Chapter 4
Intellectual Property

Intellectual Property

- Intellectual property is a term used to describe works of the mind – such as art, books, films, formulas, inventions, music, and processes – that are distinct and owned or created by a single person or group
- It is protected through **copyright**, **patent**, and **trade secret** laws
- **Copyright law** protects authored works, such as art, books, film, and music
- **Patent law** protects inventions
- **Trade secret law** helps safeguard information that is critical to an organization's success

Intellectual Property

- Copyright, patent, and trade secret laws together form a complex body of law that addresses the ownership of intellectual property
- Defining and controlling the appropriate level of access to intellectual property are complex tasks
- **Copyright:**
  - Copyright and patent protection laws specify ownership for limited times to Authors and Inventors the exclusive Rights to their respective Writings and Discoveries
  - A copyright is the exclusive right to distribute, display, perform, or reproduce an original work in copies or to prepare derivative works based on the work

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- Authors may grant exclusive right to others
- Copyright infringement is a violation of the rights secured by the owner of a copyright; Infringement occurs when someone copies a substantial and material part of another's copyrighted work without permission
- **Copyright Term:**
  - Copyright law guarantees developers the rights to their works for a certain amount of time
  - The Copyright Term Extension Act, also known as the Sonny Bono Copyright Term Extension Act
    - For works created after January 1, 1978, copyright protection endures for the life of the author plus 70 years

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- For works created but not published or registered before January 1, 1978, the term endures for the life of the author plus 70 years, but in no case expires earlier than December 31, 2004
- For works created before 1978 that are still in their original or renewable term of copyright, the total term was extended to 95 years from the date the copyright was originally secured

– **Eligible Works:**

  - The types of work that can be copyrighted include architecture, art, audiovisual works, choreography, drama, graphics, literature, motion pictures, music, pantomimes, pictures, sculptures, sound recordings, and other intellectual works as described in Title 17 of U.S. Code

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- To be eligible for a copyright, a work must fall within one of the preceding categories, and it must be original
- Copyright law has proven to be extremely flexible in covering new technologies such as software, video games, multimedia works, and web pages
- Evaluating the originality of a work is not always a straightforward process, and disagreements over whether or not a work is original sometimes lead to litigation
- Copyright infringement lawsuits are common in the world of music
- Some works are not eligible for copyright protection, including those that have not been fixed in a tangible form of expression and those that consist entirely of common information that contains no original authorship

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- **Fair Use Doctrine:**
  - Allows portions of copyrighted materials to be used without permission under certain circumstances
  - Maintains balance between protecting an author's rights and enabling public access to copyrighted works
  - Factors to consider when evaluating the use of copyrighted material
    1. The purpose and character of the use (such as commercial use or nonprofit, educational purposes)
    2. The nature of the copyrighted work
    3. The portion of the copyrighted work used in relation to the work as a whole
    4. The effect of the use on the value of the copyrighted work

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- The concept that an idea cannot be copyrighted but the expression of an idea can be key to understanding copyright protection; Also, there is no copyright infringement if two parties independently develop a similar or even identical work

– **Software Copyright Protection:**

- The use of copyrights to protect computer software raises many complicated issues of interpretation; For example, a software manufacturer can observe the operation of a competitor's copyrighted program and then create a program that accomplishes the same result and performs in the same manner
- To prove infringement, the copyright holder must show a striking resemblance between its software and the new software that could be explained only by copying

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- However, if the new software's manufacturer can establish that it developed the program on its own, without any knowledge of the existing program, there is no infringement
- Two software manufacturers could conceivably develop separate but nearly identical programs without infringing the other's copyright
- Registering a copyright for a software program is a simple process; The individual or organization that owns the software must complete a brief application form that requests basic information such as the title of the program, who created the program and when, and who owns the copyright; The copyright holder then just needs to send the application, along with a small fee and a copy of the program, to the Copyright Office

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- **The Prioritizing Resources and Organization for Intellectual Property Act of 2008:**
  - This Act created the position of Intellectual Property Enforcement Coordinator within the Executive Office of the President
  - It also increased trademark and copyright enforcement and substantially increased penalties for infringement
  - One of its programs, called Computer Hacking and Intellectual Property (CHIP), is a network of over 150 experienced and specially trained federal prosecutors who focus on computer and intellectual property crimes
- **General Agreement on Tariffs and Trade (GATT):**
  - A trade agreement among 117 countries
  - This agreement also created the World Trade Organization (WTO)

