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Final Homework Assignment
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Balancing Private Intellectual Property with the Public Domain

a review by Chuck Mann of the book

The Future of Ideas: The Fate of the Commons in a Connected World

by Lawrence Lessig
Random House, 2001, 352 pages

Synopsis:

In his new book, *The Future of Ideas*, Stanford Law Professor Lawrence Lessig identifies a "digital commons" implemented in the Internet and contested by the old, entrenched commercial interests versus the new, technology innovators – the Old struggling to maintain their control and the New fighting for freedom and openness. Professor Lessig supplies numerous examples of real-life situations and carefully-crafted arguments to persuade the reader of the necessity to balance control and freedom of the digital commons for the good of society and how technological and legal changes can subtly alter that balance.

He warns us that the free exchange of ideas and innovative technology is being suppressed by the entrenched commercial interests protecting their old way of doing business. Current changes in intellectual property law are stifling the development of creativity, innovation, and free expression – not protecting and enhancing it.

Lessig seeks to strike a balance favoring decentralized innovation without having too much power concentrated in the private sector. He envisions a commons that is not dominated by either government or corporate entities.

Biography: Lawrence Lessig is a Professor of Law at Stanford Law School and founder of the School's Center for Internet and Society. Prior to joining the Stanford faculty in 2000, he was the Berkman Professor of Law at Harvard Law School from 1997 to 2000. Lessig was also a Fellow at the Wissenschaftskolleg zu Berlin 1999-2000, and a Professor at the University of Chicago Law School from 1991 to 1997.

Lessig earned a BA in Economics and a BS in Management from the University of Pennsylvania in 1983; an MA in philosophy from Trinity College, Cambridge University in 1986; and a JD from the Yale Law School in 1989.

He authored *Code and Other Laws of Cyberspace* in 1999.

Lawrence Lessig

Book Review:

New versus Old; Entrenched versus Upstart: It is an age-old story of struggle. Professor Lessig's new book explores the dynamics behind the battle between the established, incumbent businesses and the new innovators over intellectual property and basic freedoms on the electronic battlefield of the Internet.

The setting of *The Future of Ideas* is within the notion of "commons" which Professor Lessig defines as resources held communally to which anyone has a right without obtaining the permission of anyone else or to which permission is granted in a neutral, non-discriminatory way. Examples of familiar commons are the public streets and parks. Anyone has access to the streets and parks without having to obtain permission from anyone else. For the most part, no one has to pay a fee to use the public streets and parks. Or, if they do, the fee is applied neutrally and consistently. Lessig refers to this as a "free" commons in the sense that everyone has the freedom to access it with no one having the exclusive right to choose whether the resource is made available to others. It is held and used for the common good.

The commons addressed by Professor Lessig is the collection of resources essentially found implementing and via the Internet. This digital commons is distinctly different from the commons of our streets-and-parks example in the property of "rival," i.e. consumability. People attempting to use the streets and parks are competing for those limited resources. If everyone tries to use them at the same time, traffic jams ensue on the streets and the parks are overcrowded without enough space to go around. One person's use of the resource reduces another's ability to use that same resource. That person's use *rivals* another person's use. However, the use of information or an idea is *nonrivalrous*. One's use of an idea does not diminish another person's ability to use an idea just as one's use of language does not reduce another's use of language. This type of resource is not exhaustible.

The digital commons of this book is a set of nonrivalrous resources to which unique laws apply. Lessig develops the argument that the nonrivalrous intellectual property of this commons cannot and should not be considered like physical, rivalrous property. The same protections are not required, and that equivalence view is leading us to overly protect and restrict intellectual property to the detriment of society.

Control for rivalrous resources is required to both ensure that there is sufficient incentive to produce the resources and to make sure that consumption by some will leave enough of the resources for others. Whereas with nonrivalrous resources, control is needed to only assure that the resource is created in the first place. For once it is created, a nonrivalrous resource cannot be undone. It is inexhaustible.

Lessig points out that the framers of our Constitution intended to foster an environment where ideas could flourish and quickly be brought into the public domain where they would further inspire new ideas which would benefit society as a whole. They never intended for ideas to be hoarded and locked away. When Thomas Jefferson, the first patent commissioner, helped to frame the Constitution, the term of a patent was set for only four years, but was quickly extended to fourteen years. The duration and scope of patents remained fairly stable for the first two hundred years of the nation. Today patents are good for twenty years.

