Intellectual Property Rights and Computer Technology

- What, exactly, is Intellectual Property?

- How have intellectual property laws been challenged by the introduction of cybertechnology and digital information?

- Before examining these questions, we consider some reasons for why property laws (in general) are important?

Why Property Laws are Important

- Property Laws play a key role in shaping a society and in preserving its order by establishing relationships between:

  - individuals,

  - different sorts of objects,

  - the state.

What Is (Tangible) Property?

- When discussing property, we tend to think of *tangible* items.
- Originally, "property" referred to land.
- Property now also includes objects that one can own, such as:
  - an automobile,
  - articles of clothing,
  - a DVD collection.

Why Protect Intellectual Property?

- One answer is: Our current laws say that intellectual property should be protected.
- But we can ask: On what philosophical grounds are our property laws themselves based?
- In Anglo-American law, philosophical justification for intellectual property rights is grounded in two different types of views:
  1) natural rights,
  2) conventional (or constructed) rights.

Protecting Intellectual Property (continued)

- One theory holds that a property right is a "natural right," to which individuals are justified for the products that result from their labor, including intellectual objects.

- The other theory views property rights as a social construct designed to encourage creators and inventors to bring forth their artistic works and inventions into the marketplace.

Software as Intellectual Property

- Should computer programs be eligible for patent protection?
- Should they be protected by copyright law?
- Do they deserve both, or perhaps neither, kind of protection?
- Computer software consist of lines of programming code (or codified thought).
- It is not expressed or "fixed" in a tangible medium in a way that literary works are.

Software as Intellectual Property (Continued)

- A program's *source code* consists of symbols.
- Its *object code* is made up of "executable images" that run on the computer's hardware after they have been converted from the original source code.
- Initially, it was not clear that software programs should be given copyright protection.
- Some argued that computer programs are more like inventions that can be patented.

Software as Intellectual Property (continued)

- Software programs also resemble algorithms, which, like mathematical ideas or "mental steps," are not eligible for patent protection.

- Initially, computer programs were not eligible for either copyright or patent protection.

- Eventually, however, *both* copyright and patent protections were granted to software programs.

The Case for Protecting Software as a form of Intellectual Property

- The software industry has made the following kind of argument for why software should be protected with intellectual property rights.
- PREMISE 1. Stealing a tangible object is morally wrong.
- PREMISE 2. Making an unauthorized copy of proprietary software is identical to stealing a tangible object.
- CONCLUSION. Making unauthorized copies of proprietary software is morally wrong.

Intellectual Property Protection Schemes

- We examines four schemes for protecting intellectual property:

1) *Copyrights*;
2) *Patents*;
3) *Trademarks*;
4) *Trade secrets*.

Copyright Protection

- Copyright law in the Anglo-American world was enacted in response to concerns about certain uses of printing-press technology.

- Two different kinds of concerns arose in response to the widespread publishing of pamphlets made possible by the printing press:

a) the British monarchy wanted to control the spread of "subversive" and "heretical" works being printed; and

b) authors wanted to protect their creative works from being reproduced without their permission.

What Does Copyright Law Protect?

- A copyright is a legal form of protection given to a "person" or author.

- The author can be an entity such as organization or a corporation, such as Microsoft, as well as an individual.

- A copyright protection is given for the expression of an idea such as a book, poem, musical composition, photograph, dance movement, motion pictures, audiovisual works, or computer software.

Copyright Protection (Continued)

- For a work to be protected under copyright law, it must satisfy three conditions in that it needs to be:

1) original;

2) non-functional;

3) fixed in a tangible medium.

Copyright Protection (Continued)

- Copyright holders have the exclusive right to:
  - make copies of the work;
  - produce derivative works, translations into other languages, movies based on the book, and so forth;
  - distribute copies;
  - perform works in public (musicals, plays. etc.);
  - display works in public (e.g., art works).

The *Fair Use* Provision in Copyright Law

- The principle of *fair use* balances the exclusive controls given to copyright holders against the broader interests of society.

- Fair use means that an author or publisher may make limited use of another person's copyrighted work for purposes such as:

  - criticism,
  - comment,
  - teaching,
  - scholarship,
  - research.

Fair Use (Continued)

- The fair-use principle has also supported the practice of "reverse engineering."

- Reverse engineering is very important in the computer industry in particular, and in engineering in general, because it allows someone to buy a product for the purpose of taking it apart to see how it works.

The *First-Sale* Doctrine in Copyright Law

- The first-sale doctrine is another balancing scheme in copyright law.
- It applies once the original work has been sold for the first time, when the original owner loses rights over the work of art.
- Once you purchase a copy of a book, audio tape, painting, etc., you are free to give away, resell, or even destroy the copy of that work.
- It is not clear whether one is permitted to give away digital versions of these works.

SBCTEA: The Extension of Copyright Protection

- SBCTEA has been controversial.
- Review Scenario 8-1 (in the textbook) involving Eric Eldred, who set up a Web site for electronic versions of out-of-print books (in the public domain) that were then very difficult to locate.
- When SBCTEA passed, many books that were about to enter the public domain could not be included on Eldred's site.

