



澳門理工大學

Universidade Politécnica de Macau
Macao Polytechnic University

COMP422 – Ethics and Professional Issues in Computing

Chapter 4

Intellectual Property

Instructor: Shirley Weng In Siu

Faculty of Applied Sciences
Macao Polytechnic University

Learning Objectives

4.1 Plagiarism

4.2 Intellectual property rights

4.3 Protecting intellectual property

4.4 Fair use

4.5 Protections for software

4.6 Open-source software

4.7 Creative Commons

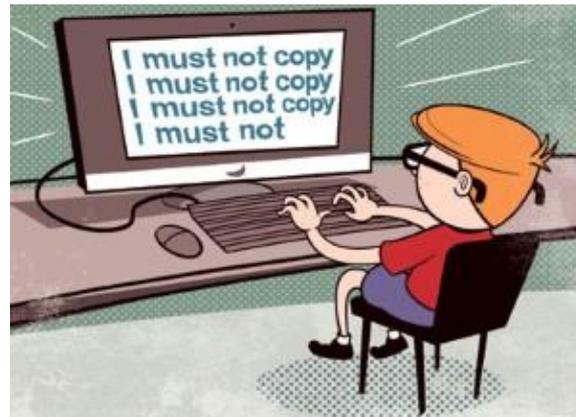
Self-study material:

Digital media, Legitimacy of intellectual property protection for software, Peer-to-peer networks

4.1 Plagiarism

What is Plagiarism?

- According to the Council of Writing Program Administrators (WPA)
 - Plagiarism occurs when a writer **deliberately uses** someone else's language, ideas, or other original (not common knowledge) material **without acknowledging** its source.
- According to the Oxford dictionary of education,
 - Plagiarism is 'The act of **appropriating someone else's idea** or work and passing it off **as one's own**'.



In MPU's Regulation

- Violation of **academic integrity** – all dishonest behaviors in academic and research activities
- Plagiarism
 - The **use of all or part of** the opinions, concepts, arguments, rewriting and copying the content of others' works (including text, image, computer programme, music, design, etc.) as their own without the **original author's consent** or **without proper citation**, can constitute plagiarism.
- Penalties
 - Relevant assignment/thesis/learning module, etc. will be scored as zero, fail or no pass
 - Depending on the case, the student may be suspended from study for one academic year / expelled from the University

Types of Plagiarism

- **Copy** the words of another without both (1) putting the copied text in quotation marks and (2) citing the source
- **Paraphrase** the words of another without citing the source
- Incorporate the **figures or drawings** of another person without crediting the source
- Include facts that are ***not common knowledge*** without citing the source
- Use **another person's ideas or theories** without giving that person credit

How to Avoid Plagiarism

- 1. Paraphrasing** the work of another: thoroughly understanding it, then use your own words to express the ideas. Finally, check it to ensure the original meaning is not distorted and **cite the source**
 - Keep the meaning of the original text, but do not copy its exact wording or structure
 - Strategies: use synonyms for words not generic, change the structure, active to passive voices (vice versa), etc.
- 2.** (If paraphrase cannot be done effectively) Put **quotation marks** around text obtained from another source & acknowledge the work/author, e.g.,

According to Jones (2022), "...original text.."
- 3. Cite the source** of information, tables, illustrations and figures

Paraphrasing - Example

Original	Plagiarism	Paraphrasing
<p>Because of their unique perspective, Americans fear globalization less than anyone else, and as a consequence they think about it less than anyone else. When Americans do think about globalization, they think of the global economy as an enlarged version of the American economy.</p> <p>(Source: Thurow, L. (1993). <i>Fortune Favors the Bold</i> (p. 6). New York: Harper Collins.)</p>	<p>According to Lester Thurow (1993) Americans fear globalization less than people from other countries and as a consequence spend less time thinking about it. Indeed, Americans see globalization as an enlarged version of their own economy.</p> <p>Why is this plagiarism?</p> <p>The writer has used Thurow's exact words without enclosing them in quotation marks. S/he has only substituted synonyms here and there. Even though Thurow is credited with a citation, this would be considered plagiarism.</p>	<p>Lester Thurow (1993) maintains that because Americans see globalization simply as a bigger form of their own economy, they are less concerned about it than is the rest of the world.</p> <p>Why is this acceptable?</p> <p>The writer has kept the meaning of the original passage without copying words or structure. Words like <i>globalization</i> and <i>Americans</i> are generic terms (i.e., terms that are commonly used for the concept they illustrate - it is difficult to find synonyms for them). Thus you may use these words without placing them in quotation marks.</p> <p>(Complete Thurow reference appears in bibliography)</p>

Paraphrasing - Example

Original	Unacceptable Paraphrase #1	Unacceptable Paraphrase #2
<p>We do not yet understand all the ways in which brain chemicals are related to emotions and thoughts, but the salient point is that our state of mind has an immediate and direct effect on our state of body.</p> <p>(Source: Siegel, B. (1986). Love, Medicine and Miracles (p. 69). New York: Harper and Row.)</p>	<p>Siegel (1986) writes that we still do not know all the ways in which brain chemistry is related to emotions and thoughts, but the important point is that our mental state has an immediate and direct effect on our physical state.</p> <p>Why is this unacceptable?</p> <ul style="list-style-type: none">• The writer has kept the same exact sentence structure• The writer had only substituted synonyms in certain places; in others the wording is exactly the same as that of the original.• Even though the writer mentions the original source in the introductory phrase, the result is plagiarism.	<p>According to Siegel (1986), our mind affects our body quickly and directly, although we do not yet understand every aspect of how brain chemicals relate to emotions and thoughts.</p> <p>Why is this unacceptable?</p> <ul style="list-style-type: none">• Although the writer has changed the structure of the sentence, key phrases have been taken directly from the original.• Even though the writer mentions the original source in the introductory phrase, the result is plagiarism.

Citation Basics

- Usually there are 2 parts for each citation:
 - **In-text citation:** appears at where other people's idea is used, for example:

Finally, scholars have also argued that theory-based approaches to scale development do not always result in instruments that realistically capture ordinary classroom situations (Knoch, 2009).
 - **Reference:** a complete reference for each source should appear in the reference list at the end of the paper like this:

Knoch, U. (2009). Diagnostic assessment of writing: A comparison of two rating scales. *Language Testing*, 26(2), 275-304.

Source:

https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/apa_sample_paper.html

Citation Styles

- A set of guidelines on how to cite sources in the academic writing
 - APA (American Psychological Association) style
 - MLA (Modern Language Association) style
 - Chicago style
 - IEEE style
 - and more... ([check this link](#))

Discipline	Typical citation style(s)
Economics	Harvard
Engineering & IT	IEEE
Humanities	Chicago notes and bibliography ; Harvard ; MLA
Law	Bluebook ; OSCOLA
Medicine	AMA ; NLM ; Vancouver
Political science	APSA
Psychology	APA
Sciences	ACS ; Chicago author-date ; CSE citation-name or citation-sequence ; CSE name-year ; Harvard
Social sciences	AAA ; APA ; ASA ; Chicago author-date

Table source: <https://www.scribbr.com/citing-sources/citation-styles/>

Source Code Plagiarism

- Source-code plagiarism in programming assignments can occur when:
 - a) A student **reuses** source-code authored by someone else and,
 - b) Intentionally or unintentionally, **fails to acknowledge** it adequately, and **submitting it as his/her own work**.
- Examples (please don't do these):
 - Reproducing/copying source-code without making any alterations, or modifying it minimally or moderately
 - Converting all or part of someone else's source-code to a different programming language
 - Generating source-code automatically by using code-generating software (e.g., AI tools like Copilot & ChatGPT), unless explicitly allowed
 - Paying another individual to create a part of or all of their source-code

G. Cosma and M. Joy, "Towards a Definition of Source-Code Plagiarism," in *IEEE Transactions on Education*, vol. 51, no. 2, pp. 195-200, May 2008, doi: 10.1109/TE.2007.906776.

Final Words

- Macao Polytechnic University expects students to uphold academic integrity in all academic undertakings, and **students must avoid plagiarism.**
- Any act of academic dishonesty shall be handled according to relevant rules and regulations seriously. For more information, please refer to [MPU's website](#).
- **A zero mark will be given if you copy someone else's work or you let someone copy your work.**

4.2 Intellectual Property Rights

Information Technology Changing Intellectual Property Landscape

- We benefit from access to high-quality television shows, music, movies, computer programs
- Value of intellectual properties much greater than cost of media
- Illegal copying pervasive
- Internet allows copies to spread quickly and widely
- In light of advances in information technology, how should we treat intellectual property?

What Is Intellectual Property?

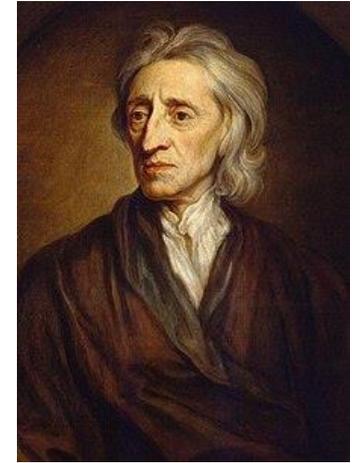
- Definition*: **IP refers to creations of the mind**
 - Inventions
 - Literary and artistic works
 - Symbols, names, images used in commerce
- Intellectual property \neq physical manifestation
 - A new poem, or the piece of paper on which the poem is printed?
- It is widely accepted notion that **people have the right to own property**. Does this right extend to intellectual property?

* World Intellectual Property Organization

Property Rights

The Second Treatise of Government

- People have a right...
 - i. to property in their own person
 - ii. to their own labor (fruits of their physical labor)
 - iii. to things which they remove from Nature through their labor
- As long as...
 - nobody claims more property than they can use
 - after someone removes something from common state, there is plenty left over



John Locke (English philosopher, 1632-1704)
Source: Wiki

Locke's Notion of Property Rights

Before cutting down the tree, everyone had a common right to it.



According to John Locke, people have a natural right to the things they have removed from Nature through their own labor (labor-mixing), they can do whatever to it (sell, pile it up, give away.....)

