

Intellectual Property (IP)

... after discussing ethical issues in previous section, we now look at legal aspect.
Intellectual property is one of the most topical issues in the computing field ...

Intellectual Property

- Property – the right of ownership
- Physical Property – the right of ownership to something tangible, e.g. land, house, car, book
- Intellectual Property
 - “The rights to, among other things, the results of intellectual activity in the industrial, scientific, literary or artistic fields” – World Intellectual Property Organization (WIPO)
 - intangible creative work

Intellectual Property Objects

- Intellectual property takes the form of “intellectual objects”:
 - original music compositions
 - poems
 - novels
 - inventions
 - product formulas
- Intellectual objects are non-exclusive
 - many people can use them simultaneously, without affecting each others
- Non-exclusive and reproducible features made the issue of ownership rights problematic and difficult to define

Computing Technology and IP

- Computing technologies made copying and distribution of IP extremely easy and cheap:
 - digitised formats (JPG, MP3, PDF)
 - high-volume inexpensive digital storage media (HDD, CD, DVD, flashdrive)
 - scanner technology (ease of copy)
 - compression technology (ease of storage and distribution)
 - can make ‘perfect’ copy (ease of copying)
 - computer network (ease of distribution); www makes it easy to find and download material
 - peer-to-peer technology (ease of distribution)

IP Protection

- Digital Rights Management technologies:
 - encryption, digital watermarks, activation, player-side control (detect unauthorized, hardware restriction)
- Intellectual Property legislation
 - Copyrights
 - Patents
 - Trademarks
- Legislation governing IP:
 - UK: Copyright, Design and Patents Act, 1988
 - US: Copyright Act, 1976 and 1980, and Digital Millennium Copyright Act, 1998

Copyright

- Copyright protect literacy (in literary, scientific, and artistic domain), musical, dramatic, artistic, architectural, audio or audio-visual works
 - computer programs are protected exactly as literary works are protected
 - time limited: usually author's lifetime plus 70 years (50 in Brunei)
- Exclusive right to the owner of copyright to:
 - reproduce it, prepare derivative works based upon it, distribute copies of it to the public, perform the work publicly (if applicable), display the work publicly.
- Copyright protection extends to expression and not to ideas, procedures, or methods of operations
- Copyright is an automatic right which applies when the work is fixed, that is written or recorded in some way
 - condition: original, independently created by its author

Patents

- Patent protect original, useful and non-obvious inventions such as mechanical processes and designs, electronic devices
 - examples in computer field: hardware components, software system (online shopping systems)
 - time limited: 20 years
- Must be applied for. Conditions:
 - the invention is new; it involves an inventive step; it is capable of industrial application
- These cannot be patented:
 - 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

Trademarks

- Trade marks are words, phrases, or symbols that uniquely identify a product or a service - like logos and brand names
- Condition: the mark or name must be truly distinctive and, strictly speaking, the names should always be accompanied by the official trademark symbol TM

Why IP Protection?

- People have a natural right to the things they have removed from the nature through their own labour
- Enables an individual to put their will into something
- Expression of an individual's personality in the world
- Incentive to create and to work
- A producer or creator deserves to be rewarded for their production or creation in return for their effort
- Add value to IP objects; free things are abused

Why not IP Protection?

- An idea can be owned. Most come from someone or somewhere else.
- If all ideas were in the public domain, more new and innovative ideas can be generated
- Artists, academics and scientists frequently create without reward; creation is its own reward
- May exclude others from using and building upon those ideas
- Restrict progress and free exchange of ideas in the scientific or artistic fields

Patent

Patents give exclusive rights

- A patent gives an inventor exclusive rights to an invention.
- In exchange, the inventor must publicly disclose the invention.
- A patent must be applied for by submitting some claims and the detail of the invention.
- The term of a patent is time-limited (20 years).

Patents restrict competitions

- You can't use a patented idea that you independently discover.
- Your work might infringe some pending patents.
- Patent language is very hard to understand, so
 - You can't really be sure if your idea is covered by a patent
 - You can't really share innovations through patents
- It is not guaranteed that the owner may exploit his invention, but he may prevent other people from using it.
- The patent system favors big companies equipped with patent arsenals.

Is software patentable?

- Scientific truth and mathematical expression are not patentable.
 - Thus, programming techniques shouldn't be.
- In the US, software was initially non-patentable.
- In 1981, the court changed position and specified some conditions for patenting software
- In EU and India, freedom fighters managed to fight against patentability of software.

Arguments supporting software patentability

- Promotes investment in R&D
 - Investment wasted in defensive patents
- Can increase the valuation of small companies
 - Can destroy small companies
- Investment should be protected
 - Investment is already protected by copyright. Anyway, investment is discouraged by the risk of patent litigation.
- The distinction between hardware and software is academic.
 - The distinction is real. For software, the material cost is small.

