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INTRODUCTION

With the introduction of powerful new technologies, the world of intellectual property rights has changed. This report outlines the development and provides a first basis for further research on the legal aspects of these changes. The aim of the report is twofold: to analyse the changes that these rights undergo in a highly globalised and technologically advanced society and see what new means of protection that have arisen from these changes.

The title of the report “The Answer to the Machine...” comes from a slogan adopted by some writers: “The answer to the machine is in the machine”. The meaning of the slogan is simple: the new threats that digital technology brings with it should be handled by that exact same technology.

This report will mainly deal with copyright, and not with patents or trademarks or other related issues. Later other reports will focus on these particular parts of intellectual property rights.

It should be emphasised right at the outset that this report tries to cover a wide area of interest, which necessarily means that the treatment of each subject must be short and concise.

This report has been read and commented upon by many people whose views I have benefited from. I should especially like to mention the people in the TAHUTI-team: Bernd Stadler, Mattias Bjarme and Thomas Alexandre, whose views and powerful criticisms has been of tremendous use to me.

WHAT ARE INTELLECTUAL PROPERTY RIGHTS?

The subject of this essay is the intellectual property rights. Before we move on to more pressing problems it would be wise to make some basic issues clear. The first of these issues is *what* intellectual property rights are.

Intellectual property rights are immaterial rights, for example copyright, patents and trademarks. The basic motivation behind the legal creation of these rights is complicated. Partly the idea was to protect the often-large economical investments made by innovators and partly the legislators wanted to ensure that the individual innovator was protected, in order for him to find it worthwhile to innovate.

The copyright to a book is a good example. The author invests much time and effort in the writing of a book and the result should accordingly be protected. A large company that invests millions in the development of new technology should also have some kind of financial protection for this investment – and the patent legislation provides exactly this.

In this essay copyright will be the main focus.

It should be pointed out that intellectual property rights are highly complex and difficult to deal with. They do not represent the ownership to objects, but instead they represent the ownership of concretised ideas, which makes them abstract things. No study can or should be complete in the sense of covering all aspects. I have tried to remedy omissions in my report by profusely referring to other works in the same area.

WHY ARE THEY IMPORTANT NOW?

The overwhelming interest in copyright that we see today has its explanation in two different, but linked, trends.

One trend is the transition from **industrial society** to **information society**. It is often said that this transition will change the economical basis of our society. Instead of relying on actual goods and raw material, our society will to a larger extent rely on and profit from information. Information is – by its very character – immaterial and the only way of protecting and exploiting this new asset is by utilising intellectual property rights.

The other trend is the ever-expanding role of the **media producers** (or in cyberspeak: the content providers). It follows from the explosion of this market that films, videos, games and music become more and more economically important. And all of these products are basically protected as intellectual property.

Combined, these two trends explain what can almost be called a renaissance for intellectual property rights in many different situations. With the new possibilities for **e-commerce** these rights gain even more in importance and value.

THE PROTECTION OF INTELLECTUAL PROPERTY TODAY

This chapter deals with questions on the protection of intellectual property today. Without becoming technical in legal matters it is interesting to see how different countries and federations view intellectual property.

IN GENERAL

Luckily much of what has been decided upon when it comes to intellectual property rights has been decided internationally. International trade with protected material would be greatly complicated if there were not international conventions on the subject.

Without going into detail – the aim of this essay is not to explain basic intellectual property rights¹ - this chapter will sketch the outlines of intellectual property protection in the world today.

There is of course a lot of national legislation as well, but as we shall see the subject is highly internationalised.² National legislation will not be dealt with in this report.

THE WORLD

Intellectual property rights are highly internationalised and established today. One of the most important conventions – the **Berne convention** – dates back to 1886 and was signed by January 1:st by 127 states.³

The level of protection provided for in the Berne convention is a minimum level. An author of a work is protected throughout all signing states without having to register his work. The small copyright symbol, ©, has no other effect in the signing countries than to remind the user of the existing copyright. Protection is thus acquired instantaneously.

What is then protected? In article no. 2 of the convention we find the following explanation of what is protected by the convention:

¹ For a good introduction I recommended *Copyright* (Stockholm 1998) by Henry Olsson – well known actor on the copyright scene. This book is in Swedish, for an extensive collection in English on material concerning intellectual property rights see the web: <http://cyber.harvard.edu/metaschool/fisher/library/>

² Olsson, *Copyright* p 275

³ All conventions and treaties can be found at *WIPO:s Homepage* <http://www.wipo.org>

The expression "literary and artistic works" shall include every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; lectures, addresses, sermons and other works of the same nature; dramatic or dramatico-musical works; choreographic works and entertainments in dumb show; musical compositions with or without words; cinematographic works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science.

Different derivative works and performances are protected as well.

The Berne Convention was not however signed by all the countries in the world and other conventions, notably the World convention of 1952, were written to regulate the issues for countries with certain formal requirements for attaining copyright. In these countries it is however, according to the World convention, enough to apply the copyright symbol, year and author to the work like this:

© Nicklas Lundblad, 1998

If an author has done this he has copyright to his work in those countries that have signed the World convention but not the Berne convention. In those countries that have signed both, the Berne convention overrides the World convention and no formal requirements are made.

The total time of protection is 50 years in the Berne convention.

The treaties are administered by the World Intellectual Property Organisation (WIPO). The main objectives of the WIPO can be found on their webpages⁴:

The objectives of WIPO are:

(i) to promote the protection of intellectual property throughout the world through cooperation among States and, where appropriate, in collaboration with any other international organization;

(ii) to ensure administrative cooperation among the intellectual property Unions, that is, the "Unions" created by the Paris and Berne Conventions and several subtreaties concluded by members of the Paris Union.

Intellectual property comprises two main branches: industrial property, chiefly in inventions, trademarks and , and copyright, chiefly in literary, musical, artistic, photographic and audiovisual works.

In recent years new copyright treaties have been presented. In 1996 two important treaties were signed: WIPO COPYRIGHT TREATY and WIPO PERFORMANCES AND PHONOGRAMS

⁴ WIPO History page, <http://www.wipo.org/eng/general/wipo/wipo.htm#objectives>

TREATY. These two are now being implemented around the world. Much of the work within the European Union is based on the implementation of these treaties. Interesting new paragraphs deal with problems that arise from the digitalisation of works and the globalisation of trade.

The TRIPS agreement within the WTO (World Trade Organisation) should also be mentioned.

WTO is an organisation focusing on trade-related aspects of rights. Once again we can use the organisation's own presentation:⁵

The WTO is the only international body dealing with the rules of trade between nations. At its heart are the WTO agreements, the legal ground-rules for international commerce and for trade policy. The agreements have three main objectives: to help trade flow as freely as possible, to achieve further liberalization gradually through negotiation, and to set up an impartial means of settling disputes.

The TRIPS agreement contains, among other things, rules on minimum coverage and dispute resolution. The TRIPS agreement is the one with the most coverage so far, in terms of signing parties.⁶

The TRIPS agreement refers to the Berne Convention and the details shall not be discussed here.⁷

EU

Within the European Union intellectual property rights are studied within the context of the transition to information society. Much of the work is concerned with different aspects on new technology.

In December last year a new suggestion for a Directive was put forward. In many points this directive is based on the WIPO-treaties of 1996. For example the Directive contains different paragraphs dealing with the removal of technical protections of works, such as waterstamps and signatures.

This suggestion is what is discussed most frequently today. But the European Union has issued several Directives on Copyright and related issues:

⁵ WTO Facts pages, <http://www.wto.org/wto/about/facts0.htm>

⁶ WTO TRIPS pages, http://www.wto.org/eol/e/wto07/wto7_7.htm #note10

⁷ See, for a more complete analysis, Olsson, *Copyright* pp 307-311

Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases

Council Directive 93/98/EEC of 29 October 1993 harmonising the term of protection of copyright and certain related rights

Council Directive 93/83/EEC of 27 September 1993 on the co-ordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission

Council Directive 92/100/EEC of 19 November 1992 on rental right and lending right and on certain rights related to copyright in the field of intellectual property

Council Directive of 14 May 1991 on the legal protection of computer programs (91/250/EEC) "Software"

Council Directive of 3 October 1989 on the co-ordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the pursuit of television broadcasting activities (89/552/EEC) "Television without frontiers"

The directives range from satellite television to databases and reflect the great interest the union takes in the development of a unified law of intellectual property for the countries of the union.

USA

The US signed the Berne convention in 1989, which is comparatively late. Copyright in USA, however, differs from Copyright in the European union. This sometimes creates large difficulties. One of the issues often brooded over is the protection of computer programs. In Europe computer programs are protected as literary works, which means that you sometimes do not allow patenting them.⁸ In the US programs and algorithms can be patented. Clearly this situation illustrates the drawbacks of having different legal systems in different parts of the world when trade becomes a more and more global phenomenon.

The US is very interested in the new problems and there has been a vivid debate about copyright and free speech (more about this later). However suffice it to say, somewhat oversimplified, that you nowadays acquire copyright to a work according to the Berne convention's rules also in the US.

⁸ Unless they can be shown to be a part of a system. The trend in this area is to lower the threshold for what is considered to be patentable.

NEW RISKS IN NEW ENVIRONMENTS

The development of information and communication technology has radically changed the intellectual property scene. In this chapter we will study two important facts that constitute new risks for rights holders in the new environment. (There are other changes as well – consider the fact that intellectual property rights usually are at least in some small way dependant on the media they are fixated on. When all media forms converge, this difference between works becomes obsolete. The two risks mentioned here are to some extent caused by this media convergence).

The new possibilities will be treated later, see the chapter *New Questions and New Possibilities*.

