Intellectual Property and Open Source Software

[many slides by Glen Newton, currently Carleton U]

Overview

- Copyright and copyleft
- Patents
- Licensing
- Open Source Software

Copyright

- "…*is a legal concept, enacted by most governments, giving the creator of an original work exclusive rights to it, usually for a limited time. Generally, it is "the right to copy", but also gives the copyright holder the right to be credited for the work, to determine who may adapt the work to other forms, who may perform the work, who may financially benefit from it, and other, related rights*." - Wikipedia
- Is applicable to the *expression* of an idea, not the idea itself
- Originally created to be applied to text, like books, articles, etc.

Copyright

- Can be shared
- Transferable / licensable
- Usually inheritable
- Usually authors life +[50|70|n] years
  - after which the work enter the Public Domain
- Ownership issues: *Work for hire*

The McGill student essay case

- Turnitin.com
- Essays are submitted and checked angainst the database of existing essays. Essays submitted are added to the databse
- It is argued this does not meet the “fair use” copyright standards:
  - The company copies the entire paper, not just a portion
  - Students' work is often original, interpretive and creative rather than just a compilation of established facts
  - Turnitin is a commercial enterprise

Copyright: Fair use/Fair dealing

- Some copying allowed, as defined by fair use (U.S.) / fair dealing (Most Commonwealth)
- Depends on country; sometime explicit through legislation, sometimes established through the courts

Canadian Copyright

- Moral Rights
  - attribution
  - right to publish anonymously or through a pseudonym
  - integrity of work ("*alteration, distortion or mutilation*")
  - cannot be assigned (transferred) but can be waived
- Duration: author + 50yrs
- Facts and ideas not copyrightable

Canadian Copyright: Fair Dealing

- Exceptions from copyright for research, private study, criticism, review, or news reporting
- the user must mention the source of the material, along with the name of the author, performer, maker, or broadcaster for the dealing to be fair

Fair dealing – how do we deal with someone else's IP?

- 1. **The Purpose** of the Dealing Is it for research, private study, criticism, review or news reporting?
- 2. **The Character** of the Dealing How were the works dealt with? Was there a single copy or were multiple copies made? Were these copies distributed widely or to a limited group of people? Was the copy destroyed after being used? What is the general practice in the industry?
- 3. **The Amount** of the Dealing How much of the work was used? What was the importance of the infringed work? Quoting trivial amounts may alone sufficiently establish fair dealing as there would not be copyright infringement at all. In some cases even quoting the entire work may be fair dealing. The amount of the work taken must be fair in light of the purpose of the dealing.
- 4. **Alternatives** to the Dealing Was a "non-copyrighted equivalent of the work" available to the user? Was the dealing "reasonably necessary to achieve the ultimate purpose"?
- 5. **The Nature of the Work** Copying from a work that has never been published could be more fair than from a published work "in that its reproduction with acknowledgement could lead to a wider public dissemination of the work - one of the goals of copyright law. If, however, the work in question was confidential, this may tip the scales towards finding that the dealing was unfair."
- 6. **Effect of the Dealing on the Work** Is it likely to affect the market of the original work? "Although the effect of the dealing on the market of the copyright owner is an important factor, it is neither the only factor nor the most important factor that a court must consider in deciding if the dealing is fair."

Intellectual Property and Changing Technology (cont.)

Challenges of New Technology:

- Digital technology and the internet has made copyright infringement easier and cheaper
- New compression technologies have made copying large files (e.g. graphics, video and audio files) feasible
- New tools allow us to modify graphics, video and audio files to make derivative works
- Scanners allow us to change the media of a copyrighted work, converting printed text, photos, and artwork to electronic form

Copyright Law and Significant Cases (cont.)

Significant Cases (cont.):

- Sharing music: the Napster case
- Was the sharing of music via Napster fair use?
- Napster's arguments for fair use
  - The Sony decision allowed for entertainment use to be considered fair use
  - Did not hurt industry sales because users sampled the music on Napster and bought the CD if they liked it

Copyright Law and Significant Cases (cont.)

