

Professional Issues in IT

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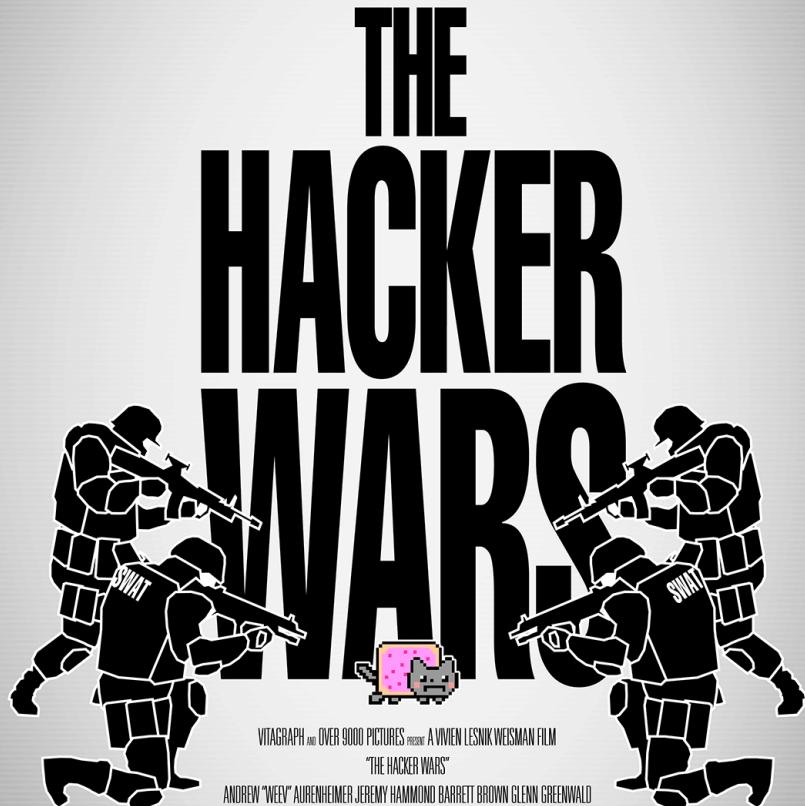
"THE US SURVEILLANCE STATE'S OBJECTIVE
IS TO ELIMINATE ALL PRIVACY GLOBALLY"
— GLENN GREENWALD

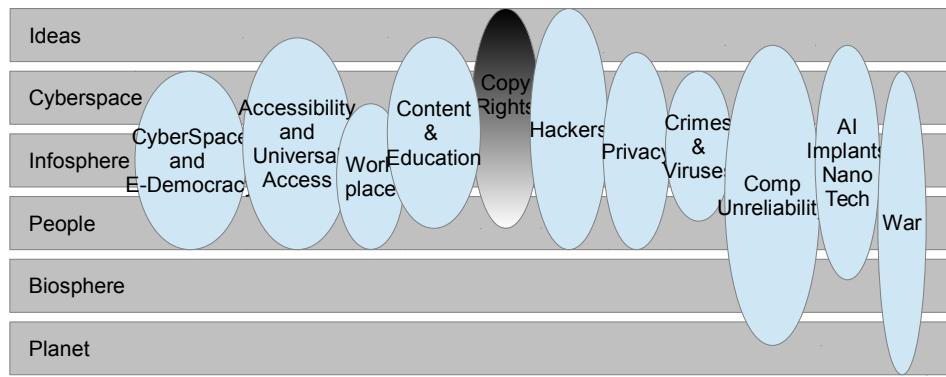
"MIND BENDING THRILLER"

Chuck Gomez
THE HUFFINGTON POST

"ENGROSSING EXPLORATION"

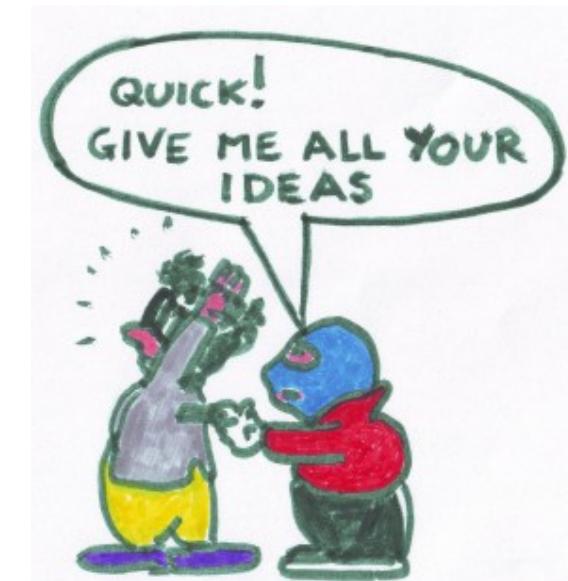
Sanjeev Bhattacharya
ESQUIRE UK

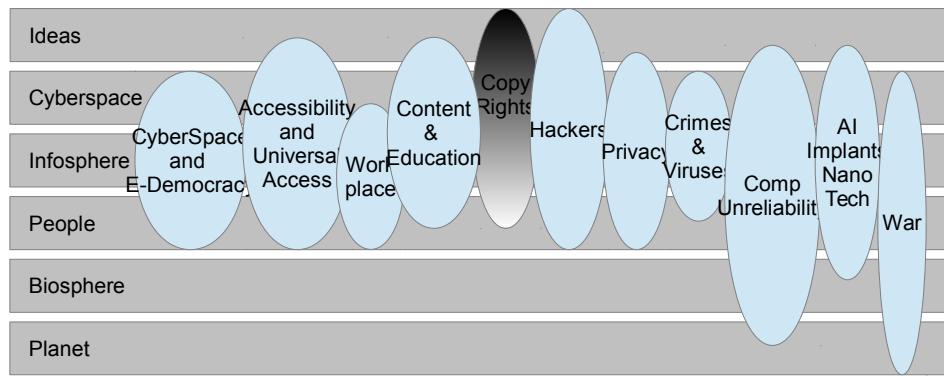




Intellectual Property & Copyrights

- Intellectual work ... created by minds .. arts, books, films, formulas, inventions, music, movies
- If work is unique, is created by a person, and owned by person/group), then it becomes intellectual property.
- How to protect it?
 - Copyright: Covers authored Works (books, art, film, music)
 - Patent: Covers inventions
 - Trade Secret Laws: Information critical to product/company success





Ethical Issues with Intellectual Property

- Some people think that intellectual property protection stifles innovations
 - Case Discussion: Wikipedia Articles
- Owners of intellectual property want compensation or royalties for their work.

