

School of Engineering

An Introduction to Intellectual Property

Material for this lecture obtained from
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Property Rights

Before looking at intellectual property, let's look at where property rights come from. Herman Tavani (in Ethics and Technology) states that there are three philosophical basis for the concept of property.

Theory **Result**

Labor Property is a natural right that is justified in terms of the labor invested in creating property.

Utilitarian Property is not a natural right, but an artificial right created by the state. Property rights are granted by the state because they result in greater overall benefit to society.

Personality Property is a moral right and is justified because a creative work expresses the personality of its creator.

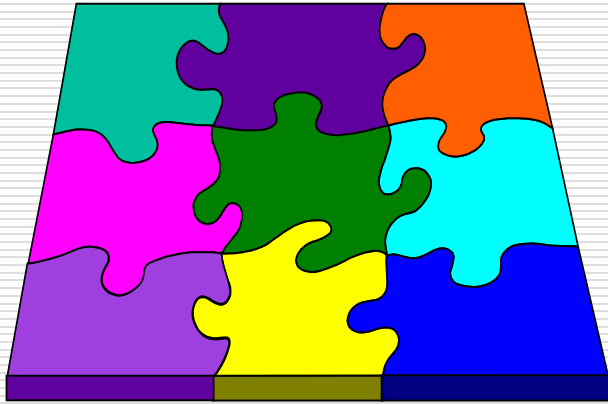
Two types of Property

- ❑ Physical property – land, money, houses, clothes, food.
- ❑ Intellectual property – ideas (expressed as designs, music, art, writing, dance, *software*). Intellectual property is ***intangible***.

Difference between **physical** and **intellectual** property

- ❑ Physical property is expensive to create and to reproduce; for example, houses, automobiles, diamonds.
- ❑ Intellectual property may take a lot of effort to create (e.g., a book) but is easy to reproduce at minimal cost.
- ❑ Historically, societies have attempted to protect intellectual property by giving designers special privileges.

IPRs - Recognition, Protection, Exploitation, Enforcement



- ❑ **IPRs:** Patents*, reg Designs*, unreg Design Right, RegTrade Marks*; Copyrights, moral rights, Chip Topographies,
- ❑ **Quasi IP:** Know How, Trade Secrets, Confidential Information, Reputation/Passing off,

ATTITUDE, COMPETENCE, KNOWLEDGE

Attitude:

- *Ability to:*
 - *appreciate the ethical view; recognise that intellectual property is integral to an engineer's work, that awareness of intellectual property rights is everyone's responsibility*
-

ATTITUDE, COMPETENCE, KNOWLEDGE

☐ **Competence**

☐ *Ability to:*

☐ *implement initial steps to protect; know who to consult for further advice, and when; identify the context in which intellectual property rights are being used or created*

ATTITUDE, COMPETENCE, KNOWLEDGE

Knowledge

- *Ability to:*
 - *understand the legal frameworks governing intellectual property rights and their commercial exploitation; fulfil responsibility of managing an intellectual property portfolio; appreciate the human resource issues and recognise the benefits of learning from history*
-

Types of Intellectual Property

☐ Patent

- Protects inventions

☐ Trademark

- Protects traders: those who sell products

☐ Trade secret

- A trade secret is a critical piece of information that an organization wishes to keep secret

☐ Copyright

- Protects writers and artists

WHO OWNS IP?

- ☐ The inventor/originator ?
 - ☐ Employed or work for hire
 - ☐ Contractual relationships
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- ☐ Students
 - ☐ Collaborative research projects
 - ☐ Contractual relationships again
-

The First Patents

From the UK patent office website

Britain has a very long patent tradition in the world. Its origins can be traced back to the 15th century, when the Crown started making specific grants of privilege to manufacturers and traders. Patents were signified by **Letters Patent**, open letters marked with the King's Great Seal.

The earliest known English patent for invention was granted by Henry VI to Flemish-born John of Utynam in 1449. The patent gave John a 20-year monopoly for a method of making stained glass, required for the windows of Eton College.

Patents

Patents grant an inventor the right to exclude others from producing or using his or her discovery for a limited period of time.

Society grants a patent in return for the inventor revealing (“teaching”) details of the invention.

