



Lecture 12: Intellectual Property, Open Source and Software Patents

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This lecture

- Intellectual Property (IP)
- Copyright
- Open Source (OS) software licenses
- Software patents

Intellectual Property (IP)

Overview

- What is IP?
- IP ownership
- Protecting IP

What is IP?

- IP = Intellectual Property
- IP is the result of creative activity and / or innovation arising from use of **human** intellect
 - intangible
- IP is protected by Intellectual Property Rights – IPR
- Two main groups of IPRs:
 - IPRs that permit / restrict a third party's rights to use your IP (copyright & related rights)
 - IPRs that give a monopoly right (patents, trademarks)

Ownership of IP

- The creator of IP and the owner of IP are not necessarily the same
 - E.g. In the UK, employers own their employees' IP (difference UK – EU)
- Ownership position can be varied by contract
- IP can be jointly owned by a number of creators
- Ownership transfer (assignment) must be in writing

Students and IP

In the University of Edinburgh, original IP generated by a student during his or her studies is owned by the student

BUT this is not necessarily the case:

- in other higher education institutions: policies differ
- In commercially sponsored studentships
- If there is a contribution of the institution's employees to IP
- for students who are also employed researchers

Rights to protect IP

- Copyright ©
 - applies to **original** literary, dramatic and musical works incl. software and computer-generated works
- Patenting
 - limited application to software
- Database right
- Others
 - trademarks (TM v ®), domain names, design rights, know-how, semiconductor topography rights

Rights to protect IP

- Ideas
 - no automatic protection for ideas per se
- *More and more "process organizations" and "architectures to achieve a solution"*
 - *this way software is protected quite often indirectly*

Copyright

Overview

- What is copyright?
- Copyright in more detail:
 - Ownership
 - Duration
 - Infringing acts
 - Defences
- Copyright and Information Technology
 - Copyright and computer programs
 - Copyright and the internet
 - Copyright and databases

What is copyright?

- Copyright is an Intellectual Property Right
- Copyright comes into existence with the work
 - no need for registration (exception: possible in US)
- Subject matter includes **original** literary, dramatic, musical and artistic works (LDMA) but not ideas *per se*
- Literary Works include computer programs and compilations

Copyright in more detail

- Who owns the copyright?
 - Author/Employer/Publisher
 - Not always straightforward
- Duration of Protection
 - Lifetime of author plus 70 years for LDMA works (Literary, Dramatic, Musical, Artistic)

Infringing acts

Primary: individual

Secondary: commercial

- Copying the work
 - Reproduction in any form including in an electronic medium and transient reproduction
- Issuing copies of the work to the public
- Rental / lending the work to the public
- Performing the work in public
- Communicating the work
- Adapting the work

Defences

- Sometimes described as “permitted acts” with respect to work that you are authorized to use
- Educational copying (limited)
- Decompilation of computer programs for certain uses: interoperability, error correction, security research, fair dealing.
- Fair Dealing:
 - Non-commercial purpose (previously research)
 - Private study
 - Criticism/review
 - Reporting current events

Copyright and computer programs

- Copyright protection extended to computer programs in 1992
- Protection for lifetime of Author plus 70 years
- What will infringe the copyright in a computer program
 - The copying of a “substantial part”
 - Hinges on the quality (originality, importance), not quantity (lines)
- Lawful use of copyright protected computer programs
 - Making a back-up copy
 - Decompiling a computer program for certain uses (see previous slide)
 - Adapting for lawful use i.e. correcting errors
 - Observe, study or test to determine underlying ideas

Copyright and the internet

- Challenges of modern Internet – YouTube etc
 - Need to obtain rights clearances
 - Control of uploaded material
- Especially during "Lock-Down" many people (especially Churches) struggled how to properly use copyrighted material (never done before)

Copyright and databases

- Database = “a collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means”
- EU Databases Directive in 1996 = Copyright and Rights in Databases Regulations 1997
- Protection in two parts:
 - Copyright protection for “**structure**” of database
 - Structure = method of arrangement involving intellectual judgment
 - A new **database right** - specific right for the **contents** of the database (see next slide)

Database right (different IPR than copyright)