Significant Cases (cont.):

- Sharing music: the Napster case (cont.)
- RIAA's (Recording Industry Association of America) arguments against fair use
  - "Personal" meant very limited use, not trading with thousands of strangers
  - Songs and music are creative works and users were copying whole songs
  - Claimed Napster severely hurt sales
- Court ruled sharing music via copied MP3 files violated copyright

Copyright Law and Significant Cases (cont.)

Significant Cases (cont.):

- Sharing music: the Napster case (cont.)
- Was Napster responsible for the actions of its users?
- Napster's arguments
  - It was the same as a search engine, which is protected under the DMCA
  - They did not store any of the MP3 files
  - Their technology had substantial legitimate uses

Copyright Law and Significant Cases (cont.)

Significant Cases (cont.):

- Sharing music: the Napster case (cont.)
- RIAA's arguments
  - Companies are required to make an effort to prevent copyright violations and Napster did not take sufficient steps
  - Napster was not a device or new technology and the RIAA was not seeking to ban the technology
- Court ruled Napster liable because they had the right and ability to supervise the system, including copyright infringing activities

P2P and how does it work

- KAzaa, torrents, etc
- Different from client-server architecture
- All nodes in a network are treated the same; no centralized control
- All make some of their resources available to others

Search for contents is done via a distributed hash table

Copyright Law and Significant Cases (cont.)

Significant Cases (cont.):

- File sharing: MGM v. Grokster
- Grokster, Gnutella, Morpheus, Kazaa, and others provided peer-to-peer (P2P) file sharing services
  - The companies did not provide a central service or lists of songs
  - P2P file transfer programs have legitimate uses
- Lower Courts ruled that P2P does have legitimate uses
- Supreme Court ruled that intellectual property owners could sue the companies for encouraging copyright infringement

Copying and Sharing (cont.)

New Business Models and Constructive Solutions:

- Organizations set up to collect and distribute royalty fees (e.g. the Copyright Clearance Center), users don't have to search out individual copyright holders
- Sites such as iTunes and the new Napster provide legal means for obtaining inexpensive music and generate revenue for the industry and artists
- Revenue sharing allows content-sharing sites to allow the posting of content and share their ad revenues with content owners in compensation

Copying and Sharing (cont.)

Digital Rights Management :

- Collection of techniques that control uses of intellectual property in digital formats
- Includes hardware and software schemes using encryption
- The producer of a file has flexibility to specify what a user may do with it
- Apple, Microsoft Sony – and Amazon, Sony, Kobo all use different schemes of DRM

Copying and Sharing (cont.)

New Business Models and Constructive Solutions (cont.):

- The industry imbeds advertising in files that it then posts to the P2P sites, the advertiser gets its message out and the industry gets its fees
- Fan fiction is generally not seen as a threat, the writers are also the customers for the original works

Copying and Sharing (cont.)

Ethical Arguments About Copying:

- Unlike physical property, copying or distributing a song, video, or computer program does not decrease the use or enjoyment by another person
- Copying can decrease the economic value of creative work produced for sale
- The fair use guidelines are useful ethical guidelines
- There are many arguments for and against unauthorized copying

Copying and Sharing (cont.)

International Piracy:

- Some countries do not recognize or protect intellectual property
- Countries that have high piracy rates often do not have a significant software industry
- Many countries that have a high amount of piracy are exporting the pirated copies to countries with strict copyright laws
- Economic sanctions often penalize legitimate businesses, not those they seek to target

Copying and Sharing Discussion Question

- Some have argued that copyright lawsuits have been used to stifle innovation, do you agree? Why or why not?

Copyright Law and Significant Cases
Discussion Question

- What do you think the impact would be on creative industries, such as music, movies and fiction novels, if copyright laws did not protect their intellectual property?