The copyright clause of the Constitution permits Congress to grant authors an exclusive right for limited times. The trend with copyrights has been to both broaden the scope and to increase the duration of their protection while making them easier to obtain and hold. Copyrights for every creative act that has been reduced to tangible medium can now last upward of 150 years! This is well beyond the usefulness to the author, and is a detriment to society who should have this material in the public domain to foster further creativity based upon these materials. Lessig describes our present situation as a struggle over ideals and the rules that should govern our freedom to innovate. This law professor describes it as a *constitutional* question over whether we are to remain a free society in the digital age or whether we will allow our fundamental values to be changed.

The Internet is the embodiment of the digital age commons. It is the commons of Professor Lessig's book in which he addresses three distinct layers of the Internet for his analyses. The bottom layer is the *physical* layer. It is the hardware of the communications system – the computers and cables that physically connect everything together. Above this is a middle, logical layer called the *code* layer that contains the software to implement the protocols of the communications system. The top layer is the *content* layer. The content layer contains the actual information that gets communicated across the network – electronic messages, digital images, video, voice, and any other new data forms that innovators may develop.

Professor Lessig explains the unique relationships that are possible among these three communications layers. Each of these layers could be either controlled or free (i.e. owned or organized in a commans). Examples he gives on page 25 of his book are as follows:

Communications System:	**Hyde Park**	**Madison Square Garden**	**Telephone System**	**Cable TV**
Content **(Top Layer)**	Free	Free	Free	Controlled
Code **(Middle Layer)**	Free	Free	Controlled	Controlled
Physical **(Bottom Layer)**	Free	Controlled	Controlled	Controlled

The Speakers' Corner of Hyde Park in London is where anyone is free to make a public speech about whatever they want. Access to the physical layer, the park, is free. The code layer, the spoken language such as English, is free. And, the content, what the speakers say is free to be whatever they want.

Madison Square Garden in Manhattan is a stadium where games are played. Access to the physical layer stadium is controlled by the owners who charge a fee for its use, and they exercise their discretion to pick and choose whomever they wish to have access. It is not free to all comers. However, like Hyde Park, the code layer of the spoken language and the content layer of what game and how it is played are free. So a system based upon a private physical layer supports a commons comprised of a free code layer and a free content layer. This is a similar model to the Internet. The physical layer of computers and cables is owned

privately by various companies and entities around the world, while the code and content layers – although originally free – are becoming more of a mixture between free and controlled.

The old telephone system was a regulated monopoly that owned both the physical and code layers. The equipment from end to end was owned by the telephone company. The code layer that determined how the messages where handled and processed was owned by the telephone company. But, people were free in the content layer to say whatever they wanted. Lessig argues that the Internet is moving in the direction of this model as Internet Service Providers (ISPs) restrict more and more of what is allowed in the code layer. Those who control the wires can control the code layer.

The cable TV companies control all three layers beginning at the bottom with the physical layer. For example, cable networks now require everyone getting access to the cable to go through a small number of controlled ISPs which the cable companies control. The long-distance carrier for the Internet is the "backbone provider." The choice of the backbone provider and the route to the backbone has been taken away from users. It is bundled in with the access. The code layer is coming under increased control as technology firms such as Cisco develop technology that enables more control over the network instead of permitting it to be nondiscriminatory and a neutral commons. With this increased control in the code layer, the cable companies use it to restrict the material that is permitted in the content layer. Instead of allowing the end-to-end openness of the original Internet, these companies have become gatekeepers restricting what used to be free.

Professor Lessig gives several examples of this shift. The cable companies have a conflict of interest when it comes to using the Internet for streaming video. Some limit the time a customer may use streaming video connection claiming that there is not enough capacity for all of its customers to use it. Again, capacity limitations are cited to prohibit customers from operating a web site saying it would attract too much traffic. But, here too, the access provider has a conflict of interest since it is also offering a web site hosting service. Some access providers do not permit home networks where two or more computers connected together in a home network share access to the Internet. They force the homeowner to purchase access for multiple computers.