COPYING WITHOUT LOSS OF QUALITY

In the digital environment, all works are just exactly that: digital. This means – somewhat simplified – that they can be translated into a series of ones and zeros. Copying in this environment merely means to replicate the series of numbers that constitute the work. What we do is not actually copying in the traditional sense of photocopying, it is replicating. We create a new instance of the work that in as far as quality goes is identical to the original work.

This, of course, means that the incentive for people to copy works is much higher in digital environments than in the traditional analogue world. When you make photocopies of a book the reduced quality of the copies is obvious. The look and feel of the copies make them a less valuable substitute for the book. If you copy a digital book you suffer no such reduced quality at all.

One of the answers to this threat has been to incorporate, by technical means, a quality reduction into the digitised works. This is not always a good idea, since quite legitimate needs for copying exist: making backup copies when material is lost in a computer crash, for example.

GLOBAL ACCESS TO PROTECTED WORKS

Another important change is the fact that the global information networks make it possible to distribute information to the entire world. This also goes for copies of intellectual property. An author that wants to control the use of his or her work will feel greatly disheartened at the thought of millions of Internet users copying wildly. In some sense you loose the possibility of controlling your work with so many different actors on the scene.

Not only can people from all around the world access your web page and illegally (or not) copy your material. They can also copy it to others, thus spreading it throughout the world with the speed of the network backbones.

NEW TECHNICAL MEANS OF PROTECTION

The emerging technologies not only give rise to a variety of risks, they also provide the rights holders with a powerful tool to control and manage use of intellectual property. In this chapter we shall briefly study some of the new technologies and the legal aspects associated with them.

We will shortly study some of the new technologies in a very special perspective: we will study them from the viewpoint of someone constructing a Copyright Management System – a system for controlling and managing copyright. These systems will be introduced later on, but the building blocks, or some of them, will be introduced here.

There is no ambition to make an exhaustive list over new technologies. This is neither possible nor interesting. We will only present some representative examples.

New technologies

This is by no means a technical introduction – the aim is instead to explain the legal relevance of the different technologies. The explanations will only be as detailed as is required by the legal analysis.

Watermarking

Watermarking a protected work is a process in which the work is labelled in a special way for future reference. The technique can be made visible or invisible and different kinds of information can be attached to the protected work. Often the technique is used in imaging software, but texts and even music can be watermarked. Today new methodologies are being developed to watermark streaming video and multimedia. The idea is adding a pattern that does not destroy the quality of the marked work but can be extracted later on to reveal to whom the work belongs. Watermarks can be divided into two different kinds: private and public. The difference being that the private ones only can be extracted by the imprinter. The public ones can be extracted by anyone. The private ones thus present a higher degree of safety.

This ability to mark images will be a substantial part of a CMS. It is however not a solution in itself. Within the IMPRIMATUR-project⁹ a report on watermarking has been released which examines the different techniques and scenarios in which watermarking is developed today. The authors remark that

⁹ <http://imprimatur.alcs.co.uk>, see also later on in this report.

...watermarking is often invoked as a cure-all solution to the protection of copyright of multimedia data, [but] many questions need to be answered before such techniques can be effectively applied in real world scenarios.¹⁰

Many different research projects revolve around the use of watermarking. For further reference some of these will be mentioned below. The commercial application of watermarks has already started, and some commercial companies will be mentioned as well.

Kodak and **IBM** has developed different kinds of visible and invisible watermarks. IBM is very interested in the use of watermarks and there is a lot of work being done on different techniques. (See the report *Digital Watermarking for High-Quality Imaging* Minerva M. Yeung, Frederick C. Mintzer, Gordon W. Braudaway and A.R. Rao).¹¹

IMPRIMATUR – as has already been mentioned – has done studies in this area.

The **TALISMAN** project – an EC project – has done some research in this area and strives to accomplish different solutions for different forms of digitally stored data.¹² Some of the work has been done in co-operation with the Signal Processing Lab of the Ecole polytechnique fédérale de Lausanne (EPFL) and the Laboratoire de Réseaux de Communications in the field.. This work has resulted in some demonstrating software that can be downloaded from the Signal Processing Lab's homepage.¹³

One of the most well known commercial applications of watermarking is **Digimarc**. On their web site, Digimarc states that:

Over a million people can already "read" a Digimarc® watermark since our "reader" is available for free on our web site and our embedding and reading software is bundled in approximately 90% of all image editing software. In fact, you may already have one of these tools: Adobe Photoshop® 4.0, Corel DRAW™ 7, Corel PHOTO-PAINT™ 7, Micrografx Graphics Suite™ 2.0, Micrografx Webtricity™ 1.0 and Micrografx Picture Publisher™ 7.0. Just look for Digimarc in the Filters or Image menu of these software programs to embed or read Digimarc watermarks.¹⁴

Digimarc is accordingly mostly interested in watermarking images.

¹⁰ *Watermarking Interoperability and State of the Art*, (Draft 1998) Barni, Bartolini, Piva IMP/14062/A p 1 This preliminary report will most likely be divided into a State of the Art report and one dealing with interoperability.

¹¹ *Digital Watermarking for High-Quality Imaging* Minerva M. Yeung, Frederick C. Mintzer, Gordon W. Braudaway and A.R. Rao

<http://domino.watson.ibm.com/library/CyberDig.nsf/a3807c5b4823c53f85256561006324be/aa6b0384b52dc7b0852565930072646a?OpenDocument>

¹² *Talisman Project Description* <http://www.tele.ucl.ac.be/TALISMAN/index.html>

¹³ *Signal Processing Lab EFLA Watermarking Page* <http://ltswww.epfl.ch/~jordan/watermarking.html>

¹⁴ *Digimarc Homepage* http://www.digimarc.com/about_wm.html

Today there are ways of thwarting these new technologies, which of course presents a rather difficult problem to the imprinters.

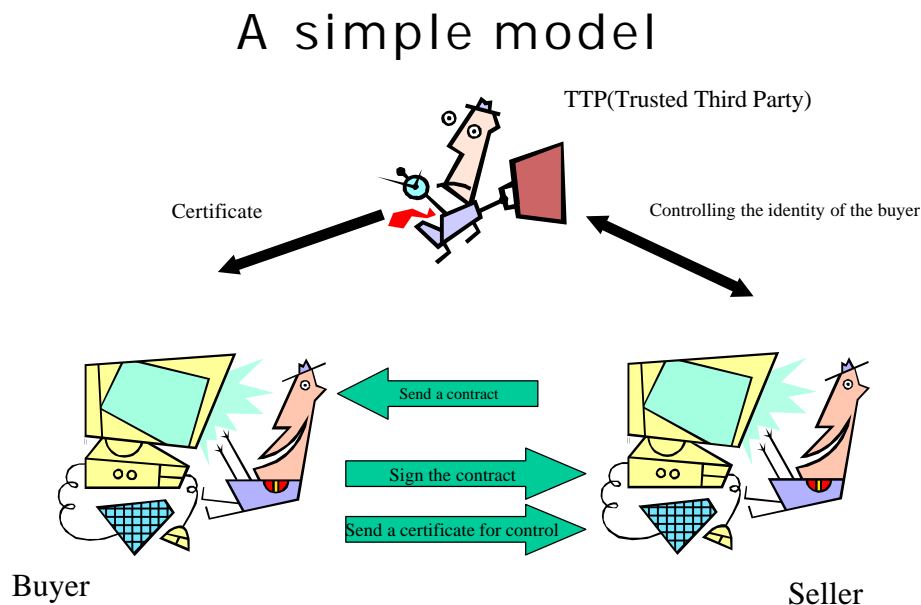
A more complete overview of the commercial market can be found in the already mentioned report from the IMPRIMATUR project. pp 19-25.

Digital signatures or digital identification

Another very important part of a CMS is the ability to identify the actors in the market. This ability is of central importance and the question of digital identities is closely connected to that of watermarking images. If the users remain *totally* anonymous the watermarking technology will be of little or no use, since we will only know what has been done with the pictures, not by whom.

One way of explaining this is to say that watermarks deal with the identity of digital objects and signatures /fingerprints deal with the identity of digital subjects.

Digital signatures and certificates allow a person to identify him- or herself to another actor. The technology is simple and can be presented with a picture:



What we see in this model is a simple model of digital identification. The seller sends a contract for signing to the buyer who signs it and then sends the contract back with a certificate that has been issued by a trusted third party (TTP). The seller then checks the

certificate with the TTP (to see that it has not been revoked for example) and sends the content he is selling to the buyer once he is satisfied that the buyer is who he claims to be.

The point of the certificate is exactly this: to prove a person's identity. It is vital to see not only that the signature is correct but also *who* holds the signature. This is what the TTP and the certificate accomplishes.

The technologies that digital identities are built from are quite complex to design, but very often transparent for the user.

The actors in this market are many, but the best known is Verisign Inc. Their homepage provides further technical insight into the mechanics of signing for the interested.¹⁵

The role of the TTP is one of the most intriguing parts of the emerging new systems. One possible future entails a network of trusted third parties that uphold commercial law, act as certificate authorities and as civil courts for international lawsuits.

Agents

Something that is comparatively new in the area of CMS:s is the thought of using agents for copyright control and for signing contracts. The agent – a small and simple program moving on the net for example - would then act as an intermediary and check for the best offer or an offer of a certain sum for a CD, for example.

Another use for small programs crawling over the web is one closely associated with watermarking. Digimarc has robots crawling over the web, examining the use of pictures that have been imprinted with Digimarc's watermarks. This lets Digimarc track the use of pictures in a mechanical way – something that would take much time and money to do manually.¹⁶

E-payment systems

Finally, one important aspect of the new systems is of course the ability to pay on-line. Different types of e-payment systems have been developed to let users pay for the content they want. Important systems today have different ways of attacking the problem. CyberCash and

¹⁵ *Verisign Homepage* <http://www.verisign.com>

¹⁶ The legality of this is highly questionable. The mailing list CYBERIA-L regularly discusses questions related to law and new technologies and participants of the list have suggested that it is unlawful intrusion to let a robot crawl over all the material on someones pages.