Copyright: Implications for software

- Software code (and binary) is copyrightable
- New implementations are possible, but precautions are needed ("clean-room design")
- Copyright ownership of code (see *work for hire*)

Copyleft

- Copyleft is a form of licensing and can be used to maintain copyright conditions for works such as computer software, documents, music and art [wikipedia]
- Anybody can use the artefact as long as they respect the license and include it
- Important difference with just making it public for anybody to use: prevents potential “uncooperative” people from making it into proprietary software

Is free software a business opportunity?

- Free as in free speech, not free beer
- Many companies work with free software model:
  - Basic functionality if open source and free
  - Business add-ons are not free
  - Training is provided for a fee
  - See e.g. tasktop.com

Patents

- "...*a right granted to anyone who invents or discovers any new and useful process, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof*." - Wikipedia
- Intended to promote innovation through disclosure
- Evaluation: should be novel, non-obvious to expert, etc.

Patents

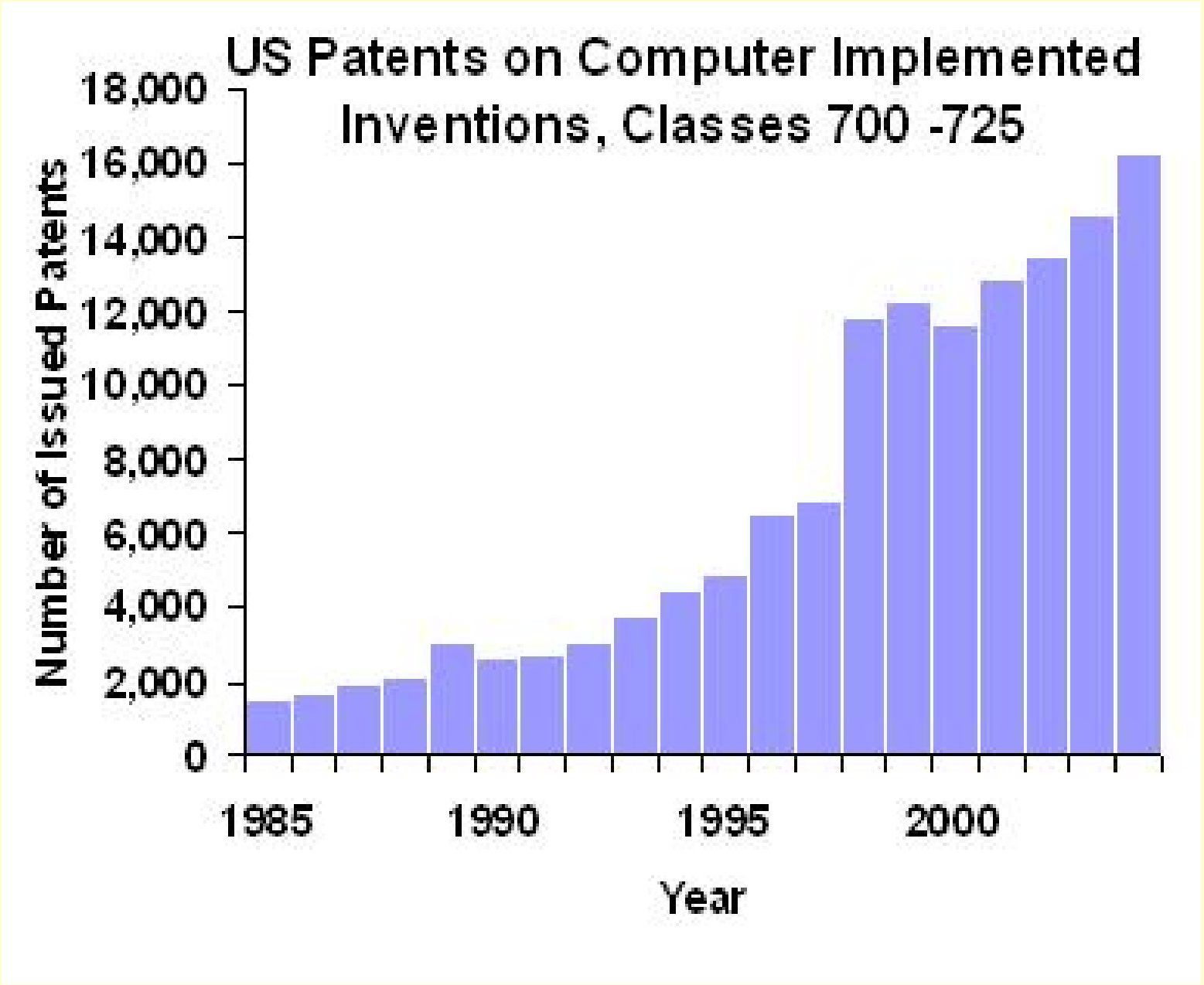
- Negative right: excludes others from producing, using, selling, importing, etc.
- Duration: usually 17-20 years
- Licensable, assignable, transferable
- Nullified by Prior art