These arguments build to the thesis of Professor Lessig's book that he describes in his own words as:

> My claim so far can be summarized like this: When the Internet was first born, both norms (among core network facilities) and law (restricting the telephone company) effected an end-to-end environment. This created the initial neutral platform. But as the Internet moves to broadband platforms, neither norms nor the law require network providers to preserve the same innovation environment. The trend instead is toward control – toward layering onto the original code layer of the Internet new technologies that facilitate greater discrimination, and hence control, over the content and applications that can run on the Internet. The Net is thereby moving from the principle of end-to-end that defined its birth to something very different. [pg. 161]

And that "something very different" may be bad, so we must be vigilant to guard our freedom of access to a commons of ideas and our freedom to innovate and improve society through this technology.

The improved technology permits more stringent enforcement of the copyright laws and allows some companies to reach beyond intentioned limitations of Congress on the copyright laws. Professor Lessig contrasts the practical reach of copyright enforcement in a college student's dorm room with that of the student's web page. Within the dorm room intellectual property may be used is various ways without obtaining the permission of the original authors. For example, there may be taped copies of old LP records, posters of rock stars taped to windows, books borrowed from friends, photocopies of class material or chapters from assigned texts, song lyrics written on notepads, pictures of cartoon characters on the wall, and even computer icons based upon cartoon characters. Not all of these uses are impermissible, although these unlicensed and uncompensated uses occur without the express permission of the copyright holder.

However, similar uses of copyrighted materials on the student's web page are more restricted because technology makes their detection much more available than is possible in the dorm room. Computer programs called Bots can scan the Internet and detect the materials the student has posted on his web page. The copyright holders, or their agents, can now go after the student and shut down his site over what – in real space – would be "violations" that do not actually matter much. The friction in real space sets the law for real space which would indicate that there is no meaningful violation at all. Lessig points out that in fact there is little difference between the infringement in either real space or cyberspace. With the billions of pages on the Internet, it is very unlikely that someone would actually see the student's web page. More people in fact may see the student's poster in the dorm room than would see a copy of it on his web page. So the infraction is not greater on the web page, but the enforcement of the copyright is much more easily done against the web page than it is for the dorm room. The potential for use of intellectual property on the Internet is more perfectly controllable. Material that is permitted in real space, because laws permit it or because it is too costly to track, becomes more controlled on the Internet.

Software companies are further using contract law to circumvent the intended limitations of the copyright law. Under the US copyright law, reverse engineering a program to see how it is written is permissible as a "fair use." But, many license agreements under which software is sold prohibit the purchaser from reverse engineering the product. Additional rights that the purchaser would normally have over the software product by way of the copyright law may be expressly waived in these required license agreements. So by contract, the materials become even further controlled by the intellectual property owners. Lessig asks if this is progress if every use must be licensed. Although the property owners benefit, society and the ordinary users have a greater cost.

But, copyright law and contract law can be combined to accomplish another end. The General Public License (GPL) of the Free Software Foundation was the original open code license. It renders GPL code and any code derived from the GPL code to be free. Anyone can use or modify GPL code as long as all recipients of your modified code are given all rights to your modifications and that they can get your source code without having to pay any royalties or licensing fees. This helps to create a richer content layer for communication systems, builds the public domain, and improves the commons.

The most successful GPL project has been the Linux operating system which is a free code implementation of UNIX. It was begun by Linus Torvalds, a computer science student

in Finland. In 1991 he released it on the Internet under the GPL, and many people all over the world began enhancing it. Linux is now the fastest-growing operating system in the world and is supplied by both commercial and noncommercial companies.

There is a distinction to be made between *open source* code and *free* code. While both types of licenses provide the user with free source code and are therefore "open," the software Lessig refers to as open source means that the user is provided the source code to do with as he pleases. He can modify it however he wishes and either give it away or charge a fee to others for his derivative code. However, Lessig refers to free code as software products distributed under the GPL that cannot be charged for and whose derivative works must also be free and under the GPL.