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- GATT includes a section covering copyrights called the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)
- Despite GATT, however, copyright protection varies greatly from country to country, and an expert should be consulted when considering international usage of any intellectual property

– **The WTO and the WTO TRIPS Agreement (1994):**

- The WTO is a global organization that deals with the rules of international trade based on WTO agreements that are negotiated and signed by representatives of the world's trading nations; It is headquartered in Geneva, Switzerland, and has 164 member nations as of July 2016; The goal of the WTO is to help producers of goods and services, exporters, and importers conduct their business globally

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- WTO developed the Agreement on Trade-Related Aspects of Intellectual Property Rights, also known as the TRIPS Agreement, to establish minimum levels of protection that each government must provide to the intellectual property of all WTO members; This binding agreement requires member governments to ensure that intellectual property rights can be enforced under their laws and that penalties for infringement are tough enough to deter further violations; Covers copyright, patents, and trade secrets

– **The World Intellectual Property Organization Copyright Treaty (1996) :**

- The World Intellectual Property Organization (WIPO), headquartered in Geneva, Switzerland, is an agency of the United Nations established in 1967

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- WIPO has strongly advocated for the interests of intellectual property owners; Its goal is to ensure that intellectual property laws are uniformly administered
- It provides additional copyright protections to address electronic media

– **The Digital Millennium Copyright Act (DMCA) :**

- The DMCA implements the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty
- DMCA criminalizes production and dissemination of technology, devices, or services intended to circumvent measures that control access to copyrighted works
- Also criminalizes the act of circumventing an access control, whether or not there is actual infringement of copyright itself; It also heightens the penalties for copyright infringement on the Internet

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- **Patent:**
  - A patent is a grant of a property right issued by Patent and Trademark Office to an inventor
  - A patent permits its owner to exclude the public from making, using, or selling a protected invention, and it allows for legal action against violators
  - Unlike a copyright, a patent prevents independent creation as well as copying
  - Even if someone else invents the same item independently and with no prior knowledge of the patent holder's invention, the second inventor is excluded from using the patented device without permission of the original patent holder

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- There are **six** types of patents, with the two of main concern to information technology firms being the **utility patent** and the **design patent**
- A **utility patent** is “issued for the invention of a new and useful process, machine, manufacture, or composition of matter, or a new and useful improvement thereof, it generally permits its owner to exclude others from making, using, or selling the invention for a period of up to twenty years from the date of patent application filing, subject to the payment of maintenance fees”
- A **design patent** is issued for a new, original, and ornamental design and permits its owner to exclude others from making, using, or selling the design

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- Design patents issued from applications filed on or after May 13, 2015, are granted for a term of 15 years from the date of grant; Design patents issued from applications filed before May 13, 2015, were granted for a term of 14 years from the date of grant
- To obtain a U.S. patent, an application must be filed with the USPTO (U.S. Patent and Trademark Office) according to strict requirements; As part of the application, the USPTO searches the prior art – the existing body of knowledge available to a person of ordinary skill in the art – starting with patents and published material that have already been issued in the same area; The average time from filing until the application is issued as a patent, rejected, or abandoned by the applicant is around 25 months

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- Whoever invents or discovers any new or useful process, machine, manufacture or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor
- “Novelty” as a necessary condition to grant a patent
- “Nonobviousness” as another mandatory requirement for a patent; To be patentable, an invention must not be obvious to a person having ordinary skill in the field on which the invention is based
- The U.S. Supreme Court has ruled that three classes of items cannot be patented: **abstract ideas**, **laws of nature**, and **natural phenomena**

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- **Patent infringement**, or the violation of the rights secured by the owner of a patent, occurs when someone makes unauthorized use of another's patent
- Unlike with copyright infringement, there is no specified dollar amount limitation on the monetary penalty if patent infringement is found
- The patent holder may grant an exclusive license to one individual company or several companies
- **Leahy-Smith America Invents Act (2011):**
  - If two people file for a patent application on the same invention at approximately the same time, the first person to file with the USPTO will receive the patent, not necessarily the person who actually invented the item first

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- **Software Patients:**
  - A software patent claims as its invention some feature or process embodied in instructions executed by a computer
- **Cross-Licensing Agreements:**
  - Many large software companies have cross-licensing agreements in which each party agrees not to sue the other over patent infringements
  - Major IT firms usually have little interest in cross-licensing with smaller firms; As a result, small businesses must pay an additional cost from which many larger companies are exempt; Furthermore, small businesses are generally unsuccessful in enforcing their patents against larger companies

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- **Trade Secrets:**
  - A trade secret is defined as business information that represents something of economic value, has required effort or cost to develop, has some degree of uniqueness or novelty, is generally unknown to the public, and is kept confidential.
  - Trade secret protection begins by identifying all the information that must be protected – from undisclosed patent applications to market research and business plans – and developing a comprehensive strategy for keeping the information secure.
  - Trade secret law protects only against the misappropriation. If competitors come up with the same idea on their own, it is not misappropriation.