What is Patentable?

- Originally physical devices that could be manufactured
- Some countries (U.S. & others) now allow business processes, mathematical processes, algorithms and software, etc.
- European Patent Convention rejects:
  - *(a) discoveries, scientific theories and **mathematical methods**;*
  - *(b) aesthetic creations;*
  - *(c) schemes, rules and methods for performing mental acts, playing games or doing business, and **programs for computers**;*
  - *(d) presentations of information*.

Software Patents

- U.S & others allow software patents
- Minefield for anyone developing software
- Unfortunately, the “novel” and “non-obvious” criteria for evaluation often not well applied
- Problematic: effectively stifles innovation due to the much shorter innovation cycle in software



http://en.wikipedia.org/wiki/Image:Software_patents2.JPG

Software Patents: Example: RIM & NTP

- NTP: patent house
- NTP claimed RIM infringed 8 patents
- RIM claims prior art
- RIM stock plummets
- RIM order by U.S. courts to shut down Blackberry service; DoD intervenes
- Settled for US$600M

Search Engines and Online Libraries

- Search Engines
  - Caching and displaying small excerpts is fair use
  - Creating and displaying thumbnail images is fair use
  - Court ordered Google to remove links to pages that infringe copyright; Google is appealing

Search Engines and Online Libraries

- Books Online
  - Project Guttenberg – public project that digitizes books in the public domain (epub, mobi, etc.). Jurisdictional issues
  - Microsoft scanned millions of public domain books in University of California's library
  - Google has scanned millions of books that are in the public domain and that are not; they display only excerpts from those still copyrighted (google books)
- Some court rulings favor search engines and information access; some favor content producers

Free-Speech Issues

Posting Documents for Criticism:

- Documents that are copyrighted and trade secrets have been posted as a form of criticism
- Organizations have sued to have the documents removed from the Web
- In some cases courts have ruled that it is a copyright violation and the documents must be removed
- In one judgment against the Church of Scientology, the court ruled that the church’s primary motivation was "to stifle criticism of Scientology in general and to harass its critics"

Free Software

- Free software - idea, an ethic, advocated and supported by large, loose-knit group of computer programmers who allow people to copy, use, and modify their software
- Free means freedom of use, not necessarily lack of cost
- Open source - software distributed or made public in source code (readable and modifiable)
- Proprietary software - (commercial) sold in object code (obscure, not modifiable) (E.g.: Microsoft Office)

Free Software

Should All Software Be Free?

- Would there be sufficient incentives to produce the huge quantity of consumer software available now?
- Would the current funding methods for free software be sufficient to support all software development?
- Should software be covered under copyright law?
- Concepts such as copyleft and the GNU Public License provide alternatives to proprietary software within today's current legal framework

Issues for Software Developers

Patents for Software?

- Patents protect inventions of new things or processes
- The US Supreme Court said that software could not be patented; however a machine that included software could
- Patents are not supposed to be given for things that are obvious or are already in common use
- The Patent Office has made mistakes

Issues for Software Developers (cont.)