DigiCash try to produce e-money, whereas the SET standard developed by VISA, Mastercard, Microsoft, IBM et al is concentrating on the use of creditcards.

The e-payment systems allow for what is sometimes called micropayments – really small payments per user that add up to substantial sums for the user total. The motive behind this technique is that the overhead costs for using your credit card to pay small amounts of, say one cent, are much too large for it to be economically viable to do so. If you instead collect micropayments until they reach a substantial amount, the credit card cost need only be charged once – thereby making it economically defensible.

COPYRIGHT MANAGEMENT SYSTEMS

Sometimes the phrase "The answer to the machine lies in the machine" is used to describe a possible solution to the new problems of the digital environment. What the phrase implies is quite simple: the technology that makes it easy to copy and distribute protected works can be changed in a way that provides new ways of protecting works.

One way of doing this is by using Copyright Management Systems (CMS).

What then is a Copyright Management System? The term is not clearly defined. What we can see is that it denotes a wide range of systems, that incorporate different new technologies for identification, tracking and storing information about intellectual property use. Several state of the art reports have been written on the subject.¹⁷ In short we could say that a Copyright Management System is a system that utilises all or some of the previously described technologies to protect and manage intellectual property.

The CMS area has boomed in the last few years. A lot of work is being done and several different projects devote time to the study of new technologies. The central question often

¹⁷Tuck, Bill *Electronic Copyright Management Systems – Final report of a scoping study for eLib*, <http://www.sbu.ac.uk/litc/copyright/ecms.html>

Barlas, Chris *State of the Art 2 October 1997*, Imprimatur report, <http://imprimatur.alcs.co.uk>
Market Survey of Existing Electronic Copyright Management Systems and Projects, <http://www.iieir.dmu.ac.uk/Projects/ERCOMS/ercomsm.html>

ESPIRIT Information Technologies, R&D Programme Domain 3: Multimedia Systems Summaries of Projects Fourth Framework Programme October 1997

Ramsden, Ann, *Copyright Management Technologies: The Key to Unlocking Digital Works*, <http://www.ariadne.ac.uk/issue10/copyright/>

Narcisse, Herve, *Copyright Management Systems and Other schemes for Charging by the Bytes*, <http://www.libraries.wayne.edu/~jiltman/pnarciss.html>

being how to protect copyright while still allowing fair use. Shouldn't information be free? The Information Technology Association of America (ITAA) discusses this in one of their papers:

At the heart of the matter is a paradox: How to protect ownership of copyrighted material while at the same time making digital works widely available over the Internet and other online services.¹⁸

There is no simple answer to this paradox.

I have consciously avoided the often-used term Electronic Copyright Management Systems because I think that it has the unfortunate effect of focusing attention on technological aspects of the system. Other aspects, economical, legal and not least the care of the creators are at least as crucial to make the systems work.

Even if it is difficult to define these systems, one thing can be seen with perfect clarity: there is no room for closed systems based on special software. All new CMS:s must take the Internet into account and their design must be open.

Different projects

In this section of the report we will present some of the different projects that do research work on copyright management. The presentation starts with some historically important projects and then goes on to explain new projects and angles. There are several other projects that will not be taken into consideration right now – the purpose is not to make an exhaustive list.¹⁹

CITED

One of the first projects to address the issue of CMS was CITED. The basic aims were described as follows:

The objective of the CITED project was to design a generic model of an Electronic Copyright Management System (ECMS), in other words a system providing copyright management, usage monitoring and invoicing, and protection, integrated with a digital copyright application.²⁰

The technology and model were implemented in the COPISMART project. This project is also interesting because of its tendency to concentrate all technologies within one system. When

¹⁸ *Digital Protection "Intellectual Property Protection in Cyberspace: Towards a New Consensus"*, ITAA discussion paper, <http://www.ita.org/copyrite.htm>

¹⁹ See *Electronic Copyright Management Systems: What Are They*, <http://www.acn.net.au/resources/ip/ecms.htm>, for an interesting and up-to-date list.

²⁰ *Cited Project Description* <http://www.mari.co.uk/copicat/cited.htm>

systems today tend to use the idea of open architectures, the CITED system tries to integrate all different functions of a CMS into one system.

This is partly because the basic structure of the CITED project is closed. Whereas later systems came to focus naturally on the open architecture of the Internet, earlier systems were self-contained, closed systems.

COPICAT

One of the older projects that should be mentioned is the COPICAT project. The aim of this project was stated as follows:

The COPICAT project addresses the area of electronic copyright protection. It aims to provide a basis for confidence in electronic copyright protection and open up a "blocked" market in multi-media electronic publishing.

COPICAT will develop a generic architectural model for an electronic copyright protection system incorporating the copyright-related event management model from the CITED project (ESPRIT 5469). It will extend this by adding a security model appropriate to the application domain. Selected components from the EAST project (DELTA D2016) will be used to create an educational copyright protection model. Selected multi-media educational material will form the basis for an example of material requiring copyright protection. The educational domain has been chosen because the project consortium consider that this represents a "worst case" area in which most if not all copyright protection issues arise. Most other domains appear to provide less stringent boundary conditions.

A complex ownership and access structure will be simulated. The COPICAT system will be installed and tested on a pilot site.

It is interesting to note the focus upon the educational area. The project considered this a 'worst case area'. What we have seen since the time of the COPICAT project is that the educational area, though still important, has found itself in the shadow of the dawning age of e-commerce, where commercial content is the object for protection. This historical turn is not unimportant. Some people feel that talking about CMS is wrong, a larger perspective should be taken on the issue. What we deal with, these people say, is e-commerce with content. The focus should thus be on trading with rights rather than protecting them. The difference is a subtle one.²¹

The COPICAT project also had the drawback of using the CITED project's closed model for disseminating content. This was later realised by the team behind the project and a philosophy for an open system was formulated. This statement, OSPREY(Open Structure for Protecting

²¹ Gervais, Daniel J. Dr, *Electronic Copyright Management Systems (ECMS) From Rights Trading To Electronic Publishing*, <http://www.copyright.com/stuff/ecms.html> illustrates this nicely.

Rights Electronically) , has not received much attention, but the goals closely resemble those set by the IMPRIMATUR project:

We do expect to contribute strongly to the establishment of conventions and standards, and to deploy technology which coexists with and indeed competes with other solutions. We hope to invite the developers of such other solutions to join us in the pool, to respect and take advantage of the openness, complementarity, and free interworking which it encourages. We believe in the power of collective action to empower individuals.²²

Historically this marks a change in the development of the Copyright Management Systems: the overwhelming power of the Internet changed the conditions of the scenarios. The next project – one of the largest ever to be founded in this area – tries to address these issues and many others.

IMPRIMATUR

No report on CMS's would be complete without mentioning the gigantic IMPRIMATUR project. The acronym stands for Intellectual Multimedia Property RIghts Model And Terminology for Universal Reference. The project focuses upon many different issues, although one thing seems to be especially important:

Consensus-building is the core of the project. The goal is to produce a set of recommendations for codes of business practice, standards development and legal harmonisation.²³

The consensus building is what makes the IMPRIMATUR project unique. In combination with its broad focus the consensus building makes the project more interesting than any other undertaken so far is. This is a conscious strategy on part of the project members:

The result will be that opinion-formers in the IPR industry will bring a common influence to bear in the formation of standards: commercial, technical, legal and practical.²⁴

Aside from the consensus building the projects focuses on formulating an Imprimatur Business Model, the prototyping of basic "ECMS:s" with several applied versions used for different trials, on-line co-operation with other projects and state of the art reports for electronic payment, watermarking and other technical standards.

The reports from the project are available at the project's web site: <http://imprimatur.alcs.co.uk>.

²² *OSPREY manifesto* <http://www.mari.co.uk/copicat/osprey.htm>

²³ *IMPRIMATUR Consensus Statement* <http://www.imprimatur.alcs.co.uk/consens.htm>

²⁴ *IMPRIMATUR Central Statement* <http://www.imprimatur.alcs.co.uk/central.htm>

IMPRIMATUR is running on its last year. Several different realisations of the demonstrator are available in different parts of Europe and the final evaluation of the project will be very interesting to follow. A plan for the finishing year is available at the project's web site.

Copysmart

Copysmart is also a project based on the CITED model. But the goal of the project was somewhat different:

CopySmart targets the PC environment and will provide within short term the hardware and software building blocks for implementing IPR management in multimedia applications. Respect of standards is a key issue for large market acceptance. The principle adopted is thus to not secure the PC, but the application and to provide hardware security by a standard bus, PCMCIA device. This CopySmart device will contain protected CITED functions and security functions. Cryptographic algorithms and payment functions will reside in the CopySmart device in a removable security module, so that it can easily be adapted to national regulations and payment methods.²⁵

The project has ended.

AMIDE

Once again an acronym: Advanced Multimedia Information Dissemination Environment. The project is defined thus:

AMIDE environments may be seen as large shopping centres with all the enabling infrastructure, where small and medium enterprises will be free to promote and operate a variety of information shops, where individual talents will be able to offer their services in open areas and where the consumers will be able to window, shop, to test, try-out, buy and take away information goods.