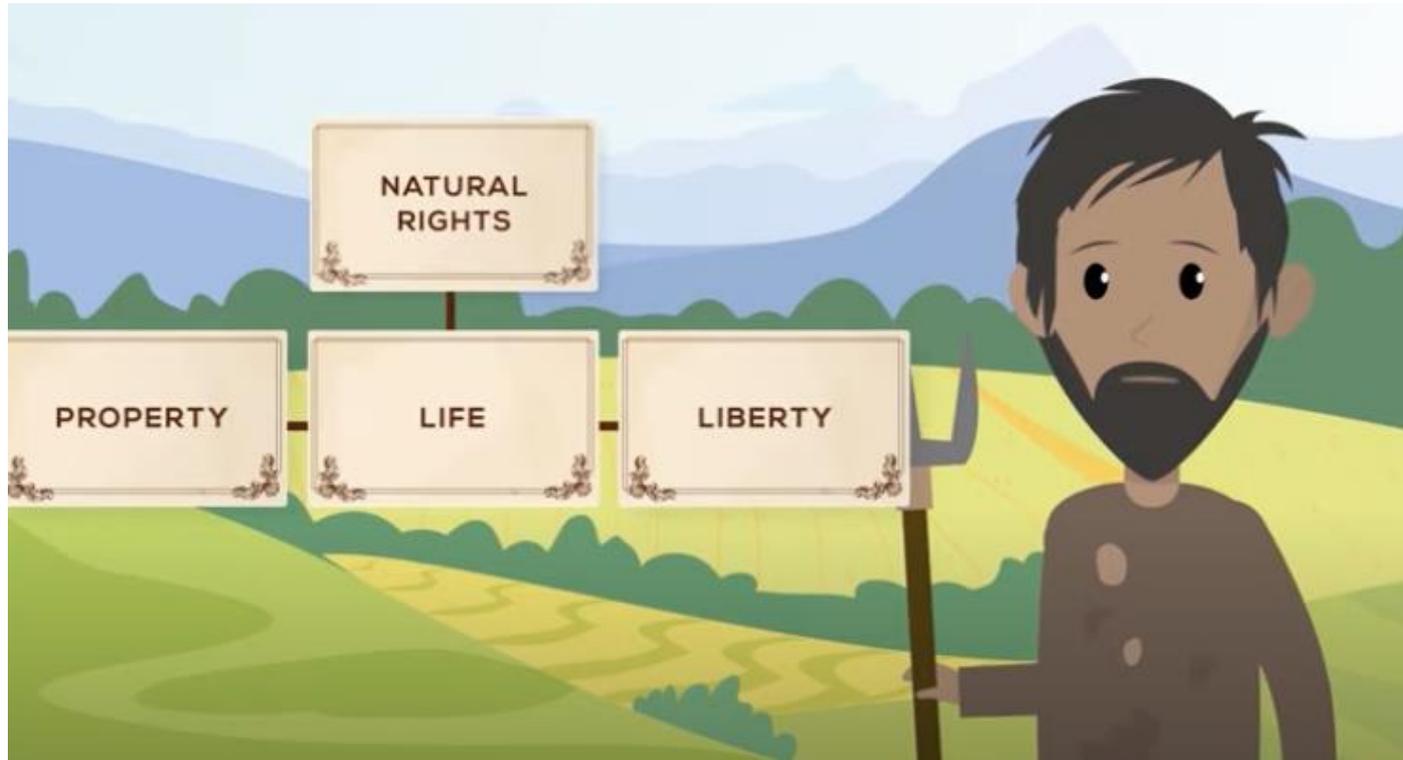
Property Rights - Examples

From ChatGPT

- Joe's body and mind belong to him. If someone were to try to force him to do something against his will, they would be violating his right to property in his own person.
- Emily is a freelance writer who creates articles for online publications. The articles she produces are the result of her labor, creativity, and expertise. If a website were to publish Emily's work without her permission or without properly compensating her, it would infringe upon her right to her own labor.

Essential John Locke: The Right to Property

<https://www.youtube.com/watch?v=DsQ932QazvA>



Expanding the Argument to Intellectual Property

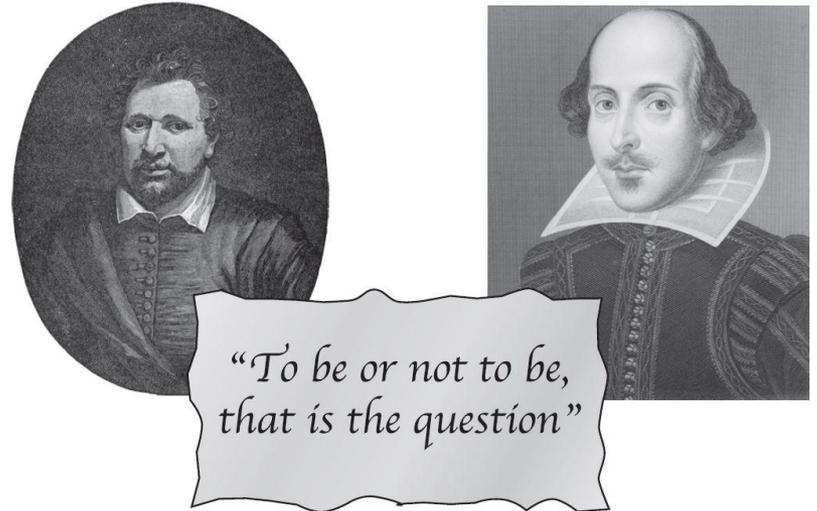
- Is there a natural right to intellectual property?
- Writing a play akin to making a belt buckle
- Making a belt buckle
 - Mine ore
 - Smelt it down
 - Cast it
- Writing a play
 - “Mine” words from English language
 - “Smelt” them into prose
 - “Cast” them into a complete play



Analogy Is Imperfect

- If Ben Jonson and William Shakespeare simultaneously write down **Hamlet**, who owns it?
 - i. There is only one *Hamlet*: the **sequence of words** that constitute the play
 - Cannot give any person a complete ownership
 - ii. Lost exclusive control over who will read, perform, or hear the play
- These paradoxes weaken the argument for a natural right to intellectual property

(Ben Jonson: Walker Art Library/Alamy;
Shakespeare: Classic Image/Alamy)



IP is not a physical object

Is there a Natural Right to IP?



Image source: <https://eventyspartners.com/blog/confidentiality-and-protecting-your-intellectual-property-during-product-development/>

- Any creator of a piece of IP has the **right to keep his ideas a secret**
- But this is a **weak right**, because Shakespeare cannot perform the play while he is keeping it confidential
- He must give up the confidentiality in order to put this creation to good use

Benefits of Intellectual Property Protection

- Some people are altruistic & gladly share; some are not
- Allure of wealth can be an incentive for speculative work
- Authors of US Constitution recognized benefits society reaps by **encouraging creativity**: *“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”*
- Then, there are opportunities for that person to make money

Benefits of Intellectual Property Protection

- You have a better mousetrap design
 1. Anyone wants it must buy it from you
 2. License your design to other manufacturer, who then have the rights to copy your design
 3. Sell an exclusive license to your competitor company, but they don't produce it, rather keep dominating the market with their own design



Image source: <https://www.forbes.com/advisor/business/monetary-incentives/>

Limits to Intellectual Property Protection

- Giving creators rights to their inventions stimulates creativity
- Society benefits most when **inventions in public domain**
- US Congress has struck **compromise** by giving authors and inventors rights for a limited time

Prices Fall When Works Become Public Domain

Artist	Work	Previous Rental Fee	Year Became Public Domain	Purchase Price
Ravel	Daphnis et Chloe Suite no. 1	\$450.00	1987	\$155.00
Ravel	Mother Goose Suite	540.00	1988	70.00
Ravel	Daphnis et Chloe Suite no. 2	540.00	1989	265.00
Griffes	The White Peacock	335.00	1993	42.00
Puccini	O Mio Babbino Caro	252.00	1994	26.00
Respighi	Fountains of Rome	441.00	1994	140.00
Ravel	Le Tombeau de Couperin	510.00	1995	86.00
Respighi	Ancient Aires and Dances Suite no. 1	441.00	1996	85.00
Elgar	Cello Concerto	550.00	1997	140.00
Holst	The Planets	815.00	1997	300.00
Ravel	Alborada Del Gracioso	360.00	1999	105.00

Table from “Letter to The Honorable Senator Spencer Abraham,” by Randolph P. Luck from **Luck’s Music Library**. (Copyright © 1996 by Randolph P. Luck. Reprinted with permission.)

Patent Expiration and Pharmaceutical Prices

In Specialty Drug Prices and Utilization after Loss of U.S. Patent Exclusivity, 2001-2007 (NBER Working Paper No. 20016), Rena Conti and Ernst Berndt use information from the IMS Health National Sales Perspectives database to study how generic introductions affected the pricing, sales, and use of the 41 cancer-related specialty drugs that lost patent protection between 2001 and 2007.

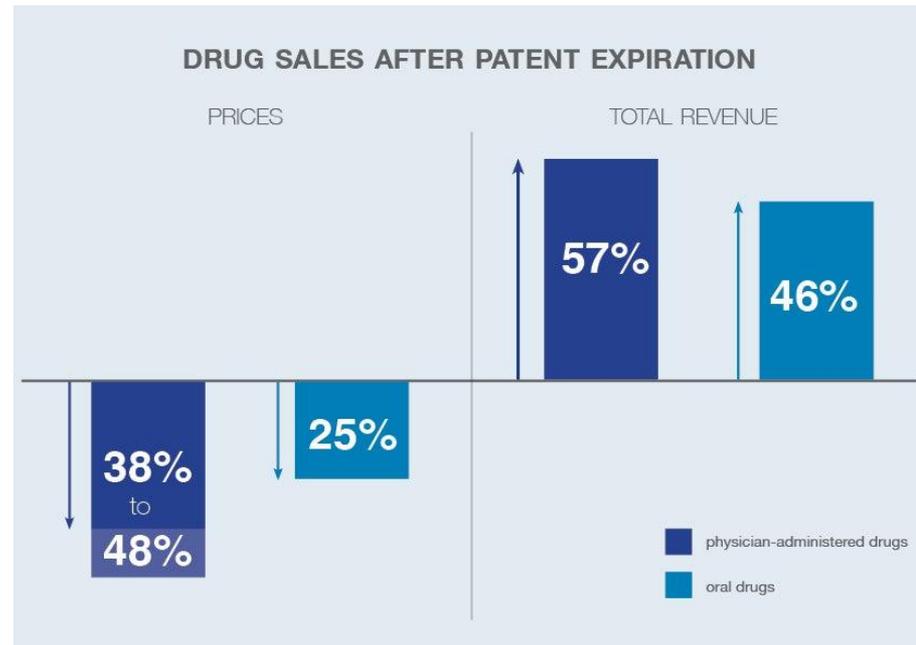


Image Source: <https://www.nber.org/digest/sep14/patent-expiration-and-pharmaceutical-prices>

4.3 Protecting Intellectual Property

Trade Secret

- **Confidential piece of intellectual property** that gives company a **competitive advantage**
 - Formulas, processes, proprietary design, strategic plans, customer lists, collection of information
 - Company must take active measures to keep it from being discovered
 - Employees with access to a trade secret usually execute a confidentiality agreement
- **Never expires**
- Not appropriate for all intellectual properties, e.g., a movie
- **Reverse engineering** allowed
- May be compromised “leakage” when employees leave firm

Coca-Cola Syrup

Invented in 1886, only pass down by word of mouth.

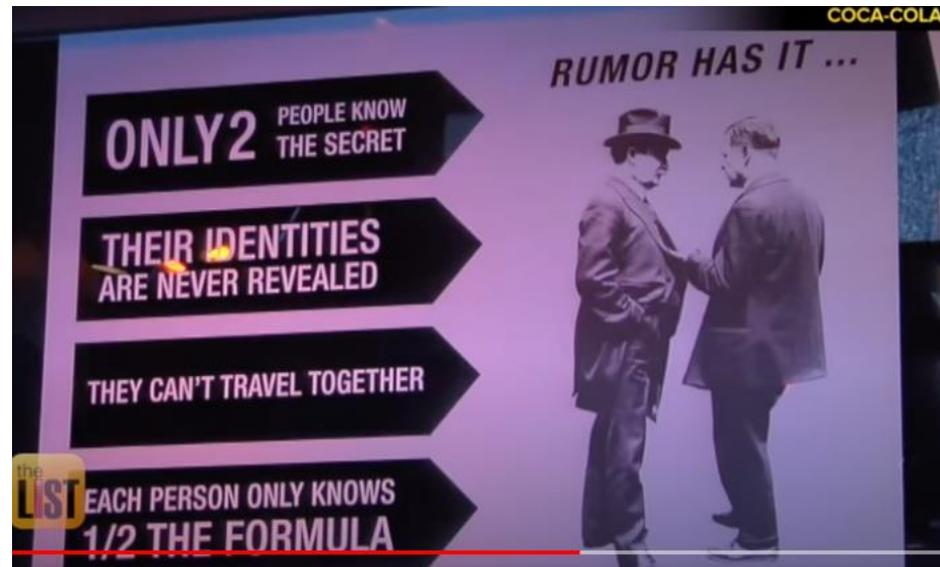
Wrote down on paper in 1919.

Keep in lock since 1920.

Coca-Cola has kept its formula secret for more than 100 years.



The Coca-cola secret formula vault in Atlanta, Georgia



Trademark, Service Mark

- **Trademark** is a word, symbol, picture, sound, or color used by a business to identify goods
- **Service mark**.... identify services
- Company can establish a “**brand name**” – more consumers’ confidence
- Does not expire

WEET-BIX

Word



Logo



Combination



Shape

<https://www.youtube.com/watch?v=iOIGPyIBdqM> 10:59

Trademark, Service Mark

- If brand name becomes common noun, the company may lose its right to exclusive use of the brand name
- Companies advertise to protect their trademarks
- Companies also protect trademarks by contacting those who misuse them

Trademark Genericide

- Loss of trademark protection due to the adoption of a mark by the public as a generic name for a product or service



Let me take a Xerox!
Better:
Xerox's copier



In **Bayer Co. v. United Drug Co. (1921)**, a U.S. court held that “aspirin” had become the common generic name for the drug, so competitors could use it; the word passed into the public domain for ordinary retail use.