Some Definitions

- **Copyright:** Right to distribute, display, perform, reproduce an original work in copies, or to prepare derivative works based on the work
- **Copyright Protection:** The Legal Process through which a person/entity can be granted copyright
- **Copyright Holder:** The person/entity that holds legal rights of copyright
- **Copyright infringement:** Violation of legal rights secured by owner of copyright.
- If work is used without obtaining permission from copyright holder, the copyright holder may (1) Give permission for free (2) Charge fees for its usage (3) Take infringer to court for violation of copyright (results in fines/penalties)
 - **What IF: Violator doesn't know he/she is committing a violation?**
- **Copyright Term:** The period for which a copyright is a copyright (typically 30 years – US law). It is not indefinite. If extension is required, can be granted for another period.
 - **Putting books on-line written 100 years ago? A good collection can be found on google books.**

What the Laws Say

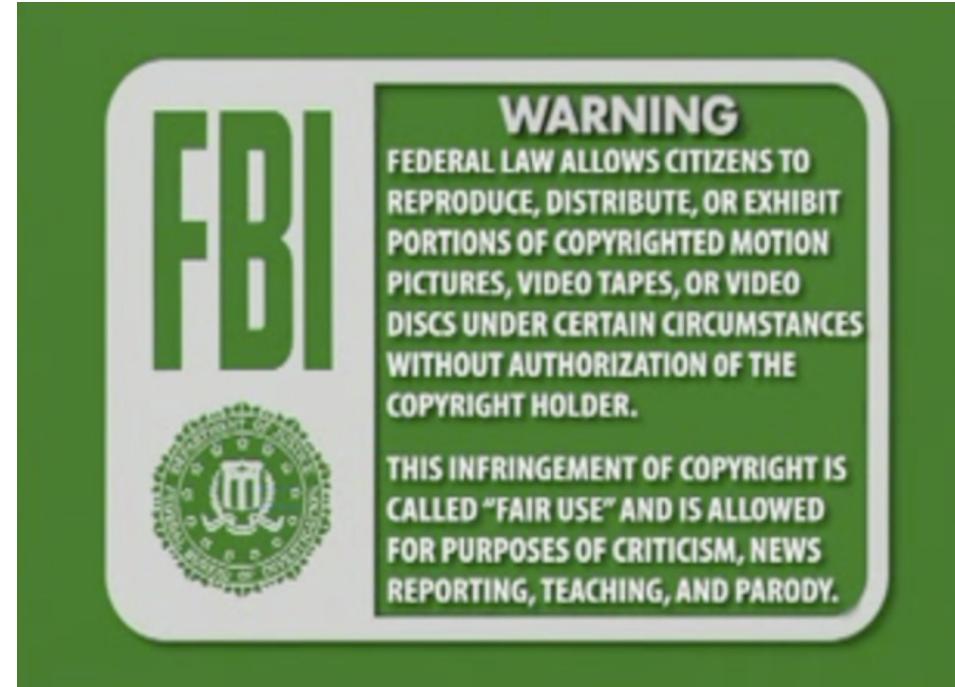
- Universal Copyright Convention
 - Geneva: 1952, Paris: 1971
 - A formal copyright notice is required for all copies of a work.
 - Minimum term of copyright (books) is life of author + 25 years
 - Does not apply to computer software (not considered tangible)
- Copyright Ordinance, 1962 (Pakistan)
 - Minimum term of copyright (books) is life of author + 50 years
 - Registration of copyright not mandatory but recommended
 - Infringement can be taken to either civil court, or criminal courts

What is Eligible for Copyright?

- Condition 1: Architecture, Art, Audio/Visual works, Music choreography, drama (audio/video/stage), graphics (pictures/images), sculptures.
 - New technologies: software, video games, multimedia
- Condition 2: Must satisfy Condition 1, and must be original (Not derivatives).
 - **Issue: How to check originality? From where to check?**

Fair Use

- Some copyrighted material can be used in another work without asking for permission from copyright owner.
- Parody, Teaching, Search Engine Indexing, Text Mining, Data Mining, Web Mining, Reverse-Engineering
- 2003: Case by commercial photographer against image search engine on usage of thumbnail images. The photographer lost on grounds of fair-use
- What if the copyright owner finds out and performs litigation?
 - Court will decide on following grounds:
 - Is copy used for profit/non-profit
 - Nature of copied work. Is it verbatim copy or just conveying of idea? Is attribution present?
 - The portion of copied work compared to whole
 - How much the copied work has effected the value of original work
 - If copyright owner does not want fair-use, they must declare so in copyright agreement.



Copyrighting Software

- Developer may 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.
 - Microsoft Office vs Libre Office vs Open Office
 - KDE Environment vs Windows 8 Environment
 - Tic-Tac-Toe created by company 1 and Tic-Tac-Toe created by Company 2?



Copyrighting Software: Historical Perspective

- Software historically viewed as intangible object, hence could not be copyrighted
- 1983: Franklin Computers produced a clone of Apple Computers. Apple won the case. First time a computer software (OS) was protected by claim of copyright
- 1995: WTO Trips Agreement
 - Computer programs are protected as literary works. Authors of computer programs and producers of sound recordings have the right to prohibit the commercial rental of their works to the public. (*World Trade Organization, “Overview: The TRIPS Agreement,”* <http://www.wto.org>)
- 1998: DMCA Digital Millennium Copyright Act introduced for bringing US law into compliance with global copyright laws, and essentially criminalizing copyright infringement.



