to cope with is a new group of competitors: universities and even authors. However, if Adam Smith's "invisible hand" tells us the truth - something we have reason to believe - then more acute competition serves the public interest. Therefore, we should be happy about the implications of digitization and the Internet in the field of publishing of scholarly works.

Guido Westkamp:

The following remarks are intended to present a brief introduction into those national and international norms and provisions which currently shape copyright law, in particular with respect to the thematic scope of this workshop.

In short, copyright is undergoing the perhaps most drastic changes of its history. These changes can briefly be summarised as a turn from a bundle of certain economic right towards an access or use right. This is dangerous as it comes potentially close to embracing access to and use of information and data.

The reason why this is the case is, again, manifold. One reason is, naturally, an increase in electronic uses of copyrightable material and the ease of copying and dissemination associated with it. The second reason has a political dimension: in the European Union, two distinct copyright systems exist: according to the author's rights systems, protection is afforded to the personal intellectual creation embodied in a work. The UK system is much more based upon investment than personality. This, according to wisdom currently prevailing in the European Commission, necessitates harmonisation under Article 95 EC as it is conceived as a potential barrier to trade. Hence, European harmonisation has been introduced by way of directives, the final two of which – the directive on the legal protection of databases and the directive on copyright in the information society – are most relevant to the workshop topic. Finally, international norm setting was achieved under the 1996 WIPO Copyright treaties dealing with the conceived dangers of the internet.

The most important changes copyright has faced occur on two levels. First, the traditional set of economic rights is expanded. Secondly, a new set of rights dealing with the protection of digital rights management systems and technological measures was introduced which is intended to regulate, where appropriate, access to copyrighted works.

The analysis will, in turn, deal with these changes.

First, it should be noted that the threshold for determining copyright protection has been left untouched. Despite a rise in informational works – works which must reflect a personal intellectual creation by reason of an original selection or arrangement of contents – neither has the European Union achieved any formulation nor has any attempt been made to harmonise the threshold for copyright protection. In that sense, jurisdictions are still relying on the catalogue of works under Article 2 of the Berne Convention. This is particularly difficult to reconcile with the question as to when, in particular, scientific and organised works are in fact protectable. The basic and commonly shared opinion suggests that neither ideas embodied in a work nor information “as such” is protectable under any type of Intellectual Property right. The reason is that (1) information is discovered and not created and (2) that ideas have no form by virtue of which these may be protected. The commonly used example is a telephone directory, but the same principle applies to electronic databases, software and compilations of research results. It needs to be pointed out, though, that the exact demarcation lines are difficult to detect. However, the taking and re-compilation of existing research and scientific does not amount to a reproduction if what has been taken does not, in itself, reflect a personal intellectual creation.

The second principle, stemming from a more general notion of Intellectual Property theory, is a basic distinction between copyright and industrial property rights, most notably patents. Copyright gives a bundle of rights rather than a use right. A patent

gives a use right but only under commercial circumstances. This highlights, again, the basic distinction under which copyright does not protect information contained in a work. Such monopoly only exists, for a much more limited period of time, in patent law, and for this good reason patent law demands a process of filing and eventual analysis as to novelty.

Turning to copyright once more, the exclusion of information is reflected in the basic distinction between physical and non-physical rights. Physical rights are the right to reproduce the work in a physical form and the right to (physically) distribute those copies. Once a copy has been placed on the market, the author is not permitted to exert any further control over its destination, i.e. it may be resold without any authorisation. In terms of non physical rights, the most striking feature is that any communication, by whatever means, must reach the public. Most copyright acts include certain categories of these rights such as uses on television, broadcasting, theatre (or other) performances etc. these acts are usually, but for the most extraordinary purposes, always intended to reach a public, which in turn was defined as denoting a commercial activity. This notion, though not explicitly expressed in most copyright statutes, can at least implicitly be derived from the interplay of acts of communication typically reaching a vast audience and the impact of this on the ordinary meaning of the public: a large group of consumers sharing no ties.

In line with the general copyright principles, protection is granted for the expression of a work. Ideas and Information “as such” are not subject to such monopoly. Traditionally, the judicial treatment of the so called idea/expression dichotomy did not cause any intricacies since the works in question were already published. The principle therefore enabled a public domain to be built. For the scientific community, in particular in areas such as natural sciences, engineering and life sciences, copyright did not prevent access to such information.

This has changed. Exploiters of cultural works have detected a danger to the commercial viability of their businesses and pledge for stricter protection. These concerns have been met by various international and European instruments, in particular:

- The introduction of a general right of communication to the public under the 1996 WIPO World Copyright Treaty for Authors and under the 1996 WIPO World Performers and Phonogram Producers Protection Treaty (Articles 8 and 6 respectively). This right is understood to complement the non-physical rights in respect of online transmission in closed or open networks. The acts which would infringe copyright include the communication of a work to the public as well the making available (such as on an internet site). There are serious concerns about such right. Whereas a strict regime may well protect works of high authorship at an acceptable standard, it appears to give no regard to the issue of information access. For the purpose of copyright, the quality of a work is normally the most decisive factor. The right will, however, apply without such distinction. Secondly, it becomes quite impossible to determine who the public will be. As noted, traditional copyright draws a distinction between physical and non-physical rights. The list of non-physical rights normally found refers to certain technologies which will reach the public, and the term therefore does not require any elaborate attempts of definition. The introduction of a much more general right of communication will now place the emphasis for judicial interpretation on exactly such broad terms. This

means that the commercial factor, which was at least notionally underlying aspects such as broadcasting becomes inapplicable. Therefore, the right is dangerously close to monopolising private (one to one) communications and could even stretch to email communications. This is in contrast to traditional copyright which does not imply any right as to the communication of a work.

- The European Union has introduced a general right of transient copying under the 2001 directive on Copyright and Related Rights in the Information Society. This refers to acts of technically necessary copies which occur once information is transmitted through electronic networks. Here, temporary or transient copies effect a faster transmission. They have no value as such. This right subsists alongside the communication right. The directive has, to ease the effects of this broad understanding, introduced a defence based upon either a lawful use of for the benefit of an intermediate service provider who will not be liable for copyright infringement. However, liability will be incurred if the transient copy has economic significance. It remains entirely unclear whether a transmit copy has such value, as it does not result in any tangible copy which can be re-utilised. For providers of scientific material, the combined effect is quite serious. Both the reproduction right, as understood in the sense the directive suggests, and the right of communication to the public will avail owners of copyrighted materials with a general use right. In effect, no limitation will apply. As a use right, it remains immaterial whether the act of access (or providing an opportunity to access for third parties by uploading information) is intended to make use of the work or of the information contained therein.
- Thirdly, most limitations with regard to the scientific or research use are withering away. The directive contains a list of optional limitation member states may introduce or uphold but seeks no general balancing test for certain private copies or academic purpose in relation to digital copying. This further makes the situation for the free dissemination of scientific material complicated.
- An additional step towards a strict copyright management system is the introduction of provisions for the protection of both Digital Rights Management Systems and Technological Measures protecting copyrighted works. Again, this is likely to cause a development toward an access right. As yet, it remains dubious whether the access to information only will qualify as copyright infringement or whether such act would, contrary to all principles of tort law, amount to an infringement by simply committing an act to circumvent such measures or manipulate rights management systems.
- The final step in legal development is likely to be a shift from traditional copyright principles towards an assessment under different concepts. Most notably, access to copyright works (indeed, database systems) was subjected to scrutiny under competition principles, and here the most important current disputes surrounds the character of such Intellectual Property rights as an “essential facility”. Moreover, there is, at present, a new line of thought developing which aims to assess Intellectual Property and its interface with information and communication freedom under constitutional law. There is nothing of substance as yet.

Apart from these aspects, the online delivery of copyrighted material needs to be viewed in light of the limitation which had been granted to the area of academic research. There is a great divide globally and on a European level as to the scope of limitations necessary and acceptable. The most important issue here is whether a new levy system should be introduced which would then facilitate the licensing of university libraries to disseminate academic materials. It should, of course, be noted that a voluntary license – for the sheer fact of publication – can always be asked for, but this will remain subject to a license agreement.

As to online delivery, it should also be noted that in relation to entirely open system access and download facilities will also have an impact on foreign users. It still is unclear which law will apply to the act of downloading a copyrighted work. The conventional concepts – either the law of origin or the law of the country for which protection is sought – are both fraught with difficulties in practical application.

From a legal point of view, it therefore appears difficult to advise in respect of the FIGARO project on any one aspect. The authors would, however, like to state his personal opinion that the complexities of current copyright law need to be addressed so as to facilitate a more flexible, case by case judicial analysis. This could either be achieved on the level of economic rights, by reinserting a general test based on aspects such as the character of the work, the purpose of the use, the overall social/commercial impact on the use of the work. This could systematically also be achieved by introducing a general limitation under a wider fair use concept.

Burkhard Schäfer:

The traditional academic library faces a crisis. Research journal publishers have increased their prices by an average of 10% per annum over the last decade. In the same time, the introduction of the Research assessment exercise in the UK has dramatically increased the pressure on academics to publish. The market reacted by an equally dramatic increase in the number of journals. Libraries therefore have to buy ever more, and more expensive journals. Library budgets in the UK however grew if at all only in line of inflation. While arts, humanities and law have seen less dramatic rises in the prices for journals, they too face a problem. Storage space is increasingly at a premium, especially since university libraries quite often also double as student microlabs. Electronic publishing can always address this second issue, even if the electronic journals should remain as expensive as their paper counterparts. Edinburgh and Glasgow Schools of Law are at present negotiating for instance the possibility that hard copies of journals are kept in only one of the two libraries for those journals that both subscribe to electronically. Electronic publishing offers however even more radical solutions to the problems facing the academic archive. Firstly, there is the potential for institutional self-archiving. In addition to publishing in traditional journals, academics can upload their papers in open access digital archives. In its simplest form, this can simply be their own or their departmental website. On the next higher level, these archives can be located on the level of universities. Finally and more ambitiously there are projects such as the Budapest Open Access Initiative funded by the Soros Foundation Open Society Institute. Its protocol allows all databases which comply with it to function as if they were part of one central server, regardless of their physical location. Even small institution-based servers can in this way generate large aggregates of research

literature. Researchers can self-archive their papers and don't need to upload the same paper on several smaller discipline-based archives. Only this creates the necessary mass to challenge the main journals. In the near future, technologies will be available that can be used to transform these archives from cheap alternatives to paper journals to superior competitors, for instance through the possibility to allow users to customise hyperlinks between papers, a technology already used commercially in the Juris system. OAI promotes the adoption of their protocol by repositories of all kinds. Sites which meet the format requirements can register to become OAI-complaint and have their records joined to an international federation of repositories. In the UK, the joint information systems committee JISC supports institutional self-archiving. Edinburgh University is one of the leading partners in a consortium to create and promote such archives (The Nottingham University led SHERPA project)

Since electronic publishing has low initial costs (compared with paper publishing) "free-to-air" journals form a complementary strategy to reduce costs, firstly by offering free or low costs journals, secondly by creating market pressure for established publishers to reduce their costs too. Learned societies in particular can act as competitors to established publishers. In law, the electronic law journal project at Warwick University offers two free to air law journals, the Web Journal of Contemporary Legal Issues is another examples of this new breed of publications. Unlike self-archiving, open access journals do not face the problem to negotiate copyright release for articles published already in paper journals. They do however face potentially higher costs for peer reviewing, copy-editing, proof reading and general administration. Possibilities to meet these costs range from "author pays" models to sponsorship to a system of "value added" publishing were the core texts remain free of charge, but individuals and institutions are offered additional services (like for instance the hyperlinking facility discussed above, customising of papers etc). It also allows to tap into this huge underused resource (in Europe), students. While student edited journals are the norm in US law schools, they are the exception in the UK. Apart from the potential to reduce costs, they have pedagogical advantages, from involving students early on in research to more reader friendly writing by academics. Edinburgh University is presently developing a student edited webjournal on IT and IP law.