- Right to maker of database to prevent unauthorised extraction/utilisation of the database contents
- Extraction
 - transfer of a substantial part of contents to another medium
- Re-utilisation
 - making available a substantial part of the contents to the public by distribution of copies
- Protection lasts for 15 years since last update
 - ⇒ “living” database = potentially indeterminate protection
- William Hill case (<https://cms-lawnow.com/en/ealerts/2005/07/database-rights-recent-judgment-from-the-court-of-appeal>)

Conclusion

- Copyright is oriented towards “works” like texts or plays or paintings
- It does protect software
- Databases have more specific provision

Activity 1

Alex is exceptionally good at organizing and summarizing lecture notes. Alex decides to create comprehensive study guides based on the course lectures and textbooks for a particularly challenging computer science course. These study guides include summaries, infographics, and occasionally, Alex's own explanations to clarify complex topics.

Alex begins selling these study guides online to other students at different universities. The guides quickly become popular, helping many students understand difficult concepts better. However, the professor of the course discovers Alex's side business and raises concerns, as the guides are derived from her lecture material and the course textbook, which she partially authored.

Activity 1

Go to **wooclap.com** and use the code **RSHFSC**

Who do you think owns the copyright of the study guides Alex created?

- 1 Alex 0% 0
- 2 The professor 0% 0
- 3 The university/professor and Alex 0% 0
- 4 The university 0% 0

wooclap 100% 0 / 0

Activity 2

Sophia and Jack are Masters students in computer science at a university known for its cutting-edge research in artificial intelligence. They are working on their thesis project together, which involves developing an advanced predictive analytics tool that integrates machine learning techniques with real-time data processing. To make their project more efficient, Sophia suggests using a popular LLM, GPT-X, to aid in generating some of the initial code for data preprocessing and integration. Jack writes the initial prompts and feeds them into the LLM, which outputs several hundred lines of Python code. The students then refine and integrate this code, significantly enhancing the functionality with their algorithms focused on predictive modeling.

Activity 2

Go to **wooclap.com** and use the code **RSHFSC**

Copy participation link

- 1 Sophia and Jack 0% 0
- 2 The university 0% 0
- 3 The creators of GPT-X 0% 0
Click on the projected screen to start the question
- 4 No one 0% 0

wooclap 100% 0 / 0

Open Source (OS)

Overview

- Introduction to software licensing
- What is OS?
- Key features of OS Licences
- Risks of OS and how to manage them

The need for licensing

- Intellectual property rights in software
 - copyright
 - patents
 - database rights
 - etc
- Copyright Infringement
 - copying, using or storing the whole or a substantial part
 - quality, not quantity
- Software licences legitimise acts that would otherwise amount to copyright infringement

Proprietary software licensing

- Supplier-biased terms, e.g.:
 - Tight licence grant (limited scope of use, number of users etc.)
 - Closed source
 - Licence Fees, royalties, duration and termination
 - Strict limitations on liability
- Customer-biased terms, e.g.:
 - Software warranties
 - IPR Indemnities
 - Source Code Escrow: Ensures the customer gains access to the source code if the vendor goes bankrupt or stops supporting the product.

What is OS?

- OS is a type of license for software which makes the software **free** to view, modify, use its source code or other design material, subject to certain conditions (depending on specific license)
 - "free" as "free speech" (freedom) rather than "free beer" (zero cost)
 - Usually free also in terms of cost, but paying for enterprise-level support, professional services, specialized features, or integration

OS- the legal view

- Just another type of software licence
- Typical features:
 - Full access to source code
 - Right to modify code and to distribute
 - 'Sharing' of modified code through the same terms
 - Little warranty protection
 - Licence often at no charge (but often with support or other charges)

OS- the developer and business view

- Highly collaborative development model
- Rapid evolution of software across the community
- 'The Cathedral and the Bazaar' introduced the ideas
- Cheaper alternative to proprietary software
- Has moved to more organised models with quite stable communities.

Standard form OS licenses

- A range of standard form licences
- Some examples:
 - GPL – the Gnu General Public Licence
 - BSD – the Berkeley Software Distribution
 - MPL – Mozilla Public Licence
 - Apache, MIT, etc.