Criminalizing Copyright Infringement

- DMCA Digital Millennium Copyright Act (1998)
 - It is an offense to circumvent a technical prevention of the copyright. (e.g. DRM, license management software, etc.)
 - It is an offense to develop tools that allow others to access technologically protected work.
 - It is an offense to manufacture, import, or provide, tools that enable others to circumvent protection of copyrighted work technically.
 - **5 Years Jail + \$ 500,000 Fine for each offense**
- Ammendment in Copyright Ordinance, 2000 (Pakistan)
 - Criminal Penalty = 3 years, or fine of Rs 100,000/-, or both
 - Doubled for two offence counts, tripled for three offence counts, etc.
 - Search orders can be carried out by law enforcement without any formal notice from courts

Copyrighting Software

- Software to enable copying of DVD movies ??
- Usually original DVD movies can be played but not copied because the production companies use a technology called Content Scrambling System (CSS)
- DeCSS circumvented the scramble
- Series of litigation cases by movie vendors against owners of DeCSS. Case decided in favor of DMCA proponents
- Movie Vendors also file series of Lawsuits to prevent electronic copy of DeCSS

```
void CSSdescramble(unsigned char *sec,unsigned char *key) {  
    unsigned int t1,t2,t3,t4,t5,t6;  
    unsigned char *end=sec+0x800;  
    t1=key[0]^sec[0x54]|0x100;  
    t2=key[1]^sec[0x55];  
    t3=(*((unsigned int * )(key+2)))^(*((unsigned int * )(sec+0x56)));  
    t4=t3&7;  
    t3=t3*2+8-t4;  
    sec+=0x80;  
    t5=0;  
    while(sec!=end) {  
        t4=CSSt2[t2]^CSSt3[t1];  
        t2=t1>>1;  
        t1=((t1&1)<<8)^t4;  
        t4=CSSt5[t4];  
        t6=(((((t3>>3)^t3)>>1)^t3)>>8)^t3)>>5)&0xff;  
        t3=(t3<<8)|t6;  
        t6=CSSt4[t6];  
        t5+=t6+t4;  
        *sec++=CSSt1[*sec]^(t5&0xff);  
        t5>>=8;  
    }  
}
```



Opponents of DMCA

- Example Arguments

- It gives intellectual property owners too much power .
- It restricts free flow of information.
- It does not allow fair-use
- It can be a person's right to copy or circumvent copying of a copyrighted material (back-up, copy music for different playback devices)
- Why ban something which does not kill (while guns that kill are not banned)

- Some specific scenarios:

- Web-hosting companies will have to remove web-sites that allegedly break copyright law
- File-sharing companies may remove content just on an accusation that a copyright is being infringed.

- User uploads a music file on your web-site without you knowing ... music company can sue you under DMCA, i.e., the website, rather than the file uploader.

- Exemptions

- Audio-Visual work is exempted if used in a library for media studies, for example
- ISP's/web-hosts exempted from liability of infringement if one of their subscriber infringes. However, they must still comply with content removal procedures
- All those exempted who copy a software for maintenance and repair, as long as they delete the files after the operation has been performed

Typical DMCA Notice

My name is **INSERT NAME** and I am the **INSERT TITLE** of **INSERT COMPANY NAME**. A website that your company hosts (according to WHOIS information) is infringing on at least one copyright owned by my company.

An article was copied onto your servers without permission. The original **ARTICLE/PHOTO**, to which we own the exclusive copyrights, can be found at:

PROVIDE WEBSITE URL

The unauthorized and infringing copy can be found at:

PROVIDE WEBSITE URL

This letter is official notification under Section 512(c) of the Digital Millennium Copyright Act (“DMCA”), and I seek the removal of the aforementioned infringing material from your servers. I am providing this notice in good faith and with the reasonable belief that rights my company owns are being infringed. Should you wish to discuss this with me please contact me directly.

Thank you

YOUR NAME

Address

DMCA Notices

- youtube.com/yt/copyright/copyright-complaint.html
- Wikipedia, Scribd ...
- Website owners respond VERY VERY quickly to DMCA notices.

Scribd. | Support Desk login

HOME | GUIDES AND FAQS | SUBMIT A REQUEST | CHECK YOUR EXISTING REQUESTS

Guides and FAQs / General Info / Copyright and DMCA

Immediately report copyright infringements/abuse on Scribd

 Jason posted this on May 08, 2013 03:59 PM

[!\[\]\(dfb84ab3fa4a1b4f28dc01d9af276142_img.jpg\) Share](#) [!\[\]\(7c41baf749615027b9d1195ec275841f_img.jpg\) Tweet <14](#)

Report copyright infringements and abuse on Scribd

If someone has posted your copyrighted content or your personal information to Scribd, use this form to let us know. You will receive a response within 2 **business** days.

If you have any questions about this form, please contact copyright@scribd.com.

THIS IS AN OFFICIAL NOTIFICATION THAT A USER OF SCRIBD (choose one): *

has posted my copyrighted/trademarked work without my permission.

has violated my privacy by posting personal information, pictures, or other private data not in the public record.