Trademarks and Service Marks



1926

If a trademark is misused it could come undone.

If you didn't know zipper was a trademark, don't worry, it's not. But it used to be. It was lost because people misused the name. And the same could happen to ours, Xerox. Please help us ensure it doesn't. Use Xerox only as an adjective to identify our products and services, such as Xerox copiers, not a verb, "to Xerox", or a noun, "Xeroxes". Something to keep in mind that will help us keep it together.

xerox.com

Ready For Real Business **xerox** 

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Xerox Corporation ran this advertisement as part of its campaign to protect its trademark. (Screenshot by Xerox. Copyright © 2012 by Xerox Corporation. All rights reserved. Reprinted with permission.)

Trademarks and Service Marks

- Adobe has responded to web posts about “photoshopping images” by posting this follow-up message: “The Photoshop trademark must never be used as a common verb or as a noun. The Photoshop trademark should always be capitalized and should never be used in possessive form, or as a slang term”



HOW TO PHOTOSHOP PICTURES (SIMPLE 3 STEP BEGINNERS GUIDE)

Learn how to turn a mediocre picture into something to be proud of in this beginner's guide to editing a picture in Adobe Photoshop.

[Photoshop](#) | [Software](#) | By [Judyth Satyn](#)

Patent

- A **public document** that provides detailed description of invention
- Patentable
 - Products, processes, machines, compositions of matter, etc.
 - Non-obviousness
 - Not previously published
 - Different from what has been patented or used
 - Have a useful purpose or industrial application (utility)
- Provides owner with **exclusive right** to the **invention**
- Owner can prevent others from making, using, or selling invention for 20 years
- After the patent expires, anyone has the right to make use of its ideas

Patent Search

Indexes over **120 million patent publications from 100+ patent offices**, including major ones like the USPTO (US), EPO (Europe), CNIPA (China), JPO (Japan), KIPO (Korea), WIPO (PCT), plus many national offices across Europe, Asia, the Americas, Africa, and Macao (MO)

Google Patents 11

[← Back to results](#) (database optimization);

Large scale unstructured database systems

Abstract

Systems, methods, and computer-readable media provide techniques for on-demand access to object data hosted in distributed object storage. A query is received for the distributed object storage **database**, wherein the distributed object storage **database** includes first object data stored in a first data center at a first geographical location, and second object data stored in a second data center at a second geographical location. It is determined that the query is for at least a portion of the first object data stored by the first data center. The query is transmitted to a first computing device in the first data center. Results are received from the first computing device for the query, and the results are provided in response to the received query.

Images (10)

Classifications

- G06F16/258** Data format conversion from or to a database

[View 4 more classifications](#)

US11816126B2
United States

[Download PDF](#) [Find Prior Art](#) [Similar](#)

Inventor: [Craig Geppert Wilson](#), [David Robert Golub](#), [Mehrab Mohammad Hoque](#), [Adinoyi Wisdom Omuya](#), [Charles Robert Kalmanek, Jr.](#), [Eliot Horowitz](#)

Current Assignee: [MongoDB Inc](#)

Worldwide applications

2020 · [US](#) 2022 · [US](#)

Application US17/894,386 events

- 2016-01-11 · Priority claimed from US14/992,225
- 2022-08-24 · Application filed by MongoDB Inc
- 2022-08-24 · Priority to US17/894,386
- 2022-11-30 · Assigned to MONGODB, INC. ©
- 2022-11-30 · Assigned to MONGODB, INC. ©
- 2022-12-22 · Publication of US20220405298A1
- 2023-11-14 · Application granted
- 2023-11-14 · Publication of US11816126B2

Status ● Active

2036-01-11 · Anticipated expiration

Copyright

- Government provides authors with certain rights to original works that they have written
- Five principal rights
 1. Reproduction
 2. Distribution
 3. Public display
 4. Public performance
 5. Production of derivative works
- Copyright owners have the right to authorize others to exercise these five rights with respect to their works
- Copyright-related industries (movies, music, software, book publishing) represent 6% of U.S. gross domestic product (> \$900 billion/ year)

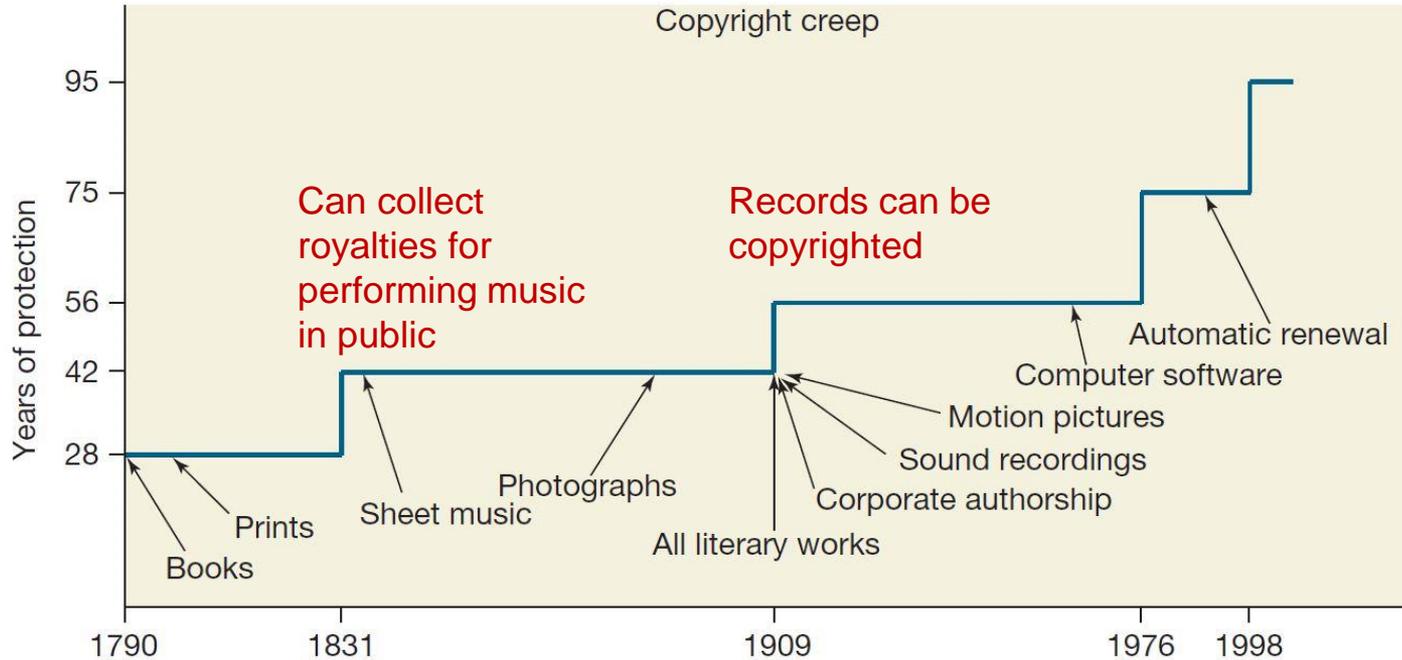
Case of Basic Books vs. Kinko's Graphics

- In the 1980s, Kinko's Graphics Corporation engaged in what it called the “**Professor Publishing**” business.
- It distributed brochures to university professors asking them to provide lists of readings they planned to use in their courses.
- Kinko's used these lists to produce **packets of reading materials** for students taking these classes. The packets typically contained chapters from books.
- In 1991 the US District Court for the Southern District of New York ruled that when Kinko's produced these packets it infringed upon the copyrights held by the publishers. The judge ordered Kinko's to pay statutory damages of \$510,000 to the plaintiffs, a group of eight book publishers. Kinko's subsequently got out of the Professor Publishing business.

Key Court Cases and Legislation

- Davey Jones Locker, a BBS system
 - Richard Kenadek found guilty of violating copyrights of owners of software he posted on a computer bulletin board system (BBS)
 - Subscribers paid \$99/year for access to more than 200 commercial software
 - In 1994, Kenadek was indicted for infringing the copyrights of the owners of the software
- **No Electronic Theft Act of 1997**
 - In 1994, David LaMacchia, MIT student, posted copyrighted software on a public BBS, counted to have downloaded million dollars' worth in less than 2 months
 - Charge was dropped because he didn't profit from his action
 - **Made it a criminal offense to reproduce or distribute more than \$1,000 worth of copyrighted material in a six-month period**

Copyright Creep (1 of 2)



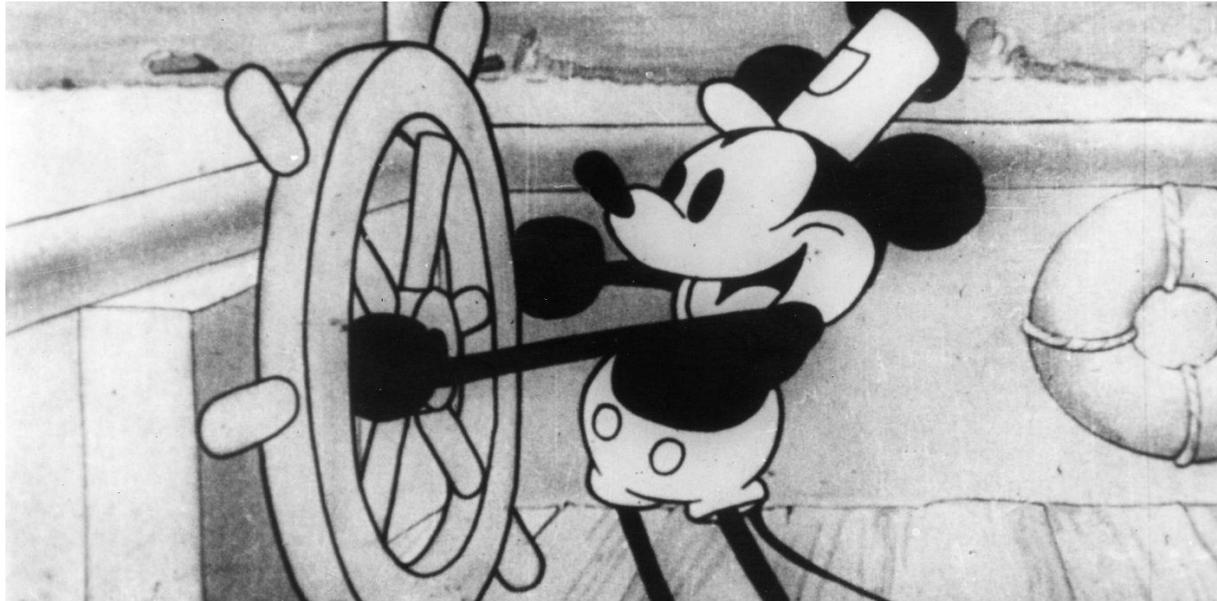
Since the first Copyright Act was passed in 1790, both the **length of copyright protection** and the **kinds of intellectual property** that can be copyrighted have grown dramatically.

- Desire to have international copyright agreement, match with that of the European law
- Introduction of new technologies (video recording, audio recording...)

Copyright Creep (2 of 2)

- Since 1790, protection for books extended from 28 years to 95 years or more
- Some say latest extension done to prevent Disney characters from becoming public domain
- Group of petitioners challenged the Copyright Term Extension Act of 1998, arguing Congress exceeded Constitutional power
- U.S. Supreme Court ruling
 - CTEA does not create perpetual copyrights
 - CTEA is constitutional

Mickey Mouse's Original Story Lost Copyright after 95 years of protection (January 2024)



Source:
<https://screenrant.com/mickey-mouse-copyright-expiration-explained/#:~:text=According%20to%20US%20copyright%20law,lost%20with%20Mickey%20Mouse%20copyright.>

<https://time.com/6551496/mickey-mouse-public-domain-steamboat-willie/>

Released in **1928**, *Steamboat Willie* is Mickey Mouse's first appearance in the first Disney movie with sound. Copyright set to expire in 1984 (**56 yrs**)

In **1976**, after lobbying the congress, copyright was changed:

Author lifetime + 50 yrs

In **1998**, after again lobbying the congress, copyright was extended:

Author lifetime + 70 yrs, max 95 yrs

In Jan **2023**, the copyright on *Steamboat Willie* officially expired, and Mickey Mouse is now officially in the public domain. Now anyone in the U.S. can use the *Steamboat Willie* version of the Mickey Mouse character without fear of copyright infringement.