The invention must satisfy three criteria:

- usefulness
- novelty
- non-obviousness

A patent is granted to someone who can demonstrate that their invention would not be obvious to someone “**ordinarily skilled in the art**” (non-obviousness)

After 20 years, a patent expires and anyone can freely exploit the invention.

After 20 years a patented drug can be made by any manufacturer and becomes known as a generic drug.

PATENTS

- ❑ A patent usually lasts 20 years
 - ❑ Granted on the basis of geographical region
 - ❑ Kept active by paying annual fees
 - ❑ Patent holder can prevent anyone else from using the technology
 - ❑ Doesn't give automatic right to use oneself
-

BENEFITS FROM PATENTS

- ☐ Encourage innovation and inventions
 - ☐ Encourage investment
 - ☐ Encourage openness
 - ☐ Encourage the development of industry
 - ☐ Give the University/Research organisations something to trade
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PATENTABILITY

- ☐ Needs to be novel
 - ☐ Needs to contain an “inventive step”
 - ☐ Needs to be non-obvious to “one practised in the art”
 - ☐ Needs to be capable of industrial application
 - ☐ Must not be “excluded”
 - ☐ For everywhere except the USA, needs to be secret at the time of filing ie “not in the public domain”
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What we do to acquire a patent

- ☐ Make sure there has been no disclosure
 - ☐ Establish novelty – patent/literature search
 - ☐ Establish who owns what – review any contractual or collaborative elements
 - ☐ Produce full specification, drawings, sequences etc, usually with help of patent agent
 - ☐ File at UK Patent Office
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What happens next?

- ❑ After 12 months – add any further information/evidence and file PCT (international application)
 - ❑ At 18 months patent is published
 - ❑ After 30 months – national phase – requires translations and fees
 - ❑ Costs vary from £30k to £100k ???
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Uses of a patent

- ❑ Patent provides owner with means of stopping others – doesn't have intrinsic value
 - ❑ University needs to license the technology
 - ❑ In some cases, IP can be foundation of a spin-out company
 - ❑ Inventors can share in royalties – formula is on the web
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What to do if you invent something

- ☐ Please check with IP Manager or Business Development Manager before disclosing to anyone
 - ☐ Even a departmental seminar can constitute disclosure
 - ☐ If research leading to invention is industry sponsored even more important – contractual obligations
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Trademark

A trademark is a distinctive symbol that traders use to identify their products.

Two of the most famous trademarks in the world are the Coca-Cola and McDonald symbols.

A trademark is very valuable to a manufacturer because it is a shorthand for their products and their assumed reliability and quality.

The nature of a trademark may vary; it may be a symbol, word or picture. Trademarks may even extend to distinctive styles and color in packaging.



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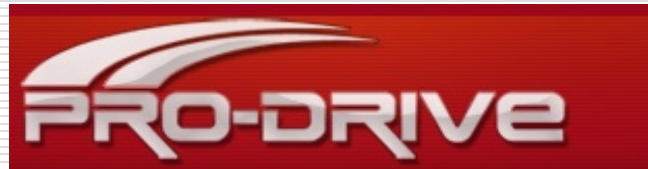
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Trade Secrets

A trade secret is a piece of information that provides an organization with a competitive advantage over other companies; for example, formulae, plans, manufacturing processes.

A good example is the formula for Cola Cola.

A company's projected sales figures may constitute a trade secret because that information is valuable to a competitor.

It is illegal to reveal a trade secret.

Non-disclosure Agreement

A non-disclosure agreement, NDA, is commonly used to protect a trade secret when one of the parties is not part of the company owning the trade secret.

For example, an author may be provided with details about a company's future product because the book will appear at the same time as the product hits the market. The author will be asked to sign an NDA to ensure that details of the product (trade secret) will not be prematurely disclosed.

Copyright

Copyright originally applied to the written word and was designed to protect the copyright owner by giving him or her “the exclusive right to reproduce, distribute, perform, display, or license their work”. Copyright lasts for the lifetime of the owner plus 50 years (70 years in the UK but 50 for sound recordings and broadcasts). Note – the fine details of copyright duration are rather more complex.