has engaged in libel/slander/defamation against myself, my family, or my

Return to Scribd

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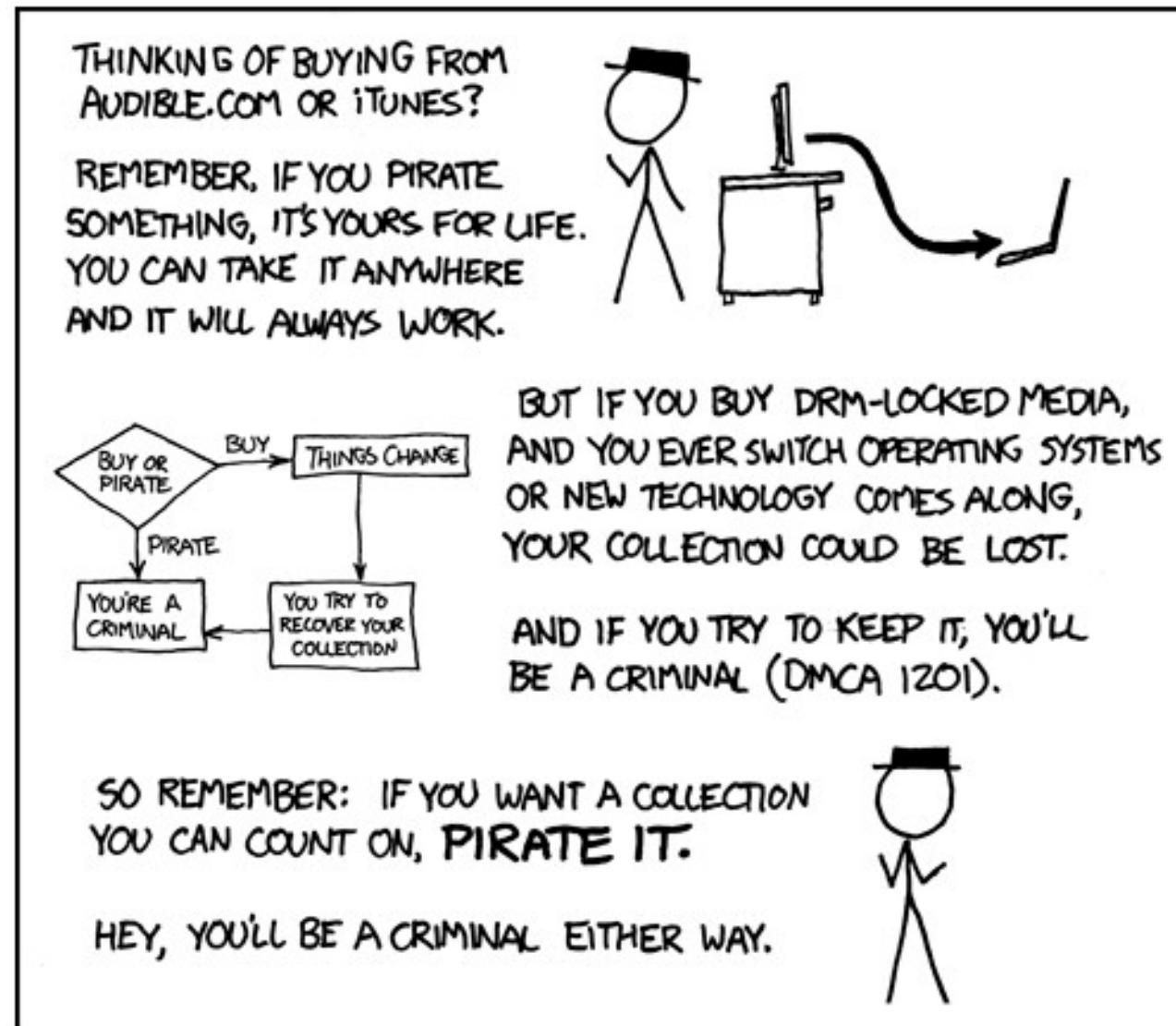
Digital Rights Management (DRM)

- A set of technologies + tools + licenses allowing copyright holders to control the use of digital content and devices “after” they sell them.

Generation 1 DRM:
Curb Copying

Generation 2 DRM:
Curb Copying
Curb Executing
Curb Viewing
Curb Editing

- Participating companies:
 - Amazon, Apple, Google, BBC, Microsoft, Sony, Valve, EA



E.g. of DRM In Software



- CD-Keys, License Servers (See Next Slide)
- Installation limited to specific number of tries
- Persistent Authentication (Always-On-DRM)
- Software Tampering if copy is found un-authentic