But copyright laws vary by country, so some places Mickey remains protected.

Case Study: Database Guru

- Rajiv employed at Felicity Software
- Signed a confidentiality and proprietary rights agreement
- Developed some database optimizations
- Moved to [Unrelated.com](https://unrelated.com), supervises team developing database software
- Realizes his optimizations would help team at [Unrelated.com](https://unrelated.com)

Two Alternatives for Rajiv

1. “Clean room” strategy
 - Provide team with publicly available information
 - Provide team with performance targets
2. Become personally involved
 - Ask team open-ended questions
 - Allow them to rediscover the optimizations he made at Felicity

Which option should Rajiv take?

Kantian Analysis

- “Clean room” option
 - Rajiv does not violate agreement he signed
 - “You can share your expertise with others” is a rule that can be universalized
 - Morally right
- “Personally involved” option
 - If he does not ask leading questions, OK
 - If he asks leading questions, he is disclosing information and violating agreement he signed
 - Breaking a contract = breaking a promise → wrong
 - Is it reasonable to think he can avoid asking leading questions? Morally dubious

Social Contract Theory Analysis

- Similar to Kantian analysis
- “Clean room” option
 - Rajiv helps team without violating an agreement
 - This is OK
- “Personally involved” option
 - If he can avoid disclosing information, OK
 - If he gets impatient and discloses information, not OK

Act-Utilitarian Analysis (1 of 4)

- Quantify consequences of each option in dollars
- Time considered: next 5 years
- Affected parties
 - Rajiv: Income over next five years
 - Unrelated.com
 - Lost income due to delay in releasing product
 - Expected costs associated with potential litigation

Act-Utilitarian Analysis (2 of 4)

“Clean room” option

- Consequences for Rajiv’s increased salary
 - Expects 10% raise, worth \$15,000
 - Total worth \$75,000 over five years
- [Unrelated.com](https://www.unrelated.com)
 - Six month delay *costs* the company six months’ revenue from its steady state
 - $50,000 \text{ customers} \times \$10/\text{month}/\text{customer} \times 6 \text{ months} = \$3,000,000$
 - No risk of litigation

Act-Utilitarian Analysis (3 of 4)

“Ask right questions” option

- [Unrelated.com](https://www.unrelated.com)

- Three month delay costs the company six months’ revenue from its steady state, or \$1,500,000
- Litigation risk 6.25% and cost \$5,000,000, so expected loss $\$5,000,000 \times .0625 = \$312,500$

- Rajiv

- If no litigation, 15% raise, worth \$112,500 over 5 years
- If litigation, get fired, lose \$750,000 over 5 years
- Expected outcome: $0.9375 \times \$112,500 - .0625 \times \$750,000 = \$58,594$

Act-Utilitarian Analysis (4 of 4)

	Course of Action	
	Set up clean room	Ask team "right questions"
Affected parties		
Rajiv	\$75,000	\$58,594
Unrelated.com		
Lost income due to delay in product release	(\$3,000,000)	(\$1,500,000)
Litigation risk	\$0	(\$312,500)
Overall benefit	(\$2,925,000)	(\$1,753,906)

Better

Virtue Ethics Analysis

- “Clean room” option
 - Gives team opportunity to create a system that meets performance requirements
 - Rajiv shares expertise, insists performance goals get met, characteristic of a good engineer and manager
- “Personally involved” option
 - Working hard and sharing expertise are characteristic of good managers
 - Runs risk of violating confidentiality agreement, which is dishonest and not characteristic of good managers
- Prudent choice is “clean room” option

Conclusion

- “Clean room” option better option according to Kantianism, social contract theory, and virtue ethics
- “Personally involved” option better according to act utilitarianism, though a more risk-averse analysis (if assuming a higher probability of litigation from Felicity) would have resulted in “clean room” option being preferred

Protecting Intellectual Property - Example

ResMed CPAP device

Trade marks

Plain word marks
Logo marks

RESMED AIRMINI



Patents

Mask & ventilator
Data processing



Designs

Visual appearance of product



Copyright

Software source code
Product images
Advertising copy
Product manuals

Trade secrets

Commercially valuable
information, not
disclosed in patents

• An example of how a company protects its IP with multiple IP rights >

<https://www.youtube.com/watch?v=iOIGPyIBdqM>

6:20 – 8:20

4.4 Fair Use

Fair Use Concept

- Sometimes legal to reproduce a copyrighted work without permission
 - Citing short excerpts for the purpose of teaching, scholarship, research, criticism, commentary, news reporting.
- Those circumstances called **fair use**
- To balance the interests of copyright holders and the public interest in the wider distribution

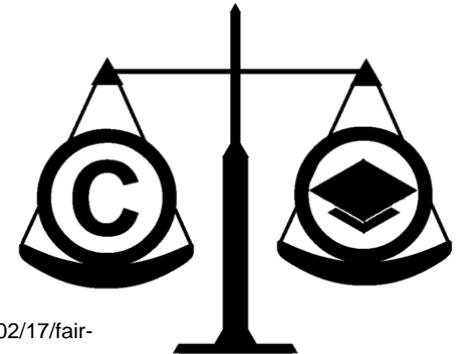


Image Source: <https://library.osu.edu/site/copyright/2014/02/17/fair-use-101-why-do-we-need-fair-use/>

Fair Use Concept

https://www.youtube.com/watch?v=IFhF_tHrj4s

To judge fair use, courts consider four factors:

1. What is the purpose and character of the use?

Purpose (why) e.g., teaching, commentary, news reporting, scholarship

Extent (how) to which the author has transformed the original copyrighted work “transformative”, the more the better

2. What is the nature of the work being copied?

Factual, nonfiction, published work are preferred

3. How much of the copyrighted work is being used?

Brief excerpts rather than entire chapters

4. How will this use affect the market for copyrighted work?

Use out-of-print material; spontaneously chosen selection

Fair Use Example #1

A professor puts a few journal articles on reserve in the library and makes them assigned reading for the class. Some students in the class complain that they cannot get access to the articles because other students always seem to have them checked out. The professor scans them and posts them on his Web site. The professor gives the students in the class the password they need to access the articles.

Purpose and character of use

Strictly educational, in favor of fair use

Nature of work

Journal articles are nonfiction, in favor of fair use

Amount of work being copied

Entire article, against fair use

Affect on market for work

If these journal articles are no longer for sale, then no affect; professor prevent unauthorized access; in favor of fair use

Conclusion: More likely to be considered fair use

Fair Use Example #2

An art professor takes photographs of a number of paintings reproduced in a book about Renaissance artists. She incorporates the photos into PowerPoint lectures for her class.

Purpose and character of use

Strictly educational, in favor of fair use

Nature of work

Art, fictional, against fair use

Amount of work being copied

Entire photo; even if the original painting is in the public domain, the photograph of the painting is probably copyrighted; “Fair use almost never allows a work to be copied in its entirety”; against fair use

Affect on market for work

Depend on how many images from any one book is copied, whether the publisher is in the business of selling slides of individual images appearing in its book

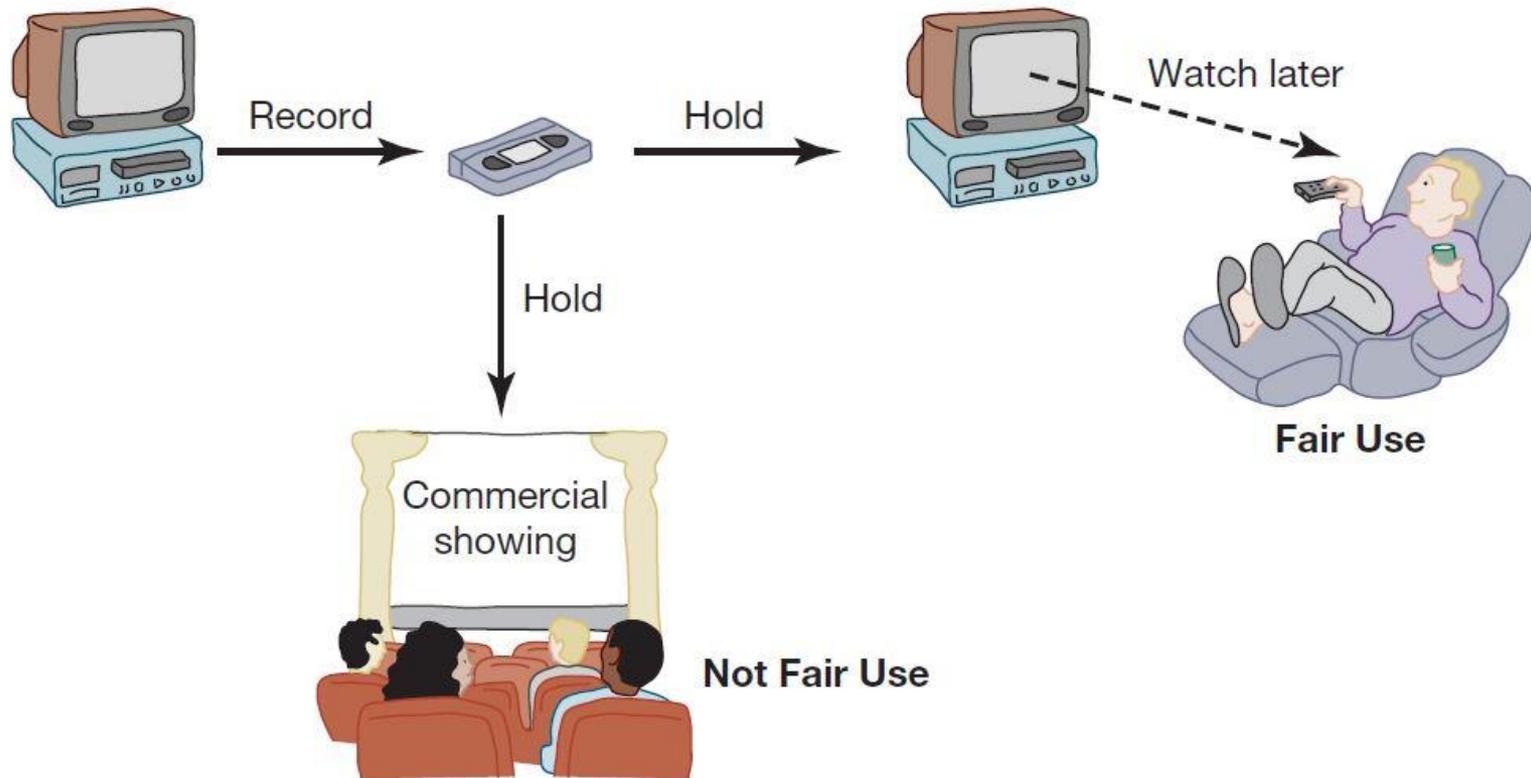
Conclusion: Less likely to be considered fair use

Sony v. Universal City Studios

- Sony introduced Betamax VCR (1975)
- People started **time shifting** TV shows
- Movie studios sued Sony for copyright infringements
- U.S. Supreme Court ruled (5-4) that **time shifting is fair use**



Time Shifting



The Supreme Court ruled that videotaping television broadcasts for private viewing at a later time is fair use of the copyrighted material. This practice is called time shifting. Using videotaped material for a commercial purpose is not considered fair use.