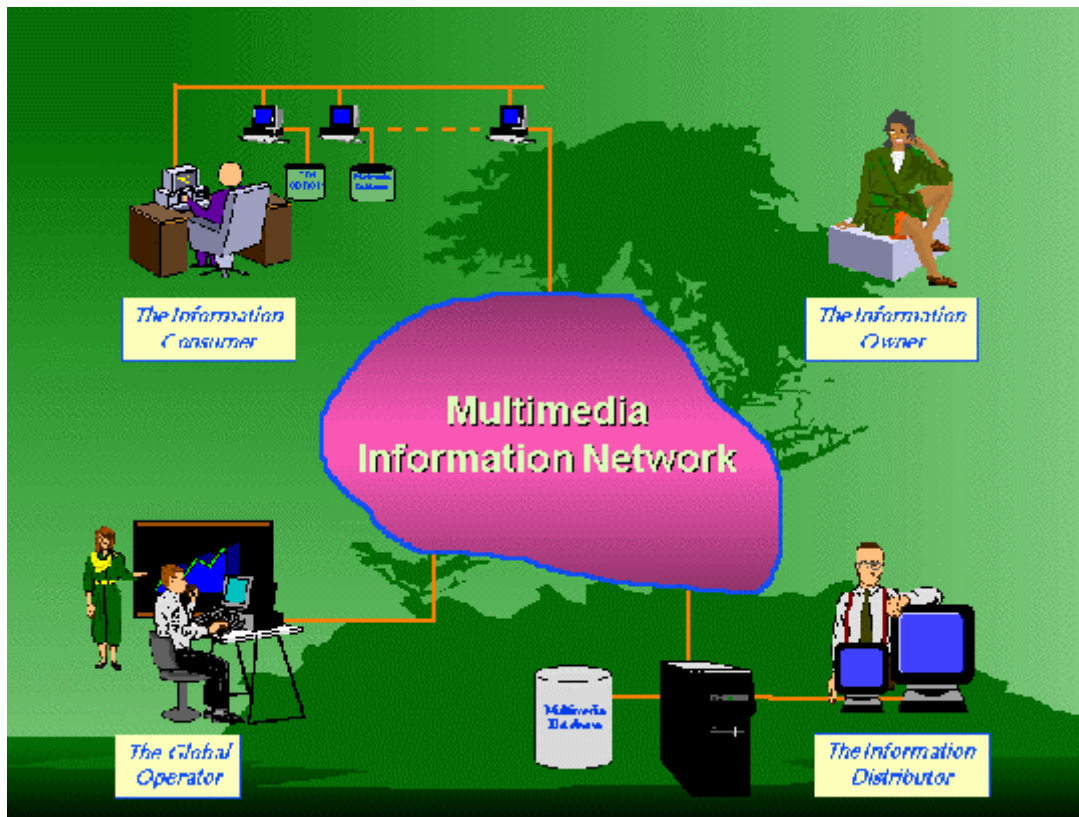
AMIDE provides a global technical framework for the implementation of the information society through the following enabling technologies and concepts:

- Actors registration process
- Service presentation and selection
- Homogeneous access to information
- Homogeneous retrieval of information
- Transparent presentation of information
- Pay on usage only
- Royalty payment
- Electronic payment

²⁵ *Copysmart Project Description*, <http://www.cordis.lu/esprit/src/ep20517.htm>

- Copyright protection
- Use-rights contract definition
- Medium independent dissemination²⁶

The AMIDE model of the multimedia environment differs somewhat from the traditional one and sections the market in a different way:



The model is still very similar to the ones presented elsewhere, but the way of focusing on information and not protected works (these are not necessarily equivalent) makes the model different.

The AMIDE project was finished in 1996 and has resulted in three new products (AMIDE Telecom, AMIDE Internet and AMIDE off-line) described at the projects web site.²⁷

To acquire additional information on these products one must contact AMIDE.

²⁶ AMIDE Project Description, <http://amide.ip.lu/public/vision.html>

²⁷ AMIDE Project Web site, <http://amide.ip.lu/public/products.html>

TALISMAN

The TALISMAN project has already been mentioned. This project will also end this year. The project has four major aims:²⁸

TALISMAN aims to provide European Union service providers with a standard copyright mechanism to protect their digital products against large scale commercial piracy and illegal copying.

With the increasing availability of digitally stored information and the development of new multimedia services, security questions are becoming ever more urgent.

The acceptance of new services depends on whether suitable techniques for the protection of the information providers' interests are available.

One problem that has not found a solution yet is the one of how to realise copyright protection for digitally stored data.

- set-up an end-users driven task force defining a Common Functional Model, addressing the following issues:

legal aspects

rights management organisation and identification of the related roles

definition of different scenarios of products circulation

marketing and economic studies

- specify an open and monitoring framework system having the ability to integrate hierarchical protection system in an evolutive way. (the demonstration will be done on instances of such algorithms developed within the project but the framework should be open to algorithms coming from third parties, in particular proprietary ones)
- propose this evolutive and hierarchical model as a standard to standardisation bodies. (Talisman is currently and presently chairing the Copyright Issues ad-hoc group in DAVIC.)
- demonstrate in close-to-real conditions the relevance of the work. (in other words, a sequence of images will be sent over the network -terrestrial CATV, satellite and ATM networks- and the demonstration that the copyright protection is resistant will be done. This will be addressed through a monitoring system which should be achieved with a good cost efficiency.)

And the results expected are:

- systems for protecting a video sequence (label, watermark)
- a system enabling to prove to a copyright authority
- monitoring devices connected to networks allowing auditing and accounting

As easily can be seen, the focus of the TALISMAN project differs somewhat from, that of the IMPRIMATUR project. The TALISMAN project also offers publications at its web site.²⁹

²⁸ *Talisman Project Description* <http://www.tele.ucl.ac.be/TALISMAN/index.html#2>

FIRM

A different but yet interesting initiative was presented in the Forum on Technology-based Intellectual Property Management, Washington, DC. April, 1997 by Terry Winograd and Martin Röscheisen. FIRM is also an acronym and stands for Framework for Interoperable Rights Management. The objective is to define a service layer on top of existing Internet protocols.

The authors themselves describe their project thus:

FIRM is based on the assumption that the rights management landscape will continue to be heterogeneous, with each of the systems making different design trade-offs to best accommodate the constraints from a specific area of application. FIRM therefore defines a two-level standard, consisting both of a generic specification that defines a domain-independent common rights language object model, and a standard format that allows anyone to contribute media-specific or domain-specific rights definitions.³⁰

The FIRM projects works with contracting solutions and has introduced the very fruitful notion of an e-person:

An epers is a software agent that is the persistent digital representation of (a role of) a person with a structured request interface. When acting online, users are identified by a (possibly opaque) handle to their e-person, allowing any communication partners to get back this structured representation and negotiate access conditions in detail--only in some cases involving the user (e.g. when certain interactions are not covered by the default preferences that a user set up for his or her e-person). One and the same person can have more than one epers. A Unix account can be seen as a current form of a limited version of an e-person.

This idea is a part of a shift in paradigms that can be seen in different projects on altogether different subjects. Instead of thinking of the Internet only as a network, people now tend to think of it as a space (as in cyberspace) or a room. When it comes to the legal aspects this change will most likely mean that judicial questions are centred on the possibility of creating a legal environment in the new digital room – instead of trying to regulate the use of information- and communication technology. Again the difference between the views is subtle but important.

Winograd and Röscheisens project focuses on a special form of digital contracts called "compact". The idea of compact is expressed in the report as well:

Compact (also: smart contract): A compact is the computational object that is the digital representation of an agreement between two or more parties, be it a legal contract or a more light-weight "communication pact" (e.g. one related to privacy). Compacts are "smart contracts" in that they have a structured (FIRM) interface, code that implements behavior, state (e.g. the validity status, the number of times a right was exercised, etc.), and a set of textual descriptions. In other

²⁹ *Talisman Project Description* <http://www.tele.ucl.ac.be/TALISMAN/index.html#2>

³⁰ Röscheisen, Martin and Winograd, Terry, *The FIRM Framework for Interoperable Rights Management* <http://mjosa.stanford.edu/~roscheis/IMA/index.html>

words, compacts represent a mixture of informal textual descriptions and implementation code (where the fact that both have the same semantics is the responsibility of the designer of the underlying compact form). Compacts are effectively a network-centric form of an authorization monitor. They authorize actions, enforce prerequisites ("student status required"), and provide a way to live up to obligations (e.g. initiate a payment transfer when fulfilling an obligation). In other words, the piece of text by which we generally know legal contracts is just the result of one of the many methods that can be called on compact objects - but there are also others, including negotiation methods (e.g. 'terminate'), structural messages ('get me the set of promise objects'), and, last but not least, authorization interactions ('exercise this right').

The most interesting part of Winograds and Röscheisens project is that it tries to establish a rights management layer that will be able to operate together with several different CMS's. The idea seems to be to build the Rights Management Layer into the very fabric of the Internet. In this way the approach is clearly different from that of traditional CMS's that try to build open systems within the framework of existing networks.

Some commercial products

IBM's CRYPTOLOPE and InfoMarket

IBM bought a licence from Xerox Parc to use their new rights management language DPRL. A service and a product was shortly established: the CRYPTOLOPE product, where the content sent to customers was wrapped in a digital envelope and the InfoMarket, where different CRYPTOLOPE protected works could be bought.