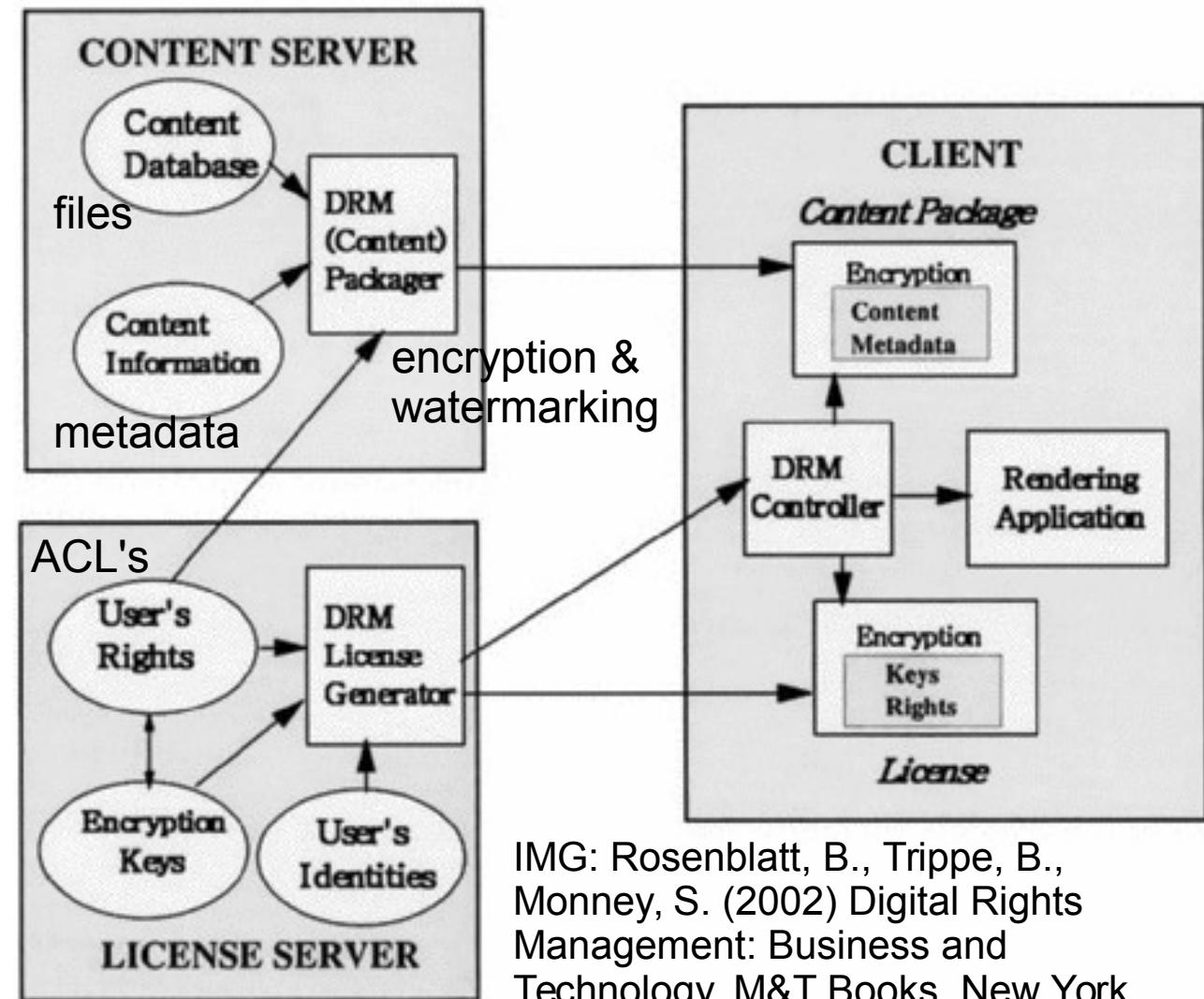
E.g. of DRM In Documents

- Passwords for opening, editing, printing Adobe PDF documents
- Download restrictions on streaming PDF files, E-Book Encryptions
- Image/Document Expiry
- Steganography



DRM Through License Servers

- **License Servers:**
Continuously download new authorization rules through the Internet, and impose those rules automatically on your work.
Concept can also be applied for software
- Content Scrambling System (CSS) for DVD-Players
(Variants exist for BluRay/HD-DVD)



IMG: Rosenblatt, B., Trippe, B., Monney, S. (2002) Digital Rights Management: Business and Technology. M&T Books, New York

DRM Through Trusted Computing

- Embed encryption key in hardware.
- Key is not accessible to the rest of the system/software
- Downloaded software will only execute if matched against hardware based encryption key
- Proponents argue that computers will be much safer (e.g., viruses/malware will not execute)
- Opponents argue that technology will be used to enforce DRM and computer security is just a ploy
 - You will be no longer anonymous on the Internet
 - Whoever controls the TC-protection infrastructure will have “tremendous” control
- Intel, AMD, HP, Dell, Microsoft ... All plan to include trusted computing in coming generation of products

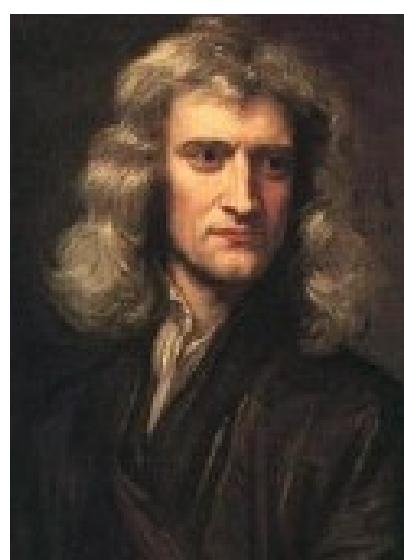
The Ethical Dilemma of Copyright



I REWARD CREATIVITY



- Free flow of Ideas
- Fair Use
- Encourages creativity
- Public Domain
- Copyright system
- Commercial use
- Rewards distributors
- Proprietary content



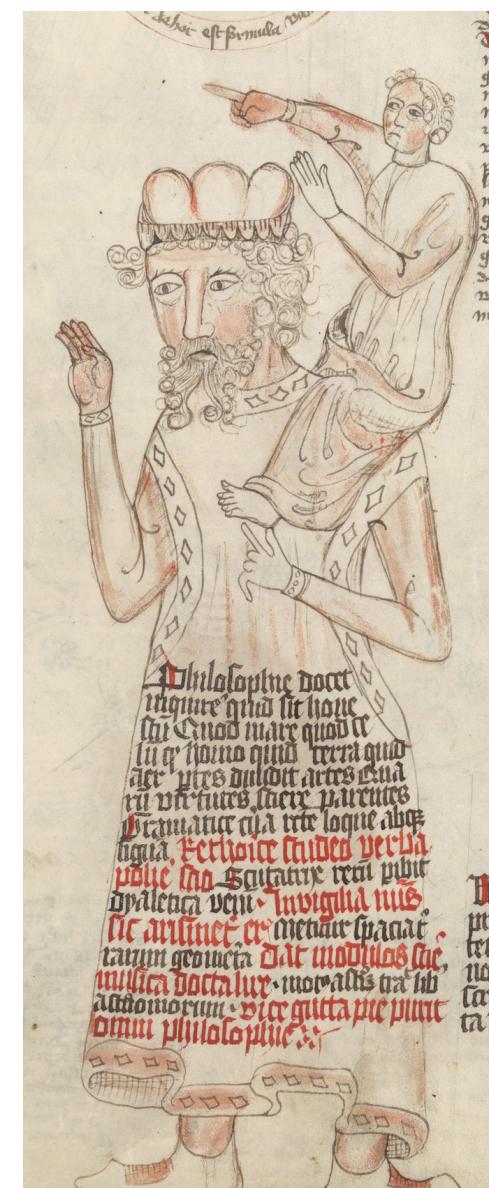
Case for Free Software

"If I have seen further it is by standing on ye shoulders of Giants"

- Letter to Robert Hooke (15 February 1676)

Isaac Newton (1642-1727)

- Science: Open, Decentralized, Participation, Sharing, Collaborations, etc. etc.
- **IT based restrictions not “scientist friendly”**
 - Articles/Books not freely available (copyrighted by publishing houses)
 - Some scientific tools are not free
- **Solution: Free Software**
- Free Software does not attack closed-source software vendors. It is a philosophy against the inadequacies of closed-source software.



