Lesson Proper for Week 7

The Nature of Intellectual Property

According to the United Nations' World Intellectual Property Organization (WIPO), intellectual property is defined as: 'the rights to, among other things, the results of intellectual activity in the industrial, scientific, literary or artistic fields'. Intellectual property takes the form of intellectual objects', such as original musical compositions, poems, novels, inventions, and product formulas. Intellectual objects are non-exclusive because many people can use them simultaneously and their use by some does not preclude their use by others. Furthermore, although the initial development of intellectual property objects may be time-consuming and costly, the cost and effort associated with the reproduction of intellectual objects is usually marginal. These non-exclusive and reproducible features of intellectual objects have made the issue of ownership rights especially problematic and all the more difficult to define. Protecting intellectual property from unauthorized copying, defining who the creators are and who are owners (as two distinct parties), deciding how their interests should be protected legally, and balancing these interests with those of the public, are contentious issues.

But what has been the impact of computing technology on intellectual property? Certainly computing technologies, and the Internet specially, have made the copying and distribution of intellectual objects much easier, but they have also raised a number of new legal and ethical issues about intellectual property rights in general.

Computing technology and intellectual property

Computer technologies have made high-quality copying and high-quantity distribution of intellectual property extremely easy and cheap. Some of these technologies are as follows:

· Storage of all sorts of information (text, sound, and graphics) in standard digitized formats

· High-volume, relatively inexpensive digital storage media, such as hard disks, CD-ROMs, and DVDs (digital versatile discs, also called digital video discs)

· Character scanners and image scanners, which simplify converting printed text, photos, and artwork to digitized electronic form

· Compression formats, such as MP3, that make music and movie files small enough to download, copy, and store

· The ease of copying digitized material and the fact that each copy is a 'perfect' copy

· The ease of distributing digitized material over computer networks

· The World Wide Web, which makes it easy to find and download material

· Peer-to-peer technology, which permits easy transfer and exchange of files among large numbers of people over the Internet, without any centralized system or service.

In response to these new challenges to intellectual property protection, the entertainment and software industries have implemented a number of technical measures to protect their interests. These fall under the general heading of digital rights management technologies which attempt to prevent or deter unauthorized copying and distribution of films, music, software and other products. Many of these technologies attempt to use encryption, with varying degrees of success, to prevent copying of DVDs and CDs. For example, music and films are released in 'protected' formats that can only be played on particular hardware, or will not play on older or incompatible machines. These measures have included attempts to create copy-protected CDs, using 'digital watermarks' that prevent unauthorized copying of audio files. They have also included content scrambling systems which prevent DVDs from being copied or viewed on any other hardware than DVD players.

In 2001, Microsoft irritated customers with its 'activation' feature which required users installing Windows XP to undergo an intrusive registration process in order to prevent the operating system being installed on other machines. Future software in Microsoft operating systems will automatically detect 'unauthorized' media files and check their copyright status. Many of these measures have failed, partly because of consumer resistance, and because software has quickly been produced that has 'cracked' these anti-copying protections.

Digital rights management has also involved a move away from a 'sale' paradigm where an intellectual product, once sold, is the property of the owner to do with as they wish, to a 'licensing' paradigm, where the user enters into a licensing agreement with the owner of the copyright. In this paradigm, a licensing contract places restrictions on uses, such as time limits. Some critics of this trend have argued that it is a restrictive tool that prevents fair uses of intellectual property, for example in educational institutions and libraries.

Intellectual Property Legislation

The relevant legislation governing intellectual property in the UK is the Copyright, Designs and Patents Act, 1988. The US equivalents are the Copyright Act, 1976 and 1980, and Digital Millennium Copyright Act, 1998.