These different approaches to technology facilitated non-traditional publishing create very different legal problems. Self-archiving faces very obvious copyright issues not encountered by free to air journals which publish original work. Other legal problems are less obvious. One function of traditional publishers is to protect their authors from litigation. Think for example of a research article that questions the efficacy of a commercial drug. Will an underfunded open source archive/journal be as robust as a commercial publisher in resisting threats of libel litigation? Will it simply remove "dangerous" papers? To the extent that OAI establishes a successful monopoly, should there be a legally recognised "right" of authors to upload their papers? Conversely, under which conditions should an author have a right to withdraw an uploaded paper? Imagine a lecturer who uses an archives facility to hyperlink papers needed for a course, and who makes the so created customised archive available to his students. Does this create potential violations of the moral rights of the authors, if for instance they are linked to a derogatory comment of their publication? If a free paper or archive changes ownership and becomes commercial, should authors have the right to withdraw their papers?

The main argument of my talk is hence the interaction of what is technologically possible, institutionally required, legally permissible and economically or academically desirable. Each aspect of this equation influences every other one, often in unpredictable ways. Cheap as opposed to free online journals for instance might initially increase costs to libraries, as they will be ordered in addition to existing high impact journals, at least initially. Can institutions/publishers/governments financially support these loss making journals, or does this raise unfair competition issues? Universities and Ministries of education have established reward structures, often based on instruments like citation indices. The precise nature of these instruments will determine the interest the author has in his work. If there are problems (for instance regarding the standing of online journals, or the problem of citation of online archives) are solutions best developed in law (a moral right to be quoted), technology (automatic electronic registration of “hits” on websites), in a change of these reward structures, or a mixture of these measures? In what follows, I will explore the interplay of these different issues, arguing for more radically new forms of publishing which technology makes possible, and which pre-empts many of the pertinent legal issues (but raises new ones)

The starting point for my own analysis is going to be where our discussion yesterday ended, the issue of peer review and quality control. I think that this is the most problematic “Red Herring” which has had a very negative influence on the entire debate. One of the main reasons given by academic publishers for their high charges is the service that they provide. The main component of this service is the system of peer review. Because publishers guarantee the quality of the academic end product, so their argument, they are not only entitled to but depended upon high charges for their journals. This claim has two presuppositions: Firstly that the main result of academic work is an object, e.g. an article. Secondly, that it is important to ensure the quality of this article. Both presuppositions are false, I think. I want to start with the first of them, and ask somewhat provocatively: what sort of “artists” are academics, what sort of artist should they be? Are we more similar to a sculptor, to someone who invests a lot of hard work to produce a physically touchable end-product, the sculpture? Or are we more like performance artists, like singers or actors, who produce a less tangible product?

My argument is that for all the wrong reasons, academics and academic products are at present more similar to sculptors, or poet and novelist, we “produce” finished objects (articles, books, inventions). What we should be doing is much more similar to performance artist, inviting others (academics and the general public) to participate as spectators in our work, not as buyers of it.

This obviously has implications for the debate on intellectual property. Is it really copyright protection that we need, or is there some leverage to be gained from the debate on the protection of rights similar to copyright, for instance the concept of neighbouring rights?

The issue of quality control is directly at the heart of this matter. I think that what academia is suffering from collectively, over the past 200 years at least, is a sort of collective Stockholm Syndrome. The Stockholm syndrome is the psychological theory that hostages tend to fall in love with their captors and that they develop emotional bonds with them. I think that is very much what we did as academics. We had to have peer review for mainly economic reasons, not epistemological reasons, and we fell in love with our captor. We invented reasons why peer review is a good

thing in itself, and why it is absolutely needed for quality enhancement. But that is really only the same survival strategy hostages take towards their captor. It makes life so much easier if we can reinvent ourselves as the willing participants in a totally pointless process rather than its victims.

Why is peer review a bad thing? Normally it is seen as the hallmark of academic publishing or academic activity. It is said to enhance or ensure quality. Now, if we put our prejudices and comforting narratives aside for a moment, we can realise immediately that this is untenable. Peer review does not enhance quality. There are very few papers or results that are enhanced by the process of peer review.

Granted, sometimes one might have a good reviewer whose comments are genuinely helpful. But one can equally get helpful comments from colleagues or from people met at a conference. Peer review is not different in that respect from any other person commenting on a first draft of a paper. What peer review does is not primarily to *enhance* the quality of academic research. It produces or excludes research that is too bad to be published, and that is not the same thing at all. It doesn't increase or improve the quality, it only deselect pieces of possibly low quality. Once that distinction is made we realize what the purpose of peer review really is. In an environment where the production of tangible forms of knowledge and its dissemination is expensive and the channels of communication are restricted, some form of peer review is indeed necessary. Traditional printing is expensive. You have to cut down trees and transport them to some other place where they are manufactured into paper, and then you have to transport the paper to somewhere else again, where the expensive printing machinery is located, and as a result you have heavy books that need to be transported yet again and finally stored. All this is expensive. It is also costly on the libraries or the intended reader who has to find storage space. Because of these costs, it is not feasible to print every idea, thought or inspiration academics might have. For all these reasons, we need a system, or rather we needed a system in the past, where the worst of academic output was deselected at source. To the extent however that we can reduce these costs, exclusion of low quality material becomes less important.

This adjustment between costs of production and quality control is by no means unique to our time. At a time when books were hand written, peer review and negative quality control were even more important than they are today. Prior to the invention of the printing press, copies had to be hand-made. Since it took great effort and considerable investment in time to produce a single copy, it was crucial not to waste it on works of insufficient quality. Consequently, the only book frequently copied was the bible. This guaranteed quality due to the high standing of the author. (though arguably, there wasn't any peer review).

Now we have the internet, we can produce output without very high costs, and with that peer review loses its *raison d'être*. There is no any longer the economic pressure to deselect a low quality material. And with that we can stop to pretend that peer review is actually enhancing academic research.

Not only that, there are other issues involved here. Firstly, peer review is failing even measured against its own standards. Alan Sokal and Jean Bricmont started the onslaught on the peer review system when their spoof article "transgressing the boundaries - towards a transformative hermeneutic of quantum physics" was published in the peer reviewed "Social text". For some time, scientists could console themselves with the thought that this problem was unique for a very specific branch of

contemporary philosophy. However, last year's scandal at the MIT paid put to this. An academic tipped for the Nobel price on the strength of his long list of publications in the leading peer-reviewed journals was finally found out as a fraudster who had deliberately (and not even in a particularly sophisticated way) used falsified data. There are two reasons for the demise of peer review as a useful tool for quality control. One is increasing specialisation. It is increasingly difficult to find competent and independent peers - more likely than not, they are going to be co-authors or direct competitors. Secondly, the high costs of in particular empirical research make replication of results increasingly difficult. Funding councils might be prepared to finance groundbreaking new research. They are much less forthcoming in financing the testing and evaluation of old results.

Not only is peer review inefficient, it is positively harmful. First, as discussed extensively in the literature following Kuhn's "Structure of Scientific Revolutions", it re-enforces conservative tendencies within established scientific paradigmata. In a peer review system traditional knowledge is more easily accepted, newcomers and new ideas have difficulties in passing through the border police of academic quality control.

Second, it puts an epistemologically important part of academic discourse behind closed doors. Sometimes the reviewers actually have good ideas. The only way I can make these public is by a small footnote. I thank my anonymous referee for this brilliant comment. Would it not be much better to publish both of them together? The internet makes this possible. With that, there is no more reason to keep the process of review behind closed doors. Internet publishing allows us in principle a process of permanent, and open, peer review in which readers annotate constantly the published text. You can think of an article which permanently accumulates comments, very much like the process at Amazon for instance, where people can comment and write reviews of books, for everyone to read directly on line. Epistemologically speaking, this process is considerably more efficient. The number of reviewers is increased, the critical process of debate is in the open, and the reviewing process is not completed after an arbitrarily set (and rather short) period of time. The one possible comeback argument in favour of peer review is that it creates trust in the wider public. Policy maker, lawyers (evidence) and other members of the public need to know which scientific theories they can trust, and which are "junk science". However, even for that function the anonymous peer review fails. Not only for the factual mistakes mentioned above. To judge the validity of a statement, as any professional spy would tell you, it is crucial to know "sources and methods". To determine e.g. if a foreign country is in the possession of dangerous weapons, to know that *someone* considers this likely is not enough. To determine the credibility of such a statement, it is crucial to know who these people are, if they have ulterior motives or a stake in the outcome (disgruntled dissidents hoping for crime change etc.) The same holds true for quality statements about academic work. Indeed, the US may be moving soon to a mandatory publication of failed pharmaceutical experiments – information typically filtered out through the peer review process of scientific publishing.

Traditional peer review – or, generally the idea that academics produce products, high quality finished products also meant that academic research and teaching became artificially separated. The very best articles, the leading articles in their field, are often totally inappropriate for teaching purposes, because they don't invite the reader into the thought process which produced the paper. They give us authoritative end results, but little guidance on how the author came from an initial research question to

just that result. We give our students finished results, and they sit there and marvel how on earth anyone could come up with such an answer. Why? Because the way we produce our knowledge does not invite the reader to participate in the process that created that specific research output, and the authority bestowed by the reviewer's seal of approval discourages the sort of critical attitude that we want to instill in our students. Internet publishing and its low marginal costs allow us to move away from producing as output objects (papers and articles) to a process version of academic research which is much more appropriate to what we are doing, epistemologically and pedagogically.

That is why I think peer review is a "Red Herring". The internet allows us finally to produce and disseminate knowledge in a way that is appropriate for what we are actually doing, a true image of the process that is scientific discovery. We can publish all our papers as they emerge, which also increases the chance to find out cheaters. This colleague at the MIT miraculously was able to publish 200 papers a year. Had he been forced to demonstrate how he came to his results by a step to step process that the reader could follow, it would have become evident at a much earlier stage that something wrong was going on. As teachers, we all know this simple truth: Frequent meetings with our students and explanations of their work as it progresses are the best way to ensure that they are indeed the authors of the dissertations that they submit, and the most reliable safeguard against plagiarism. We should expose our colleagues to the same scrutiny that we consider appropriate for our research students, and a process model of academic publishing allows us just that. Two emerging technologies on the internet already address this issue. One was already mentioned in a different context: Wikis, the most famous being wikipedia, allow a continuous process of writing, criticism and rewriting of information. In addition to the benefits mentioned in an earlier contribution, the ability for all users to amend anytime an earlier entry, and where issues are particularly controversial, extend the encyclopaedia by a linked discussion board, allows to make optimal use of "the wisdom of the crowds" and brings the process of analytical criticism into the open. Blogging is another development that supports the same idea. Last year, for the first time, students in my master course used blogs by influential researchers as source for their essays. Blogs are an even better example of the process I indicated above: away from the static end-product to participating in a performance by the author.