Arguments against software patentability

- Patent search is costly (\$20,000) and uncertain.
 - Get a protection insurance
- Copyright gives sufficient protection.
 - Copyright only protects a particular implementation, not the idea
- Many software patents are trivial
 - Patents can be challenged
- Standards may be patented
 - Most standards organization require patents to be available on a non-discriminatory basis (i.e., uniform fee).
- Legal actions are very expensive and very uncertain.
 - Avoid legal actions by paying royalty.

Patents do not encourage software innovation

- It is a matter of routine to combine a lot of ideas into a program
- It is a matter of routine to “innovate” in programming.
- Most programmers cannot afford legal fees.
- Dubious patents have been granted on:
 - Essential ideas, e.g. double-clicking
 - Obvious ideas, e.g. multitasking.
 - Obvious combinations, e.g. hyperlink and dial-up access.
 - Broad ideas, e.g. media streaming.
 - Standardized format, e.g. using xml to store office document
- Software may infringe on patents not intended for software

Copyright

Fair Use Provision

(for public interest)

- Exception clauses in Copyright laws, which allow for the reproduction and use of copyrighted works, under certain conditions
- To balance the intellectual property interests of authors, publishers and copyright owners with society's need for the free exchange and free flow of ideas
- Four factors to determine whether is fair use:
 - The purpose and nature of the use (criticism, comment, teaching, news reporting, scholarship and research)
 - The nature of copyrighted work
 - The amount and significance of the portion used
 - The effect of the use on the potential market for or value of the copyrighted work

Activity 3

Consider the following scenario:

A lecturer puts some journal articles on reserve in the library and makes them assigned reading for her class. These articles are copyrighted material. Some students in the class complain that they cannot get access to the articles because they always on loan to other students. The professor scans them and posts them on her website. The professor gives the students in the class the password they need to access the articles. What factors need to be considered in deciding whether this constitutes 'fair use' of copyrighted material?

Digital Millennium Copyright Act, 1998

(for owner interest)

- Reduce fair use of copyrighted material, and increase the penalties for copyright infringement
- 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

Software Piracy

(against the Copyright)

- Large-scale and organized copying and distribution of counterfeit software
- Should software be owned?
 - Natural right argument:
 - A person has the right to own the product of his labour
 - But, software is reproducible
 - If somebody copies software, the author is not deprived of it
 - But, opportunity to sell is lost
 - Thus falls the “natural right” argument. The right to sell is not a natural right, but a right within a social economic system.
 - Will the society benefit by giving rights to own software?

Copying software: the case against (in support of copyright)

- Software piracy:
 - Reduce income for personnel in software industry
 - Discourage software development
 - Software declining quality
 - Diminish resources for development
- When copyright is right:
 - Encourage publication, so that the society benefits, copyright is granted to authors.
 - Gives exclusive rights to authors to compensate their effort.
 - Copyright is not permanent.
 - Copyright is a restriction on publishers.
 - Copyright is about giving benefits to the public, not about giving power to the authors.
 - Fair use benefits public: lend books to friends, watch film with friends, etc.

Copying software: the case for (in objection to copyright)

- Software piracy:
 - Software are overpriced
 - Poverty and economic development
 - Global inequities of access to computing technology, and the uneven development of IT industries in different countries
 - Generally don't feel ethically wrong, as compared to stealing
- When copyright is wrong:
 - Revisions to copyright law sacrifices more public freedom.
 - The Digital Millennium Copyright Act (1998) restricts reading and lending of electronic publications and reverse engineering.
 - No reverse engineering means no competition.
 - Copyright is now about restricting the users, rather than restricting the publishers.

Issues on copyright

- Copyright restriction has become draconian
 - The Business Software Alliance invites people to betray coworkers and friends for non-compliance of copyright
 - The Software Publisher's Association threatens ISP to allow them to monitor all users for the file sharing violation.
 - Some schools require students to buy restricted textbooks.
- Copy restriction has become intrusive
 - Sony Extended Copy Protection (XCP) installed a rootkit to interfere with CD copying, which presented a security hole in the system.
 - Use of piracy detection software = privacy intrusion software
 - Restrict even the “owner”, in the case of restricted DVD to backup; in the case of e-books, to read in other computers

Know your rights

- Copyright: granted to producers of artistic works, including software.
- Users do not buy, and consequently own software. They pay for a license to use.
- Some licenses add more restrictions on top of copyright.
- Some licenses grant freedom from copyright restrictions.

Activity 4

Consider the following scenario:

A friend of yours has downloaded a 'cracked' (that is, pirated) version of a moderately expensive image-editing application called PictureShop, and is now circulating copies of the software, free, among his friends and fellow students. You have to convince your friend that what he is doing is unethical.

He uses the following arguments; how would you counter each one?

- I cannot afford to buy the product
- The company is a large, wealthy corporation that can afford the losses
- I wouldn't buy it at the retail price anyway
- Making a copy for a friend is just an act of generosity
- This violation is insignificant compared to the billions of dollars lost to piracy by dishonest resellers making big profits
- Everyone does it. You would be foolish not to.