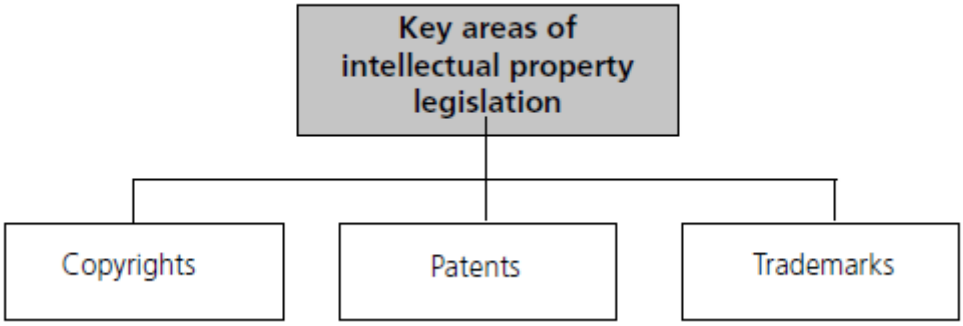

Figure 1: Three Key Areas of Intellectual Legislation

Copyright and Copyright Protection

In principle, copyright can be used to protect literary, musical, dramatic, artistic, architectural, audio or audio-visual works from being reproduced without the permission of the copyright holder. Copyright literally means the right to make and distribute copies to perform or display the work in public, and to produce derivative works, such as translations into other languages.

To be eligible for copyright protection, the work in question must be original; in other words, independently created by its author. The work must also be embodied in some tangible medium of expression. When thinking about intellectual property, an important distinction needs to be made between the idea and the expression of that idea. In most cases, copyright protection is granted to the expression of an idea, but not the idea itself. Thus, a musical sound cannot be copyrighted, unless it is written down as sheet music, or recorded in a specific medium.

Copyright laws do not protect concepts or principles. Copyright is easier to obtain than patents (discussed below) and has a much longer duration, usually lasting for an author's lifetime plus seventy years. In the US the copyright law was revised in 1980 to cover some forms of computer software.

Works protected by copyright law include computer databases and computer programs that exhibit 'authorship'; that is, they contain original expressions of ideas.

The Copyright Licensing Agency (CLA)

The CLA was established in 1982 to protect the rights of copyright holders, by allowing organizations which are likely to need to make copies (such as business, education and the government) to purchase a license to reproduce material from books, journals, periodicals and magazines. (**www.cla.co.uk**)

Federation against Software Theft (FAST)

FAST was the world's first anti-piracy organization, working to protect the intellectual property of software publishers. It was formed in 1984. (**www.fast.org.uk**)

Patents and patent protection

The primary candidates for patent protection are original, useful and non-obvious inventions such as mechanical processes and designs, or compositions of matter such as a new pharmaceutical product. Examples of patented technologies in the computer field include hardware components (e.g. circuits, sound cards and microprocessors) and some forms of software (such as online shopping systems). In principle, patented designs or inventions are legally protected, and cannot be used by other manufacturers without a license, or payment of royalties to the patent owner. A patent is generally awarded for a period of seventeen years and usually after this time the invention will become 'public domain'. Formulas and scientific principles, however, belong in the public domain and cannot be patented.

The UK Patent Act, 1977 requires the following conditions to be satisfied for a patent to be granted for an invention:

- The invention is new
- It involves an inventive step
- It is capable of industrial application.

In addition, the Patent Act 1977 states that anything that consists of the following is *not* an invention for the purposes of the Act:

- A discovery, scientific theory or mathematical method
- A literary, dramatic, musical or artistic work, or any other aesthetic creation whatsoever
- A scheme, rule or method for performing any mental act, playing a game or doing business, or a program for a computer
- The presentation of information.

In some industries, patents have been the object of much criticism, because they are seen as giving a virtual monopoly on a product or invention, enabling the producer to benefit from that monopoly by charging high licensing fees. There has also been a prolonged legal debate over whether software programs, and the algorithms that they incorporate, should be eligible for patent protection.

Trademarks and Trademark Protection

Another type of legal protection for intellectual property objects are trademarks. These are words, phrases, or symbols, which uniquely identify a product or a service. Examples include logos such as the famous bitten apple image crafted by Apple Computer, or the Microsoft Windows logo. To qualify as a trademark, the mark or name

must be truly distinctive and, strictly speaking, the names should always be accompanied by the official trademark symbol, such as Microsoft Windows™. A trademark is acquired when someone is either the first to use the mark publicly or registers it with the Patent Office.

Trademarks are generally violated in one of two ways:

· **Infringement** occurs when someone else uses the trademark in connection with the sale of its goods or services.