That is the first argument I want to make. Peer review was economically necessary in the past, but it always was epistemologically counterproductive, and now we have the means of academic production to get rid of it.

My second argument is that at the moment, we also observe a failure of the academic imagination and we also, as a result, will make things worse before they get better. What do I mean by that? There are examples of free to air academic journals. My own association, BILETA, is involved with a journal for internet law and technology which is free-to-air. We have very little production costs as papers are sent to referees by e-mail and the reviewers work for free. We can do that really on a shoestring budget. But the format which we are using is still relatively close to that of the traditional journal. At the centre is still the refereed article. We are slightly more flexible in having a category for work in progress. This is already a big concession. Based on what I said before, I think that is where we as academics are failing. We should think much more radically of new ways to publish on the internet. One of these more radical forms I have already indicated, publishing as continuous annotating and commenting of articles. A draft paper is put online, other people can post their

comments. The author then re-writes the paper and updates it constantly. This is the process model of academic work, as opposed to the product model. Similar forms of dynamic collaboration do already take place on the internet in contexts other than academic publishing. Harvard University's "open law" project produces compilations of comments by experts on draft submissions to courts. The best known example, at least as basis for an analogy, is the LINUX software system: multiple users constantly upgrading and improving a system that is never really completed.

However, things are going to get worse rather than better, for some time to come at least. As we have seen yesterday, excessive journal prices are at least partly due to market failure in the field of academic publishing. First, there isn't enough competition between publishers, with a small number of publishers dominating the market. Second, the people who decide which journals to buy are not the people who actually have to invest money. We tell our librarians that we really need this new important legal journal, and it is not us who are paying for it, it is our university. As a result, we might be overenthusiastic in recommending journals for the library. If library budgets and the salary budgets came from the same pot, and the savings we made in recommending journals for the library translated into salary increases, this might result in rather interesting competition in the field of academic publishing, but it is of course not going to happen. This market failure that allowed academic publishers to increase on average annually journal prices by 10% will get worse now that traditional publishers move into electronic publishing. Source of concern is especially the idea that we now need licences to access a website, rather than acquire property of the journal itself. This potentially makes it much more difficult to switch a journal against a (better priced, or better quality) competitor. Imagine that you subscribe for ten years to a previously rather good journal. In due time, a better or cheaper journal comes along, or the established journal loses its academic reputation together with its editor. To swap for the better journal under the new system might lose the access to the past backup copies, which are also only available on the publisher's website. This would mean in effect to lose the investment made over the past ten years. This is a huge disincentive to switch. There are legally issues involved here. In particular, I think that potentially, competition law is going to provide academics and universities with some leverage, and it might be possible to argue that there should be either a legal or contractual obligation to make backup copies available if subscription was paid for them at the time they were originally published.

I now want to draw some very tentative conclusions for the legal issues involved in the alternative form of publishing, and if IP is part of the problem or of the solution. First, I want to re-iterate a point made by most of the contributors. Academics aren't primarily motivated by the commercialisation of their research and are by and large willing to make it available for free, provided that the "alternative payment" in terms of recognition, citation and peer-esteem can be efficiently collected. IP regimes based on the notion of commercial exploitation in the Anglo-American tradition are therefore least suitable for academic publishing, online or offline and contributed to the undesirable present situation in which tax funded academic research is made available for free to publishers who can then reap the financial benefits of the initial public investment. However, I think we have to be more specific than that and exclude at least one form of academic publishing, the publication of teaching materials. Since I do not compete with fellow academics for a scarce resource "knowledge", I do not need to exclude them from using my work. We do compete however, as members of our teaching institutions, for the scarce resource "good" (or

“fee paying”) student - at least in the Anglo-American world. Some of the problematic consequences of this competition can already be seen. Some institutions, including my own, make some teaching materials only available to registered students, potentially limiting in the process their duty to disseminate knowledge. Nor is it necessarily the case that a “commons” in academic writing is equally benign if it comes to teaching material. The move by MIT to make all their teaching material freely available online can also be interpreted as a rather sinister attempt to prevent competition. Universities with sufficient endowment income might decide that while it is unnecessarily burdensome for them to move into online education themselves, less established institutions who need this source of income might use it to compete eventually also in other fields, e.g. research. By making their own material available for free, they decrease the value of paid-for online education offered by competitors. Again, this is more a competition law problem than an IP issue (though of course, conceptually they are the same, IP rights creating limited monopolies)

I already indicated above that the conceptual vocabulary of “neighbouring rights” might be useful to develop a theory of copyright protection for “process publication”. Technological solutions can further contribute to an adequate protection of the author. “Moral rights” in the continental European tradition ensure the right to have one’s work attributed, which is important if the predominant reward system is based on the ubiquitous citations indices. In addition to these citation indices, it is possible to use much more direct measurements of the impact of internet based publications that do not rely on the observation of IP law. It is for instance possible to measure the hits that a website receives, the number of downloads made of an article, or the links to a website (already used for ranking purposes in search engines like google). Both models can be refined. A low quality article might get a substantial number of hits by users who leave the website more or less immediately when they realise that the work in question is irrelevant. To address this distortion, users can be asked to “grade” websites that they visit. This can be seen as a new application of Lessing’s idea of “law as code”. IP protection of academic writing becomes less important if it becomes physically impossible for a user to access an article without leaving behind a trace that measures the impact or importance of this article.

However, this new form of publishing also creates new problems. As described above, the new form of publication combines academic papers with publication of annotations and comments. Discussion of IP issues in academic publishing focus so far on the protection of the author of the original paper. However, the IP rights of the commentators are in this model of equal importance. Partly, this is an issue for the reward systems employed by several higher education regimes. To work to its full potential, it is necessary to recognise the work invested in commenting on other peoples’ writing in the form described. At present, peer reviewers are either financially rewarded or work entirely for free. Under the new system, their work would be of the same category as any other academic writing and should be recognised as such. The system of “moral rights “ however can potentially create conflicts between the commentator and the original author. The IP law protection against “denigrating treatment” could allow an author to delete or otherwise suppress comments that are seen as too negative, especially if papers are published on the website of the author or his institution. Repositories managed by third parties, and the contractual permission to accept annotations and comments, might be a way forward.

Secondly, commentators could artificially increase their own impact rating by posting low quality comments on high impact/high quality papers. Again, technological rather than legal solutions might mitigate this problem

Another problem could be labelled: “quality control, the empire strikes back”. It is a quality control problem in the sort of academic-work-as-process model which I am advocating here. Obviously, one consequence of my proposals will be the proliferation of low quality articles. It might be a problem to use or to optimize the search engines to get only those articles that are of relevance to a potential user. On the other hand, search engines become so important under this system that they could seriously distort the quality measurements discussed above. Most of the pertinent legal issues have already been discussed in other research on e-commerce, in particular if there should be a right to be listed on search engines, if intentionally misleading ranking should carry legal penalties, if financial incentives to rank one’s site more highly (as in the case of google) are akin to fraud or conversely, if the use of misleading meta tags by authors to increase the popularity of their site should carry similar punishment.

A potentially even bigger problem is to authenticate the authors online. Amazon can again serve as an example. Readers are invited to write reviews on books, and their reviews influence buying behaviour. Obviously, this system is open to abuse if authors write positive reviews of their own work under a pseudonym. In a system where peer review is replaced by continuous commenting and annotating, authors might feel tempted to post positive comments to their own papers. More generally, the issue becomes how we can make sure that the person who claims to have written an article online is really the person he claims to be. This is where some equivalent to traditional publishers might become necessary, taking up the theme of FIGARO. The third party repository would not so much guarantee the quality of the content of academic writing, but the identity of the author. The question of anonymity and pseudonymity is again a general problem for the internet, with discussions ranging from internet democracy issues to the manipulation of share values in internet discussion forums. How can you make sure that people are who they claim to be?

The final problem is how we can avoid the tragedy of the commons repeating itself? If most academic writing is made available for free online, how can we prevent someone appropriating the results? That is where IP is challenged. I am not totally sure how far the Open Source software licence can really be translated or extended by analogy to academic publishing. I think the way you might use Linux differs from the way people might misappropriate academic results in publishing. It would be partly an empirical question, partly a legal question of how we can ensure that things that have been produced for free by the academic community remain free. In an extreme scenario, someone like Bill Gates (who is in the process of copyrighting electronic replications of all major works of art) could come around, “harvest” articles from free websites, collects them in commercial databases with some “added value” and claim ownership for it. Technically, this is indeed feasible provided again that owners of the main search engines also have a property interest in the collections of academic writing. Theoretically, it would be possible under such a scenario that third parties can only access commercial collections (potentially protected by IP law on databases and similar collections) of academic articles, while free sources are simply not listed any longer. As with most of the issues discussed here, the solution once again might be in the field of competition law rather than IP law as traditionally understood.

Elena Bordeanu:

Firstly, I totally agree with your opinion on the quality control regarding the difficulty to find out the origin of information on the Internet, who is the owner. Let me bring to you an example from my teaching experience. There, most of the time, teachers wanting to evaluate a student's work and having reasonable doubts over the origin of such a work, do searches on the Internet with keywords for finding any article that would treat the same subject or that can be connected to the idea expressed by the student.

Secondly, I also criticize your opinion as I am thinking of self-regulation. And talking about self-regulation I am referring to the Common Law perspective which is very different from the European one. In Europe we tend to regulate everything, to have rules for every practical issue. Opposite to this, there is the experience of self-regulation which is used, for example, for arbitration. Indeed, the internet has its origin in the self-regulation idea. So, I don't know if the question of open source could be a good solution for academic research, but there are possibilities to apply it properly.

After this introduction, let me carry on with my presentation. I wanted to say that it is a pleasure to be here and talk about copyright in a country where printing has its origins. I am talking about the idea of copyright related to the possibilities of reproducing the work. Even the concept of copyright refers to the American approach. We are talking about copy, the right to copy. In French law we are rather speaking about the right of the author, "*droit d'auteur*". So starting with that, we will see that there is a big difference between the two approaches. And why I am talking about the author's right? Because according to French law, the author is all important. He is the person having all the rights. From this point of view can we talk about a real right to copy? Is there a right that is conferred to the users to make copies? And I am only referring to private copies here.

Some authors found the source of such a right in the European Convention of Human Rights – these rights are well known, and in France appear in the declaration of 1789. All this is in connection with the freedom to access information, which is a part of the freedom of expression. And once again, I am wondering if there really is a right to access the information.

The right to make private copies appeared in legal texts, European or national ones, like an exception to the rights granted to the author of a copyrightable work. As I said, he is the one having all the power over his creation. The Intellectual Property French code says that "*once a work has been disclosed, the author may not prohibit copies or reproductions reserved strictly for the private use of the copier and not intended for collective use with the exception of copies of works of art to be used for purposes identical with those for which the original work was created and copies of software, other than backup copies.*" What is then its legal regime? I won't lay emphasis on this debated issue anymore but I would like to strengthen an idea related to one of the contributions presented yesterday. It is about the relation between DRM and this exception (could this be extended to all the other exceptions mentioned in the European Directive?).