Copyright extends to:

Literary works

Computer software

Musical work

Sound recordings

Drama

Motion pictures

Visual works: statues, paintings, graphic works

Choreographic works

Exclusions (not copyrightable):

Non-tangible works

Ideas

Facts

Names, slogans, formulae, equations

Copyright and Digital Technology

- Until the arrival of digital technology in the 1960s and its expansion into the domestic world in the 1990s, most electronic technologies were **analog**. That is, signals could have an infinite number of values within a range.
 - Analog signals are difficult to process faithfully and to store. Successive copying degrades analog signals.
- Digital signals have fixed values and can be copied and stored an infinite number of times with no loss of quality.
- The unauthorized copying of analog signals posed a modest threat to copyright owners because *copies-of-copies-of-copies...* degrade rapidly. The ability to copy digital material perfectly means that a copy is as good as an original.

Copyright and Plagiarism

- ❑ **Copyright** is a system designed to protect those who create original works.
- ❑ **Plagiarism** is the act of passing off the work of others as your own. In the academic world, plagiarism is regarded as the number one sin.
- ❑ You can commit plagiarism without breaking copyright (e.g., copying something that is in the public domain).
- ❑ You can infringe copyright without committing plagiarism (e.g., you can acknowledge the work you copy as belonging to someone else but that does not give you the right to do it).

History of Copyright

1557 Queen Mary I gives control of all printing and bookselling to a single guild, the Stationer's Company.

1662 The Licensing Act establishes a register of licensed books.

1710 The first copyright law grants exclusive rights to **authors**, rather than **publishers**. Rights were limited to 28 years before they passed into the public domain .

1787 the US Constitution states "the Congress shall have 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"

History of Copyright

1886 The Berne Convention provides a scheme to allow the mutual recognition of copyright between nations. This provides a universal law and removed the need for separate registration in every country. The United States became a Berne signatory in 1988.

1928 The Rome Act recognizes the **moral rights** of authors and artists, giving them the right to object to modifications of a work in a way that might prejudice or decrease the artists' reputations.

History of Copyright

1990 The Circulation of Computer Software Act (USA) prohibits commercial lending of computer software by libraries etc.

1996 the **World Intellectual Property Organization** (WIPO) allows the **fair use** of material in a digital environment and provides a balance between the rights of authors and education and research.

1998 The **Digital Millennium Copyright Act** launched in the USA. This implemented the WIPO Internet Treaties and permitted temporary copies of programs during computer maintenance.

Copyright and Fair Use

Copyright protects the creator of an original work by stopping unauthorized duplication.

Society suffers if people are denied access to material that they need for research or education.

Fair use has been defined to allow people to bypass the copyright law under certain circumstances; for example, criticism, comment, news reporting, teaching, scholarship and research.

Whether copying is fair use depends on:

- ❑ the **purpose** of the use – for commercial or nonprofit educational purposes;
- ❑ the **nature** of the copyrighted work;
- ❑ the **amount** of material copied in relation to the work as a whole.

The notion of fair use is poorly defined and individual cases can be challenged in court.

Myths about Copyright

- If it doesn't have a © symbol, it's not copyrighted
- If I give it away, I'm not infringing copyright
- Putting it on the web is fair use
- If I modify someone's article slightly, I'm ok
- I'm really doing them a favor by giving them free advertising

Copyright or wrong?

My friend has a program. Why shouldn't I copy it? It will save me a lot of money and no one will suffer; it's a *victimless* crime.

It is true that no one is worse off following the copying of a program. But the situation is rather more complex.

Cost of Copying

- ❑ A company exists to make a profit for its shareholders.
- ❑ A company invests in the creation of a new product. It is expected that the product will sell and generate more income than it cost to manufacturer.

Cost of Copying

- ❑ If the product is copied (*pirated*) the company may not generate the expected income. Indeed, the company may make a loss and go out of business.
- ❑ The dangers of copying may force a company to drop out of a specific market and society loses by not getting new products that might have been valuable.

Consequence of Copying

- ❑ Companies claim they lose a lot of money because people copy their books, software, music, CDs, DVDs etc.
- ❑ Suppose 100 students copy a piece of sophisticated software costing \$500 per copy. The company will argue that they have lost \$50,000. Such large sums of money make it worthwhile for companies to prosecute copyright violators.
- ❑ Although companies lose less per music CD than per software package, CDs are sold by the million and the lost revenue can be vast. Some companies sue individuals who copy music as a means of frightening others.