Sony v. Universal City Studios

Purpose and character of use	Personal use, in favor of fair use
Nature of work	Creative work, against fair use
Amount of work being copied	Entire work, against fair use
Affect on market for work	<ul style="list-style-type: none">• Studios receive large fees from TV stations for broadcasting their movies• Larger the audience, more advertisement fee is charged by TV stations• VCRs increase the size of the audience• Hence, studios can receive more broadcasting fees

Ruling: Time shifting (for private use) is a fair use of the copyrighted materials; The studios unable to demonstrate that had eroded the commercial value of their copyrights; VCRs could be used to copy both copyrighted and noncopyrighted material, Sony should not be held accountable (even if people use it with infringement)

Digital Recording Technology

- Copying from vinyl records to cassette tapes introduced hiss and distortions
- Introduction of compact disc a boon for music industry
- Cheaper to produce than vinyl records
- Higher quality
- Higher price \Rightarrow higher profits
- **But** it's possible to make a perfect copy of a CD



Audio Home Recording Act of 1992

- Protects rights of consumers to make copies of analog or digital recordings for personal, noncommercial use
 - Backup copy
 - Give to family member
- Digital audio recorders must incorporate **Serial Copyright Management System (SCMS)**, so consumers can make a digital copy from the original recording, but it prevents someone from making **a copy of the copy**
- Royalty pay on sale of all digital audio-recording devices and blank digital audio-recording media
 - Royalties are shared among songwriters, music publishers, musicians, recording companies, etc.

RIAA v. Diamond Multimedia

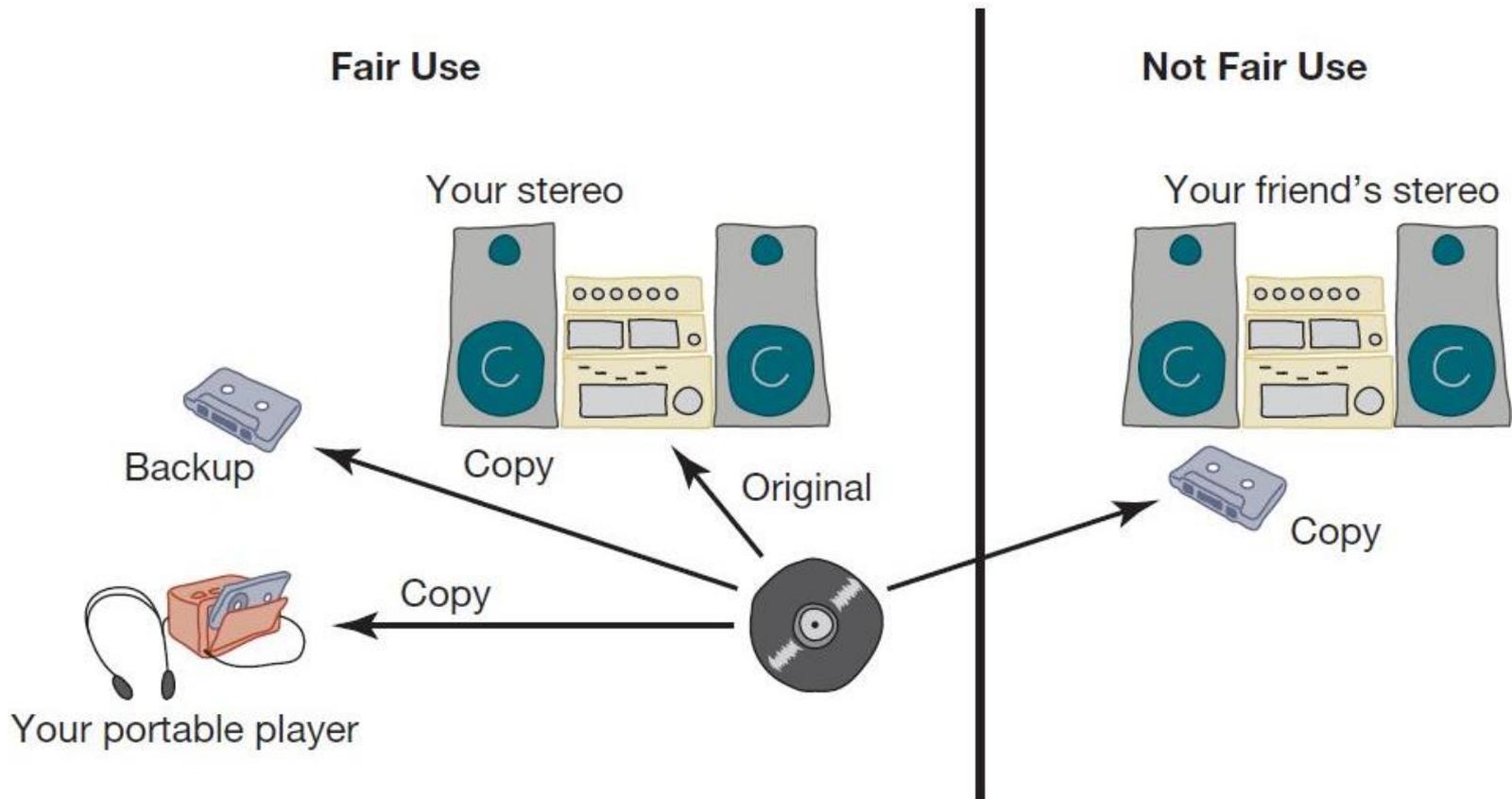
Recording Industry Association of America (RIAA)

- MP3 compression allowed songs to be stored in 10% of the space, with little degradation
- Diamond introduced Rio MP3 player (1998)
- People started **space shifting** their music
- RIAA started legal action against Diamond for violation of the Audio Home Recording Act
- U.S. Court of Appeals, 9th Circuit, affirmed that space shifting is consistent with copyright law



Image source: Wiki

Space Shifting



Space shifting is the creation of a copy for **backup purposes** or for **use in a portable device**, and it is considered fair use. **Making a copy for a friend is not considered fair use.**

Kelly v. Arriba Soft

Leslie Kelly: photographer who maintained Web site with many of his copyrighted photos

Arriba Soft: created search engine that returned thumbnail images from other web sites

Kelly sued Arriba Soft for copyright infringement



Fair Use?



Kelly v. Arriba Soft

- Leslie Kelly: photographer who maintained Web site with many of his copyrighted photos
- Arriba Soft: created Internet-based search engine that returned thumbnail images from other web sites
- Kelly sued Arriba Soft for copyright infringement
- U.S. Court of Appeals, 9th Circuit, affirmed that Arriba Soft's use of Kelly's images was "significantly transformative" and fair use
 - *Thumbnail images had low resolution, blurry with little aesthetic appeal*
 - *Did not harm the market value of the original images, actually guide users to Kelly's website*

Google Books Library Project

<https://books.google.com/intl/en-GB/googlebooks/library.html>

Google Books Library Project – An enhanced card catalog of the world's books

We're working with several major libraries to include their collections in Google Books and, like a card catalog, show users information about the book, and in many cases, a few snippets – a few sentences to display the search term in context.

The screenshot shows the Google Books interface. At the top, there is a search bar with the Google logo and a search button. Below the search bar, there are navigation buttons for 'Books', 'Add to my library', and 'Page iii'. The main content area displays the search results for 'The Prince' by Machiavelli. On the left, there is a 'GET PRINT BOOK' button, a 'No eBook available' message, and links to various retailers: Cambridge University Press, Amazon.com, Barnes&Noble.com, Books-A-Million, and IndieBound. Below these links, there is a 'Find in a library' button and an 'All sellers »' link. A small thumbnail image of the book cover is shown. Below the thumbnail, the title 'Machiavelli: The Prince' is displayed, followed by the author 'By Niccolo Machiavelli'. There is a search box for the book with a 'Go' button and a link to 'About this book'. On the right, a large preview of the book's title page is shown, featuring the title 'MACHIAVELLI' and 'The Prince' in a large, elegant font. Below the title, it says 'EDITED BY QUENTIN SKINNER' and 'Regius Professor of Modern History in the University of Cambridge'. At the bottom, it says 'AND RUSSELL PRICE' and 'Senior Lecturer in Politics, University of Lancaster'.

Authors Guild v. Google (1 of 3)

- Google announced plan to scan millions of books held by several huge libraries, creating searchable database of all words
- If public domain book, system returns PDF
- If under copyright, user can see a few sentences; system provides links to libraries and online booksellers
- Authors Guild and publishers sued Google for copyright infringement (copying books for commercial reasons)
- Judge ruled in favor of Google and dismissed lawsuit

Authors Guild v. Google (2 of 3)

- Judge: Google Books is a fair use of copyrighted works
- Purpose and character:
 - Purpose is to create a massive index
 - Character is highly transformative
 - Precedent: **Kelly v. Arriba Soft Corporation**
 - Weighs *strongly* in favor of fair use
- Nature of work being scanned: mostly nonfiction
 - Weighs in favor of fair use

Authors Guild v. Google (3 of 3)

- How much being scanned: entire work
 - Weighs *slightly* against fair use
- Effect on the market: stimulating book sales by helping people discover books
 - Weighs *strongly* in favor of fair use

Mashups

- In music, a mashup is a composition that incorporates elements taken from preexisting songs
- A vs B: instrumental track from one song + vocal track from another song
- Audio collage: create new composition from dozens of audio fragments
<https://www.youtube.com/watch?v=xPwkrbGkjX8>
- Fair use? Lae suggests...
 - Audio collage: yes, because it is highly transformative
 - A vs B: no, unless “criticism, satire, or parody”

*Each case is unique and must be evaluated on its own merits.

Image Source: <https://medium.com/@lotsofloes/mashups-the-art-of-mixing-music-and-how-you-can-make-one-yourself-1b9f45b43f4b>



Fair Use Case Study 1

A high-school computer science teacher, Mr. Johnson, wants to teach his students about the functionality and programming logic behind a popular graphic-design software called "ArtMaster Pro." The software is developed and copyrighted by a well-known software company, GraphicTech Inc. Mr. Johnson used ArtMaster Pro to demonstrate various graphic-design concepts such as layer management, vector graphics creation, etc. His goal is to educate the students about features so that they can know how to use similar tools in their future projects. The tools also have more specialized features such as high-end 3D rendering capabilities and automation scripts. The demonstration of Mr. Johnson covers roughly about 20% of the software's overall functionality.

Is Mr. Johnson's use of ArtMaster Pro in the school classroom for demonstration considered a fair use?

Fair Use Case Study 2

There is a software called "CodeBuilder Pro," a programming-environment software developed by a mid-sized software company, DevSoft Inc. It comes with an open-source license that allows users to view the source code but has strict terms regarding redistribution and modification for commercial purposes. A group of independent programmers forms an online community called "Code Enthusiasts." They come together because they believe that CodeBuilder Pro has some limitations in terms of its support for a new and emerging programming language, "NovaScript." Their goal is to enhance the software's functionality so that it can better support NovaScript programming. They start modifying the source code of CodeBuilder Pro and releasing the updates in a weekly basis. On one hand, their intention is to contribute to the programming community by making the software more useful. On the other hand, some members of the community hope that their improved version could potentially gain popularity and attract sponsorships or donations in the future to support their community.