Digital Rights Management could be a valid answer to the question of implementing copyright law. We are all aware of the fact that new technologies increase the transfer

of information and make it difficult to track a copyrightable content, to find out who the real author of a work is.

And if we are talking about technology, I would like to mention that not only the most advanced of them could be used for protection. The simple ones could accompany the legal framework. I am referring to a French case where a text belonging to the public domain was published on two websites. It was a question of infringement of the author rights of the first party by the second. I am now bringing this to you in order to underline the issue of proof on the internet. How can we prove that we have an original or a copy? This is an important question. In this case it was technology that brought the answer. In particular, the two ways of typing the text were compared and the result was that in the same cases we had the same errors, for example spaces between the words. The parties managed to show that it was possible to compare two texts on the internet. And it seems to me that such techniques could not only establish content monopolies, they could also contribute to the disappearing of any exception to this.

And we have seen that there are some limits - I am referring to software. For example, it is common nowadays to buy a CD or some other goods on the internet and to discover that they can't be used on another medium. And related to this, let me present you two other recent French cases (the first one of June 2003, the second of September 2003). What happened in these cases? Two persons bought a CD with music and discovered later that it was impossible to listen to these CDs on other devices, for example on their car radios. And on the CDs it was only mentioned the followings: *"this CD contains a technical device that limits the possibilities of copying it"*. The persons finally complained against the distributor and the editor and they won. It is important to look at the legal regimes invoked in the two cases. In the first one the person chose to act on a consumer law basis and to refer to a failure in delivering the correct information on the qualities of the product. And in the second case the person used contract law to prove that the product bought had latent defects. There is an article in the French civil code saying that *"a seller is bound to a warranty on account of the later defects of the thing, which is not adequate for the use for which it was intended or which so impair that use, that the buyer would not have bought or would only have given a lesser price for it had he known of them"*.

Thus, we can find other ways of protecting information on the internet, not only the technical ones or those related to intellectual property.

In these cases, judges gave an injunction to the distributor to use the following sentence on the products: *"Attention, this product can't be read on any machine or car radio."*

Therefore the use of different anticopying devices won't be easy in practice. Most of the users understand to preserve their right to copy, if we can actually talk about a right to copy. And they will find more traditional legal ways for protecting it.

But why is this relevant for this meeting? We should actually be debating over the academic research and copyright. Are we really concerned about this aspect of copyright? It seems to me that academic research has two sides. On the one hand, we need to communicate our ideas from a scientific point of view, but also from a commercial point of view - and I would also like to refer to the four scenarios presented yesterday by one of the participants. And on the other hand, we need to have access to other resources, which actually implies making copies. The status is

complex and is placed in the very heart of the debate on the relation between copyright and new techniques.

What exactly is more appropriate to such a case? As I already said, I could think of Open Source as an example. A question was raised yesterday about the difficulties to put a boundary to such a creation. But what happened with the collective works or the works made for hire? It seems to me that traditional IP law, is able to deal with such kind of situations.

Another aspect I would like to focus on is the exception to the reproduction right mentioned in the Article 5, 3rd paragraph of the European Directive. In France there is a long debate over this issue. I am referring to the use of copyrighted works for the sole purpose of illustration of teaching or scientific research. The main reason for mentioning it is that most of the teachers are using illegally all kind of information for their lectures. The fact of copying information and using it for your lecture is today illegal. And apparently this situation will continue because France isn't ready to grant such a right to universities or research laboratories. I want to quote a reply of the French Ministry of Culture from April 2003, who was saying that this option can not be considered because it is incompatible with international treaties as well as with European directives, "*letter et esprit de la directive*". The emphasis lies once again on the author.

Meanwhile the French government has created a working group of representatives of universities and, of course, of all the organisations representing the authors in order to reach a fair and balanced deal.

In practice, the French universities make contracts with different organizations of authors for determining the conditions of use of the works protected by copyright. Here I want to refer to a presentation done yesterday that was addressing contracts and the fact of transferring rights. Of course, you all know that in France it is impossible to transfer the moral rights of the author. I would like to underline this.

The third point of my presentation is rather a complex of different legal aspects. I would like to concentrate on personal data aspects. Someone mentioned yesterday the control of academic content through subscriptions. But this implies a large amount of personal data and we all remember what happened with Microsoft Passport. I would also like to underline another issue, that of using different techniques for tracking illegal content on the internet. The French commissioner for personal data protection was requested to give his opinion about the use of such a device, software called Web Control that was collecting IP-addresses on the internet. The French commissioner disapproved it in March 2001 because IP-addresses are considered personal data.

Furthermore, I already mentioned some limits of digital rights management. But I am wondering if law is really the answer to the problem. I would like to quote John Perry Barlow who was saying that protections that will be developed will rely far more on ethics and technologies than on law. Encryption will be the technical basis for most intellectual property protection.

We should all admit that Digital Right Management could partially affect piracy. If piracy could be decreased by just a few percentages points from using the digital right management, than this might translate into millions of dollars of otherwise unrealised revenues. But Digital Right Management does not come without a price. And here I would like to refer to the cost of building, deploying or maintaining a DRM infrastructure.

Moreover, the DRM protected content is economically less valuable than unprotected content. So, deploying DRM will result in fewer sales of legitimate content. The question is whether or not the benefits of DRM outweigh its costs.

In addition, I would like to mention the issue of proprietary technology that does not allow us to read a certain file on several media. For example, Acrobat gives us the possibility to draw some limits to the use of documents. Thus, I can forbid printing or copying such a document. If I manage to do the forbidden action by simply using different software, could this be considered a circumvention of the technical protection?

Will all this be enough for protecting copyright? Can we actually think about the end of copyright law? I am confident that a balance will be drawn between the conflicting interests of the authors and of all the other users or organization interested in it.

Federica Gioia:

1. The agenda prompted participants to envisage “*how a legal framework might be adjusted in order to preserve intellectual property rights of scientific authors*”. As formulated, it sounded as if it assumed that such adjustment is indeed necessary for the purposes of the digital environment. I would like to question such an assumption. Are we sure that the digital environment *per se* requires any adjustment of the traditional principles of intellectual property whatsoever? A number of factors seems to indicate a negative answer, namely:

- i. The EU approach. Whereas no. 5 of the preamble to the “Info Directive” (Directive 2001/29/EC of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society) states that while “technological development has multiplied and diversified the vectors for creation, production and exploitation”, “no new concepts for the protection of intellectual property are needed”; all that is required is that the laws on copyright and related rights be “adapted and supplemented to respond adequately to economic realities such as new forms of exploitation”..
- ii. With specific regard to publishing, on the assumption that this is one of the most significant ways in which the fundamental right to expression is exercised, it is interesting to have a look at the Universal Declaration of Human Rights (adopted and proclaimed by the General Assembly of the United Nations more than half a century ago, when the digital world was long to come: on 10 December 1948. Similar provisions are to be found in the European Convention for the Protection of Human Rights and Fundamental Freedoms as well as in the International Covenant on Economic, Social and Cultural Rights). Article 19 UDHR provides that the right to freedom of opinion and expression includes the right “to seek, receive and impart information and ideas through any media and regardless of frontiers”. Indeed, the last qualifications seem to encompass the very characteristics of the Internet. It is widely accepted that the pursuit of academic research and the related academic freedom are among the interests protected by freedom of speech. Furthermore, the drafters of the UDHR were well aware of intellectual property: Article 27 provides, on the one hand, that “Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and

to share in scientific advancement and its benefits”; on the other hand, that “Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author”.

- iii. a glance at the historical perspective: it has been noted that “throughout history numerous innovations and advances have created more efficient systems to disseminate data. For example, development of the mail system, printing press, telegraph, telephone, radio and television all represent vast improvements in the ability to disseminate information. The Internet is simply the most recent, albeit the most effective, technological advance useful in the dissemination of information”. As Beckerman-Rodau clarifies, the “migration of intellectual property to the Internet” only “exacerbated the problem of unauthorised copying and distribution of intellectual property, which militates in favour of strong private property protection for intellectual property”.
- iv. some countries, inter alia Italy, have enacted legislation to the effect that any and all rules governing the publishing industry (including issues such as authorizations, editors’ liability and the like) shall be the same, irrespective of the paper or digital nature of the publication at stake (Italian Law 7 March 2001, no. 62, article 1). The need for all journals, including electronic journals, to comply with the regulations on publishing can now be safely established, after some uncertainties and discrepancies had arisen in case law.

The foregoing elements seems to convey and support the idea of intellectual property law as being per se media-neutral, i.e. not influenced by the specific characteristics of the means in which it is embodied or through which it is exploited, subject only to the need to take into account any new factual scenario which might develop. As stated by WIPO, “the fundamental guiding principles of copyright and related rights ... remain constant whatever may be the technology of the day: giving incentives to creators to produce and disseminate new creative materials; recognizing the importance of their contributions, by giving them reasonable control over the exploitation of those materials and allowing them to profit from them; providing appropriate balance for the public interest, particularly education, research and access to information; and thereby ultimately benefiting society, by promoting the development of culture, science, and the economy”. All such objectives seemed to be already well enshrined in Article 27 UDHR.

2. Against this background, I have no doubt as to the *need for scientific authors to have their rights protected under intellectual property laws* (I come thus to another point of the agenda), as clearly mandated by Article 27 UDHR. Not only is there definitely such a need, but there is no such thing as an alternative between the Anglo-American as opposed to the continental-European approach. Both approaches are needed: the Anglo-American, with a view to preserving the revenues possibly arising in connection with the protected subject-matter, the continental, with a view to ensuring the moral rights of the authors. While the EU has been most effective in ensuring protection of the former aspect, it still has to take care of the latter. I will here forward a second provocative remark: are we sure that intellectual property and specifically copyright, as currently conceived and shaped, is aimed at protecting authors? At least in the EU, the trend seems rather aimed at protecting those who, by investing money and dedicating financial resources, make creation possible in the first place. When it comes to copyright protection in the EU legislative documents,

productivity, economic growth and employment are far more frequently mentioned than individual creativity as objectives worth pursuing and achieving. Most of the initiatives underpinning European copyright legislation seem to strengthen investors, as opposed to authors; infrastructure providers, as opposed to content-providers. The assumption underlying the whole European copyright system is that an appropriate reward of those who sustain the financial burden of creativity is the condition upon which the survival of the latter relies. Accordingly, authorship seems on its way to evolve very much along the lines which led, in the field of patents and scientific research, to enact rules vesting the employer with economic rights of patents for inventions developed within the context of employment relationships. In the context of scientific publishing, if title to economic rights is to be vested with the party sustaining the financial burden underlying the scientific contribution and making it possible, it might be appropriate to draw distinctions among protected subject-matters based upon the kind and amount of financial and economic investment involved in their creation. It is common knowledge that scientific research relies more heavily and significantly on financing than literary, legal or artistic writing and publishing.

This seems the approach already taken by a number of universities. The University of Oxford vests itself with rights' ownership in respect of "*all intellectual property ... devised, made or created ... by persons employed by the University in the course of their employment*", provided however that the University "*will not assert any claim to the ownership or copyright in ... artistic works, books, articles, plays, lyrics, scores, or lectures, apart from those specifically commissioned by the university*". Columbia University vests the faculty with ownership of copyright whenever authors "*make substantial use of financial or logistical support from the University beyond the level of common resources provided to faculty*", provided however that "*even when intellectual property rights are held by the University, revenues from new digital media and other property should be shared among its creators*".