Software licensing and risk

- Open Source is an area of legal risks for developers and users
- 75% of developers “borrow” code from 3rd parties
- Evaluating risks is key to choice between Open Source and proprietary software

Key risks of OS licensing

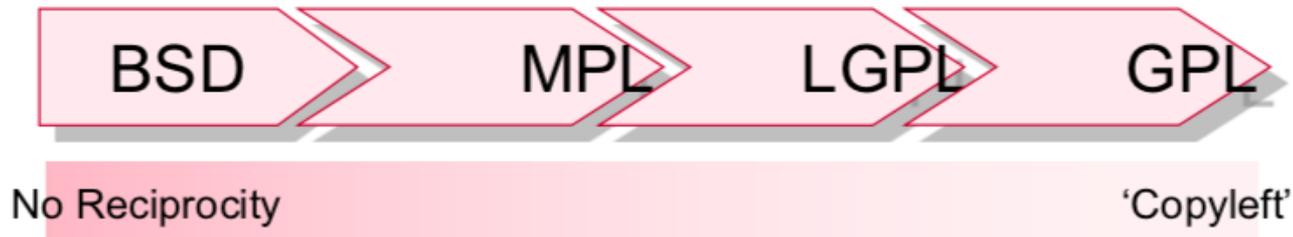
- Risk 1 - IP infringement claim
 - IP Indemnity protection (or lack thereof)
- Risk 2 - Limitations on onward exploitation
 - Reciprocity (the 'forcing restriction')
 - Managing the risk

Risk 1: IP infringement

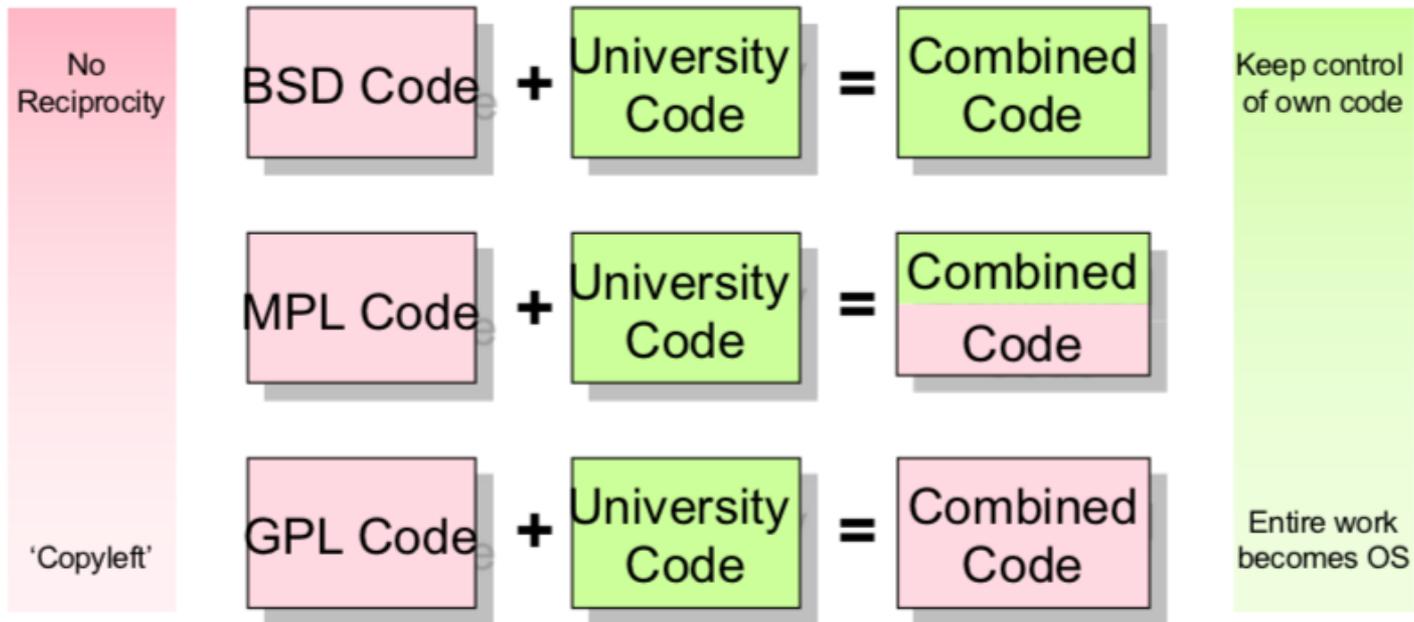
- Nature of OS development
 - Complex history with many contributors
 - Hobbyist developers may take 'short-cuts'
- Potential for allegations of copyright infringement
- Potential risks / restrictions in onward exploitation of modified code
- Needs to be dealt with as an additional business risk