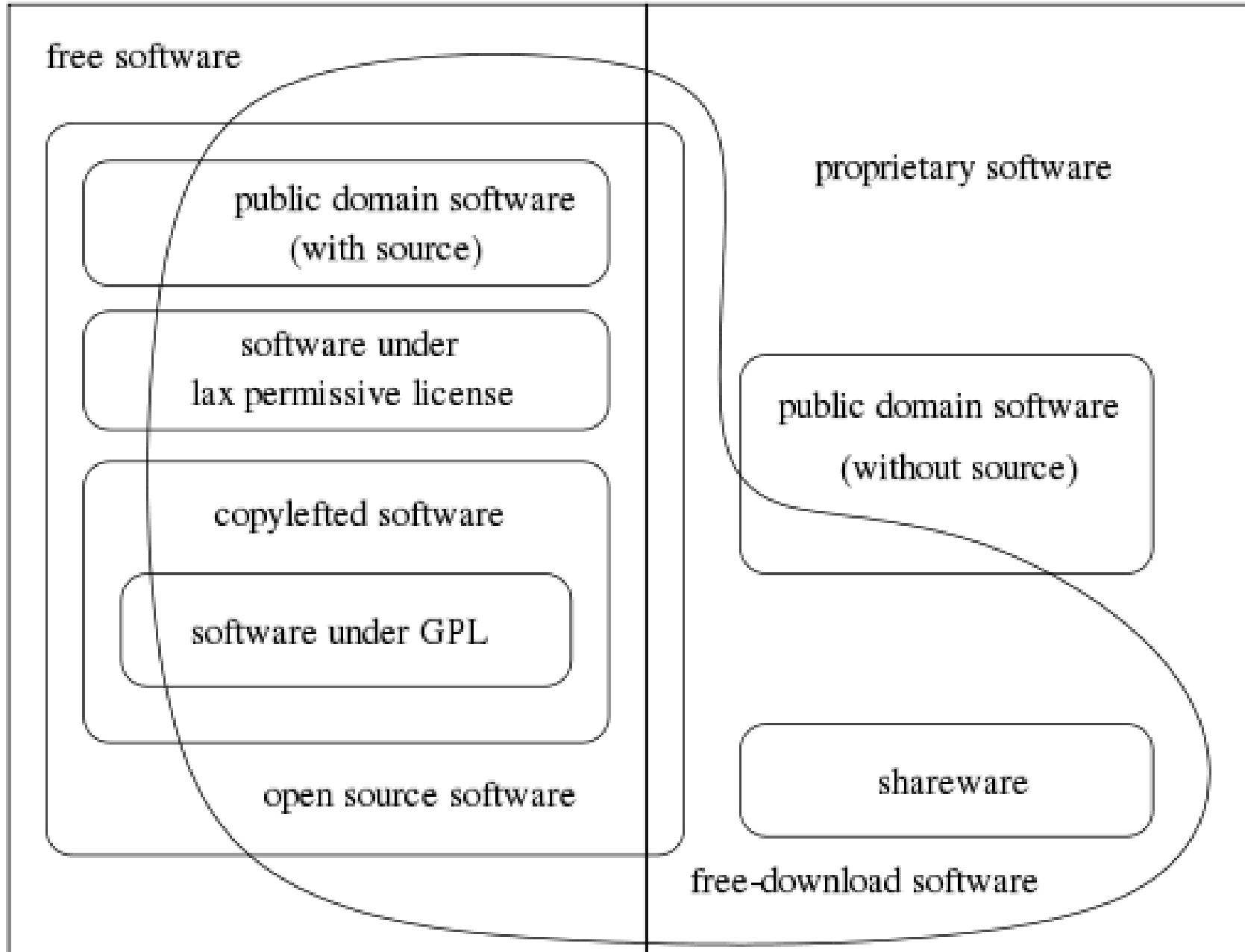
Giant Orion from Greek Mythology

Free Software Definition

by Free Software Foundation

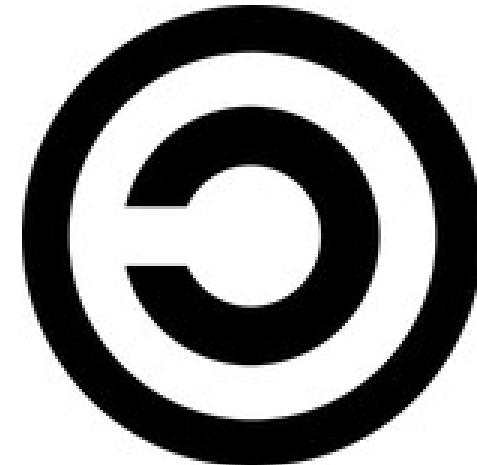
- Free software means software that respects **users' freedom** and community. This means that users have the:
 - **Freedom to run**, // *for any purpose*
 - **Freedom to copy**,
 - **Freedom to distribute**, // *share as it is, or share after changing*
 - **Freedom to study**, // *requires access to source code*
 - **Freedom to change**, // *for improvement. requires freedom to study*
 - **Freedom to improve**
- the software. Thus, free software is a matter of **liberty**, not **price**.
- To understand the concept, you should think of free as in free speech, not as in free beer.

All Types of Free Software



IMG: Chao-Kuei

Copyleft



- Uses same concepts as copyright but instead of restriction/prohibition, copyleft allows freedoms:
 - Freedom 0 – the freedom to use the work
 - Freedom 1 – the freedom to study the work
 - Freedom 2 – the freedom to copy and share the work with others
 - Freedom 3 – the freedom to modify the work, and the freedom to distribute modified, and therefore, derivative works.
- Ordering from 0 to 3 ← C style arrays
- Not all free software use copy-left because of Freedom 3. They prefer Freedom 3 to be more Share-Alike.
- Popular Types:
 - GNU General Purpose License (R. Stallman)
 - Creative Commons (L. Lessig)



LICENSES



TERMS



Attribution

Others can copy, distribute, display, perform and remix your work if they credit your name as requested by you



No Derivative Works

Others can only copy, distribute, display or perform verbatim copies of your work



Share Alike

Others can distribute your work only under a license identical to the one you have chosen for your work



Non-Commercial

Others can copy, distribute, display, perform or remix your work but for non-commercial purposes only.