[Are Code Enthusiasts's modification of CodeBuilder Pro considered a fair use?](#)

4.5 Protections for Software

Software Copyrights

- Early days, company sold complete systems (software + hardware) to customers
- Copyright protection for “software” began 1964
- What gets copyrighted?
 - **Expression of idea (implementation), not idea itself (or the concept)**
 - **Object code, executable program (which the company will distribute)**
 - **Screen displays produced by the program as it executes**
- Typically, companies treat source code as a trade secret

Violations of Software Copyrights

- Copying a program to give or sell to someone else
- Preloading a program onto the hard disk of a computer being sold
- Distributing a program over the Internet

Important Court Cases

- **Apple Computer v. Franklin Computer (early 1980s)**
 - Franklin ACE manufactured Apple compatible computer
 - They directly copied some operation-systems functions from a ROM on the Apple II
 - Court ruled in favor of Apple
 - Established that **object programs are copyrightable**
- **Sega v. Accolade (1992)**
 - Accolade disassembled object code of a Sega game to determine how to interface a video game with the game console
 - Court ruled in favor of Accolade (public would benefit from additional video games)
 - Established that **disassembling object code to determine technical specifications is fair use**

Safe Software Development

- Reverse engineering okay
- Companies must **protect against unconscious copying**
- Solution: “**clean room**” software development strategy

Team 1 analyzes competitor's program & even source codes (if avail) and writes specification



Team 2 (never sees the competitor's product) uses specification to develop



Functional
Specification
(what but not how)



Oracle v. Google



1990, Sun Microsystems developed Java & the API



2005, Google purchased Android, developing OS for mobile phones; tried to acquire license for Java libraries, but failed



ORACLE

Ruling 2018, Google's copying of 11,500, only 170 lines were actually needed

Google

Ruling 2016, Google's use was a fair use

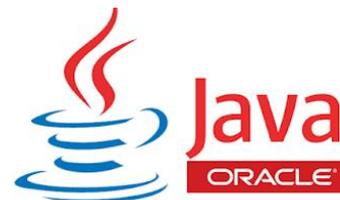
Google

Ruling 2012, Java APIs were not copyrightable

Google did a **clean-room implementation of Java**, but copied 11,500 lines of declaring code from 37 Java API



2007, released beta version of Android



2010, Oracle acquired Sun and Java, sued Google for copyright infringement

Google v. Oracle (2021, Supreme Court 6-2)

Google backed by Microsoft, Mozilla, Red Hat, IBM... 150 academics

Nature of the copyrighted work	APIs served as declaring code rather than implementation, and that in context of copyright, it served an "organization function"... , in which fair use is more applicable.
Purpose & character of the use	Google took and transformed the Java APIs "to expand the use and usefulness of Android-based smartphones" which "creat[ed] a new platform that could be readily used by programmers"...
Amount & substantiality of copyrighted material	Google only used about 0.4% of the total Java source code and was minimal. Google did not copy the code that was at the heart of how Java was implemented, and that "Google copied those lines not because of their creativity, their beauty, or even (in a sense) because of their purpose. It copied them because programmers had already learned to work with [Java SE], and it would have been difficult ... to attract programmers to ... Android ... without them."
Market effect of the copyright-taking	Should not be considered as a replacement for Java but as a product operating on a different platform (Java SE for desktop, Android for mobile); if they had found for Oracle, it "would risk harm to the public", as would "lock" developers' existing Java knowledge and harm future software creativity

Software Patents (1 of 3)

- Until 1981, Patent Office refused to grant software patents
 - Saw programs as mathematical algorithms, not processes or machines
- U.S. Supreme Court decision led to first software patent in 1981
 - *Diamond v. Diehr* “use of a computer to control the heating of rubber”, the invention was a new process for rubber molding
- Further court rulings led to patents being granted for wider range of software

Software Patents (2 of 3)

- Thousands of software patents now exist
 - Microsoft files ~ 3,000 applications annually
 - **Licensing patents a source of revenue**
- Secondary market for software patents
 - Patent-holding companies (a.k.a. **patent trolls**):
Companies that specialize in buying patents and enforcing patent rights
 - Based on assumption that companies would rather settle out of court than spend time and money going to trial
 - RIM didn't settle quickly; ended up paying \$612 million

RIM settles NTP patent fight with \$612.5M payment

- NTP, a patent-holding company found in 1992
- Own several patents related to “email transmission in a wireless environment”
- In 2001, NTP sued Research In Motion Ltd. (RIM) that its wireless email technology used methods covered by its patents
- In 2006, reach out-of-court settlement, RIM agreed to pay \$612.5 million to settle the long-running legal fight between the two companies.



RIM's popular **BlackBerry** e-mail service

Key Differences between Software Copyrights and Software Patents

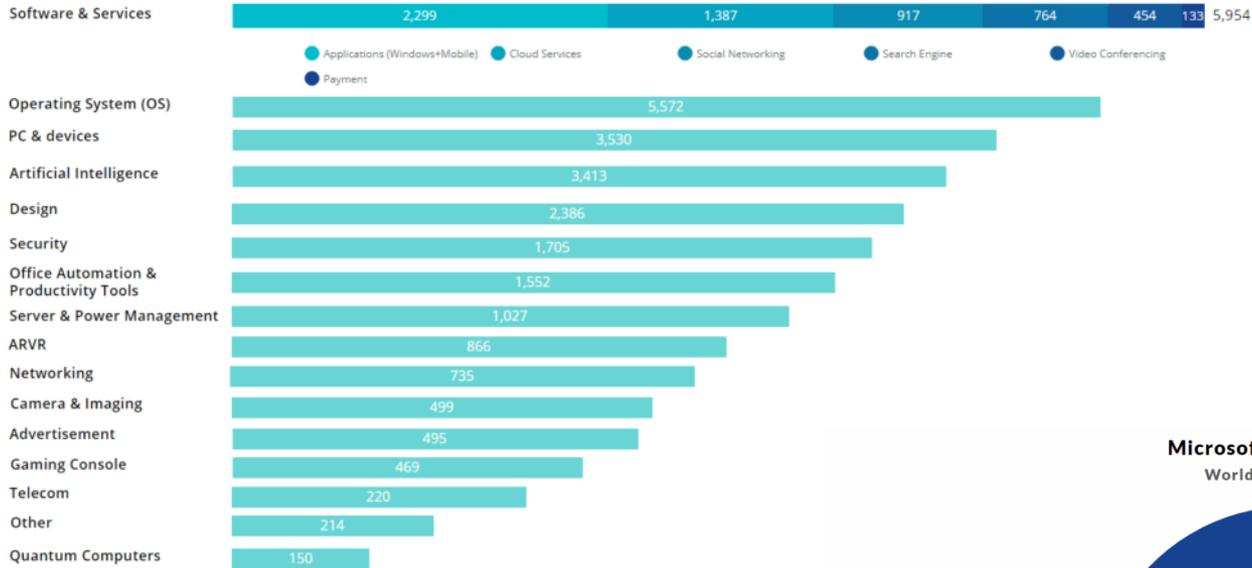
	Software Copyright	Software Patent
What is protected?	Source code, object program, screen displays	Software process with practical utility
Is getting protection expensive?	No	Yes
Is getting protection time consuming?	No (months)	Yes (years)
Is reverse engineering allowed?	Yes	No

Software Patents (3 of 3)

- Critics say too many patents have been issued
 - Patent Office doesn't know about prior art, so it issues bad software patents
 - Obvious inventions get patents
- Companies with new products fear getting sued for patent infringement
 - Build stockpiles of patents as defense mechanism
 - Software patents used as legal weapons

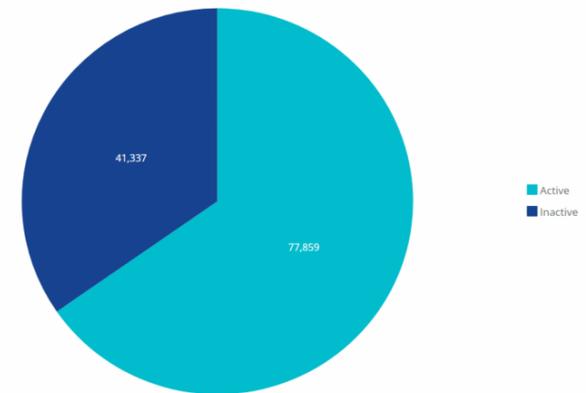
Microsoft Has More Than 77,000 Active Software Patents

Microsoft Patent Portfolio
Technology Area



Note: The patent count

Microsoft Patent Portfolio
Worldwide Legal Trends



Note: The patent count is calculated by considering all patents in the portfolio, Data Range Based on the Publication Year (2011 - 2025)

Smartphone Patent Wars (1 of 2)

- Nokia sues Apple, alleging Apple violated 10 of its patents (2009)
- Apple countersues Nokia for violating 13 of its patents
- Apple sues several Android smartphone makers
 - Accuses Samsung of Galaxy phones copying “look and feel” of Apple iPhones and iPads, including rounded corners, tapered edges, use of a home button, and bounce-back affect when user over scrolls

Smartphone Patent Wars (2 of 2)

- Samsung countersues Apple on mobile communication technologies
- Escalates until more than 100 lawsuits filed by various manufacturers globally; billions of dollars in legal fees
- Smartphone makers agree to cross-license each other's patents (2014)

A **cross-licensing** agreement is a contract between two or more parties where each party grants rights to their intellectual property to the other parties. (wiki)

Apple and Samsung agree to drop patent lawsuits outside US

World's largest smartphone makers end non-US lawsuits in step back from three years of legal hostilities

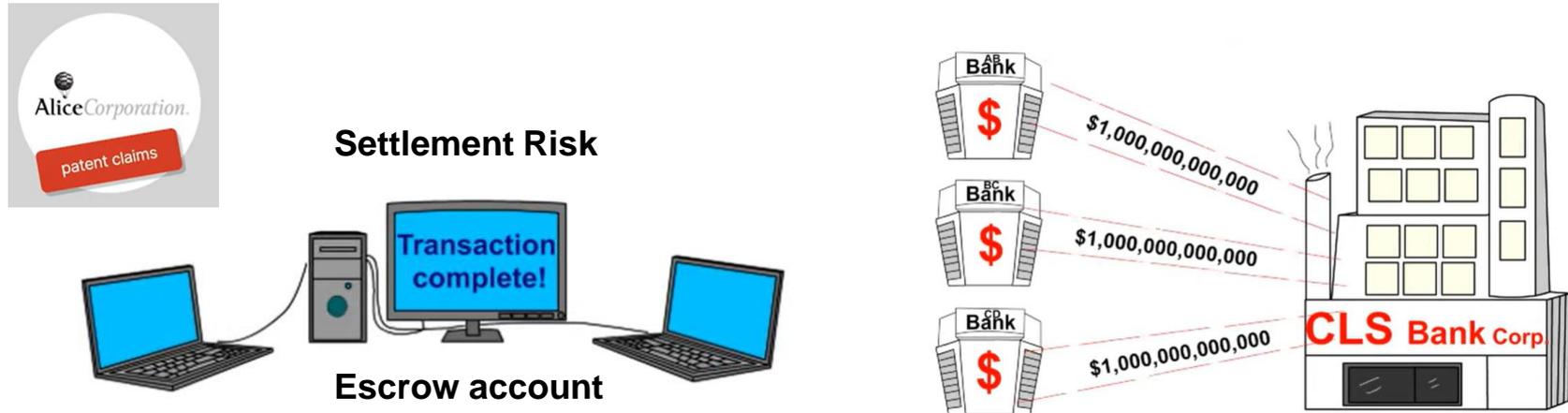


iPhone 4. In May, a California jury ordered Apple to pay \$158,400 to Samsung, finding that Apple had infringed one of Samsung's patents in creating iPhones 4 and 5. Photograph: Kin Cheung/AP

<https://www.theguardian.com/technology/2014/aug/06/apple-samsung-drop-patent-lawsuits-outside-usa>

Therefore, overly broad software patents would hamper innovations... the turning point is here...

Alice Corporation v. CLS Bank



- Decision: US Supreme Court ruled in 2014 that simply implementing an abstract idea on a computer is not sufficient for patent protection – there must be an “**inventive concept**”, Alice’s patent is invalidated.
- Many district courts and federal courts have cited **Alice Corporation v. CLS Bank** to invalidate hundreds of software patents

<https://www.youtube.com/watch?v=ajGggYfoUE4>
(0:24 -)

4.6 Open-Source Software

Criticisms of Proprietary Software

- Increasingly harsh measures being taken to enforce copyrights
- Copyrights are not serving their purpose of promoting progress (but making people wealthy – earning from selling licenses)
- It is wrong to allow someone to “own” a piece of intellectual property
 - Users of a piece of IP have to choose between respecting ownership rights or e.g., helping their friends
 - If “Cooperation is more important than Copyright”, then refusing the software copy request of your friend is wrong <-- a tension
- **Open-source movement:** promotes a cooperative model of software development

Open-Source Definition



- Numerous **Open-Source definitions** exist, according to the **Open Source Initiatives**, OS programs have following key characteristics:
 - No restrictions preventing others from selling or giving away software
 - Source code included in distribution
 - No restrictions preventing others from modifying source code; derived works can be distributed with the same license terms as the original program
 - No restrictions regarding how people can use software
- **Copyleft license** has an extra condition: Same rights apply to everyone receiving redistributions of the software

Beneficial Consequences of Open-Source Software

- Gives everyone opportunity to improve program
- New versions of programs appear more frequently than commercial programs
- Eliminates tension between obeying law and helping others
- Programs belong to entire community, development can continue indefinitely
- Shifts focus from manufacturing to service: software support, better manual, easier installation, etc.