DMCA: The Extension of Copyright Protection

- The DMCA has a controversial anti-circumvention clause.

- Review Scenario 8-2 (in the textbook) involving Dimitri Sklyarov, who wrote a program to decrypt the code for an electronic book reader that was developed by Adobe (a US-based software company).

- Adobe feared that with Sklyarov's program, "pirates" could read e-books for free.

- Sklyarov, a Russian citizen, was arrested under the DMCA's anti-circumvention clause, when he attended a conference in the U.S.

The LaMacchia Case

- In 1994, Robert LaMacchia was arrested for operating an electronic bulletin board system (BBS) system (*Cynosure*), on which users could upload/download proprietary software.

- LaMacchia did not charge for this service and did not make any money from the Cynosure BBS; so, did he commit a crime?

- How did the incident involving LaMacchia and Cynosure foreshadow the Napster case?

Patent Protections

- A patent is a form of legal protection given to individuals who create an invention or process.

- Unlike copyrights, patents offer a 20-year exclusive monopoly over an expression or implementation of a protected work.

- Current U.S. patent law is based on the Patent Act of 1952, amended in 1995.

Patents (Continued)

- Patent protection can be applied to inventions and discoveries that include utilitarian or functional devices such as machines, "articles of manufacture," or "compositions of matter."

- Patents are granted to inventions and discoveries that satisfy three conditions:

1) *usefulness,*
2) *novelty,*
3) *non-obviousness.*

Gotshalk vs. Benson

- Benson's algorithm is an important feature of all programs.

- If he had been granted a patent for his algorithm, Benson would have controlled almost every computer in use for 12 years.

- The patent was denied to Benson on the basis of a policy that bars patents for mere mathematical formulas or abstract processes that can be performed by a series of "mental steps" with the aid of pencil and paper.

The *Diamond v. Diehr* Case

- The *Diamond v. Diehr* case is considered a landmark ruling in the dispute over patenting software.

- The outcome of this court case, based on 5-4 decision, resulted in the first patent awarded for a computer program.

- In this instance, the computer program assisted in a process of converting rubber into tires.

- Critics argued that Diehr had only a new computer program, since all of the parts of the machine used in the conversion process consisted of traditional technology except for the computer program.

Diamond v. Diehr (Continued)

- Although the Court ruled in favor of Diehr, the justices, in their decision, continued to affirm the view that computer algorithms themselves are not patentable.

- The Court pointed out that the patent awarded to Diehr was not for the computer program but for the rubber tire transformation process as a whole.

Proliferation of Patents for Computer Software

- Some worry that patent protection has gone too far.
- The U.S. Patent and Trademark Office (PTO) issues about 20,000 new software patents every year.
- Aharonian (2001) notes that between 1993 and 1999, the number of patents issued increased by tenfold.
- Between 1979 and 1999, more than 700,000 patents had been issued for electronics inventions.

Trademarks

- A *trademark* is a word, name phrase, or symbol that identifies a product or service.

- The Lanham Act, also referred to as the Trademark Act of 1946, was passed to provide protection for registered trademarks.

- The Act intends to ensure that the quality associated with a certain logo or symbol used by a business actually represents the quality that consumers expect (e.g., the BMW label).

Trademarks (Continued)

- To qualify for a trademark, the "mark" or name is supposed to be *distinctive*.

- However, Deborah Halbert (1999) notes that a (not so distinctive) trademark for "uh-huh" was granted to Pepsi.

- Also, consider that a major movie theatre in the U.S. has trademarked the expression "Silence is Golden."

Trade Secrets

- A trade secret is defined as

  information used in the operation of a business or other enterprise that is sufficiently valuable and secret to afford an actual or potential economic advantage over others.

- Trade secrets can be used to protect:

- formulas (such as the one used by Coca-Cola);
- blueprints for future projects;
- chemical compounds;
- process of manufacturing.

The Case Against Property Rights for Software

- Not everyone believes that property rights for software are justified.

- Some argue that while property rights for physical objects make sense, intellectual property rights for software does not.

- Richard Stallman has opposed copyright protection for software.

Alternative Frameworks to Property Rights for Software

- Stallman (2004) views software ownership as a form of "hoarding" that disregards the general welfare of society.

- He believes that software should be freely available for humankind rather than restricted by property rights.

- Stallman notes that the development of software in the computer industry has evolved from a spirit of cooperation and sharing to one in which cooperation is virtually forbidden.

Alternative Frameworks (Continued)

- Grodzinsky, Miller, and Wolf (2004) suggest that Stallman's position on why software should be free may have been influenced by the MIT culture of the 1970s, where source code could be freely exchanged.

- Although Stallman advocates for the view that software should be free, he intends "free" to refer to liberty not to price (or "free" as in free speech versus free beer).

Alternative Frameworks (Continued)

- In the late 1970s and early 1980s, the burgeoning computer industry hired many of the best software developers and programmers from academic computing labs.
- Some of those individuals took the software they developed with them, and some of that software eventually became proprietary.
- In response, Stallman began his GNU (Gnu's Not Unix) project in 1984, whose goal was to develop an entire Unix-like operating system that was "open" and freely accessible.