Lawrence Lessig
(South Dakota,
USA, 1961 -)
Stanford Law
School, Stanford
University

IMG: <http://education-copyright.org/creative-commons/>

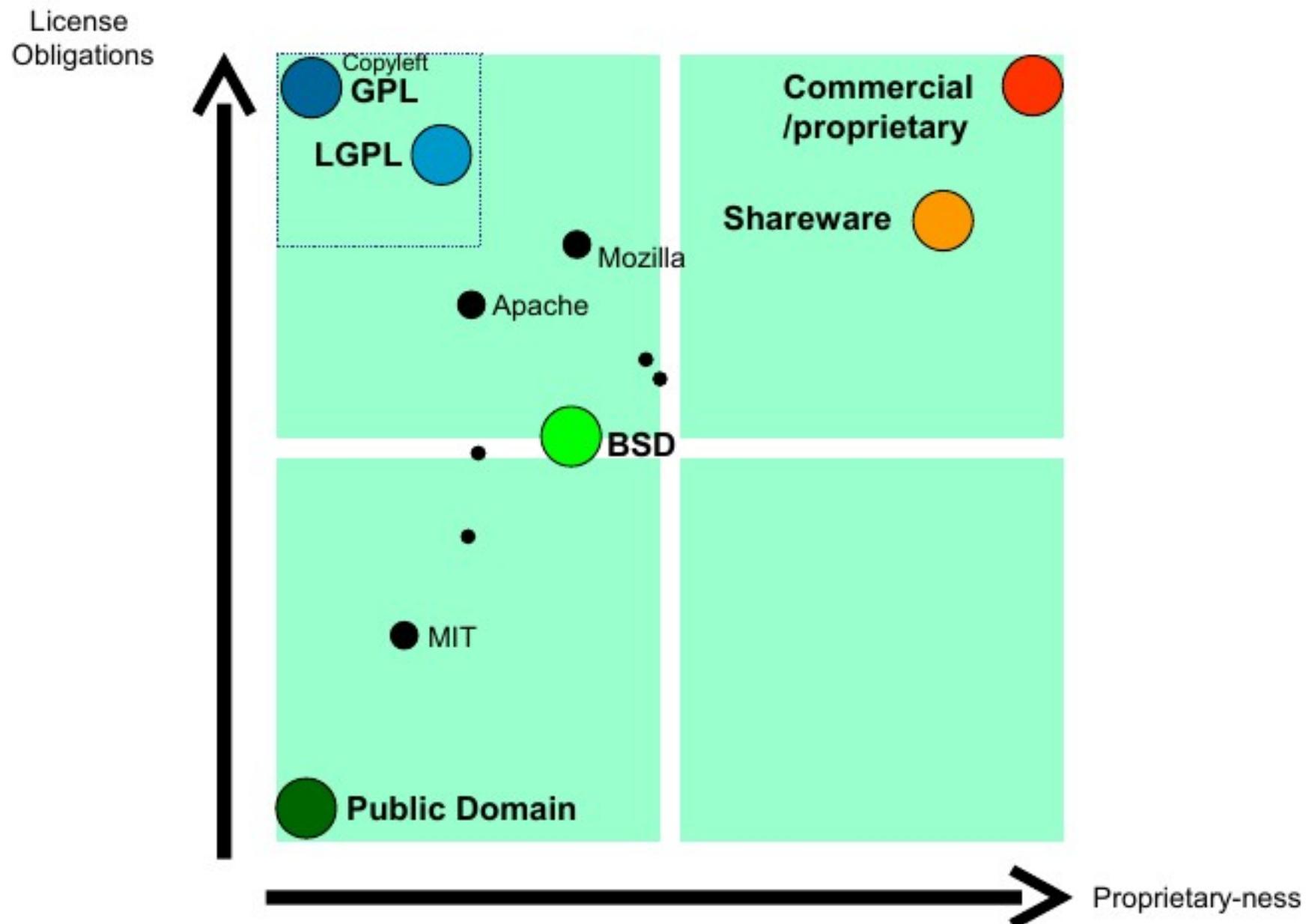
GNU GPL License

- Most widely used ... 65% of free software use GPL License
(Source: Freecode statistics: Aug. 2007)
- Version 1:
 - Source code must always be available with software.
 - Software under GPL can only be merged with permissive free software
- Version 2 & 3:
 - Applicable to cases where software vendor is legally obliged to distribute software in binary form only
 - Patent compatibility added.
 - Clauses added for vendors who provide free software, but restrict them to a single hardware only (e.g. Trusted Computing)

License Summary

License	Distribution	Modification	Patent	
Apache	Permissive	Permissive	yes	
GNU GPL3	GPL3 Only	Copylefted	Copylefted	
GNU Lesser	Restrictions	Copylefted	Copylefted	

Software Licensing Map



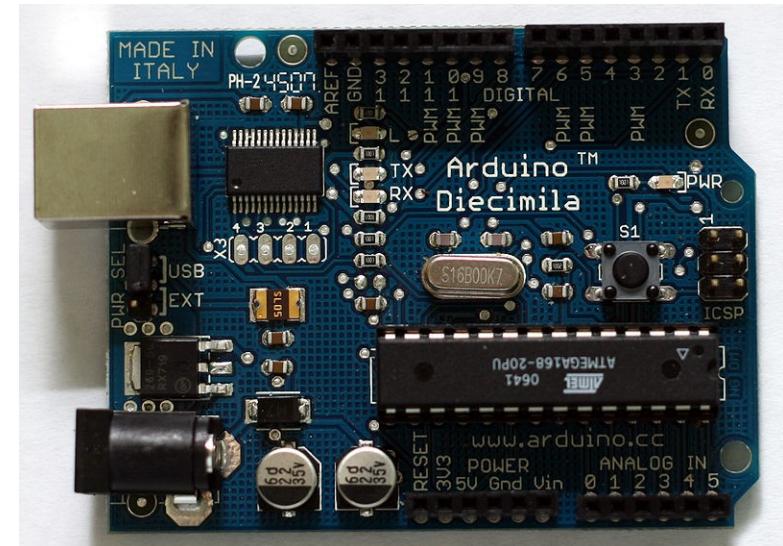
IMG: Norberto Patrignani

Open Source Hardware



- Freely distribute the following when selling hardware:

