Unit 4

Programs

Open Source and Licensure

Legal Disclaimer
Copyright laws, licensing, and related subjects are very complicated and require a law degree to fully understand. As such, the information in this document will be simplified to explain the concepts of information ownership. No information in this document was written by a lawyer and should not be taken as legal advice.

Intellectual Property (IP)
Consider the following situation:

You own a company that produces self-driving cars. These self-driving cars use a state-of-the-art piloting system that has been shown to operate with a 0.03% chance of failure. (Failure means breaking traffic laws, crashing, etc.) This piloting system took 10 years of development and cost over 1 Billion dollars. To protect it, your company patented it, meaning that only your company is legally allowed to produce it for the next 14 years. When your company released its car to market, it felt a logo was necessary for people to recognize your brand. To keep other people from using your logo, your company trademarked the logo.

Your company currently has 100 cars in a warehouse waiting to be shipped to new customers. Your company also owns millions of dollars of expensive computer equipment, which it houses at its headquarters.

In this situation, both the 100 cars and the piloting system are property of your company. The piloting system, however, is a special type of property—intellectual property.

Intellectual property is property that is intangible—meaning it cannot be touched. Examples of intellectual property include
- Songs
- Patents
- Copyrights
- Trademarks
- Works of Art
- Works of Literature

In the United States, as well as many other countries, stealing one of the cars in the warehouse or computer equipment from company headquarters would be illegal. It is an example of theft because someone is blatantly stealing your property.

Similarly, it would be illegal if someone put your logo on their self-driving car and tried to sell it. This is also an example of theft—theft of intellectual property because the thief took your logo and is using it without permission. This type of theft is called trademark infringement.

Another example of intellectual property theft is someone manufacturing and selling self-driving cars that use your patented piloting system. Because you own a patent on it, the U.S. government will recognize that you own that intellectual property for a specified number of years after the patent was obtained.

Hacking and Piracy

Hacking

Piracy

Theft of intellectual property is often referred to as "piracy." Piracy is a big issue for people and companies whose livelihoods depend on intellectual property. It is even worse for creators of digitally based IP like music and software for one main reason:

Digital music files and software, like any other form computerized data is ultimately stored as a long sequence of 1's and 0's. Once you have a single copy of a song or a piece of software, you can make an infinite number of copies easily and at virtually no cost.

It is for this reason that piracy of digital IP is very hard to defend against. You are relying on the honesty and integrity of every individual who buys the software to not copy your intellectual property.

To make matters worse, piracy is very hard to police because of the internet. People in many countries—including ones that have lax piracy laws—have access to the entire internet. If U.S. law enforcement found a piracy website that was hosted in France, they would have to rely on the cooperation of the French Government to take down the website and prosecute those responsible for it. Most countries cooperate in these situations, but there are inevitably ones that do not. In any case, the process takes a long time, allowing the piracy to continue.

The Importance of Protecting Intellectual Property

If no attempts to stop piracy were made, creating intellectual property like music or software would cease to be profitable. No companies would spend billions of dollars developing innovative and useful new software if they could only sell it to the few honest individuals willing to buy a copy. Protecting intellectual property keeps its production profitable. As long as producing new IP is profitable, we will continue to see companies innovate and develop new property to satisfy us, the consumers.

Anti-Piracy Measures

Fortunately, companies that produce IP like software can combat piracy despite the ability of anyone that has their IP to infinitely copy it. The main technique used is called "licensing."

Licensing
In a capitalist economy like that of the united states, when you buy a product like a power drill, you own that product. That physical object is now your private property. You can destroy it, resell it, modify it, repair it, and anything else—so long as it is legal.

You may then wonder, "If I buy a copy of software like Windows 10 to put on my new computer, is it not then my property? Can I not copy it, modify it, or resell it?"

The answer is somewhat counterintuitive:
Windows 10 is the intellectual property of Microsoft. When you "bought a copy of Windows 10," Microsoft did not sell you its intellectual property. Instead, Microsoft sold you a license to use Windows 10. The license to use Windows 10 is your property, but Windows 10 is not.

This example demonstrates the concept of licensing. By selling licenses to use software, companies can maintain ownership of their IP and acts of piracy can be easily identified.

Additionally, companies can design their software in a way that it will not work unless you purchase license from them and enter a license key during setup. Companies can then maintain a list of valid licenses and make copying the software without purchasing a license useless.

It should be noted that this solution is not without its flaws. Many criminals put large amounts of effort into circumventing special measures put in place by software companies to make users purchase a key before installing their software.

Open Source Software
There is a large movement in the software industry that believes all people should have access to capable software for free. The free and open source movement is made up of thousands of people who attempt to further that cause. Open Source software is unique because the source code is freely available. Some open-source software is licensed and sold. Some notable examples of open-source software are listed below:
- Mozilla Firefox, a popular web browser
- Linux-based operating Systems
- Apache HTTP Server, a popular web server
- The OpenOffice suite, a popular alternative to the Microsoft Office suite

Advantages of Open-Source Software
There are a few distinct advantages of open-source software. Most of these advantages come from the fact that many different people are involved in the development and maintenance of open-source software. Listed Below are some advantages of open-source software.
- Transparency

Since the source code is freely available, it is unlikely that developers of popular open source software will get away with adding unwanted or malicious features in their software because someone is bound to blow the whistle.

- Security
  With large communities working on a piece of software, security holes are more likely to be found and patched more quickly than with some companies. Keep in mind that this is not always the case.
- Faster Updates and Bugfixes
  Because open-source communities do not run on a company's schedule, updates that fix bugs or add new features are often released more quickly.
- Cost
  Open-source software is almost always provided for free.

Open Source Licensing

Open source software is still intellectual property even if its creators do not choose to charge money for it. For this reason, open-source software is still released under a license. There are many different types of open-source licenses—each with its own stipulations as to what you can and cannot do with software. A couple common stipulations include:

- Prohibiting Modification and Redistribution
  Some open-source licenses may stipulate that you cannot modify the code and redistribute it.
- Prohibiting Commercial Use
  Some open-source licenses may stipulate that you cannot use the software commercially (i.e. to make money).

Keep in mind that open-source does not always mean free.

For example: Some distributions of the Linux operating system are open-source but charge a yearly fee for a license. In exchange for the yearly fee, you gain access to professional tech-support with the distribution along with the license to use the software commercially.