Once the principle is established, various contractual schemes and devices might be developed, with a view to preserving adaptability and flexibility depending on the circumstances at stake (namely, type of relationship, amount of support by the institution, type of work and perspective forms of exploitation available; type of user). Pursuing the objectives of keeping prices low, quality high and maximising distribution of the information might require publishers to resort to alternative forms of financing (other than charging a fee for consultation of and access to the information as such, possibly including advertising banners, sponsoring and the like).

3. On the other hand, it might also be argued that copyright protection, whilst necessary, is not sufficient and needs to be supplemented by other forms of protection ensuring preservation of the economic viability. As a matter of fact, the most obvious forms of exploitation of academic publishing are likely to fall within the scope of copyright exceptions, as mandated recently by EU legislation: namely, those activities could benefit from the exception to the right of reproduction provided for "*specific acts of reproduction made by publicly accessible libraries, educational establishments or museums, or by archives, which are not for direct or indirect economic or commercial advantage*" (Article 5.2.c, InfoDirective), as well as from the one provided for "*use for the sole purpose of illustration for teaching or scientific research, as long as the source, including the author's name, is indicated, unless this turns out to be impossible and to the extent justified by the non-commercial purpose to be achieved*" (Article 5.3.a, InfoDirective). Similarly, under US law, uses of protected materials for scientific, research-oriented purposes have always be

construed as an exception falling under the fair use clause (parody, criticism, comment, news reporting, teaching or scholarship), whose ultimate purpose has been identified in preserving the freedom of “*important forms of communication that are the types of speech that the first Amendment seeks to protect from government intervention*” (Beckerman-Rodau).

In that respect, the *sui generis* protection guaranteed to the maker of a database under the EU legislation (*Directive 96/9/EC of 11 March 1996 on the legal protection of databases*) seems particularly promising (and a possible response to worries arising in connection with “*the situation of companies and especially online publishing houses that scientific authors work for*”). According to Article 5.2 thereof, a database is “*a collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means*”. It is uncontroversial that a collection of scientific works should qualify as a database within the meaning of the Directive, as it is uncontroversial (Clark) that “*an issue of a learned journal is... a database, whether issued in paper or electronic form*”.

4. The question as to whether charges for scientific online publications should be understood as “*hindrance to science as opposed to proper business*” also should be addressed under the traditional principles governing intellectual property laws. It has been stated (Kamperman Sanders) that “*in the face of expanding protection of intellectual property rights, freedom of access for academics and civilians alike is currently of grave concern*”, epitomized by developments such as the WIPO treaties, the Info Directive and the Database Directive. Again, I fail to see the “new” issue at stake. IPR law, is, has always been, and will continue to be a matter of balance. This is apparent even from the UDHR (Article 27) and it has been long acknowledged. The academic community seems to be well aware of this: in June 2001, a group of Dutch academics known as the Zwolle Group agreed to develop “*a set of principles aimed at optimising access to scholarly information in all formats, explaining the underlying relationships of the stakeholders involved (i.e., authors, publishers, librarians, universities and the general public) and providing a guide to good practice on copyright policies in universities*”. In December 2002 those statements were elaborated into a set of principles, under the heading “Balancing stakeholder interests in scholarship friendly copyright practices”, with a view to assisting such stakeholders “*to achieve maximum access to scholarship without compromising quality or academic freedom and without denying aspects of costs and rewards involved*” and on the assumption that the aforementioned stakeholders share common goals, including “*attaining the highest standards of quality, maximising current and future access, and ensuring preservation*”. They explicitly endorsed the so called “Tempe principles”, according to which “*the academic community embraces the concepts of copyright and fair use and seeks a balance in the interests of owners and users in the digital environment. Universities, colleges, and especially their faculties should manage copyright and its limitations and exceptions in a manner that assures the faculty access to and use of their own published works in their research and teaching*”.

The whole intellectual property system has long been familiar with the idea that scientific, research-oriented uses of protected materials, as opposed to commercial uses, should fall outside the scope of the exclusive rights. We have already mentioned copyright; this is also true for patents (experimental use) and even trademarks (use for descriptive purposes is allowed, provided not entailing likelihood of confusion and in accordance with honest business practices: see EU Directive and CTMR).

5. The foregoing remarks do not purport to suggest that addressing the issue of IP rights in the digital context is a waste of time. Excluding the need for a substantive review of the traditional principles and rules underpinning the intellectual property system is not tantamount to saying that no awareness of the specific features of the digital environment is advisable or that no amendment of the current practice might be envisaged. Initiatives such as the Zwolle principles witness the desire of the publishing community to nail down the respective needs and interests of the various constituencies and to shape flexible practices adequately reflecting and balancing such needs and interests. Only, the various stakeholders should be aware that appropriate answers not necessarily lie in laws and regulations, but might as well be found in **contractual** mechanisms (including the phase of dispute resolution, by encouraging a wider recourse to Alternative Dispute Resolution mechanisms such as conciliation or arbitration), possibly coupled with **technological measures of protection** within the meaning of the InfoDirective, provided such supplementary instruments comply with the relevant mandatory provisions (and without prejudice to the possible impact that such need for individualised, ad hoc contractual negotiations might have on the feasibility of collective management of rights).

6. I would like to conclude by addressing the question as to whether Internet is “*a source of danger to the rights of scientific authors*” by striking a note of optimism. Internet is an opportunity as much as a danger: it may provide enhanced opportunities for easy copying, but also definitely provides authors with enhanced visibility and wider audiences. Furthermore, both publishing companies and authors could benefit from and take advantage of the new rights arising in connection with the Internet: web sites are now conceived as attracting copyright protection, or at least sui generis protection under the EU Database Directive. Under Italian Law, once established that the web site falls within the scope of copyright protection, it also follows that the imitation of the general features of its appearance so as to entail a likelihood of confusion is prohibited as an act of unfair competition. This provides the web site authors with a type of protection which very much resembles the “*right in the typographical arrangement of published editions*” granted to publishers under British law. Further issues which might arise in respect of the use of trademarks or other distinctive signs can be adequately addressed under the traditional laws on trademarks, unfair competition and the like. Brief, I would like to conclude by rejecting the commonplace statement that “*digital technology ...introduces new and unprecedented threats of piracy*” (Jeanneret), or that the relationship between copyright and technology is “*uneasy*” (Ginsburg), and instead subscribing to Prof. Cornish’s view that Internet is rather “*an exotic concoction of prospects*”.

Concepción Saiz-García:

First of all, I would like to start stressing the need of protecting authors, and more specifically, authors of scientific works, by means of Copyright law. Contractual law is effective by protecting author’s interests in relation to the person who is going to exploit the work. And even in such cases a specific regulation to strengthen the always weaker position of the author to preserve contractual balance is necessary. However, contractual law seems not to be sufficient to protect the author in case of non-authorized exploitation acts carried out by third parties.

Secondly, I think that scientific works should not be excluded from Copyright system. Although many propose free access - or returning science to the scientists - to such works; in my opinion, their exclusion would raise problems in determining which works under art. 2 of the Bern Convention could be subsumed under that description - for instance works of architecture, engineering projects... . Besides, as I said before, without copyright protection authors would be completely unprotected against any action of the publishing agents or any other third party. If necessary, let us remember that one of the aims of this exclusive right is to encourage the creation of intellectual works. And this is achieved through the two-fold nature of the faculties contained in copyright: patrimonial and moral. In regard to patrimonial rights, I would like to say that in my country, scientific authors are not adequately remunerated. As far as the moral rights are concerned, I don't believe that many authors would be willing to publicly share their work unless a juridical order warrants paternity and integrity (both inalienable and nontransferable rights) of those works.

It would be different if the author agreed on a free publication of his work. Just a decade ago, it used to be possible only by transferring the exploitation rights, except the communication to the public right, to the publisher in return for a payment, that in the most cases was but a small percentage of the money obtained from the distribution of copies of the work. Nevertheless, free distribution is nowadays a reality. It has triggered a great change, not only from the point of view of authors of scientific work, who are currently giving their copyrights to commercial publishers for free, but from the viewpoint of public interest of free access to culture, because the use of the new technologies has yielded a drastic reduction in the distribution costs of the works.

A good example of this new situation is FIGARO. Leo Waaijers said in one of his works, that in FIGARO the author does not need to assign his copyright to the Front Office. It is true that an exclusive rights transfer, in the sense of the classical publishing contract, is not required. In FIGARO, the content distributor will need at least an authorization to undertake the acts of exploitation that will be indispensable for the on-line exploitation of the works. That's why a contract between author and publishing agent will be necessary. In that contract both the "reproduction right" and "the right of making available to the public" must be authorized.

Reproduction: it must be authorized because, first, it is a previous step of the works up-loading. Other reproductions such as transient or incidental and essential for the technological process whose sole purpose is to enable a transmission in the network between third parties by an intermediary, don't need to be authorized. Art. 5 of the Directive excludes them; this exclusion is mandatory for all member States, unlike other limitations that are observed. All excluded reproductions acts are economically irrelevant out of the on-line exploitation. And second, because, regardless of the financial system of the publishing agent, for instance a pay per view or an open access systems, the license they give the end user implies the transfer of the reproduction right for private use.

However, a regulation of the parties' interests should be completed with subsequent terms in the contract. And at this point, I would like to refer to Digital Management Systems. According to the above mentioned model, the author of scientific works continues being the exclusive rightholder of his work. He has only authorized the up-loading and the public availability of his work, so he still has to decide which way his work will be exploited.

Nowadays new technologies have allowed authors to control the on-line exploitation of his work. As we all know, Digital Rights Management Systems enables the author to decide whether his work shall be exploited through a license system - e. g. *pay per view system, subscriptions,...*-, or not - *free access system*-. Nonetheless, authors usually don't have the proper infrastructure and skills to install such digital protection systems, and normally the e-publisher will be the one who provides such technologies. It is clear that the author must agree the use of such technological measures with the e-publisher.

At the same time those measures will not only allow the control of the reproduction for private use, but also prevent it. With this assertion we have come to one of the most controversial issues of the current copyright system: **the legal limit of reproduction for private use.**

The EC Directive 2001/29 of the European Parliament on the harmonisation of certain aspects of copyrights and related rights in the information society, disposes in its art. 5. number 2 letter b) that "Member States may provide for exemptions or limitations to the reproduction right provide for art. 2 in the following cases: b) In respect of reproductions on any medium made by a natural person for private use and for ends that are neither directly nor indirectly commercial, on condition that the rightholders receive fair compensation which takes account of the application or non-application of technological measures referred to in art. 6 to the work or subject-matter concerned".

I would like to recall the voluntary character of this disposition for the Member States. The voluntary character may yield different regulation for each country. This is not advisable given the global nature of the Internet.

We all know that the way authors have been compensated for the private reproduction of their work is through a fixed amount of money, due to the impossibility of controlling the mechanic reproductions. Nowadays, this initial foundation on a market deficiency cannot be maintained for the reproduction right for private use by digital means, as thanks to the DRMS the rightholder can control the reproduction of the work. That's why the detractors of the extension of reproduction right to the private sphere, as with computer programmes and databases, need to find a new justification. And this argument can only be found in the public interests on open access to culture, education, science and information.