- Mechanical Drawings
- Schematics
- Materials required
- PCB Layout Data
- Open Source Software Code
- IC Layout Data



Arduino Diecimila Board

- Popularized with the usage of programmable logic devices, (Use Hardware Description Language HDL ← Share this then)

Patents

- Exclusive right granted by a country to an inventor.
 - Helps the inventor to exclude public from making, using or selling his or her invention in that country during the life of the patent.
 - Allows for taking up legal action against violators.
- Unlike a copyright, a patent prevents independent creation as well as copying.
- 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.

What can Be Patented?

- Depends from country to country
- Case: USA
 - Processes, a.k.a Methodologies
 - Machines
 - Manufactured Objects
 - Compositions of Matter (e.g., chemical compounds)
 - Any other thing which is useful, novel, and not immediately obvious to another person having skills in the same field.
- 157,775 patents registered in 2008.
- 157,248 patents registered in 2007.

Software Patents

- Case: USA
 - ~ 20,000 software patents registered per year.
 - Amazon.com patent for “one-click shopping,” based on the use of a shopping-cart purchase system for e-commerce, and then sued Barnes & Nobles who used the one-click approach on their website.
 - Critique: issuance of patents for very mundane processes which are very broad in understanding.
 - Eventually ... out of court settlement.

Copyright Registration in Pakistan



- Instead of legal protection granted by license, copyrights have to be registered in Pakistan.
- Intellectual Property Organization of Pakistan (www.ipo.gov.pk)
- Registers:
 - Copyrights
 - Patents
 - Trademarks

Patents in Pakistan

- Exclusive right to make, use, and sell an invention for a period of 20 years.
- Patent owner has the right to sell the patent to another party before elapse of period.
- What can't be patented in Pakistan?
 - Discoveries of Laws of nature
 - Computer Programs (Software)
 - Perpetual motion machines
 - Literary, dramatic, musical and artistic works.
 - Treatment of human beings, animals, flowers & plants.
 - Purely scientific & mathematical formulas & principles.

Patents in Pakistan

- HEC Program:
 - Valid from July 2006 till date (2014)
 - Patent fee of \$ 5000 bore by HEC if patent is determined to be patentable
 - Online system developed by HEC to ensure confidentiality (progress can be checked online)
- Should patent be registered with IPO.gov.pk or internationally (e.g., US Patents Office)?
 - International Patent (read US Patents Office):
 - Inventor, his/her institution, and country get international exposure, appreciation (not to exclude that it involves more economic benefits)
 - Making benefits from the patent. Local patents don't have much readership.
 - Local Patents
 - US Patents may not have jurisdiction in some areas. As a result, ideas can be copied and re-implemented in those countries.

Patents in Pakistan



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Facilitating Institutes of Higher Learning to serve as an Engine of Growth for the Socio-Economic Development of Pakistan



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IN HEC

HEC RECOGNIZED UNIVERSITIES

E-ACADEMIA

HEC REGIONAL CENTERS

TENDERS

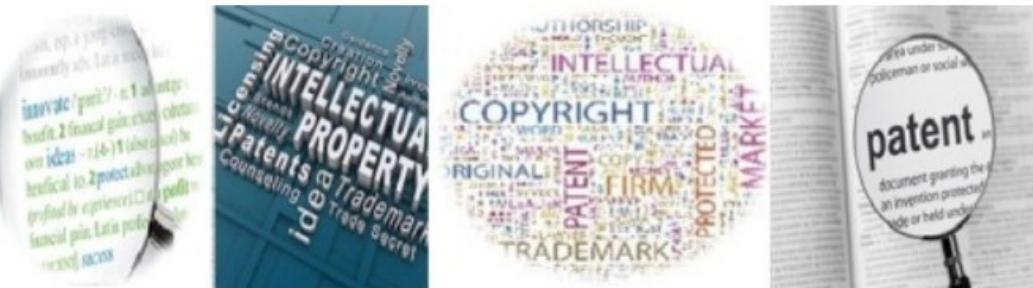
MEDIA PUBLICATION

CAREERS

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Patent Filing

Introduction



At A Glance

[List of Patent Issued.pdf](#)

Preferred Way

You may register to upload your idea / invention in document format(only) on HEC website for evaluation of the committee to determine the patentability of invention

► [Registered User Area](#)

► [New User Registration](#)

<http://www.hec.gov.pk/InsideHEC/Divisions/RND/IP/Patent%20Filing/Pages/Default.aspx>

Plagiarism

- Stealing someone's ideas or words and passing them off as one's own.
- Electronic content on www has compounded this problem
- Not just academia, but literary authors, playwrighters, musicians, journalists, software developers, etc. are accused of committing plagiarism.
- Well defined rules on plagiarism but for many people, there is no clear understanding on what “is” plagiarism, and what is not.

Terminator (84) was Plagiarized by James Cameron. Original story “soldier” by Harlan Ellisson was aired on TV 20 years earlier (1964). Ellisson sued Cameron and an out of court settlement for unknown amount was reached.



Plagiarism

- Plagiarism detection systems allow detection of plagiarized works
 - Used by teachers, corporations, law firms, publishers
 - Work by matching submitted document against a database of many/*millions* of other documents, webpages, and repositories.
 - Popular Services, TurnItIn, Jplag, Sherlock