The CRYPTOLOPE technology sounded very promising:

IBM's CRYPTOLOPE containers are a fundamental element of the IBM InfoMarket service. The CRYPTOLOPE technology provides a secure container for distribution of digital content and enables a payment mechanism through which content providers can receive payment for those works which are distributed online.³¹

This was in May 1996. The introduction of the system was by no means shy:

"A major inhibitor to the expansion of information commerce, as well as the availability of quality and quantity of online content, has been the lack of good rights management," said Jeff Crigler, vice president, IBM InfoMarket. "By executing on our plan, we will be able to provide greater control over the use of content, thus encouraging content providers to make higher quality content available on the Internet."³²

³¹ *IBM and Xerox Intend to Join Forces for Intellectual Property Protection on the Internet* (May 1, 1996)
<http://www.ibm.com/News/iworld/501xer.html>

³² *IBM and Xerox Intend to Join Forces for Intellectual Property Protection on the Internet* (May 1, 1996)
<http://www.ibm.com/News/iworld/501xer.html>

Today IBM has discontinued the InfoMarket and sold all technology and software to KnowledgeLink Interactive Inc who continue the InfoMarket but with a lower profile.³³

InterTrusts DIGIBOX

InterTrust Inc is one of the companies that conform to the aforementioned shift from CMS to E-commerce with content. Their system is now presented as a whole sale E-commerce solution:

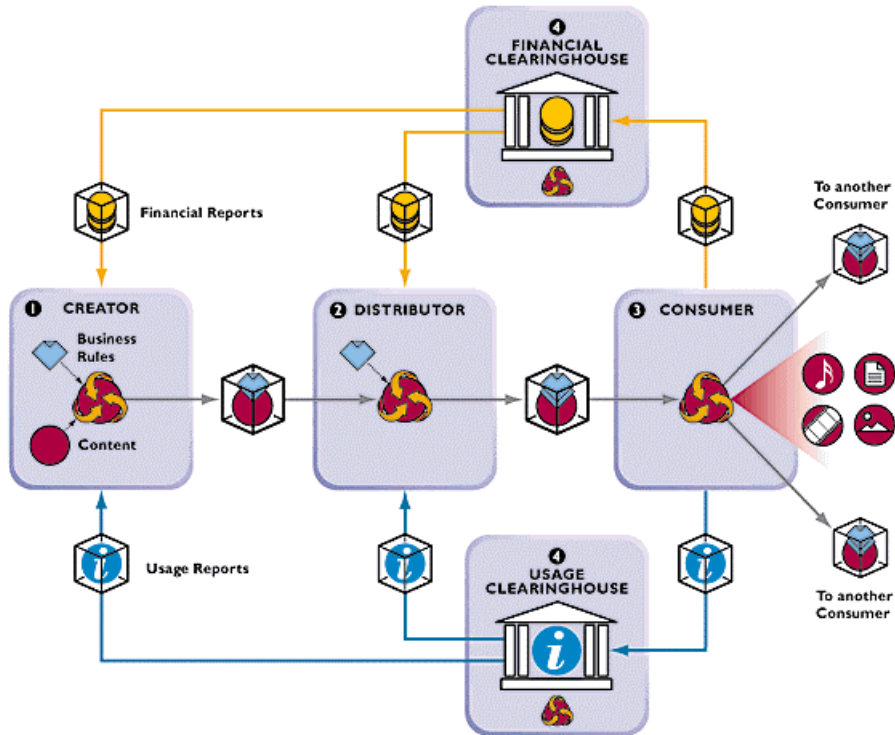
InterTrust Technologies Corporation has invented the first general purpose platform for secure electronic commerce and digital trust management, and is delivering this platform to partners as a unique set of middleware and tools. The InterTrust Commerce Platform enables anyone to securely govern electronic relationships and interactions and ensure rights management such as payment, distributed usage measurement and reporting, persistency, superdistribution, and legal compliance. For the first time, digital value chains can be formed and relied upon to serve all parties' interests. InterTrust technology operates on any type of media and in any environment including the Internet, corporate intranets, disk-based media, and broadcast environments.³⁴

Intertrust speaks of digital trust management. It is becoming more and more obvious that trust is an intrinsic part of any system, and in a sense this is exactly what a CMS is doing. But if trust was enough no CMS would be needed.

The system that Intertrust presents consists of four different parts: InterRights Point™(manages use), DigiBox™ Container (locks the content), eService™ Infrastructure (the infrastructure)and InterTrustworthy™Applications (certification programme).The commerce model is not unlike those found within general CMS's – the same idea of rights clearance and financing clearance is found as in many other sketches and business models.

³³ *Knowledge Link Homepage*, <http://www.infoMarket.k-link.com/>

³⁴ *InterTrust Website, Technology section*, <http://www.intertrust.com/technology/index.html>



It should be noted that Intertrust claims that their system provides a solution for the interesting problem of superdistribution. Superdistribution is, somewhat simplified, when consumers sell to other consumers.

The concept of superdistribution has interested the designers of CMS. A thorough description of the concept can be found in *Superdistribution: The Concept and the Architecture*, by Ryoichi Mori.³⁵ More about this later.

IP2:s Copysight

IP2, or Intellectual Protocols 2, also offer a kind of web based CMS. On their web site it is described as a three-part programme:

Copysight is a multi-platform service designed to allow our customers to assert and safeguard their intellectual property rights against Internet pirates.

Copysight offers three distinct services:

- 1.COPYSIGHT REGISTRATION;
- 2.COPYSIGHT PROTECTION; and

³⁵ *Superdistribution: The Concept and the Architecture*, Ryoichi Mori,
<http://www.virtualschool.edu/mon/ElectronicProperty/MoriSuperdist.html>

3. COPYSIGHT DETECTION,

which you can acquire individually or in combination depending on your individual needs.

The idea of CopySight is to create an environment in which you can register, encrypt and protect, and also trace your material (much in the same way as Digimarc traces material).

One very cunning part of this scheme is that when the user registers for copyright protection, he or she gives the web addresses of the pages they want to protect. This then makes it possible for the IP-system to perform step no. three at the same time: checking the users pages for any unauthorised material (imprinted with the IP-system's mark).

The system offers no new angles and is – as far as I can judge – not unique.

LEGAL ISSUES

A number of legal issues arise in conjunction with the construction of these systems. Some of the more important shall be briefly touched upon below. Once again completeness is neither promised nor claimed. The problems are however typical and crucial to some aspects of the building of Copyright Management Systems.

Watermarking

Two questions come to mind when studying the watermarking issue. One is what happens if different technologies come into conflict with each other.

Sample problem

Say that we find two copies of one and the same picture imprinted with two different watermarks from two different companies. The watermarks both give identical dates for creation, but different authors. How should the conflict be resolved?

One way of solving this problem is to say that the conflicting watermarks cancel each other out, and that circumstantial evidence will have to be introduced into the case to support the claims of the different authors/creators.

Another way would be to certify certain technologies as 'extra safe'. This would then give the rights to the person who could show a certified watermark in his or her picture. Since this would require laws and a fair amount of administration I tend to lean to alternative number one. The issue is however not clear.

The second problem with watermarking is the bots/agents used to detect unauthorised use of material. Digimarc's bots are rumoured to ignore so-called bot exclusion files (files that signal

that the owner of a site does not wish bots of any kind to enter and examine the pages of the site). Are the bots legal?

Sample problem

I have a large web site and suddenly see from my log files that a Digimarc bot has been crawling over my pages and files and taking valuable processor time. My site is a heavily visited commerce site and any extra sort of work lessens its ability to serve my customers. I have bot exclusion files on my computer that for example the AltaVista bot respects. Can I sue Digimarc for the income I lose?

The problem here, some say, is one of computer intrusion. Can it be argued that if I have a public site I have to accept that bots and agents invade it all the time? Or can I argue that my purpose with the site in no way is to accommodate different CMS's and their bots? One way of reasoning here would be to say that Digimarc *makes* money by searching through my site for unauthorised content. This means that they earn money whereas I *lose* money when my server cannot handle customers because it is busy answering requests from bots. This is not reasonable and clearly I should be able to refuse Digimarc access to my site. Once again the issue is by no means a clear one and it cannot be ignored.

To what extent should Copyright Management Systems be allowed to scan the web for illegal content? What if this slows usual traffic? Is the gain in level of protection worth the loss of bandwidth? It can of course be argued that bandwidth will not be a problem in the future, but the question still is serious.

Digital signatures

When it comes to digital signatures the problem is similar. First we have to question whether or not a digital signature should be deemed equal to a written one (and work is being done in the EU to assure this). The second question is if we should create a presumption of identity.

Sample problem

A CD record store has been sent an order for three records signed with my digital signature. The record store sends them, but when they come home to me a claim never to have sent the order. Now: who should prove what? Is it up to me to show that I did not order them or is it up to the company to show that I ordered them?

The idea in some states in the US has been to create a presumption that states that I have to prove that I did not sign an order if it is signed with my digital signature. The advantage of this way of reasoning is that it creates an easier situation for the company, and makes it more willing to sell via the Internet. The opposite idea is less popular, but in the Danish draft for a new law on digital signatures, no rule of presumption has been introduced. The argument put forward for this is that it is a matter for the courts to decide in the every separate case, and that a rule would only harm the free evaluation of evidence.

Privacy

The largest and perhaps most ignored problem when it comes to CMS is privacy. Consider the following:

Sample problem

A CMS supplies books and charges for number of words read. To be able to do this the CMS logs your reading very carefully. Books, titles and reading hours are put into the log file. Someone who happens to know your employer works at the CMS and sees that you've been reading a lot of books on how to apply for a job, and how to deal with stupid managers and reports this to your manager. Is this legal?

The simple answer in the European Union seems to be "no". The Data Protection Directive forbids this kind of log file unless it is created after you have consented. And then no information from the log file can be given out to anyone without your prior consent. But the risk of this happening is none the less quite frightening. Imagine someone having access to what books you read, what films you watch and what music you listen to. Obviously this is data that belong within a very personal sphere and registering them is an intrusion of your privacy.

So in each and every CMS, a anonymising feature ought to be built in. This is quite possible and recommendable. Michael Froomkin has treated the problem from an American viewpoint in his essay *Flood Control on the Information Ocean: Living With Anonymity, Digital Cash, and Distributed Databases* where he writes:

Databases erode the citizen's control over her personal information in several ways. Computerised records allow a firm to form a consumer profile based on the a customer's transactions with that company. At a slightly more complex level, firms sell customer lists to each other, which may result in junk mail or increased information to the consumer, depending on one's perspective or good fortune. Meanwhile, in the U.S., social security numbers and driver's license numbers (often the same) have become de facto national ID numbers. The most important part of the emerging database phenomenon, however, arises from the combination of the growth in computer processing power with the likelihood that routine personal data collection will soon become nearly ubiquitous. As the cost of data storage plummets, these trends will make it possible to assemble an individual data profile of extraordinary detail by cross-referencing multiple, extensive, databases.