Risk 2: Reciprocity (developers only)

- What happens if a university researcher uses OS in developing research results / new software?
- Do you have to license the derivative works on same basis?
- Main difference between Licences is treatment of derivative work



OS licence comparison



Managing OS risk

- Create an internal OS policy
- Inform and educate developers / key relevant research groups
- Carry out an audit of open source use prior to exploitation of end “product”
- Create an audit trail for future use / licensee diligence
- Consider the risk in licensing on software containing open source code
- Reflect use of open source software in licence terms
- Limited warranties / no indemnity
- Include appropriate “reciprocity” provisions, if required

Software Patents

Overview

- What is patenting?
- How can a patent be granted?
- Patenting computer programs in UK/ Europe/ US

What is patenting?

- Patent protection is granted to inventions
- It gives the patent holder a negative right of monopoly
- It is a deal between the 'inventor' and the State
- Useful reference: [Thomson Reuters Practical Law on Software IP Protection](#) – particularly useful on the difficult issues on patents

How can a patent be granted?

- Unlike for copyright, the inventor must apply for a patent at the Patent Office
 - Expensive, difficult

Must demonstrate that the invention is:

- Novel
 - not in public domain
- Non-obvious
 - not obvious to someone skilled in the art
- Have industrial application ('technical effect')

Patenting computer programs

- Patenting computer programs per se is specifically excluded in many states (like the UK and the EU). In many states it is theoretically possible (US), but...

<https://www.dwt.com/blogs/startup-law-blog/2020/11/how-to-patent-software#:~:text=Under%20the%20current%20state%20of,and%20processes%20performed%20by%20it.>

- Patents **are** granted in respect of algorithms, special arrangements, architectures, etc.
 - This is a kind of "work-around"

Patenting in the US

- Much more straightforward
- Possible to lodge claims covering the program itself
- Microsoft alone holds thousands of patents for computer programs
- In US more than 10,000 applications filed annually

Keeping inventions strictly confidential

- Disclosure into the public domain prior to filing a patent application = lack of novelty for your invention
- Control disclosure of commercially sensitive/patentable technical information
- Use confidentiality agreements - 6 months novelty extension
- Disclose object code, not source code

Conclusion

- Patents are straightforward in the US
- More and more things have software as part of the invention and so software is increasingly patented in Europe and the UK.
- But, the situation is still in flux. For a clear summary, see: <https://fsfe.org/activities/swpat/swpat.en.html>

Activity 3

Suppose for example that a company has developed an innovative computer game called Spookcatcher. The game is marketed in packaging that features the name superimposed on the image of a ghost. It comes with an add-on device that the company has invented called a wailer. This attaches to the computer and emits very convincing ghostly wails at suitable points in the action. The software uses some clever data structures developed within the company that make it possible to achieve very high performance.

Bott, Frank. Professional Issues in Information Technology, BCS Learning

Activity 3

Go to **wooclap.com** and use the code **RSHFSC**

Which of the following apply in this case?

Copy participation link

- 1 Patents, to protect the new device and data structures 0% 0
- 2 Patents, to protect the computer game 0% 0
- 3 Copyright, to protect the main concept (idea) behind the game 0% 0
- 4 Copyright, to protect the source code 0% 0
- 5 Trademark, to protect the new device and data structure 0% 0
- 6 Trademark, for the branding 0% 0

Click on the projected screen to start the question

wooclap 100% 0 / 0

Reading

- **Essential:**
 - Professional issues in information technology by Frank Bott:
 - Chapter 11: Intellectual Property Rights
 - Chapter 12: Software Contracts and Licences
 - A Rulebook for Arguments by Anthony Weston:
 - Chapter 3: Arguments by Analogy
- **Recommended:** browse through [Thompson Reuter Practical Law on Software IP Protection](#)