· **Dilution** is applicable only to famous trademarks that are distinctive, of long duration, and usually known to the public through extensive advertising and publicity. Dilution is the result of either *blurring* or *tarnishment*.

o *Blurring* occurs when the trademark is associated with dissimilar products; we can encounter descriptions such as a 'Rolls Royce product', meaning 'high quality'.

o *Tarnishment* occurs when the mark is portrayed in a negative or compromising way or associated with products or services of questionable value or reputation; Hoover (vacuum cleaners) and Bic (ballpoint pens) are regularly (incorrectly) used generically rather than with reference to each specific manufacturer's products. In the field of computing, Google takes pains to remind users that the word is a registered mark and should not be used generically with the meaning of 'to search the web'.

The Digital Millennium Copyright Act

The Digital Millennium Copyright Act (DMCA) of 1998 was designed to implement the treaties signed in 1996 at the World Intellectual Property Organization's (WIPO) Geneva conference.

Provisions in the DMCA significantly curtail fair use of copyrighted material, and increase the penalties for copyright infringement. For example, the Act makes it illegal for consumers to make copies of any digitally recorded work for any purpose. In addition, the Act:

· Makes it a crime to circumvent anti-piracy measures built into most commercial software

· Outlaws the manufacture, sale or distribution of code-cracking devices to illegally copy software (except for the purposes of encryption research, or to test the security of systems)

· Requires that 'webcasters' pay licensing fees to record companies.

Some of the practical consequences of the Act are that Internet service providers that misuse copyrighted materials, or host websites that do the same, face severe penalties. This means, for example, that a university which knows students are exchanging MP3 files on the campus network – and does nothing to stop them – can be sued. It also means that copyright protection is now extended to music broadcast over the Internet, requiring royalty payments to be made to copyright holders.

The Act has been the focus of some controversy. On the whole, the software and entertainment industries have supported it, for protecting their economic and legal interests. However, librarians, universities and other organizations have opposed the Act's ban on circumvention methods because it criminalizes such actions which can be interpreted as 'fair use' of copyrighted material for research and education. Researchers, in particular, oppose the ban because it hinders open discussion of technologies such as encryption.

The Extent and Nature of Software Piracy

Software piracy refers to the large-scale and organized copying and distribution of counterfeit software. There now exists a vast international trade involving the production, transport and sale of illegal software, along with counterfeit documentation and packaging. Millions of web pages now exist, offering links to, or providing downloads of 'warez', the Internet code word for illegal software; or 'appz' a term for pirated applications. Hacker sites offer serial numbers, access codes and software 'patches' (known as 'cracks'). These bypass or circumvent encryption or other technical protections that the copyright owner may have applied to its products. Virtually every software product now available on the market can be located on one or other of these sites, from games to operating systems and popular desktop applications, many of which appear before their official release.

Illegal software is advertised, posted or made available for downloading on websites, newsgroups, IRC channels, and other bulletin board areas. Some of these sites operate free of charge, while others require a form of barter, a person first has to offer a product for others to take in order to have the right to download products already posted. Many sites fund themselves by providing advertising space to advertisers of pornography. Today, it is the norm for pirate software web pages to be crowded with advertising (usually in the form of pop-up banners) for various forms of pornographic materials.

Illegal software has also become the core business of some auction sites. Items are offered for sale on such sites for a fraction of their legal retail price. When a sale is made, the pirate simply makes a copy of the software, and ships it to the buyer. Some key statistics on the extent of software piracy are as follows:

· In 2000, Microsoft found that 90% of its products offered for sale on auction sites in Europe, the Middle East and Africa were illegal copies

· The Business Software Alliance (www.bsa.org) estimated the value of pirated software worldwide to be between 11 and 13 million dollars per year

· In the United States, pirated software is estimated to be 35% of the total software market, and industry losses are estimated at $2.3 billion per year

· Many European countries have a higher piracy rate than in the US (57% in Germany and 80% in Italy, for example)

· The highest piracy rates are in Asia. It has been estimated, for example, that 99% of the software sold in Vietnam is illegal.

Digital music: from Napster to KaZaA

The late 1990s saw the emergence in the computing market of a new standard for compressing audio signals that had previously been used in the film industry: MP3. This is a file compression format that reduces the size of audio files by a factor of 10 to 12, making it possible to download a song via the Internet in a matter of minutes. By 1999, MP3 players were being manufactured and sold, and hundreds of websites had appeared making thousands of songs available for download in the MP3 format.