These profiles have uses in commerce, in law-enforcement; some applications are benign, some less so.³⁶

Privacy from a more specialised viewpoint, concentrating on the question of reading is discussed in Cohen, J. (1996) "The Right to Read Anonymously: A Closer Look at Copyright

³⁶ Froomkin, Michael *Flood Control on the Information Ocean: Living With Anonymity, Digital Cash, and Distributed Databases*, <http://www.law.miami.edu/~froomkin/articles/oceanno.htm>

Management in Cyberspace”, *Connecticut Law Review*, Vol. 28, 981.³⁷ In this article she acidly comments that:

It has become commonplace to say that we have entered the age of information. The words conjure up images of a reader's paradise ~ an era of limitless access to information resources and unlimited interpersonal communication. In truth, however, the new information age is turning out to be as much an age of information *about* readers as an age of information *for* readers.³⁸

This is an acute perception – and the problem cannot be ignored.

³⁷ Cohen, J. (1996) *The Right to Read Anonymously: A Closer Look at Copyright Management in Cyberspace*
<http://paperhost.ssrn.com/papers/9708/9708091.pdf>

³⁸ *ibid*

THE CONSTRUCTION OF COPYRIGHT MANAGEMENT SYSTEMS

Naturally a lot of work has to be put into any project that wishes to define a CMS. The mere *combination* of technologies is a complicated task – since interoperability by no means is a natural component in the evolving technologies. However, what we will concentrate on in this chapter are aspects that could be called "non-technical".

System design is sometimes described in different phases, or in a cycle. The steps included in this cycle and the label of each steps varies with author and trends, but the same basic tasks appear within the cycle. We shall look briefly at one such model and see where legal design matters come into play.

The cycle I've chosen is presented in what is a reference work in the system design area: *System Analysis and Design*, by Kenneth and Julie Kendall. They choose to divide the cycle into the following phases:³⁹

1. Identifying problems, opportunities and objectives
2. Determining information requirements
3. Analysing system needs
4. Designing the recommended system
5. Developing and documenting software
6. Testing and maintaining the system
7. Implementing and evaluating the system

Where should legal design take place in this cycle? Without going into detail I believe that legal design should be a natural part of steps 1 – 4. Instead of the often occurring situation today, where legal *problems* arise at step 7, when system has already been implemented.

How then do we use legal design in the construction of CMS? This question is suprisingly hard to answer.

LEGAL DESIGN

Legal design is an unexplored territory. In principle it seems we have two different options: firstly, we can always make a list of requirements for each system – a list of requirements that

³⁹ Kendall, Kenneth and Julie, *Systems Analysis and Design* (New Jersey 1992), p 7

specifies how the system has to look to fulfil demands formulated in law. This could be called *passive legal design*. Secondly – and this approach I find much more fruitful – we can start to work with legal structures that can support and help the system. An example would be the writing of contractual templates, designing ways of securing evidence of customer behaviour within the system etc. This could be called *active legal design*.

Each system has to have a bit of both – but today we tend to think of law as a problem and a hindrance (in accordance with the view of legal design as *passive legal design*),. instead of using the constructive power of the law.

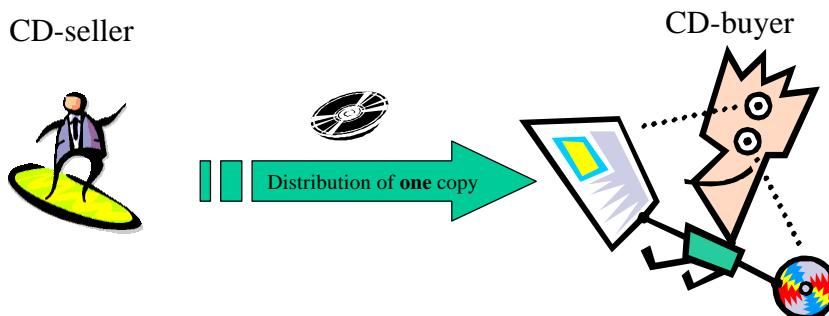
MODELLING OF TRADE

How then can we use legal design techniques when constructing a CMS? The most important part is to realise exactly how trade with intellectual property rights should be **modelled**. This task is of central importance to construct the infrastructure of any CMS. It turns out however that this is no easy task. We shall do some very simple modelling to introduce the idea and illustrate the difficulties.

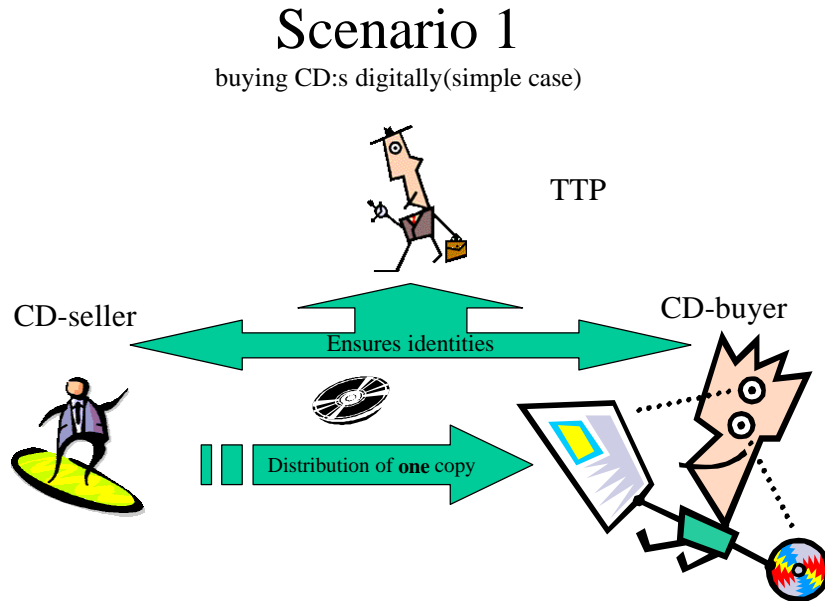
When we trade with intellectual property rights we not only trade with goods. We also trade with the rights of making new copies and selling these as well. We can see two clearly different cases here: in the first case we only sell an instance of the protected property. This is – legally – what happens today when we buy a CD-record in a shop. We buy the record, but not any associated rights. This scenario is very simple to model.

Scenario 1

buying CD:s digitally(simple case)



To this scenario we can easily add a Trusted Third Party to ensure the identities of the parties involved in the transaction.



Can this scenario be iterated? That is, can the CD be sold to a third, and fourth person as well (much as in real life)? Can we sell a CD to others in real life? The CD is a copy of a work, not intellectual property rights. Copies can be sold on (difficulties may arise if the selling constitutes exporting, but we try to keep things simple for now).

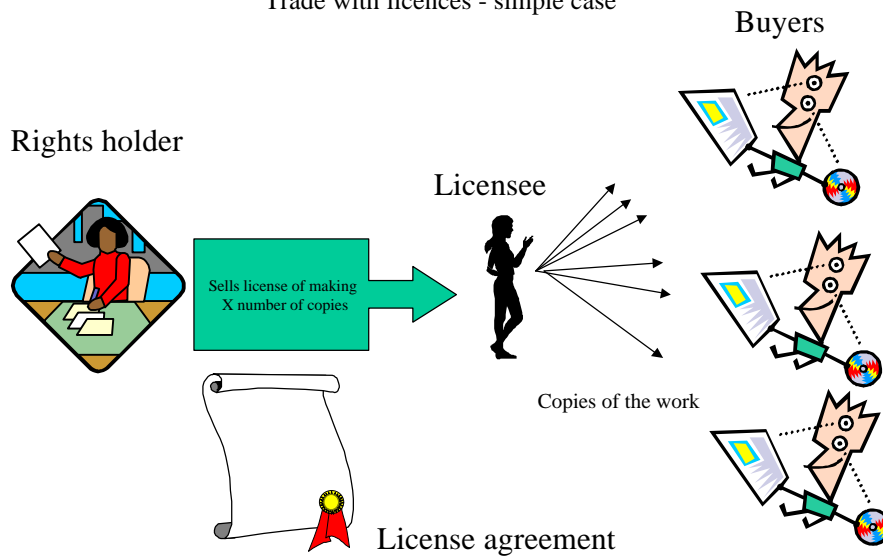
The technical requirements then change: the new technology has to ensure that a copy is erased when sold (we are still thinking in terms of the simplest of transactions, where no *rights* are involved – merely the instance of a right).

Until now no rights holder has been involved in the transactions – since no rights have been traded. What happens if we start selling rights then? If we take our starting position in Swedish law, things suddenly get very complicated. The right of selling rights one has bought is by no means as self-evident as it was in the previous case. To the contrary we find a rule in Article 28 of the Swedish Copyright Act that states that “In the absence of an agreement to the contrary, the person to whom a copyright has been transferred may not alter the work or transfer the copyright”.

We have to create a contract between the parties if we want to create possibilities for reselling the rights bought. Let us complicate the picture even more: say that we want to sell licences that allow the buyer to make x number of copies and sell these. How do we handle this in a digital environment? Study this schematic:

Scenario 2

Trade with licences - simple case



If the licence is exclusive we have no real problem! The case will then closely resemble that of CD-record shop selling to its customers (though the CD shop generally isn't allowed to create its own CDs). The rights to resell the licence will be determined by the licence agreement. From the rights holders view this scenario needs the same technological solutions as the one above, with one addition: the limitation of the number of copies that the licensee can make should preferably be incorporated into the technical architecture.