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- Trade secret laws protect more technology worldwide than patent laws do, in large part because of the following key advantages:
  - There are no time limitations on the protection of trade secrets, as there are with patents and copyrights.
  - There is no need to file an application, make disclosures to any person or agency, or disclose a trade secret to outsiders to gain protection. After the USPTO issues a patent, competitors can obtain a detailed description of it. Hence, no filing or application fees are required to protect a trade secret.
  - Although patents can be ruled invalid by the courts, this risk does not exist for trade secrets.

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- **Trade Secret Laws:**
  - Trade secret protection laws vary greatly from country to country.
  - **Uniform Trade Secrets Act:**
    - The Uniform Trade Secrets Act (UTSA) was drafted in the 1970s to bring uniformity to all the United States in the area of trade secret law.
    - The first state to enact the UTSA was Minnesota in 1981, followed by 39 more states and the District of Columbia.
    - Computer hardware and software can qualify for trade secret protection.
  - **The Economic Espionage Act:**
    - The Economic Espionage Act (EEA) of 1996 (18 U.S. Code § 183) imposes penalties of up to $10 million and 15 years in prison for the theft of trade secrets.

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- **Defend Trade Secrets Act of 2016:**
  - The Defend Trade Secrets Act of 2016 (DTSA) (Public Law No.: 114-153) amended the EEA to create a federal civil remedy for trade secret misappropriation.
  - DTSA broadly defines misappropriation to include disclosure or use of a trade secret without consent.
  - The act also allows for seizure of property under certain conditions to prevent dissemination of the misappropriated trade secret.

– **Employee and Trade Secret:**

- Employees are the greatest threat to the loss of company trade secrets – they might accidentally disclose trade secrets or steal them for monetary gain.
- Organizations must educate employees about the importance of maintaining the secrecy.

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- Trade secret information should be labeled clearly as confidential and should not be accessible to everyone.
- Most organizations have strict policies regarding nondisclosure of corporate information.
- Organizations often try to prohibit employees from revealing trade secrets by adding nondisclosure clauses to employment contracts because of risk of losing trade secrets when key employees leave.
- An exit interview is conducted with each departing employee and asked to sign an acknowledgment of responsibility not to divulge any trade secrets.
- Employers can also use noncompete agreements to protect intellectual property from being used by competitors when key employees leave. A noncompete agreement prohibits an employee from working for any competitors for a period of time, often one to two years.

Intellectual Property Issues

- The several issues that apply to intellectual property and information technology are: **plagiarism**, **reverse engineering**, **open source code**, **competitive intelligence**, **trademark infringement**, and **cybersquatting**.
- **Plagiarism:**
  - Plagiarism is the act of stealing someone's ideas or words and passing them off as one's own.
  - The explosion of electronic content and the growth of the web have made it easy to cut and paste paragraphs into term papers and other documents without proper citation or quotation marks.
  - Plagiarism has become an issue from elementary schools to the highest levels of academia.

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- Plagiarism also occurs outside academia. Popular literary authors, playwrights, musicians, journalists, and software developers have been accused of it.
- Despite codes of ethics in place that clearly define plagiarism and prescribe penalties ranging from no credit on a paper to expulsion, many students still do not understand what constitutes plagiarism.
- Some students believe that all electronic content is in the public domain, while other students knowingly commit plagiarism either because they feel pressure to achieve a high GPA or because they are too lazy or pressed for time to do original work.
- Plagiarism detection systems allow to check for matching text in different documents as a means of identifying potential plagiarism.

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Name of service	Website	Provider
iThenticate	www.ithenticate.com	iParadigms
Turnitin	www.turnitin.com	iParadigms
SafeAssign	www.safeassign.com	Blackboard
Glatt Plagiarism Services	www.plagiarism.com	Glatt Plagiarism Services

Table: Plagiarism detection services and softwares

- Some of the actions that schools can take to combat student plagiarism are:
  - Help students understand what constitutes plagiarism and why they need to cite sources properly.
  - Show students how to document web pages and materials from online databases.