Examples of Open-Source Software

- BIND (provides domain name service)
- Apache
- Sendmail
- Android operating system for smartphones
- Chrome and Firefox
- OpenOffice.org
- Perl, Python, Ruby, TCL/TK, PHP, Zope
- GNU compilers: C, C++, Objective-C, Fortran, Java, Ada
- Android operation system

GNU Project and Linux – Success Stories

- GNU Project
 - Begun by Richard Stallman in 1984
 - Goal: Develop open-source, Unix-like operating system
 - Most components developed in late 1980s
- Linux
 - Linus Torvalds wrote Unix-like kernel in 1991
 - Combined with GNU components to make an O.S.
 - Commonly called Linux, alternative to proprietary versions of Unix
 - Linux operating system on 97% of the world's 500 fastest supercomputers (as of June 2014)

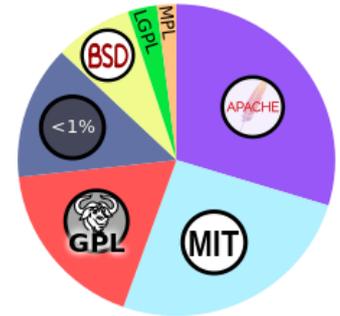


Image Source: Wiki

Types of Open-Source Licenses

- **Copyleft** licenses

- Freedom to use, modify, and redistribute
- Require derivative works to include source code under the same copyleft license
- Forbid proprietization, ensure work remains open and freely available to community
- E.g., original GPL license



- **Permissive** licenses

- Non-copyleft, freedom to use, modify, and redistribute
- Include a warranty disclaimer
- Permit proprietary derivative work
- E.g., MIT license "letting people do anything they want with your code as long as they provide attribution back to you and don't hold you liable"
- BSD license, first permissive, several versions: 4-, 3-, 2-clauses



Decide a License for the Project

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Permissions

- Commercial use
- Distribution
- Modification
- Private use

Conditions

- License and copyright notice

Limitations

- Liability
- Warranty

For a comparison table of every license, see <https://choosealicense.com/appendix/>

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<https://choosealicense.com/licenses/mit/>

4.7 Creative Commons

Streamlining Creative Re-use

- Under current copyright law, eligible works are copyrighted the moment they are created
 - No copyright notice does not mean it's okay to copy
 - Must contact people before using work
 - That slows down creative re-use
- Free Creative Commons license indicates
 - Which kinds of copying are okay
 - Which rights are being retained
- Flickr has more than 250 million photos available under Creative Commons licenses

Creative Commons

<https://creativecommons.org/chooser/>

- CC provides standard copyright licenses free of charge
- Every license comes in three forms: human-readable, lawyer-readable, computer-readable



"Somos El Bien Común" by [Eréndira Derbez](#) for Creative Commons, here cropped, licensed via [CC BY 4.0](#).

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No additional restrictions — You may not apply legal terms or [technological measures](#) that legally restrict others from doing anything the license permits.

Summary (1 of 3)

- To stimulate creativity in the arts and technology, governments grant limited ownership rights to creators of intellectual property
 - Trade secrets
 - Trademarks/service marks
 - Patents
 - Copyrights
- Goal: Provide creators of IP with rewards while ensuring public has access to their creations
- Fair use doctrine an example of trying to find the balance between rights of IP holders and the common good
 - Time shifting
 - Space shifting

Summary (2 of 3)

- New information technology has put pressure on IP laws
 - Digital representation of audio, video allows perfect copies
 - Broadband Internet allows quick and wide dissemination
 - Pirate Bay a prime example
 - Companies understand they must make “doing the right thing” as easy as “doing the wrong thing”
 - Now more convenient to get paid content through NetFlix, Hulu Plus, Apple iTunes store
- Intellectual property rights for software
 - Copyright protection less controversial
 - Patent protection highly controversial
 - **Alice v. CLS Bank** may be a turning point

Summary (3 of 3)

- Open-source movement
 - Alternative to proprietary model of software development
 - Success stories include Linux, Android, Firefox, and OpenOffice
- Creative Commons
 - An effort to create a greater sharing culture in the arts
 - Allows copyright holders to indicate up front the conditions under which others can use their work

Self-reading section

Digital Media

Digital Rights Management (DRM)

- Problem: Digital media (CDs, DVDs) allow people make perfect copies easy, broadband internet stimulates illegal download. Music industry lost sales significantly!
- **DRM: Actions owners of intellectual property in digital form take to protect their rights**
- DRM technologies may be incorporated into OS, program or hardware, “aim at tracking & controlling the use of content once it entered the market”
- Approaches
 - Encrypt digital content
 - “Mark” digital content so devices can recognize content as copy-protected

How DRM Works (more)?

How DRM works



Digital rights enforcement



Access control



License management



Content encryption



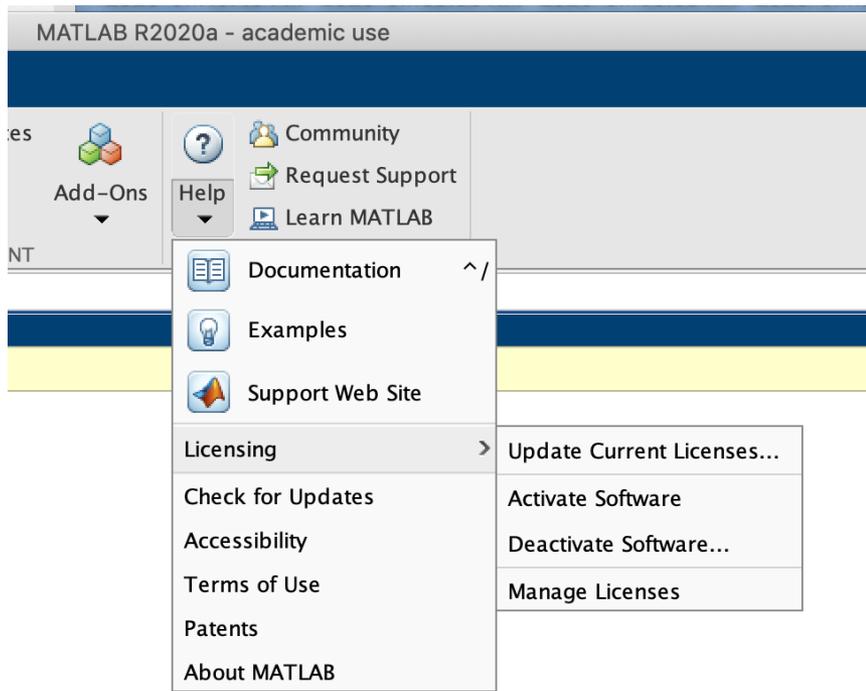
Usage tracking



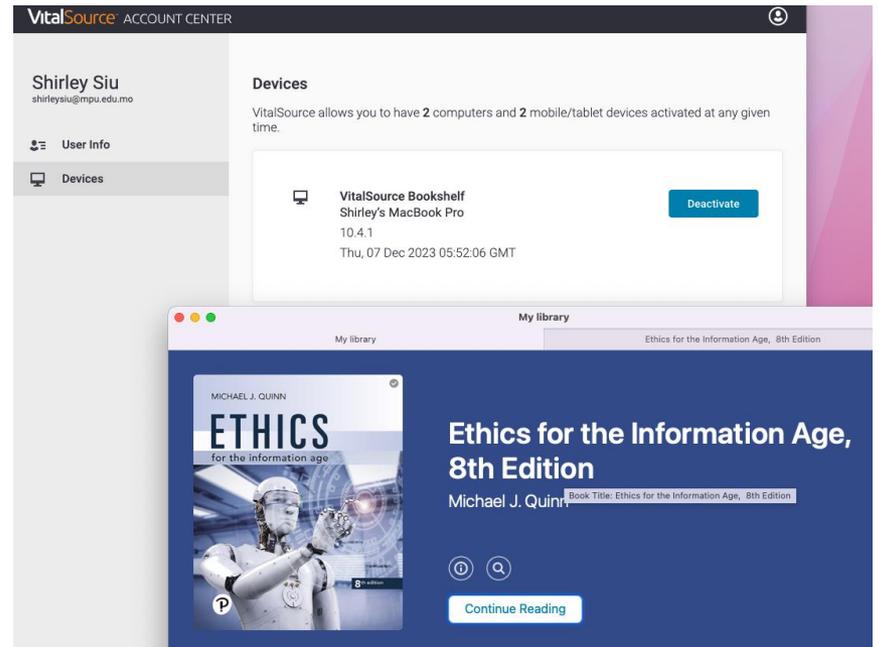
Watermark

DRM Use Cases

- Software – License management



- eBook – Usage tracking



Criticisms of Digital Rights Management

- Introduction of DRM has been controversial, any technological “fix” is bound to fail
- **DRM undermines fair use:**
 - Cannot make a private copy without making an extra payment
- Some schemes make **anonymous access impossible**
 - Microsoft Media Player upload information about the user’s viewing habits to Microsoft’s central server
- Protections never expire

Online Music Stores Drop Digital Rights Management (1 of 2)

- When iTunes Music Store opened in 2003, all music protected with a DRM scheme called FairPlay
- FairPlay blocked users from freely exchanging purchased music
 - Songs couldn't be played on more than 5 different computers
 - Songs couldn't be copied onto CDs more than 7 times
 - Songs purchased from iTunes Store wouldn't play on non-Apple devices
 - DRM-protected music purchased from other online retailers couldn't be played on iPod

Online Music Stores Drop Digital Rights Management (2 of 2)

- Consumers complained about restrictions associated with DRM
- European governments put pressure on Apple to license FairPlay or stop using DRM
- **In 2007 EMI began offering all its songs without DRM through the iTunes store**
- In 2008 Amazon reached an agreement with all four major music labels to sell DRM-free music
- Apple followed suit in 2009

Online Music Stores Drop Digital Rights Management: DRM-free Songs



MARKETS BUSINESS INVESTING TECH POLITICS CNBC TV INVESTING CLUB PRO

U.S. NEWS

Apple's iTunes Begins Selling Music Without Copy Protection

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AP | AP

WATCH LIVE

Sell with higher price
\$0.99 → +\$0.3 → \$1.29/piece

Apple's iTunes Store started selling thousands of songs without copy protection, marking the trendsetting company's latest coup and a model for what analysts say will likely become a pattern for online music sales.

Launching initially with songs from music company **EMI Group**, iTunes Plus features tracks that are free of digital rights management, or DRM, technology -- copy-protection software that limits where songs or movies can be played and distributed.