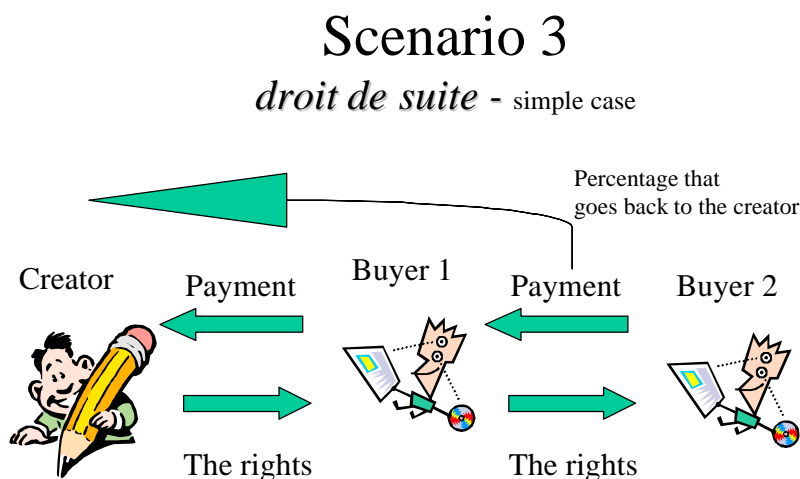
But what if we work with a non-exclusive licence agreement that allows the licensee to sell the right to make copies? The problem is still not very complicated. If we incorporate the limitation of making x number of copies into the technical architecture the situation resembles that of the man selling boxes of chocolate. He can sell boxes and people can eat so many pieces they want and then sell the rest. The chocolate box maker does not need to worry about being paid. He is paid for the same amount of pieces of chocolate no matter who eats them.

So far we have concentrated only on one form of agreement, the licence agreement. What happens if we look at a complete selling of rights, what in judicial terms is called *cessio legis*? The problem a creator faces when selling all rights is one of pricing his intellectual assets correctly. In the case of licence agreements this is not a problem: a large demand for a product is handled by the rights holder by selling more and more licences. This means that the licence holder does not have to calculate the possibility of his property becoming very attractive in the market.

But if a rights holder sells all rights, then it seems as if he has to find a correct price based on guesses of the value his assets could have. This – of course - is not an enviable situation. Predicting the future is hard, to say the least. So what can the rights holder do?

This problem has arisen before. In Swedish law we find a solution based on the principle of *droit de suite* – what could be called “right to the following”. When a commercial actor sells a work of fine arts, the artist who created the work gets a small percentage of the transactions worth *each and every time the work is sold*. This means that if there is an increase in the value of the work, the artist gets a share, no matter when in the chain of selling and buying the increase takes place.⁴⁰

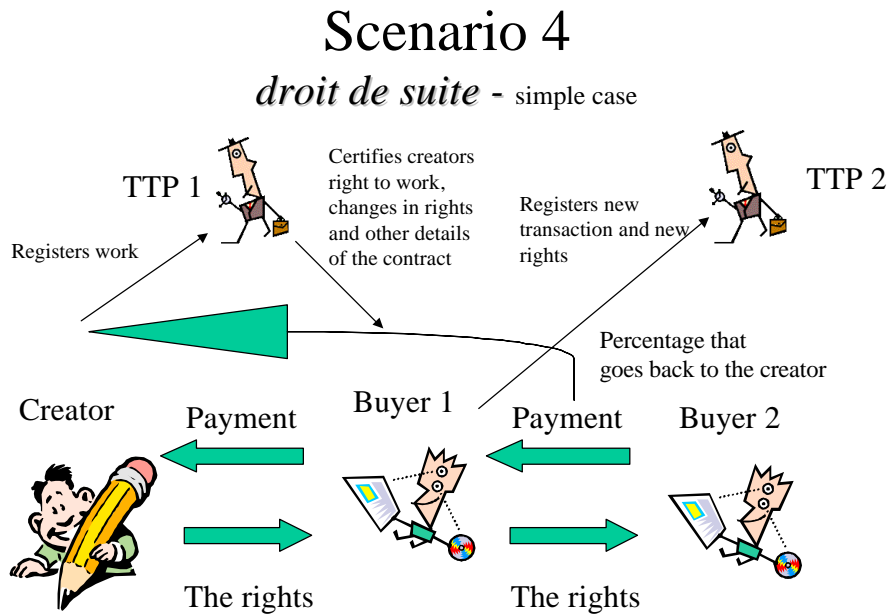
This could provide a solution for implementing what is sometimes called “uncontrolled trade” in digital environments. *Droit de suite* could be extended by contract to hold for all kinds of works and the model could look like this:



In this scenario we are presented with a simple case of uncontrolled trade, where the rights holder does not need to worry about the remuneration. One thing however remains, and that is the management of trust in this environment. It is highly likely that we have to implement trusted third parties for transaction histories (who sold this to what price?), contractual

⁴⁰ The principle is found in the Swedish Copyright Act, Article 26 j) and is applicable only under certain circumstances.

content (How *many* percent should the original rights holder have?) and the identification of the parties involved. So the model is not complete until we add some TTP:s to manage this:



This new scenario also creates an environment where the creator gets his share of the aggregated value of his or her work.

These few examples only serve to show how legal modelling can be performed. The examples are however simple and in a real situation the requirements for the models will be much higher, and the level of detail will also be much higher. The examples only serve to illustrate the method and possibilities that are offered by legal modelling.

Within the IMPRIMATUR – project much has been done to model the market for intellectual property. There is also an interesting draft available from Telia Infomedia.⁴¹

Digital Property Rights Language DPRL

Dr Mark Stefik of the Xerox Parc Palo Alto Research Center constructed another form of legal modelling. DPRL – Digital Property Rights Languages – is a way of specifying how a certain digital piece of content can be utilised. The idea is to create 'trusted systems'. Dr Stefik writes in the *Scientific American* 03/97:

⁴¹ Hiselius, Patrick och Philipsson, David *Internet Business Model* (Draft), that was partly presented at the IT-commissions hearing on ethics, 25/5 1998

The key to this technological shift is the development of what computer scientists know as trusted systems: hardware and software that can be relied on to follow certain rules. Those rules, called usage rights, specify the cost and a series of terms and conditions under which a digital work can be used. A trusted computer, for instance, would refuse to make unauthorised copies or to play audio or video selections for a user who has not paid for them⁴²

This way of thinking – ‘the answer to the machine is in the machine’ – has already been introduced. But the innovative part of Dr Stefiks work lies in the fact that he has created a language to manage these rights. Technically this would allow creators to assign rights to any digital file, regardless of format or content.⁴³

The DPRL initiative was licenced to IBM, and used in IBM’s CRYPTOLOPE technology (c.f. above) and DPRL is now being developed to be Java compatible.⁴⁴

Other initiatives in this area have shown that it can be profitable to use modal logic to create models.

THE MARKET STRUCTURE TODAY...

It is of course important to study the existing market structures – what kind of contracts are used today, is licensing or selling the usual forms of trading – when doing legal design work for a CMS. Available sources are the different societies dealing with rights management today. In Sweden that would for example involve STIM, BUS; SFF and several other actors. The reason for studying these contracts is obvious: if we hope to accomplish some sort of development we must act from existing conditions. However, there is a substantial risk that the CMS change the market structure to such an extent that the existing markets will change radically. The collecting societies – as these organisations are sometimes called – often act at a national level, which could make them very weak in a highly internationalised market.

...AND TOMORROW

There is a possibility that the societies managing rights today will disappear. However this possibility is often overrated. Some people tend to believe that intermediaries will disappear once new digital environments are introduced. It is however obvious that this is not the

⁴²Stefik, Mark “Trusted Systems”, *Scientific American* no 3 1997, <http://www.sciam.com/0397issue/0397stefik.html>

⁴³Kidman, Angus *DPRL Points Way to Document Copyright Control*, http://apcmag/news/241e_1d2.htm

⁴⁴ *ibid*

case.⁴⁵What generally tends to happen is that the role of the intermediaries change. Often towards a more broker oriented position.

The collecting societies most likely will remain in the market, but their focus will be upon brokering information instead of merely clearing rights and collecting fees – since this part of their work will be highly automated.

In summary: The future markets have to be taken into account when modelling for a new CMS, but of course this is coupled with great difficulties. We have to see that the market changes are unpredictable and often *smaller* than we think, it would seem.

⁴⁵ See for example the report *9804 Electronic Finance (Lars Jönsson, Peter Laveson)* from Swedish Office of Science and Technology.

NEW QUESTIONS AND POSSIBILITIES

In this chapter we will study some of the new possibilities and associated questions that arise from the digitalisation of trade with intellectual property.

SUPERDISTRIBUTION

The possibility of Superdistribution has already been mentioned. We shall look at the concept such as Mori presents it, the object example used by Mori is computer programs⁴⁶:

Superdistribution is an approach to distributing software in which software is made available freely and without restriction but is protected from modifications and modes of usage not authorised by its vendor. By eliminating the need of software vendors to protect their products against piracy through copy protection and similar measures, superdistribution promotes unrestricted distribution of software. The superdistribution architecture we have developed provides three principal functions: administrative arrangements for collecting accounting information on software usage and fees for software usage; an accounting process that records and accumulates usage charges, payments, and the allocation of usage charges among different software vendors; and a defense mechanism, utilizing digitally protected modules, that protects the system against interference with its proper operation. Superdistribution software is distributed over public channels in encrypted form. In order to participate in superdistribution a computer must be equipped with an S-box -- a digitally protected module containing microprocessors, RAM, ROM, and a real-time clock. The S-box preserves secret information such as a deciphering key and manages the proprietary aspects of the superdistribution system. A Software Usage Monitor insures the integrity of the system and keeps track of accounting information. The S box can be realized as a digitally protected module in the form of a three dimensional integrated circuit.