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- Schedule major writing assignments so that portions are due over the course of the term, thus reducing the likelihood that students will get into a time crunch and be tempted to plagiarize to meet the deadline.
- Make clear to students that instructors are aware of Internet paper mills.
- Ensure that instructors both educate students about plagiarism detection services and make them aware that they know how to use these services.
- Incorporate detection software and services into a comprehensive antiplagiarism program.

– Plagiarism can also be an issue in the field of software development. Measure of Software Similarity (MOSS) is software used to detect plagiarism among computer programs.

Intellectual Property Issues

- **Reverse Engineering:**
  - Reverse engineering is the process of taking something apart in order to understand it, build a copy of it, or improve it.
  - It was originally applied to computer hardware but is now commonly applied to software as well.
  - Reverse engineering of software involves analyzing it to create a new representation of the system in a different form or at a higher level of abstraction.
  - Often, reverse engineering begins by extracting design-stage details from program code.
  - Microsoft has been accused repeatedly of reverse engineering products.

Intellectual Property Issues

- One frequent use of reverse engineering for software is to modify an application that ran on one vendor's database so that it can run on another's (e.g., from Access to Oracle).
- Using reverse engineering, a developer can use the code of the current database programming language to recover the design of the information system application. Next, code-generation tools can be used to take the design and produce code (forward engineer) in the new database programming language.
- This reverse-engineering and code generating process greatly reduces the time and cost needed to migrate the organization's applications to the new database management system.

Intellectual Property Issues

- When a software manufacturer provides a customer with its software, it usually provides the software in machine-language form. Tools called reverse-engineering compilers, or decompilers, can read the machine language and produce the source code.
- Decompilers and other reverse-engineering techniques can be used to reveal a competitor's program code, which can then be used to develop a new program that either duplicates the original or interfaces with the program.
- Reverse engineering provides a way to gain access to information that another organization may have copyrighted or classified as a trade secret.

Intellectual Property Issues

- The courts have ruled in favor of using reverse engineering to enable interoperability.
- Software license agreements increasingly forbid reverse engineering.
- The ethics of using reverse engineering are debated.
  - Some argue that its use is fair if it enables a company to create software that interoperates with another company's software or hardware and provides a useful function. Reverse engineering can also be a useful tool in detecting software bugs and security holes.
  - Others argue strongly against the use of reverse engineering, saying it can uncover software designs that someone else has developed at great cost and taken care to protect.

Intellectual Property Issues

- **Open Source Code:**
  - Open source code is any program whose source code is made available for use or modification.
  - The basic premise behind open source code is that when many programmers can read, redistribute, and modify a program's code, the software improves.
  - Programs with open source code can be adapted to meet new needs, and bugs can be rapidly identified and fixed.
  - Open source code advocates believe that it produces better software than the traditional closed model.
  - Two frequently cited reasons for using open source software are that it provides a better solution to a specific business problem and that it costs less.

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Open source web browsers	Open source database management systems	Open source accounting applications
Chrome	MySQL	GnuCash
Firefox	PostgreSQL	SQL Ledger
Opera	SQLite	X Tuple PostBooks
Chromium	MongoDB	Compiere
Midori	Cubrid	Turbo Cash
QupZilla	MariaDB	KashFlow

Fig: Commonly used open source software

- Reasons to create open source code, even though people do not receive money for it are:
  - Some people share code to earn respect for solving a common problem in an elegant way.
  - Some people have used open source code that was developed by others and feel the need to pay back by helping other developers.

Intellectual Property Issues

- A firm may be required to develop software as part of an agreement to address a client's problem. If the firm is paid for the employees' time spent to develop the software rather than for the software itself, it may decide to license the code as open source and use it either to promote the firm's expertise or as an incentive to attract other potential clients with a similar problem.
- A firm may develop open source code in the hope of earning software maintenance fees if the end user's needs change in the future.
- A firm may develop useful code but may be reluctant to license and market it, and so might donate the code to the general public.

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- The GNU General Public License (GPL) was a precursor to the open source code defined by the Open Source Initiative (OSI).
- GNU is a computer operating system comprised entirely of free software; its name is a recursive acronym for GNUs Not Unix.
- The GPL is intended to protect GNU software from being made proprietary, and it lists terms and conditions for copying, modifying, and distributing free software.
- The OSI is a nonprofit organization that advocates for open source and certifies open source licenses with certification mark “OSI Certified”.