Generally, legal exemptions to exclusive rights don't create subjective rights for the users. They just limit exploitation rights aiming at the balance between the authors and the public interests. They bring the constitutional requirement of promotion and protection of culture, education, science and research to fruition. They are consequently norms that are excluded from the free negotiation principle, otherwise the agreement would be null and void. This means that technological measures that hinder their beneficiary the enjoyment of such exemptions would constitute a right abuse and a *contra legem* behaviour that should be corrected by the current authority.

I don't believe that all that I've said in general about the exemptions could be said in particular for the exemption of reproduction for private use. This is because its primary foundation lies on the market deficiency of the technical impossibility of controlling the reproduction of protected works by users that have access to them, either legally or illegally. This is the reason why I believe that there is neither legal support to affirm that there exists a subjective right of reproduction for private use,

nor objective reasons of general interests that justify the defence of reproduction for private use with compulsory character, as it happens with other exemptions. Thus this limit is a non compulsory one that would allow the rightholders to ignore it in the license contract through technological measures of access and reproduction control.

This seems to be the motivation of the European legislator who, in paragraph 4th. of art. 6. number 4 of the Directive, gives an absolute priority to the will of the parties over the general interest in which legal exemption are founded, with regard to on-line exploitation. Beside, it will not prevent rightholders from adopting adequate measures regarding the number of reproductions.

This solution has been adopted by the Spanish legislator on the draft reform of our intellectual property law. It allows generally to limit reproduction for private use, without preventing the rightholders from choosing not to do so, using technological measures regarding the number of reproductions of works, which have been normally made available through a license of use for each reproduction, either on-line or off-line. Finally, in cases of onerous on-line transfers of works lacking technological measures of reproduction control, reproduction for private use will subsist the way it exists now: by compensating the damages through a fair compensation that, in any case, should be adapted to the new means and materials of digital reproduction.

To finish my exposition, I would like to refer shortly to the current situation of Spanish e-publishing enterprises.

There is still a total lack of organisation in this field. Some enterprises have transferred to software houses specialized in e-publishing, exploiting their reproduction right and the right of communication to the public and in particular the right of making available to the public on-line their analogical archives. This practice wouldn't be a problem if the original contracts had transferred them the right of communication to the public and in particular the right of making available to the public. But this is surely not the case of contracts before the 90s. That is why a new negotiation with those authors will be required.

Regarding works whose initial exploitation is through on-line means, enterprises are in practice divided:

Some of them add to their classical publication contracts the right of communication to the public. This way does not seem to be the best one because the current legal regulation of publication contract is far from satisfying the new interests of the parties in the on-line exploitation.

Other enterprises negotiate simply the exclusive transfer of the reproduction rights and the right to communicate to the public. These contracts even regulate the kind of technological measures and the salary of the author, which will be normally linked to the kind of use: a percentage by access or time of use; an fixed amount by non controlled access.

Ziga Turk:

I would like to start with a short overview of the SCIX-Project and the results of the process analysis that was made there. Obviously we are all looking at how to change the current scientific publishing process. We have identified that the enablers of this

change are on one hand soft - like social, legal and business innovation kinds of issues. On the other hand, there is a possibility of technical innovation. A framework will be presented listing key innovation opportunities. And finally I will try to give my personal answer to the questionnaire, which was part of the programme of this seminar.

The reason for starting the SCIX-Project in the first place was that some of the key partners have been involved in issues related to scientific publishing or to scientific information exchange before the project started. We are otherwise involved in information technology for construction, that is, using computers in architecture and engineering. What we have been learning is that there is a big gap between what we as researchers know is possible, and what the industry actually implemented. We have identified, that the knowledge transfer process between the research community and the industry is one of the major obstacles to change in that area.

With Prof. Bjoerk we have been running the ITcon Journal, the Electronic Journal of Information Technology in Construction, since 1996. It is publishing volume 8 now - a good track record for an electronic journal. With Prof. Bob Martens from Vienna we have been setting up a kind of a topic archive of publications related to computer edited architectural design. This is known as CUMINCAD. I think, practically every active researcher in this community is a member and probably this site contains more or less all the relevant works that have been published in this area even since the 1960s. A lot of the scanning of old historical work has been done also.

Research in the area started in 2000. We did a survey in our scientific community on how people feel about electronic publishing or on the publishing process in general. The conclusion was that people want to read electronic, but publish on paper, and that there is a kind of a schizophrenic attitude towards this, because as readers they care about totally different things than they do as writers.

SCIX-Project is a 24-months project, with an EU funding of € 1.000.000 and 200 person months. The duration has been extended until 30th of April 2004. As you can see, the partners are more or less from the edges of Europe. This tells you that the benefits of electronic publishing are probably more imminent if readers do not have the infrastructure of big countries or big institutions. At www.scix.net you can read all about the project and all its deliverables. We have made it a policy to have everything except the exploitation plan to be public.

There are two main areas of work. One is the business process analysis, in which basically three types of studies are being done: (1) a theoretical model of the publishing process using the IDEF0 mechanism, which is a well established mechanism to model industrial or intellectual processes in order to analyse the problems, before the re-engineering of the processes can take place. (2) A redesign of the publishing process and (3) a study of the barriers to change.

The part of SciX is the technical innovation and technical demonstration, in which we are looking at how to lower the technical bar for the independent publishers, organizations or individuals to enter this open access publishing model.

We are adding another interesting angle to the project and that is how can this scientific information be tailor-made for the industry? Our partner from Iceland is analyzing how to use this open access content and make it more appealing for the industrial readers and people from the practice. We understand that if something is an open access publication, people then are free to exploit any business model and any

business ideas with that content. There was some discussion today about the need to restrict open access or whether you should allow anyone to make an advantage of that.

I would like to start with the motives for scientific publishing. Traditionally they are roughly five different motives for scientific publishing. (1) Registration of “who thought of something first”, (2) quality certification, (3) dissemination through which one also builds up his own prestige or becomes known in academic circles, (4) long-term archiving, so the work does not get lost, (5) bibliometrics or some kind of measurement of the quality of the research. We can add to these the profit or earning money and the return on investment.

As we can see, it is quite clear from this diagram, that the scientists have very different interests in the process from the publishers. The main motive of the library is archiving. The librarians want to handle paper based journals and books, because by the number of books and by the number of journals their budget is defined. And the larger the budget, the more people they can employ. They have a vested interest. The funding bodies' main interest is bibliometrics – a measure to decide whom to give the research money and whom not.

Neither the scientist nor the libraries nor the funding bodies are interested in making a profit out of that. The funding body that did make an investment into the research process is definitely not interested in making the return of investment through publishing. Of course, the publisher is interested in the return on investment, but we are speaking here on the investment into the research, not investment into the printing the scientific articles.

How do different media address these motives? This table has the paper based journals in the first column and then various types of open access, the digital publishing in the remaining ones. The green mark means that this is well taken care of, and a red one that there is room for an innovation in this area.

And as we can see there is some problem, that paper based journals today have, with the registration of who thought or who did something first, because without any electronic means of comparing the content and given the sometimes very slow publication process, which can last between one and three years, one is hesitant to give them more credit in that area. They do very poorly at dissemination, because actually by putting something in a scientific journal, the reach of that journal is rather small, it is limited to the subscribers of that journal and to the libraries. Otherwise they got quite well, actually they are better in every other category than any of the open access digital publishing outlets with the given exception of dissemination.

The question for the SCIX-Project is how open access media can be as good as or better than the paper based journals. Paper based journals have some problems: restricted dissemination due to costs, high prices because of the inelastic market, bad service to the authors because authors “publish or perish”.

It is not entirely true what the Open-Access-proponents say: The authors give the journals copyright to their work for free. In exchange for that, the journals provide the printing, the advertising and the indexing.

But I think, the vital problem in the current process, and one that the scientific community should be most worried about is, that the control of the academic community is outside of the academic community. So this autonomy, which the

academic community should have or thinks it has, has in fact been diminished by the commercial publishers.

The problem is, that, for example, a scientific publisher can invent a new journal on some exotic topic. And this journal would, of course, accept some works. People, who wrote this works, would have good bibliometric results or would be evaluated fairly well and could therefore apply for research grants and money based on the fact that they have published in these new journals. By getting these research grants their organizations can afford to subscribe to these journals. The publishers are in a position to steer what the priorities of scientific research are. Not to mention, that they appoint the editors and they appoint the review boards, which give them a certain type of control, what kind of work passes, whose work passes and whose work does not pass the review process.

I think we will come to the conclusion that open access publishing is not free and that the commercial publishers can improve their service. But I think the key issue is that if we want scientists to keep their autonomy, the publication process should be in their hands and not in the hands of some organizations, which are otherwise not involved in the research or educational process.

What can we do to improve the problems of open access publishing? What are the chances of innovation and improvement? When it comes to registration of primacy (who thought of it first), electronic processing can be faster. What these sites could have built in is digital signatures related to time stamping, so that it is known, when something was submitted and did not change since that. Similarity measurements are another opportunity. If you have texts in electronic form it is fairly easy to find out very similar work and also to measure, to some extent, the originality.

As far as the quality certification goes, electronic journals are following more or less the same principals as paper based journals. But there is a possible innovation in the organization of publication model in the sense, that there is no need to have the one-on-one mapping between the organization, that certifies that something is good, and the publishing outlet. To put it in other words, if you publish a paper in a journal now, it is the editorial board of that journal that certifies that this work is okay. What you could have is a model where you have a paper published for example in institution archives. And many different editorial boards would say, this work is okay, this work is good. The paper does not end up in one journal, it is in the repository, but the certification happens through other means.

It applies the same to the personal archives, but they would be probably a little dubious, when it comes to that. As far as dissemination is concerned, I think, we have the upper hand in relation to paper journals already. Particularly regarding electronic journals and topic archives, I don't think there is much that can be done to improve that. When it comes to institutional archives and personal archives, I think, they need to be first and foremost Google-friendly.

I am not so sure about the importance of the OAI compatibility. When I personally search for stuff, I go to Google or I go to some topic specific archive. But I can't remember when I was last going to a search engine that was based on OAI. OAI, however, is very important as a means to aggregate institutional archives.

The problem of institutional archive is that I would never go searching Fraunhofer's and then go to the Stanford University and then go to MIT and so on and so on. These institutions need to make it friendly for the search engines, so that their data could

somehow get accumulated, probably by topic archives using in the end OAI standards.

When it comes to archiving, innovation is needed in the sense that local libraries or national libraries need to get involved. The current excuse for their existence is handling of paper. It could be a major breakthrough, if we could engage them in handling electronic publications and maybe they could also take some of the roles of the publishers in this area as well.

As to the measurement of impact and other bibliometric studies, the problem is - and it appears everywhere in the business of publishing, of scientific publishing and paper based scientific publishing - that the control is somehow shifting strongly from the scientists and the libraries to the funding bodies. We are seeing that the major clients of publishing in general are becoming the organizations, who measure how good you are and how good you are not. If you look at the business perspective, somehow the ISI - the Institute for Scientific Information - is doing very well in providing that information. I think Elsevier is already developing a similar system, which would try to be competing with that. And for electronic journals to enter into that system is a fairly long and slow process. The innovation here could only come from some open citation approaches.

Probably sustainability is the major problem of electronic journals and of topic archives today. A model, which would actually work on the long run has not been invented yet. For some time one can work on a shoestring budget or for some time one can work on enthusiasm, but throughout history I am not sure how many successful things have worked in the a long run on enthusiasm. Sooner or later business takes over.