The Internet is built upon an infrastructure of servers that deliver the web page content that users access. The Apache server has two thirds of the server market, and is an open code project initiated by the government. An interesting development of the open code movement has been the affect it has had in the commercial area. In 1998 IBM abandoned its own server code in favor of the Apache because of the quality of the Apache. IBM next adopted the Linux operating system to consolidate several different systems that it was supporting. Now, the public domain is supporting the Linux operating system and Apache server that IBM is using. IBM's maintenance costs have decreased, the quality of its product lines has increased, and the ease of porting application code from one of its platforms to another has been enhanced. This open code software makes the hardware it sells more desirable and thus more valuable and more profitable.

Since software is constantly evolving, the software must be constantly revised and updated. Although IBM contributes a significant amount of effort to improving Linux and Apache, IBM is willing to release that material and keep it in the public domain rather than capturing its own version because it would then have to solely maintain its proprietary version and its costs would go up. (IBM is free to take the Apache server because it is "open" code, but it cannot take Linux because it is "free" code under the GPL.) By supporting this code in the public domain, IBM gets the benefit of the work of a great many unpaid helpers. Supporting the open code movement makes business sense to commercial companies like IBM.

The Internet is not the only major communications system that Professor Lessig discusses in his book. He also addresses the history and future of the radio spectrum which is the electromagnetic radio frequencies between 3 kilohertz and 300 gigahertz. It is used not only to broadcast AM and FM radio signals, but it is also used for such purposes as broadcasting television signals and talking on cellular telephones. Lessig contrasts the use of the two systems where one is a commons as he defines it and the other is not. As we have seen, the Internet started out with a free code layer with both the top, content layer and bottom, physical layer a mixture of both free and controlled forming a workable commons. He fears that the whole Internet system is slipping into a more controlled – and thus less free – state so that its use as a commons will diminish. On the other hand, the radio spectrum started out early under government regulation; and, with the Radio Act of 1927 giving control over the radio spectrum to the Federal Radio Commission (FRC), it was not a commons. All three layers were controlled. The FRC licensed the right to use a certain spectrum, and it was a criminal offense to use it without a license.

Before the radio spectrum was controlled by the government, the diversity of the content layer of the radio spectrum was similar to that of the early Internet. There was a wide variety of broadcast programming with commercial radio being only a tiny fraction. But, within only seven years of the passage of the Radio Act of 1927, the commercial concerns of NBC and CBS became responsible for 97% of the nighttime broadcasting. Because it was controlled and not free, its content was profoundly affected as the beneficiaries of that control lobbied for preferential treatment.

In 1946, the Supreme Court upheld the government's argument that in the *nature of things,* only if the radio spectrum were controlled by the government would it be usable. Lessig sites the English economist Ronald Coase who concluded the opposite. Coase pointed out that the radio spectrum was no more scarce than land or trees were scarce. So political regulation of access to the radio spectrum was not justifiable. Indeed, Coase, who won a Nobel Prize for his work on transaction cost economics in 1991, favored a marketplace strategy to allocate the radio spectrum to the highest bidders. Lessig points out that these are two regimes for controlling access to a resource – 1) the FCC's regime relies upon the government and 2) Coase's regime relies upon the market. But, both presume the need for a controller. They only differ in *who* controls it, and thus exclude the radio spectrum from being a commons. They both stifle innovation in the possible uses of the radio spectrum.

Professor Lessig goes on to point out how with wideband technologies, the radio spectrum could be implemented as a commons with free access through protocols that coordinate unplanned use among multiple users sharing the resource. The right to use a current slot of time on the radio spectrum would be granted to anyone who wanted it. It would not be property whose access is determined selectively by the owner.

In his book, *The Future of Ideas: The Fate of the Commons in a Connected World*, Lawrence Lessig defines the digital commons that serves as an innovation engine to foster new ideas and technologies for the betterment of society. He points out the role that intellectual property plays in the commons and how that role has shifted as patent law – and especially copyright law has been modified by Congress and reinterpreted by the courts. He explains how many incumbent corporations are further protecting their positions by supplementing copyright law with contract law through extended license agreements that go beyond what the framers of the Constitution intended. Professor Lessig calls us to be vigil in protecting our freedoms for the future. But, he equally holds out hope for a better society. His coverage is balanced, and his analysis is thorough. His message is worth reading in full.