Consequence of Copying

- Apart from being unethical and illegal, unauthorized copying can lead to a fine and, more importantly for a professional, a criminal record.
- Peer-to-peer file sharing (Napster) has made it easy to copy software on an immense scale.

“Self-copying” and competition

- ❑ An interesting aspect of copying is demonstrated by **self-copying** where a company copies and freely distributes its own product.
- ❑ Consider Internet Explorer. Microsoft **copies** it and gives it free with Windows (this is called *bundling*).
- ❑ The effect of this self-copying is to make it difficult for competitors to compete with a product that is being given away.
- ❑ Self-copying locks out competitors and stifles innovation.
- ❑ Such practices may be illegal because they break laws designed to prevent anti-competitive practices.

Arguments for not having Copyright/IP

- IP adversely affects the poor, disadvantaged, developing world etc.
 - Not all can afford to access IP that is protected and, therefore, their development or progress is curtailed.
- IP restricts progress and development because the free flow of information is restricted.
- IP is strongly supported by the mass media because they gain most from restricting the flow of information (they have an effective monopoly).

Arguments for not having Copyright/IP

- Laws designed to protect *physical* property should not be extended to *intellectual* property.
 - You can have only one copy of a specific house or car and its owner can suffer from its loss.
 - You can have multiple copies of a painting and the owner does not suffer its loss if someone else looks at the painting.
 - Society gains by the free exchange of idea, artwork, films, books etc.
- Patent law can be used to stifle invention and progress.
 - If an energy-efficient automobile engine were invented, the patent could be bought by gasoline companies to prevent its introduction and consequent effect on their profits.

Arguments for not having Copyright/IP

- Patent law can be used to steal information from traditional societies.
 - Knowledge developed over hundreds of years in developing countries can be patented and the fruits of this knowledge denied the very people who originated it.
- Copyright law can be used to suppress information
 - A government involved in a war was later embarrassed when official documentation was released. This documentation was used in a book revealing the government's complicity. The government claimed copyright on the documents to prevent their publication.
- Patent law can be applied to areas unforeseen by those who wrote the law
 - Genetic patents

Ethics and Professional Organizations

British Computer Society Code of Ethics is clearly incompatible with activities that breach the laws concerning IP.

- ☐ Members shall have due regard to the **legitimate rights of third parties**.
- ☐ Members shall ensure that within their chosen fields they have knowledge and understanding of **relevant legislation**, regulations and standards and that they comply with such requirements.
- ☐ Members shall **uphold the reputation of the Profession** and shall seek to improve professional standard... and shall avoid any action which will adversely affect the good standing of the Profession.
- ☐ Members shall act with integrity towards fellow members and to members of other professions with whom they are concerned in a professional capacity and **shall avoid engaging in any activity which is incompatible with professional status**

Special Rules for Computer Chips

(from the web) The Semiconductor Chip Protection Act 1984 (USA) is an extension of the Copyright Act that creates a hybrid between patent and copyright protection.

The Act was written because copyright protection does not extend to programs embodied in integrated circuits.

Software as Intellectual Property

- ❑ The production and distribution of computer software is a lucrative industry as a glance at Microsoft will reveal.
- ❑ Software, like the printed word, sound, and music, is expensive to create but can be reproduced at minimal cost.
- ❑ Because software can be immensely expensive to create, the ability to create copies of software is a considerable threat to the profitability of software companies.

Software and the Law

- The law concerning software is not clear and is still being formulated.
 - In the USA the Copyright Act was amended in 1980 to include software as a literary work.
- Software has some of the characteristics of literary works and some of the characteristics of engineered systems.
 - Consequently, software can be protected by both copyright and patent. Software can also be protected by trade secret legislation.

Software and the Law

- The very nature of software challenges all previous notions of intellectual property.
 - The source code of software exists in text form and can be thought of as a literary work. However, the value of the software is in its function and not its form
 - The purpose of software is to perform a useful function which makes it more like an invention.
- Because software can be represented as a mathematical algorithm, it is not patentable (algorithms can't be patented).
- The software you “buy” is often obtained under license and you do not own it.

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