Some of the barriers on the transition path are technical. In relation to electronic journals, workflow systems need to be put in place. In relation to all other types of archives it should be made easy, through technology, to set things up and to manage it on a day to day basis. As far as business related items are concerned there is a problem of who pays for the electronic archives. There are social problems like recognition of electronically published texts on the one hand and the acknowledgement of the public interest in scientific publications openly available on the other. Furthermore there are organizational problems: Who is the publisher, when it comes to electronic journals? Is it just some guy on the internet? Is it a proper organization? Is it a library? Is it a university? Is it a professional publisher, who is doing electronic business? And as to the institutional and personal archives, I think, there are new rolls for old organizations, particularly the libraries.

The work in SciX that I was mentioning is related to a business process analysis. But with technical innovation, we tried to make it really simple for people to enter into the open access publishing. Multiple languages and the support for sustainability in the sense that the maintenance of these archives really doesn't take too much effort.

The idea behind the architecture of the site is that there are a number of core-services, which are on this layer here. If you combine them differently, you create different types of publications. If you want to have electronic journals, you probably have user management reviews and annotations as well as discussions, in addition to the repository, which stores the work. But if you want to support a conference or something similar, the workflow system is different. These components like the Lego blocks and the user decides what she wants to create with them.

A special module is dealing with this content syndication towards the industrial user. It uses the same path or access to the actual data. We use XML for all that web-services.

A minor part of information exchange can happen with the protocol for metadata harvesting by OAI. Parts of this system were developed within SciX. Parts were using existing open source code. All these services on this layer are, although using in part open source code, homogeneous.

What is up and running now is using this technology? Common code base is shared by one journal, three conferences, five topic archives including the electronic publishing conference series and their archives. Currently we have three languages implemented, German, English, Slovenian, Spanish will be added fairly soon. So the code is written in a way which allows translation by people and by programmers.

The final innovation or something that comes on top is not fully operational, but probably will be fairly soon, is a kind of support for rentable services, again using the same code base. When you go to a website and would like to create a journal or a personal archive or institutional archive, you can set it up through the web only through clicking on the web interface like you select on a form that you want to set up an open archive. You fill in some information, e.g. who the manager is, what the password was and it is done for you and you can start uploading your works or your pictures or works of art or if you want - well, whatever content. The plain version looks like that, but there are some 200 parameters, which you can change such as the colours, the structure of the data base itself and the interfaces to maybe other services.

As to the IPR questions that this workshop asked: the baseline for answering those questions is actually on this slide. This diagram here shows the costs related to creating a scientific article or the costs related to lifecycle of a scientific work, in several columns. There are some costs involved in the time of the scientist, who was doing the research the first one. Writing the paper is the second one. The review process is the third one. The publication itself is there light grey and the retrieval is the dark grey. And the order of magnitude of the publisher's profit is also in the order of magnitude of these boxes here. What we need to know or have in mind when it comes to scientific publishing is that by buying scientific publication, one does not pay for the innovation, which is described in the work. One does not pay for the costs that were associated with making that work possible. And this is dramatically different to any other kinds of publishing. If I buy a CD of music or a video, what I am contributing with that money is to the effort, to the costs of making that video. If I buy a scientific journal, I am not contributing to the costs required to do the research.

I think, if one would look at the copyright laws and on any kind of legal framework related to that, this is a very important difference. It is intellectual property that should be somehow protected or managed. This property was created by public funding and it is not the publication that is supposed to make some return on investment. The legal framework should ensure, that this intellectual property right addresses the interest of the public, which in the first place made the invention possible, and that covered the cost of the invention, not the cost of the publishing.

Charges for online publication? I think, that in the end somebody needs to pay. Ideally one would have these online publications managed by existing organizations with existing budgets like, for example libraries. Then this could be quite cost-efficient.

The important is the autonomy of the scientific community. So it should be the scientific community that is providing the publication media. In that respect something like BioMed is not different from Elsevier. There is somebody at the top of BioMed, who decides to create a new journal on some exotic genetic theme. In that case, this person who - I am not sure, what his relation to the academic community is - is in exactly the same position as Elsevier setting up a new paper based journal.

I knew nothing about the difference between Continental and Anglo-Saxon IP-law before I came here. But I learned this morning that in scientific publishing it seems that there are some authors that need protection and others do not need to be protected.

Woody Allen cannot make a movie without somebody who gives him the money for the movie. He as author can be in conflict, in relation to copyright, with the producer. But Elsevier gave me no money at all to do some research. Why would their interest need to be taken care of? Somehow the Continental model seems much more appropriate than the Anglo-American one in this particular case.

Referring to Open Source Systems I am sure that there is a difference between Open Source and Open Access. Open Source means to me for example that I get the Word version with everything open. I can copy and paste this text or maybe improve it. And Open Access is a PDF or Postscript-File which let me do the reading or printing, but not much more. There is a possibility of some invention on this Open Source model in the sense that somebody posts a paper and somebody else can take the three quarters of it, improve it and puts himself at the end of the author list. Or one could use some text analysis of systems do actually compute, calculate, what the contribution of one or the second author was. I think for Open Source some invention is needed.

The problem with Open Source publishing is that if I would give word files out, people would be able maybe to steal my pictures or be able to improve on my pictures without a very clear reference to me in some sense.

I think the scientific community is not interested in the legal limits of Digital Rights Management. As a scientist I am not interested in earning one or two dollars for each click on the paper that I have published. It is marginal, these costs, these revenues are so small in comparison to the cost of doing the research.

Is internet the danger or an opportunity? I agree with, what Prof. Gioia was saying: It is a challenge. Danger is in the ease of copy-paste that, students are using extensively to produce "their" seminar assignments. But it is also good. It is what they will also need to do in real life. Why type something in again, if it is out there. What we need to teach them is to credit that properly. I have totally no problem accepting a paper from a student that would be 75 percent cut-paste from various sources, if he says, this is from there, this is from there and this is from there and this is what *I* did. And if every person would do five percent original of what others have done, we would have enormous progress.

The other danger of the internet is that people get so much involved in electronic dissemination on the internet that they forget about how to score the proper points for their evaluation and promotion. It may not be too good for their careers.

Summary:

A. General situation

As a result of the workshop it can be said that there is no comprehensive, ultimate and unanimous opinion about the requirements of DRM and digital publishing. Depending on their respective backgrounds, the individual participants (lawyers, journalists and computer professionals) had different answers to the questions posed in the workshop's principles and gave importance of various aspects in the field of DRM and in the academic field of electronic publishing.

According to the different statements the situation in the field of academic publishing is as follows: The competition between individual publishing houses is restricted by the monopoly of a few players in the market. From the point of view of the publishing houses, there is no interest in changing this situation, since their financial position would only worsen with increased competition. The present day market situation mainly affects authors of scientific papers who have to pay the publishing houses for publishing their work. The situation is, according to several participants, similarly critical for universities and their libraries, whose interests match those of the authors. Universities have to raise large amounts of money for procuring books. Public money is thus spent twice: Once in paying the researchers for their research work and again for buying scientific books that are published. As a reaction to the monopoly, many universities have set up their own publishing units or have forged alliances with other universities and research institutions.

According to Prof. Turk there are five different motives for scientific publishing. First registration of "who thought of something first", (2) quality certification, (3) dissemination through which one also builds up his own prestige or becomes known in academic circles, (4) long-term archiving, so the work does not get lost, (5) bibliometrics or some kind of measurement of the quality of the research. Prof. Turk opined that the main problem of evaluating is the fact that measurement of all scientific publications is done by commercial investors rather than by the scientific community or libraries. Prof. Turk criticized this development because the evaluation of scientific contributions should be done by the general public.

In Mr. Schafer's opinion the current practice of peer-review is problematic. This process dis-empowers authors and, at the same time, does not result in any improvement in the quality of scientific works. In this context, Mr. Schafer pointed out a few cases in the recent past, where scientific works had proved to be wrong or faked, in spite of having been subject of a peer-review.

B. Situation of online-publishing

While outlining the general conditions of online-publishing, Prof. Turk pointed out the following advantages: contrary to paper-based journals, online-publishing would permit a very quick dissemination of knowledge. Traditional scientific journals, on the other hand, could reach only a small group of readers within the scientific community and in universities. Worldwide access to the results of scientific research can be significantly faster if online-publishing is used, and one can see which scientist has achieved what results at any point in time. Scientific works can thus be compared and evaluated more easily. Long-term operation of an electronic journal would be problematic because the finances for a long-term use would not be available.

Moreover, there would be difficulties with public acceptance for electronically published texts and knowledge that a text has been published electronically. Finally, organizational problems like who is to be regarded as the publisher of an electronic journal would also have to be solved.

Mr. Schafer emphasized that electronic publishing could offer a solution to the problems facing the academic archive. Firstly, there is the potential for institutional self-archiving. In addition to publishing in traditional journals, academics can upload their papers in open access digital archives. On the next higher level, these archives can be located on the level of universities. Finally and more ambitiously there would be projects like the Budapest Open Access Initiative funded by the Soros Foundation Open Society Institute. Its protocol would allow all databases which comply with it to function as if they were part of one central server, regardless of their physical location. Small institution-based servers can in this way create aggregates of research literature, allowing researchers to self-archive without the need to upload the same paper on several smaller discipline-based archives, most of which lack the necessary mass to be successful competitors to the main journals. According to Mr. Schafer in the near future technologies would be available that can be used to transform these archives from cheap alternatives to paper journals to superior competitors, for instance through the possibility to allow users to customise hyperlinks between papers, a technology already used commercially in the Juris system.

Mr. Schafer also said that unlike self-archiving, open access journals would not face the problem to negotiate copyright release for articles published already in paper journals. They would however face potentially higher costs for peer reviewing, copy-editing, proof reading and general administration. Possibilities to meet these costs range from “author pays” models to sponsorship to a system of “value added” publishing where the core texts remain free of charge, but individuals and institutions are offered additional services (like for instance the hyperlinking facility discussed above, customising of papers etc). Cheap as opposed to free online journals for instance would initially increase costs to libraries, as they will be ordered in addition to existing high impact journals, at least initially.

Dr. Westkamp said that exploiters of cultural works had detected a danger to the commercial viability of their businesses and pledged for stricter protection. These concerns have been met by various international and European instruments, in particular the introduction of a general right of communication to the public under the 1996 WIPO World Copyright Treaty for Authors and under the 1996 WIPO World Performers and Phonogram Producers Protection Treaty (Articles 8 and 6 respectively). This right would be understood to complement the non-physical rights in respect of online transmission in closed or open networks. The acts which would infringe copyright would include the communication of a work to the public as well as the making available (such as on an internet site). The European Union had introduced a general right of transient copying under the 2001 directive on Copyright and Related Rights in the Information Society. This would refer to acts of technically necessary copies which occur once information is transmitted through electronic networks. For providers of scientific material, the combined effect would be quite serious. Both the reproduction right, as understood in the sense the directive suggests, and the right of communication to the public will avail owners of copyrighted materials with a general use right. In effect, no limitation will apply. As a use right, it would remain immaterial whether the act of access (or providing an opportunity to access for third parties by uploading information

Further, the participants rated the development of the market for commercial online-publishing companies as another critical factor. Here, a monopolization is indicated (Elsevier / Springer-Kluwer Group) similar to the situation of traditional publishing houses. Apparently, some online publishers have demanded up to US-\$ 500,00 for publishing scientific treatises. These publishers justify these costs saying that they provide other services in addition to the publishing, such as peer-reviews. According to the participants, such enormous amounts do not correspond to the savings that online-publishers receive by publishing on the Internet instead of in paper-based journals. Thus, it was pointed out that the administrative costs for digital archiving of scientific works would come up to a mere US-\$ 55.00 a year. In this context, it is to be noted that the online-publishers often get access to further sources of income such as sale of paper editions, advertisements and sponsorships through the publication of scientific articles.