Patents on Web Technologies:

- Amazon agreed to pay IBM who holds patents for online catalogs and targeted advertising
- Microsoft was fined $1.5 billion for violating MP3 patents. The decision was voided; the case continues.
- Friendster applied for a patent on its social-networking Web techniques. While the patent was pending, sites such as Facebook etc. sprang up. Friendster's patent was granted and it may now charge licensing fees to businesses using the technology.

Licensing

- Allows owner of IP to release some rights to other party
- Patent license: allows other party to use patent usually in exchange for royalties (flat rate or per item produced)
- Copyright license: allows other party to sell, copy etc. copyright holder's work

Free/Libre/Open Source Software

- Licenses that extend rights to users beyond copyright
- Free Software vs. Open Source Software
- Richard Stallman & Free Software Foundation: political

Free Software

- *Four points of software freedom*
  - *The freedom to run the program, for any purpose (freedom 0).*
  - *The freedom to study how the program works, and adapt it to your needs (freedom 1). Access to the source code is a precondition for this.*
  - *The freedom to redistribute copies so you can help your neighbor (freedom 2).*
  - *The freedom to improve the program, and release your improvements to the public, so that the whole community benefits (freedom 3). Access to the source code is a precondition for this.*

http://www.gnu.org/philosophy/free-sw.html

Open Source Software (1)

- *Free Redistribution: the software can be freely given away or sold. (This was intended to encourage sharing and use of the software on a legal basis.)*
- *Source Code: the source code must either be included or freely obtainable. (Without source code, making changes or modifications can be impossible.)*
- *Derived Works: redistribution of modifications must be allowed. (To allow legal sharing and to permit new features or repairs.)*
- *Integrity of The Author's Source Code: licenses may require that modifications are redistributed only as patches.*

Open Source Software (2)

- *No Discrimination Against Persons or Groups: no one can be locked out.*
- *No Discrimination Against Fields of Endeavor: commercial users cannot be excluded.*
- *Distribution of License: The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.*

Open Source Software (3)

- *License Must Not Be Specific to a Product: the program cannot be licensed only as part of a larger distribution.*
- *License Must Not Restrict Other Software: the license cannot insist that any other software it is distributed with must also be open source.*
- *License Must Be Technology-Neutral: no click-wrap licenses or other medium-specific ways of accepting the license must be required.*

http://en.wikipedia.org/wiki/Open_source#The_Open_Source_Definition

FLOSS Licenses

- Free and open-source software (F/OSS, FOSS) or free/libre/open-source software (FLOSS) is software that is liberally licensed to grant the right of users to use, study, change, and improve its design through the availability of its source code.
- Many softwares, with various restrictions
- Most popular: GPL, LGPL, Apache, MIT, Mozilla, BSD

FLOSS & Patents

- Major issue
- Microsoft claims Linux violates 235 of its patents

Ethical Implications of FLOSS

- Use of FLOSS by commercial entities not aware or ignoring license
- Implications on ability to distribute products

Raymond's paper "The Cathedral and the Bazaar"

- An example of "open source" ("bazaar") style of collective software development, opposed to the top-down process-driven corporate style ("cathedral")
- An email client, **`fetchmail`**
- **`linux`**-like style: reuse, abandoned, extended code
- Essential component: a community of ~ 250 eager users, finding bugs and suggesting fixes

Some lessons

- The personal goal of seeing the project done, but don’t be proprietary about the code
- Rewrite/reuse
- Be open to re-doing from scratch
- Treat users as co-developers
- Have frequent releases – maximize the number of people involved in debugging: given enough eyeballs, all bugs are shallow
- Smart data structures + dumb code is better than the other way round
- Keep things simple

- Bazaar style is not appropriate for coding from the ground up
- Need an attractive basic design the user community will believe in
- It takes a coordinator who needs not be a super-programmer, but needs to recognize good designs
- Bazaar coordinator must have good people skills

Questions?