It can be easily seen that a distribution of this kind would minimize costs for creators and maximise revenues. A very tempting concept. The concept however is laden with legal difficulties that are not all that easy to solve. One simple problem shall be mentioned here:

Sample problem

Assume that a large company sells some programs or pictures to a consumer, Mr Adams. Mr Adams then sells the product on to Mr Bean. Mr Bean finds that the product in some way is faulty. He now sues Mr Adams. Can he do that and can Adams sue the large company? If the large company had operated within traditional markets it would have had sold the product to Mr Bean itself(the company would perhaps have been recommended by Mr Adams), and Mr Bean would be protected by consumer laws, but now it seems as if the purchase was made between equals. The result is that Mr Bean in the new market structure loses his privileged position as consumer. Is this reasonable?

The new idea of superdistribution clearly dissolves boundaries between consumers and businesses. How this is handled is one major issue the new structure forces us to confront.

⁴⁶ *Superdistribution: The Concept and the Architecture*, Ryoichi Mori,

<http://www.virtualschool.edu/mon/ElectronicProperty/MoriSuperdist.html>

PROFILES

Another intriguing possibility created by the new technologies is the ability to map consumer behaviour into certain patterns and from the basis of these patterns recommend the consumer services or goods that they most probably would benefit from.

We have discussed this issue earlier with regard to privacy – but there is more to be said about profiling. On one hand it would probably be a great service to customers to make them aware of new products that they would have missed if they had not had their profiles made. On the other hand it seems like a major intrusion of the individuals privacy to map his or her consumer behaviour.

What happens with the role of the consumer in a situation where the businesses know so much about the consumers' habits and patterns of behaviour? This has to be thoroughly examined. It seems clear however that the making of profiles is not allowed if the business (in Europe this is!) has the *informed* consent of the consumer.

CONTRACTS

The role of contracts change in the new environment. The classical paper based contract served as a proof of obligations. In the new environments it is possible both to lessen and strengthen the importance of contracts.

Sample problem

If I log into a commercial site it often happens that I have to agree to the conditions that are presented in a scroll down box. This is sometimes referred to as a 'point-and-click' contract. (Similar constructions appear within shareware). Often the content of the contract is not even present in a scroll down box, but in the form of a link to the contract. What value does such a contract have?

Well initially we have to state that in most cases even verbal agreements are binding, so the contract is not automatically null and void because it is presented in this way. However there arises a series of problems. The most important is how we **secure the content** of the contract. If the contract is a web page the user could download it and change the paragraphs and then present his version, or the business could change conditions as they wish. This is not a good situation. The solution to this problem most likely lies in the hands of a Trusted Third Party. So when signing a contract we should deposit it with a TTP. This would make it possible to check the content of the contract later.

Another problem is the sloppy character of the 'point-and-click' contracts. In a business to consumer situation it is not unlikely that Swedish courts would find it unreasonable to hold too harsh an agreement against a consumer if it had only been agreed upon in this simple and make

shift way. This of course means that the business is in a weak position if it chooses to use these kinds of contracts. How then can they change this?

One possible solution is using multimedia contracts. A multimedia contract is a contract where the content of the contract is explained in video and sound, and where the business has the opportunity to ask the user if he or she understands the conditions on which they shop, buy something et c.

The business could also divide the consumers into groups with different kinds of economical freedom. If I want to shop for one hundred SKr I only have to utilise a point-and-click contract. If I want to shop for one thousand SKr I have to sit through a video explaining the conditions and the articles of the contract. If I yet again want to shop for one hundred thousand SKr I have to answer a series of questions on details of the contract, sit through the video and submit a recording of my voice saying that I agree to the terms specified.

What would the legal consequences of this be? The effect would be that the business had secured an impressive amount of evidence on what the consumer must have realised. The law does not specify different levels for different deals – on the contrary you can buy a house by making a small sign at an auction – but the evidence situation would be greatly enhanced for the business if they choose to use multimedia contracts.

AGENTS

Agents – small more or less intelligent programs – have an important role to play in a future of information overload. We create agents to sift through the vast material collected on the Internet and have them choose for us the material that is most relevant. But we can also assign tasks to them and let them negotiate deals for us. What legal issues arise in a world full of intermediaries?

Sample Problem

Say that I program an agent to negotiate a deal for me, buying a CD – record. It negotiates the deal and to my surprise it negotiates it with a hundred persons. Am I responsible for this malfunction? Does it matter if it was a malfunction or erroneous programming on my part?

In classical contractual law there is something that we can call "good faith". If there is a mistake I am not bound by it if the receiver of my message should have realised or realised that it was a mistake., If I for example only usually buy one CD-record and suddenly seem to want to buy a hundred records from the *same buyer.*, he ought to realise that something has gone awry. But if the agent negotiates with a hundred persons there is no reason for each separate seller to realise this! I could thus easily be bound by a mistake. If it is a malfunction I should

be able to negotiate myself out of the dilemma (if I can show this!), but if I programmed the agent sloppily I might very well have to stand for my actions. Agent based technology requires that we give some thought to the matter of writing contracts that make it possible for us to withdraw from deals that have been negotiated erroneously. Or perhaps we should always have to sign contracts manually, after the agent has found different alternatives.

In any case, agent based technology will require a lot of legal thinking and modelling.⁴⁷

⁴⁷ The Swedish IT –commission studies the problem, and there is an essay concentrating on a limited set of issues:
Sapherstein, Michael B, *Intelligent Agenst and Copyright Internet technology Outpaces the Law...Again*,
http://infoeagle.bv.edu/bc_org/avp/law/

SCOPE OF RIGHTS

This report would not be complete if it did not touch upon the subject of the scope of intellectual property rights. In copyright law today we find different exclusions and exemptions from copyright. Libraries have privileged positions and people are often allowed to make copies for personal use.

What, then, is the scope of intellectual property rights? In the new digital environment it is possible to control use to a very high extent, and in more detail than ever before. New opportunities of making money by using pay-per-view or micropayments that add up to substantial sums, present themselves. Is it reasonable to assume that copyright should guarantee *total* remuneration?

It can be argued that in the analogue world there was an intrasystematic impossibility of creating all kinds of use, and that the purpose of copyright law was to ensure that the creator got a *satisfactory* remuneration.

What is called 'fair use' seems to be in danger. Francis G DePeiza discusses the issue in his essay *The Frontiers of Fair Use in a Copyright Management World*.⁴⁸

Digital transfer of information is a new development with unique copyright problems. The current Copyright Act is in some ways inadequate for the protection of information transferred via the Internet. Congress should consider a bill that will adequately maintain the balance written into the copyright act but which will provide adequate protection for those with legitimate property concerns in this new industry. Whether by amendment or by a new segment of law, the interests of innocent users are at stake and need to be addressed. Alternatively, copyright management systems could be monitored to ensure that the copyright owner is not impermissibly restricting the access of innocent users.

The question has been studied within the IMPRIMATUR project and the debate is still hot. The libraries see their positions being weakened by the new technological means of protection.⁴⁹

Some groups assert that "Information wants to be free" – and say that the digital environment will mean the death of copyright. Clearly this is not the case. Instead it seems as if too strict copyright laws will strangle the information flow. The balance between ensuring the free flow

⁴⁸ DePeiza, Francis G, *The Frontiers of Fair Use in a Copyright Management World*, <http://www.law.miami.edu/~fd1883/paper.html>

⁴⁹ See Cornish, Graham P, *Electronic Ccopyright Managment Systems: Dream, Nightmare or Reality*, <http://www.ifla.org/ifla/IV/ifla62/62-corg.htm>

of information needed to realise the needs of information society, and creating mechanisms that incite creators to spread their material digitally, is not an easy one.

The Electronic Frontier Foundation is an organisation devoted to the free speech movement and several articles can be found that claim that intellectual property protection should be weakened:⁵⁰

Everywhere we turn, there are stern warnings that the new ease of making electronic copies will destroy incentives for the creation of new works -- and, therefore, that the network will destroy culture as we know it unless strong new measures are taken to enforce copyright and patent laws. Let me try to make the contrary case: the case that intellectual property law is creating serious problems and that we need to find ways to weaken our current protections dramatically for intellectual property, at least insofar as these protections apply to short electronic works in the form of text exchanged over the networks.

Either way we should always keep in mind that if the CMS we want to build is too complicated it will not further information flow and consequentially be ineffective.

⁵⁰. Johnson, David R *Rewarding Authorship in Cyberspace Is Intellectual Property the Answer or the Problem?*, http://www.eff.org/pub/Publications/David_Johnson/reward_online_authors_johnson.article

COMMENTS

This report has tried to show how Copyright Management Systems have arisen as an answer to the challenge posed by the new digital environments. We have briefly discussed new technologies and associated legal problems. A large part of the report has been involved with the concept of "legal design" to create an awareness of the method as such and the intricacies associated with it. Different scenarios for commerce, with or without licences have been adumbrated.

We have also outlined a partial history of projects dealing with Copyright Management Systems and given a few commercial examples of the idea of Copyright Management Systems.

The notion of a multimedia contract has been introduced as well as deposition with Trusted Third Parties of terms and conditions of a contract.

In summary this report has outlined the vast and complicated area of Copyright Management and given a few examples of different cases. From the list of sources the interested reader will be able to find several other examples and yet more reports in this area.⁵¹ We have probably only seen the start of a new era, not the death of copyright.

Indeed, we can say, the answer to the machine is found in the machine. But who will operate the machine? And what will the machine look like? How will it work?

These questions will be answered by future markets and research.

⁵¹ *Open Information Interchange Guide to Intellectual Property Rights*, <http://www2.echo.lu/oii/en/iprguide.html> was updated and reintroduced under the final stage of writing this report. It is very informative and recommended.

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