Intellectual Property Issues

- **Competitive Intelligence:**
  - Competitive intelligence is the process in which a company gathers and analyzes information about its industry, business environment, competitors, and products with the goal of directing their future strategy. For example, the way airlines do to charge prices of their tickets.
  - Competitive intelligence is legally obtained information that is gathered to help a company gain an advantage over its rivals.
  - An effective competitive intelligence program requires the continual gathering, analysis, and evaluation of data with controlled dissemination of useful information to decision makers.

Intellectual Property Issues

- Competitive intelligence is often integrated into a company's strategic plan and executive decision making.
- Competitive intelligence is not the same as ***industrial espionage***, which is the use of illegal means to obtain business information not available to the general public..
- Almost all the data needed for competitive intelligence can be collected from examining published information or interviews.
- By coupling this competitive intelligence data with analytical tools and industry expertise, an experienced analyst can make deductions that lead to significant information.
- The Web is the best competitive intelligence tool in the world.

Intellectual Property Issues

- A wide array of software applications, databases, and social media tools are available for companies – and individuals – looking for competitive intelligence data.
- Over two dozen colleges and universities offer courses or even entire programs in Competitive Intelligence. Also, the Strategic and Competitive Intelligence Professionals organization (www.scip.org) offers ongoing training programs and conferences.
- Without proper management safeguards, the process of gathering competitive intelligence can cross over to industrial espionage and dirty tricks.
- Competitive intelligence analysts must avoid unethical or illegal actions, such as lying, misrepresentation, theft, bribery, or eavesdropping with illegal devices.

Intellectual Property Issues

Question	Yes	No
Has the competitive intelligence organization developed a mission statement, objectives, goals, and a code of ethics?		
Has the company's legal department approved the mission statement, objectives, goals, and code of ethics?		
Do analysts understand the need to abide by their organization's code of ethics and corporate policies?		
Is there a rigorous training and certification process for analysts?		
Do analysts understand all applicable laws—domestic and international—including the Uniform Trade Secrets Act, Defend Trade Secrets Act, and the Economic Espionage Act, and do they understand the critical importance of abiding by them?		
Do analysts disclose their true identity as well as the name of their organization prior to any interviews?		
Do analysts understand that everything their firm learns about the competition must be obtained legally?		
Do analysts respect all requests for anonymity and confidentiality of information?		
Has the company's legal department approved the processes for gathering data?		
Do analysts provide honest recommendations and conclusions?		
Is the use of third parties to gather competitive intelligence carefully reviewed and managed?		

Fig: A manager's checklist for running an ethical competitive intelligence operation

Intellectual Property Issues

- **Trademark Infringement:**
  - A trademark is a logo, package design, phrase, sound, or word that enables a consumer to differentiate one company's products from another's.
  - Consumers rely on the labels attached to the products to determine the quality or source.
  - The Lanham Act of 1946 (also known as the Trademark Act, Title 15, of the U.S. Code) defines the use of a trademark, the process for obtaining a trademark from the USPTO, and the penalties associated with trademark infringement.
  - The law gives the trademark's owner the right to prevent others from using the same mark or a confusingly similar mark on a product's label.

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- *Nominative fair use* is a defense often employed by the defendant in trademark infringement cases in which a defendant has used a plaintiff's mark to identify the plaintiff's products or services in conjunction with its own product or services.
- To successfully employ this defense, the defendant must show three things:
  - that the plaintiff's product or service cannot be readily identifiable without using the plaintiff's mark,
  - that it uses only as much of the plaintiff's mark as necessary to identify the defendant's product or service, and
  - that the defendant does nothing with the plaintiff's mark that suggests endorsement or sponsorship by the plaintiff.

Intellectual Property Issues

- **Cybersquatting:**
  - When websites were first established, there was no procedure for validating the legitimacy of requests for website names, which were given out on a first-come, first-served basis.
  - Cybersquatters register domain names for famous trademarks or company names to which they had no connection, with the hope that the trademark's owner would eventually buy the domain name for a large sum of money.
  - The main tactic organizations use to avoid cybersquatting is to protect a trademark by registering numerous domain names and variations as soon as the organization knows it wants to develop a web presence.

Intellectual Property Issues

- In addition, trademark owners who rely on non-English-speaking customers often register their names in multilingual form.
- Registering additional domain names is far less expensive than attempting to force cybersquatters to change or abandon their domain names.
- Current trademark holders are given time to assert their rights in the new top-level domains before registrations are opened to the general public.
- Anticybersquatting Consumer Protection Act allows trademark owners to challenge foreign cybersquatters.