GNU and the Free Software Foundation (FSF)

- FSF was formed in 1985 to support of Stallman's GNU project.
- According to FSF, four "freedoms" are essential for free software, i.e., the *freedom to*:
1. run the program, for any purpose;
2. study how the program works, and adapt it for your needs;
3. redistribute copies so you can help your neighbor;
4. improve the program, and release your improvements to the public so that the whole community benefits.

The Open Source Initiative (OSI)

- OSI shares many of the same goals as FSF, including the ability of a software user to look at, understand, modify and redistribute the source code for that software.

- Like FSF, OSI requires that the source code for "open source software" (OSS) is freely available.

- So, both the OSS and FSF movements are similar with respect to their requirements for source code in the software development process.

- There are also important differences between OSS and FSF.

Alternative Frameworks and the Sharing of Information

- Stallman focuses his arguments specifically on why computer software, not necessarily all information, should be free (although some of his followers subscribe to the view: information wants to be free).

- But Stallman correctly recognizes that information is something that humans desire to *share* with one another.

- We do not need to accept his position on software being free to appreciate the force of Stallman's insight about the broader notion of information.

The "Common Good" Approach

- Stallman's insight about the nature of information dovetails with the "common-good" approach to ethics.

- McFarland (2004, 2005) draws on some principles of virtue ethics and natural law theory in discussing how the "common good" applies to intellectual property issues.

- McFarland does not necessarily accept Stallman's claim that software should be totally free.

"Information Wants to Be Shared" vs. "Information Wants to Be Free"

- Building on the insights of McFarland and others, we argue for the principle: *information wants to be shared*.

- This principle could be used as a starting point to guide policy debates.

- If we presume in favor of this principle, we can have fairer information policies.

Information Wants to Be Shared (Continued)

- De George (2003) notes that original copyright laws (involving print media) were designed to encourage information distribution.

- With recent laws covering digital media, such as the DMCA and SBCTEA, the distribution of electronic information is now being inhibited, despite the fact that this kind of information exchange is easy and inexpensive.

Information Wants t Be Shared (Continued)

- The original computing and Internet environments were governed by an implicit principle of *sharing* information.
- For example, Doug Englebart did not apply for a patent for the mouse that he invented.
- Also, Tim Berners-Lee did not copyright his HTML code that was eventually used as the standard protocol for the Web.

Preserving the Intellectual Commons

- We have framed laws and policies to protect the *physical commons* (i.e., parks, natural resources, etc.).

- The *intellectual commons* (of ideas) is now threatened by strong intellectual property laws.

- Many believe that we urgently need to act now to preserve the intellectual commons.

The Public Domain of Ideas

- The public domain of ideas is shrinking.
- Recall Eric Eldred's Web site of older books, which was forced to shut down.
- Books and information once easily available are now threatened as soon as they are converted into digital form.
- What will the future status of digital books be for interlibrary-loan practices?

Defending the Principle: *Information Wants to Be Shared*

- If we defend the principle that information wants to be shared (but not totally free), then it will be possible to frame reasonable intellectual property policies that both:

  a) encourage the flow of information in digital form;

  b) reward fairly the creators of intellectual objects, including software manufacturers.

- One promising scheme for accomplishing these objectives is the Creative Commons initiative.

The Creative Commons (CC)

- The Creative Commons (CC), a nonprofit organization, was launched by Lawrence Lessig and others in 2001.

- CC aims at providing creative solutions to problems that current copyright laws pose for sharing information.

- CC expands the range of creative work available to others legally to build upon and share.

CC (Continued)

- CC provides a set of licensing options that help artists and authors give others the freedom and creativity to build upon their creativity.

- Lessig (2004) points out that a "creative" scheme for licensing is needed because the current intellectual property rights regime does not make sense in the digital world.

Recent Legislation: PIPA, SOPA, and RWA

- In late 2011, three controversial pieces of legislation threaten the information commons were introduced in the US Congress:

  - PIPA (Protect Intellectual Property Act),
  - SOPA (Stop Online Piracy Act,
  - RWA (Research Work Act

PIPA and SOPA

- PIPA's and SOPA's supporters argued that stronger laws were needed to enforce copyright protection online and to crack down on pirates, especially those operating from Web sites in countries outside the US.

- Critics argued that SOPA and PIPA would grant the U.S. government, as well as some major corporations, broad powers that allow them to shut down Web sites that they merely suspect are involved in copyright infringement.

- Critics also worried that the government and corporations would be able to do this without first having to get a court order and go through the traditional process of having either a trial or court hearing.

RWA

- RWA (Research Works Act), also introduced in Congress in late 2011, focused mainly with scientific and academic research that was accessible online.

- RWA was designed to replace the National Institute of Health (NIH) Public Access Policy, which had mandated that any NIH research funded by U.S. tax payers would be freely available online.

- RWA's critics worried that future online access to important health information would be severely restricted.