Commercial online-publishing is particularly detrimental to universities. Instead of being able to sell knowledge in materially embodied form such as books, libraries have to pay for access to knowledge. If the subscription to an electronic journal is cancelled, the result is a loss of knowledge, because the universities would no longer have access to it. As a consequence, universities are less willing to make use of new electronic journals, even if these are of a very high quality. Commercial online-publishing thus contributes to the death of the free market, on the one hand. On the other hand, the current situation deteriorates quality of research and academics.

To solve this problem, the participants called for a process of emancipation of the scientific community and the continuance and expansion of existing alliances. Efforts undertaken so far in this direction have often failed due to the unimaginativeness of the scientific community, resulting in the strong position of the publishing companies.

1. Legal solutions

In Prof. Grosheide's opinion, the legal right to copyright protection of scientific authors would not differ from that of other creative persons. Prof. Turk on the contrary emphasized that the price of a music CD or a video would depend on the respective manufacturing costs while the price of a scientific journal would be much higher than the costs of the research. According Dr. Westkamp it should also be noted that it is still unclear which law will apply to the act of downloading a copyrighted work. The conventional concepts – either the law of origin or the law of the country for which protection is sought – would both be fraught with difficulties in practical application.

Most of the participants agreed that the works of scientific authors needed copyright protection. According to some participants, this protection ought to be provided mainly at the contractual level. There will certainly be disadvantages if a third person makes use of the work without the author's permission. That is why authors should take a careful look at the publishers' usage regulations for their clients, before signing a contract with an online-publisher.

1. Role of IP law

The estimation of the role of copyright in the field of digital publishing varied.

Dr. Peukert considered the abolition of copyright protection for scientific publications, or alternatively, restricting it to protection for the author against changes to his works by third persons. This would mean that publications could only be

financed by public funding, but the present problems of online-publications should be solved. At the same time Dr. Peukert doubted the practical feasibility of his suggestion, because this would imply international treaties.

In Dr. Westkamp's opinion copyright would be undergoing the perhaps most drastic changes of its history. One reason would be an increase in electronic uses of copyrightable material and the ease of copying and dissemination associated with it. The second reason would have a political dimension: In the European Union, two distinct copyright systems exist: According to wisdom currently prevailing in the European Commission, necessitates harmonisation under Article 95 EC as it is conceived as a potential barrier to trade. Hence, European harmonisation had been introduced by way of directives, the final two of which – the directive on the legal protection of databases and the directive on copyright in the information society – would be most relevant to the workshop topic. Finally, international norm setting had been achieved under the 1996 WIPO Copyright treaties dealing with the conceived dangers of the internet.

According to Mr. Schafer copyright regulations were needed that protect contents which were freely available originally from commercial exploitation by third parties. In addition to this identification and authentication of online-authors should also be ensured.

In this respect, Mr. Schafer's view was opposed by Prof. Bordeanu. She preferred solving the problem on the basis of self regulation through the legal departments. In her opinion, it was not necessary to adapt the traditional copyright regulations for the field digital publications. The best protection, according to her, would be technology and corresponding ethics among the users.

Prof. Gioia called attention to the fact that copyright itself was independent of the medium of publication. Thus, there would be no need to modify and adapt the existing copyright legislations at the European level especially in the field of digital publishing. Moreover, Prof. Gioia questioned protection of authors as a goal of the European copyright legislation. With regard to the latest EU legislation, strengthening commercial users would seem to be the legal purpose.

Prof. Saiz-Garcia found the possibility of a voluntary implementation of Art. 5 No. 2 lit. a; b) RiLi 2001/29 problematic. This, in her opinion, would create non-uniform pre-requisites within the community and is not designed for global availability of online-publications.

There were also different opinions on the advantages and disadvantages of the continental copyright regulations versus the Anglo-Saxon rights. Mr. Grassmuck was clearly against a legal model based on the Anglo-Saxon ideal. Prof. Grosheide opined that the differences would play no role, at least at the contractual level. Prof. Gioia favored a mixed model based on both legislations.

2. National differences

During their talks, some of the participants referred to national regulations and the legal situation in their home countries. On the whole, the impression was of a very heterogeneous regulatory structure.

Dr. Peukert firstly referred to § 52a UrhG, which permits the usage of published works exclusively by a definite, restricted group of persons for their scientific research. According to his views, § 52a UrhG can only be applied to a small group of

persons who can exchange the results of their research within a network. This regulation did not touch upon the world-wide usage of research results via Internet, although this is a necessary part of every national copyright regulation considering the global availability of online-publications.

Further, Dr. Peukert drew attention to the regulations in the German copyright act which tie these to an author. This would also be applicable for authors employed in a scientific institution. Hence, it would be necessary for universities to contractually allow the usage of the works of their scientists.

Mr. Schafer reported that in the UK traditional academic libraries would face a crisis as research journal publishers had increased their prices by an average of 10% per annum over the last decade. In the same time introduction of the Research assessment exercise the UK had dramatically increased the pressure on academics to publish. Furthermore in the UK, the joint information systems committee JISC would support institutional self-archiving. Edinburgh University is one of the leading partners in a consortium to create and promote such archives (The Nottingham University led SHERPA project).

Considering the potential to reduce the high costs of electronic publishing Mr. Schafer pointed out that one possibility could be student edited journals. Although these journals would be the exception in the UK, they would be the norm in US law schools. Student edited journals would also have pedagogical advantages, from involving students early on in research to more reader friendly writing by academics. Edinburgh University would presently develop a student edited webjournal on IT and IP law.

Prof. Bordeanu propounded that universities in France would be entering into contracts with authors, and the conditions for using copyright protected material would be laid down in these contracts. Prof. Bordeanu also said that it is not possible to transfer ethical values.

Furthermore the exception provided under Art. 5 Abs. 3 RiLi 2001/29 in relation to multiplication rights poses problems in the field of teaching and learning. The course material of most professors would have to be seen as illegal, if the guidelines are applied, since copying of information is not allowed. Despite this problem the French government apparently would believe that there would be no need for further action as international treaties and European directives would oppose another regulation.

According to Prof. Gioia usage and copyright regulations in Italy and a few other member states would not depend on the medium used. As confirmed by the legal departments, digital usage is considered equivalent to usage on paper. Moreover, web-sites are covered under the provisions for copyright and competition protection in Italy. This is meant to apply to both the larger design of a web-site as well as to special features. The creator of a web-site would be covered by a protective right that is reminiscent of the "*right in the typographical arrangement of published editions*" under British law.

Prof. Saiz-Garcia reported that the Spanish legislator had made provisions in principle for restricting the right to multiplication to private usage only, in their draft for the implementation of the copyright directive. However, this should not at the same time prevent the owner of the right from using technical means to circumvent this and make copies of the work, which would otherwise be possible only through a license.

The situation of Spanish online-publishing houses is, according to Prof. Saiz-Garcia, marked by a lack of organization. Some publishing companies had shifted to publishing exclusively in the Internet. Since the publications in the Internet would also contain traditional works from an earlier date, the usage rights for these would not contain any contractual terms for such (digital) publication. For this reason, older contracts with the individual authors would have to be re-phrased accordingly. In the case of works, which are envisaged exclusively for online-publication, practice is apparently divided: some publishing companies have merely added the possibility of using the work through Internet to the existing contract. However, since the regulations for existing contracts would not address the requirements of Internet-publications, Prof. Saiz-Garcia advocates against this practice. Other publishers, on the other hand, would incorporate comprehensive regulations for online-usage of works in their contracts.

II. Legal limits and perspectives of DRM

In the assessment of the possibilities and outlook for DRM in the field of academic publishing, participants agreed that DRM could not be bound by any legal limits. As far as the authorization of DRM in the academic field was concerned, however, opinion was divided.

Some of the participants completely rejected DRM in the academic field. The main argument against DRM was that it would restrict free access to knowledge and hence oppose the basic principle of the Internet, namely free access to information. DRM, they said, would not offer a legal position to the people requesting the information, but mere access. Implementation of DRM-systems in commercial online-publishing companies would probably be inevitable, because the only alternative would be free usage of these services.

Prof. Bordeanu and Dr. Peukert were skeptical about the success of DRM. Prof. Bordeanu considered DRM as a possibility for ensuring copyright protection through technical measures. One special field of application here would be author authentication. Further, DRM would be suited for countering unauthorized usage of works, leading to high profits. The usage of DRM-systems would necessitate considerable investments for setting up the DRM-infrastructure. Whether these investments would pay off would remain questionable.

Dr. Peukert was mainly concerned for the difference between commercial and scientific publications. Unlike commercial authors, scientists would be only marginally interested in financial exploitation of their works as scientific authors use the Internet as an inexpensive way of presenting their work worldwide and acquiring a reputation thereby.

According to Mr. Buhse from the point of view of commercial legal representatives DRM would be the key to success in the electronic contents business. The significance of DRM would not be restricted to the possibility of generating high turnover through the Internet. He said that the use of DRM would be based on a strategic component as well, since it contains legal, technical and business aspects. The need for DRM can be traced back to several other developments. At present there would be four different business models, which could hold their own in future as well, and can be applied to the academic field. These models envisage, among other things, remunerations for one-time usage or access over a restricted period of time. It is also

possible to restrict usage to the type of usage, individual parts or even charge for particular services.

Regarding the role of DRM Prof. Grosheide pointed out that individual usage business models for DRM and the usage forms in each case would have to be considered. Prof. Grosheide also drew attention to the difference between the management of digital rights and digital management of rights. On the one hand management of digital rights would include technologies for identification, metadata and languages. Digital management of rights on the other hand would cover decryption, watermarks, digital signatures, protection technologies and payment systems.

Finally, many participants highlighted the growing significance of database protection as an area of application for DRM. Here, protection for scientific publications would make room for the EU legislation, because online-collections of scientific publications would have to be seen as a database in the sense of Art 5.2. of the database directive (RiLi 96/9/EC) and would therefore enjoy the concomitant protection.

III. Open Source Solutions

The use of open source systems was assessed differently by some of the participants, both in terms of its definition as well as from an advanced perspective.

Prof. Grosheide basically welcomed the use of open source systems, as long as they would promote scientific encounters. He also noted that no such system would be in place as yet in the field of academic publishing.

Prof. Turk was of a similar opinion. For him, there was no great difference between open source and open access. He associated the possibility of making changes to electronic documents with the concept of open source. Open access on the contrary provides access to documents where only reading is possible, as in the case of PDF-files. According to Prof. Turk, one area of application for open source systems would be a model, which would allow authors to exchange documents or parts of documents among themselves, for purposes of editing. Further, one could also consider a tool that could analyze text and summarize it. At the same time, open-source systems would be prone to the risk of third persons appropriating the contents of documents or even eliminating them.