Information Technology and Society

Topic 4: Intellectual property

1. Purpose and limitations of intellectual property
2. Intellectual-property issues raised by IT
3. Problems: software copying, file sharing
4. Technical counter measures
5. Legal counter measures

1. Purpose and limitations of intellectual property

U.S. Constitution

- "The congress shall have the Power to … promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries…" (Art. I, Sec. 8)
- First U.S. copyright law, 1790, protected works for fourteen years

What is special about intellectual artifacts

Intellectual artifacts

- persist over time, rather than dissipate
- can be used by an unlimited number of persons at a time
- are built to a greater degree on the previous work of others

Types of intellectual property rights

- Copyright
- Patent
- Trademark
- Trade secret
- Common features:
  - Valuable
  - Creative
  - Intangible
  - Easily copied

Purpose of intellectual property

- Public benefits (not a "natural" right)
- To encourage innovation by rewarding it
- Limited monopolies for creators
- Lockean labor theory of property: possession of rights comes from labor invested
- Hegelian personality theory: our intellectual creations are part of us

Limitations on intellectual property

- *Fair use:* copying for purposes of criticism, comment, news reporting, teaching, scholarship, research
- Time limitation
- Not all information is eligible
- Want a public domain as well (like the natural environment), as common intellectual property

Exclusive rights by copyright

- Copyright protects *expression* not *ideas*
- Making copies
- Distributing copies
- Performing works
- Displaying works
- Producing *derivative works*

Copyright expiration and limitations

- Work enters *public domain* after a legislated period
- Congress has *extended* the period more than twelve times, from 14 years (1790) to current period of 75 years
- Not copyrightable: facts, ideas, processes, modes of operation

Fair use

- Recognized by 1976 law
- Criticism, comment, news reporting, teaching, scholarship, research
- *Factors:*
  - Purpose of use (commercial or not)
  - Nature of work (use of fiction less likely to be fair use)
  - Size of material copied
  - Effect on market value
- Sony case, 1984: copy of video for viewing later is fair use

2. Intellectual-property issues raised by IT

- Intellectual property is considered by some the main IT issue of the time
- Homologization of all information: bits, demographic data, gene maps
- Hence "the medium is not the message; the medium is *irrelevant*"
- As Microsoft owns code in PCs; patents exist for some genes of humans
- Intellectual property rights have been expanded in copyright and then patent form

Technical factors

- Before printing, intellectual property was not an issue because it was almost as hard to copy a book as to write one
- Before IT, only publishers could publish
- With IT, copying is easier (speed, accuracy, storage capacity, connectivity)
- Medium is a decreasing part of cost
- Production costs may be recovered by access control, technical assistance, advertising
- Malleability enables derivative works

Example: Copying software for friends

Is it morally justifiable to copy copyrighted software for one's friend?

- Is the law just or unjust?
- Do ethics let us make exceptions for our friends and ourselves?
- What about software makes this case different from stealing microchips?

Note: Morality is *public* and requires *impartiality* (B. Gert)

Considerations in software copying

- What if the friend uses the software only once?
- … to test the software for possible purchase?
- Is this case like speed limits?
- Is the cost of unauthorized copying factored into the price of software?

Electronic publishing and intellectual property

- Electronic publishing reduces costs and risk of publication
- "Access to an overwhelming number of elements of daily life is now controlled by intellectual property law." (S. Warwick)
- "Copyright in the United States is becoming more a tool for securing property interests than a mode of encouraging new works." (Warwick)

Issues raised by 1996 White Paper on intellectual property

- Issued by Clinton administration, not adopted
- *Purpose:* Consider level of protection of intellectual property needed in cyberspace
- *Case:* software distribution by MIT student
- *Repackaging database information:* ProCD CDROM
- *Reverse engineering:* studying design of a system for which one is developing software
- *Copying in transmission:* copy of email attachment stays on mail server

3. Problems: software copying, file sharing

Software patents

- Patents protect inventions and devices, give inventor monopoly for a time period
- Invention may not be obvious or in wide use
- Is software an invention or a writing?
- Supreme Court, 1981: software is not patentable because abstract; later, patents were issued with Federal court approval
- *Example:* Amazon.com obtained a patent on one-click shopping, IBM on online catalogs

Software copyright

- Recognized by Congress, 1976
- Reverse engineering of video-game machine software for research purposes (to produce games) is fair use
- Lawsuits debated “look and feel” of applications

File sharing

- MP3 file format enables 10x compression
- Napster service opened, 1999, to enable sharing of MP3 files among users using central lists of users and files
- One survey found 75% of college students sampled used Napster more than once a month
- Gnutella and other services used a decentralized listing concept

Response to file sharing by industry and courts

- Music industry obtained injunction against Napster users
- 18 record companies sued Napster to stop listing copyrighted songs without permission, winning in court
- Supreme Court okayed lawsuits against Gnutella-based decentralized system as encouraging infringement

Peer-to-peer file sharing

- P2P is distinguished from communications with central server
- Napster software enabled P2P exchange of files listed in a directory on a central server
- Courts shut down Napster for enabling copyright violations
- KaZaA: true P2P application
- After courts refused to shut down similar Grokster and Morpheus sites, RIAA sued 261 users, Fall 03

4. Technical counter measures

Industry enforcement efforts

- CD recorders delayed long past technical introduction, 1988
- Industry delayed introduction of DVD players by threatening suits
- Recording Industry Association of America sued to stop shipping of an MP3 player; lost
- Industry pushed for laws to require copy-protection be built into playing devices

Controlling use of devices

- *Digital Rights Management* (DRM) allows restricted use, e.g., the Ipod system
- *Secure Digital Music Initiative* (SDMI) enabled industry copy protection by digital watermarking
- *Digital Millennium Copyright Act* (DMCA, 1998) enables lawsuits against devices that circumvent copy protection, even if no infringement occurs
- DMCA was used to threaten suit causing cancellation of presentation of research about flaws in SDMI

Content scrambling

- Content Scramble System (CSS) enabled DVD producers to limit playing of disks to CSS-equipped players
- DeCSS software, produced by a young person in Norway, enabled unscrambling on Linux machines, allowing viewing of legally purchased DVDs
- Film industry sued to prevent free distribution of DeCSS, obtaining injunctions against posting code or linking to code; upheld on appeal

5. Legal counter measures

- Sonny Bono Term Extension Act, 1998: increased term of copyright by 20 years to life-of-author plus 70 years
- No Electronic Theft (NET) act, 1997: Criminalized circumvention of copyright protection, even for fair use
- Before NET, copyright had been a civil-law issue

Criminalization of copyright infringement

- 1982, Congress made high-volume copying of music and video a felony
- 1992, copying for private gain became a 5-year felony
- 1997, No Electronic Theft Act following D. LaMacchia software-distribution case without private gain
- Digital Millennium Copyright Act criminalized circumvention of copy-protection systemss
- 2005, recording film in a theater became a felony

Safe harbor and takedown notices

- DMCA permits copyright owners to demand takedown of unauthorized web-site postings without penalty to hosts (safe harbor)
- Competitors of sites often submit such takedown notices
- Many takedown notices seem to be invalid (e.g., fair use), so takedown may have chilling effect on valid posting

References

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