By far the most well-known of these was Napster. Napster opened on the Web in 1999 as a service allowing users to copy songs in MP3 files from the hard disks of other users. By late 2000, an average of 98 million MP3 files were available via the service. There were a number of reasons for Napster's popularity (2003). These are indicated in Figure 2 and are summarized below:

- Free music
- The opportunity to download individual songs, without having to buy a whole CD
- The opportunity to sample music and so determine personal appeal
- Access to a huge database of songs, including songs that were not commercially available
- Convenience of online access to music and being able to download and play a song from anywhere without the need to a use physical CD
- Ease of download: users could chat online while downloading music in the background.

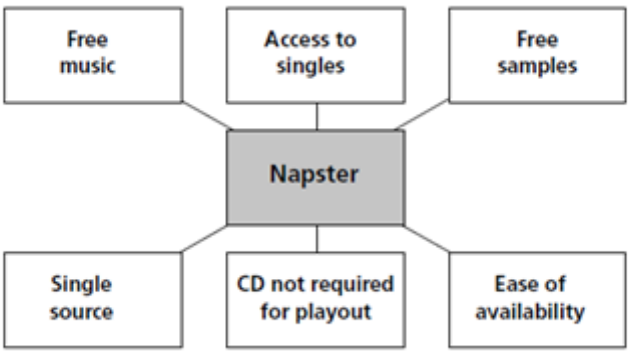

Figure 2: Napster's key features

Needless to say, the record industry was not happy with this state of affairs, and the major record companies, through their trade organization, the Record Industry Association of America (RIAA), issued Napster with a lawsuit. At issue in the legal case was a) whether the copying and distribution of music by Napster users was legal under the 'fair use' guidelines, and b) whether Napster was responsible for the actions of its users.

Many legal observers thought the large-scale copying on Napster was indeed illegal copyright infringement – not fair use – and after a lengthy case that is how the court ruled. On the second issue, Napster argued that it did not keep copies of songs on its computers. It provided lists of available songs and lists of users logged on at any time; users transferred songs from each other's hard disks using peer-to-peer software downloaded from Napster. Napster's defense was that it was not responsible for users of its software who infringed copyrights. The court,

however, ruled that Napster 'knowingly encourages and assists in the infringement of copyrights'. Napster was ordered to remove, from its listings, song titles which infringed copyright. It faced civil suits that would require payments of billions of dollars in damages. After some ineffective attempts to manage its song lists, Napster closed.

However, the death of Napster did not signal the end of free file-sharing on the Internet. Other peer-to-peer networks took Napster's place. One of the most popular peer-to-peer networks was KaZaA. Because of the way KaZaA was designed, with a different implementation of peer-to-peer file sharing, it proved much more difficult to shut down than Napster. Whereas Napster relied upon a central computer to maintain a global index of all files available for sharing, KaZaA distributed the index of available files among a large number of 'supernode' computers. Any computer with a high-speed Internet connection running KaZaA Media Desktop had the potential to become a supernode. The use of multiple supernodes made searching for content slower, but it also made it much more difficult for legal authorities to shut down the file-sharing network, because the creators of KaZaA argued that they were unable to control, and hence should not be held responsible for, the actions of the people who were using KaZaA. KaZaA proved to be highly popular. By mid-2006, nearly 240 million copies of KaZaA Media Desktop had been downloaded, and by the third quarter of 2002 its monthly user base was about 9.4 million.

The RIAA's response was to identify the IP addresses of the most active KaZaA supernodes, leading it to the ISPs of users who had stored large numbers of copyrighted files. It then either sued the ISPs or forced them to identify the names of customers suspected of running these KaZaA supernodes. A new tactic was adopted by the RIAA in September 2003 when it sued 261 individuals for distributing copyrighted music over the Internet. A month later the RIAA sent letters to 204 people who had downloaded at least 1,000 music files, giving them an opportunity to settle before being taken to court.

◄ Preliminary Activity for Week 7

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COURSE OF ACTION: Whoever has maliciously uploaded these concerned materials are hereby given an ultimatum to take it down within 24-hours. Beyond the 24-hour grace period, our Legal Department shall initiate the proceedings in coordination with the National Bureau of Investigation for IP Address tracking, account owner identification, and filing of cases for prosecution.

Activities

Assignments
Forums
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