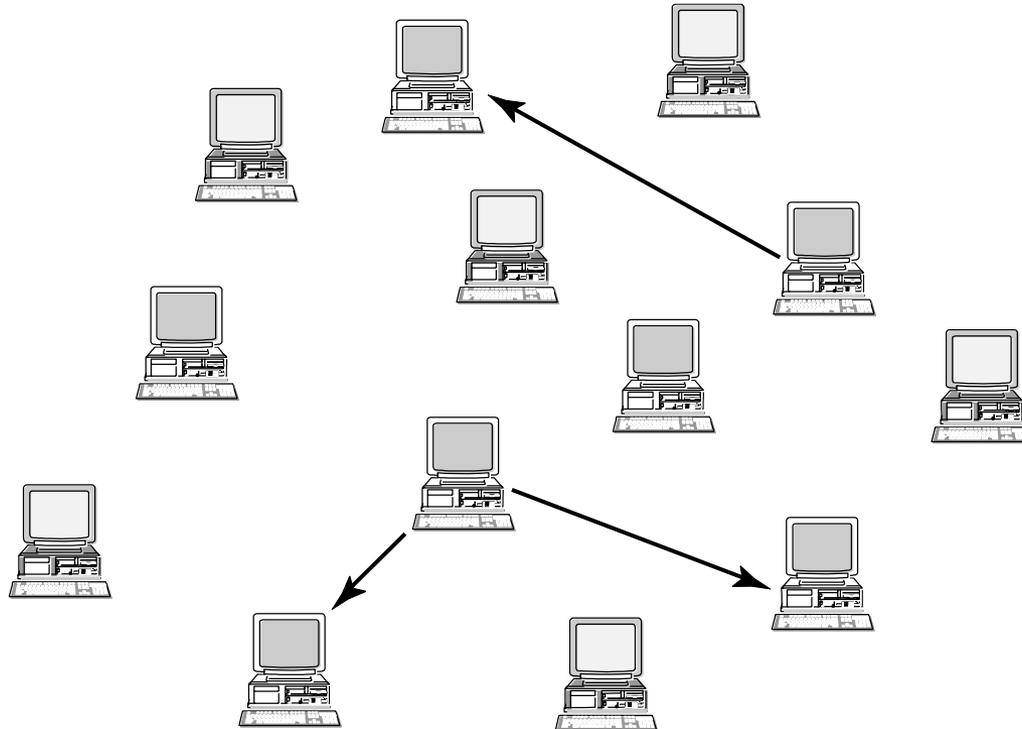
Self-reading section

Peer-to-Peer Networks

Peer-to-Peer Networks

- Peer-to-peer network
 - Transient & decentralized network
 - Connects computers running same networking program
 - Computers (peers) can access files stored on each other's hard drives
- How P2P networks facilitate data exchange
 - Give each user access to data stored in many other computers
 - Support simultaneous file transfers among arbitrary pairs of computers
 - Allow users to identify systems with faster file exchange speeds

Peer-to-Peer Networks



A peer-to-peer network connects computers running the same networking program. Computers can access files stored on each other's hard drives.

Cyberlockers

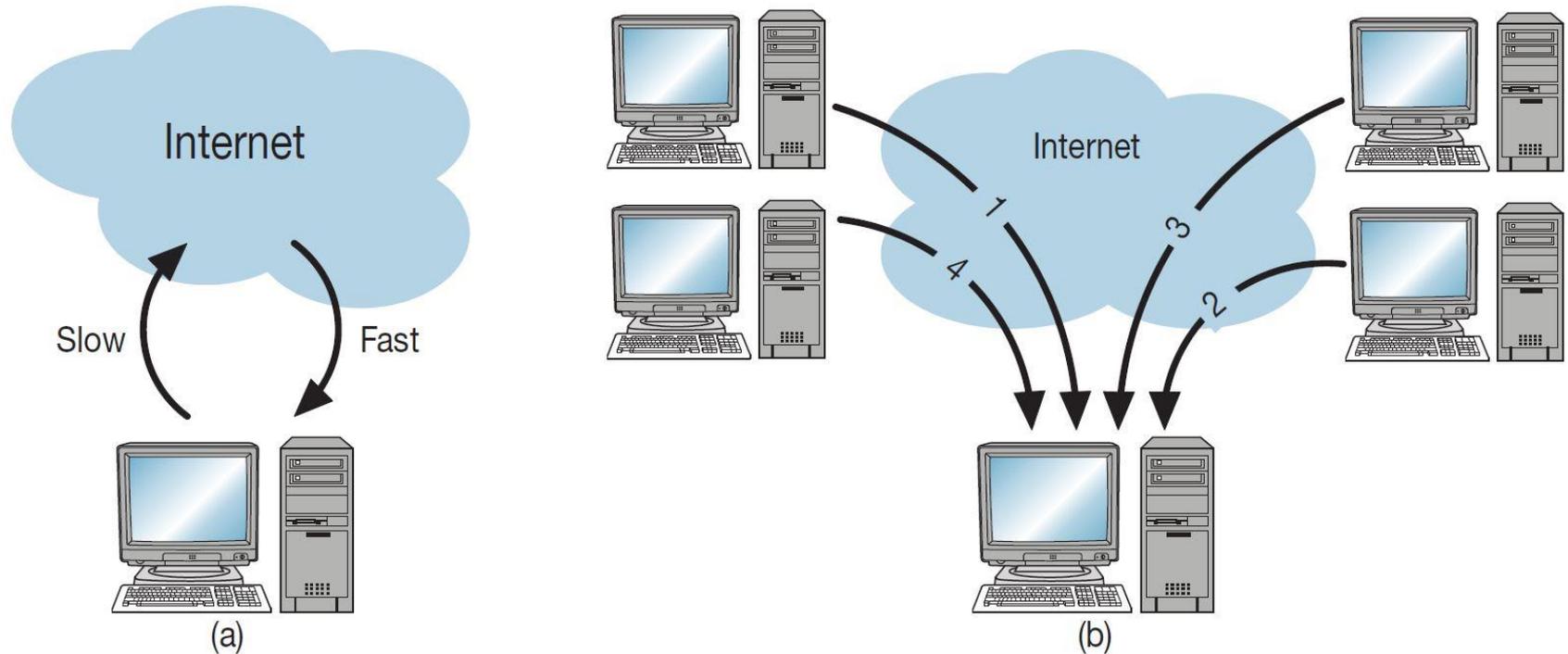
- Also called **file-hosting** services or **cloud storage** services
- Internet-based file-sharing services
- Allow users to upload and download password-protected files
- Support workgroup collaboration
- Commercial ones typically client-server model



BitTorrent

- P2P network, no central server
- Download much faster than upload
- BitTorrent speeds downloading
 - Files broken into pieces
 - Different pieces downloaded from different computers
- Used for downloading large files
 - Computer programs
 - Television shows
 - Movies

Concept Behind BitTorrent



(a) Broadband Internet connections provide higher speeds for downloading than for uploading. (b) BitTorrent reduces downloading times by enabling a computer to download different pieces of a file simultaneously from many different peers.

Legal Action Against the Pirate Bay (1 of 2)

- The Pirate Bay started in 2003 in Stockholm, Sweden
- One of world's biggest BitTorrent file-sharing sites
- People download songs, movies, TV shows, etc.
- After 2006 raid by police, popularity increased
- In 2008 the International Federation of the Phonographic Industry sued four individuals connected with site



Legal Action Against the Pirate Bay (2 of 2)

- Defendants said the Pirate Bay just a search engine
- Found guilty; sentenced to prison and fined \$6.5 million
- Meanwhile, the Pirate Bay still operational
- More than 150 proxy servers all over the world



Pirate Bay co-founders Fredrik Neij, Gottfrid Warg, Peter Kolmisoppi

PRO-IP Act

- A US law aims to enhance the protection of IP rights
- Gives federal law enforcement agencies right to **seize domain names of sites facilitating copyright infringement**
- Operation In Our Sites (2010)
 - Seized domain names of 10 Web sites making available full-run movies
 - Seized several hundred more domain names over next 1 ½ years

Megaupload Shutdown

- Megaupload a prominent cyberlocker
 - Based in Hong Kong
 - More than 180 million users
 - Once the world's 13th most popular Web site
 - Founder, Kim Dotcom, lived in Auckland, New Zealand
- 2012 – Cooperation between law enforcement agencies in US, New Zealand, and Hong Kong
 - Shut down Megaupload
 - Arrested Kim Dotcom for violating PRO-IP Act
- Other cyberlockers responded by disabling sharing functionality

<https://www.videoproc.com/resource/what-happened-to-megaupload.htm>

Megaupload Shutdown



[101]. According to the grand jury indictment, Kim Dotcom and his codefendants were part of “a worldwide criminal organization whose members engaged in criminal copyright infringement and money laundering on a massive scale with estimated harm to copyright holders well in excess of \$500,000,000 and reported income in excess of \$175,000,000” [100]. The indictment claimed that the defendants had paid millions of dollars to premium subscribers for uploading popular copyrighted works to the cyberlocker, as a way of increasing the number of paid subscribers.

Legal Online Access to Entertainment (1 of 2)

- **Widespread piracy pressures companies to make “doing the right thing” as easy as “doing the wrong thing”**
 - Major online stores provide safe, convenient downloads
 - Music without DRM
- **Consumer shift toward music streaming**
 - **Ad-supported model:** listeners stream for free (100 M), the services earn income and pay royalties to artists from ad revenue
 - **Subscription model:** listeners pay monthly fee (40 M)

Legal Online Access to Entertainment (2 of 2)

- Video streaming services: Netflix, Hulu Plus, Amazon Prime Instant Video, Sling (40% of US homes)
- Good news / bad news about music streaming
 - Good news: consumers will pay if cost reasonable
 - Bad news: Much lower revenues for publishers compared to selling CDs

Self-reading section

Legitimacy of Intellectual Property Protection for Software

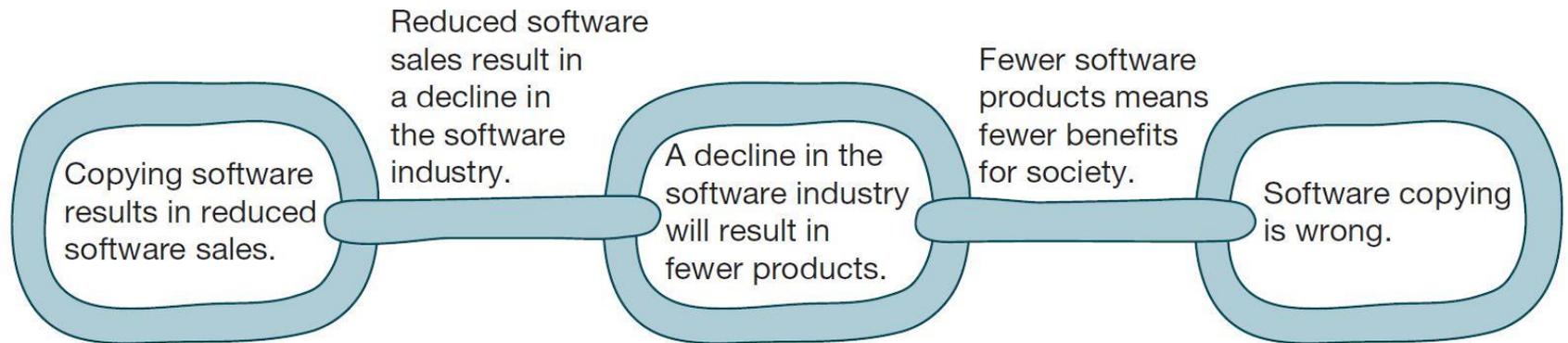
Do We Have the Right System in Place?

- Software licenses typically prevent you from making copies of software to sell or give away
- Software licenses are legal agreements
- Not discussing morality of breaking the law
- Discussing whether society **should** give intellectual property protection to software

Rights-Based Analysis

- “Just deserts” argument
 - Programming is hard work that only a few can do
 - Programmers should be rewarded for their labor
(Locke’s natural-rights argument, mixing your labor with something gives you an ownership right in it)
 - They ought to be able to own their programs
- Criticism of “just deserts” argument
 - Why does labor imply ownership?
 - Can imagine a just society in which all labor went to common good
 - Intellectual property not like physical property

Argument Why Software Copying Is Bad



The chain of reasoning of a consequentialist argument for why copying software is bad.
(Beth Anderson)

Utilitarian Analysis

- Argument against copying
 - Copying software reduces software purchases...
 - Leading to less income for software makers...
 - Leading to lower production of new software...
 - Leading to fewer benefits to society
- Each of these claims can be debated
 - Not all who get free copies can afford to buy software
 - Open-source movement demonstrates many people are willing to donate their software-writing skills
 - Hardware industry wants to stimulate software industry
 - Difficult to quantify how much society would be harmed if certain software packages not released

Conclusion

- Natural rights argument weak
- Utilitarian argument not strong, either
- Nevertheless, society has granted copyright protection to owners of computer programs
- Breaking the law is wrong unless there is a strong overriding moral obligation or consequence

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