

12

Intellectual Property Law Fundamentals

“Good artists copy. Great artists steal.”

—Pablo Picasso

It's a world unto itself. It's a field of study for philosophers, legal scholars, and think-tank researchers; it's a battleground for corporations, inventors, and artists; it's a cottage industry for lawyers, consultants, academics, and authors; it's a specialized game with incredibly complex rules and its own arcane language. Collectively, it's called “intellectual property law” and it's dedicated to answering one simple question.

Who owns ideas?

The very notion that someone can own a creation of the mind is one of the strangest ideas conceived by humans—and maybe that's part of the reason intellectual property (IP) laws are so convoluted, complex, and difficult to fathom. But IP laws are a fact of life for engineers, and whether you approve of them or abhor them you must acknowledge that they reflect the underlying value system of our society. As a Citizen Engineer, you're going to have to get to know this strange world. We'll try to make it easier. Do relax a bit—the basic concepts are actually quite simple (but like many aspects of engineering, the details can get complex).

IP 101: Core Concepts

The battle over intellectual property has its roots in a fundamental tension: People who think up new ideas or create new works often want an exclusive right to profit from them—but few ideas are ever completely new and more often build upon the efforts of others.

Intellectual property laws are crafted to protect inventors and creators and the companies that market their works. While it looks like these laws are

fundamentally about protecting the “rights” of individuals and corporations, the social value flows more from the theory that a well-engineered system of IP law maximizes overall innovation and progress. If you don’t have enough protection, the theory goes, no one can profit enough from an innovation to afford the upfront investment of time and money. With too much protection, you stifle competition and belie that fact that we make the most progress when we build on the ideas of others.

Only four major concepts are involved: patents, copyrights, trademarks, and trade secrets. Here’s the super-condensed version:

- **Patents protect ideas.** There are different types of patents, including “utility” patents, “design” patents, and “plant” patents. Utility patents are the most common type; if you can meet the required legal standards of utility, novelty, and nonobviousness, you can be awarded a patent that gives you the right (for 20 years from the date of application) to *prevent someone else* from using your idea. In exchange, you have to make public everything that is needed to understand your idea. The biggest misconception is that if you have a patent on something, it gives you the right to make that thing. It doesn’t. A patent gives you only the right to exclude others from doing so.
- **Copyrights protect the expression of ideas.** For engineers, the “expression” is often in the form of a work product such as software, manuals and specifications, mechanical drawings, chip design, mask sets, and so forth. When you hold the copyright on a work, you have the right to reproduce and disseminate it however you choose. And you get certain legal recourse against others who make copies that you didn’t authorize. Copyrights are easier to obtain and last longer than patents, but they protect only the expression of an idea, not the idea itself. Therefore, the protection afforded by copyright is narrower in scope than patents. Others can implement functional equivalents of a copyrighted work without violating copyright law as long as they do not copy the work.
- **Trademarks protect the “names” of products that embody your idea.** And by “name” we mean what you call your product, or a symbol or logo you use to identify it and distinguish it from the products of another. If you meet certain standards, trademark law gives you ways to stop someone else from using your name to identify what could be in every respect that other person’s identical product. These laws have evolved to prevent confusion among consumers, but they

can be very powerful components to things such as open source software business models.

- **Trade secrets** protect ideas that are maintained as a secret. Trade secrets include a broad category of subject matter that may be maintained as a secret, ranging from formulas, manufacturing techniques, designs, specifications, and test methods, to customer, financial, vendor and other forms of information. However, trade secret protection exists only for as long as the idea or information is not generally known or used by others, you derive some economic benefit from it not being generally known or used by others, and you take reasonable measures to preserve its secrecy. The legal protection is against theft, misappropriation, or unauthorized disclosure by others, but not against independent development by others.

While these four areas are, in a legal sense, mostly independent of one another, the interplay among them in IP law can be powerful. A central tool is the license, which is a legal grant of defined intellectual property rights by the owner or holder to a third party, typically in consideration for something else. That something else can be as simple as paying money for, say, the right to make copies of a work or to use a patent without risk of prosecution by the holder.

That is, a license is the way you get to set terms on how IP you own can be used. Since you are the owner, you have a lot of freedom in saying what people can and can't do with your IP. The law covering the class of IP (patent, copyright, trademark, trade secret) gives you the protection mechanisms to give your license enforcement teeth.

A very cool interplay of the concepts happens with open source software. We'll go into a lot more detail in Chapter 14, but the basic idea is that a software copyright owner adds (in the comments section of the code) a license. That license, in turn, lays out the terms under which someone else can make copies of the code. Those terms can be as simple as "Copy as you please; just be sure to propagate the copyright notice and this license." Or they can be very restrictive, such as "Not only do you have to propagate the license, but you must republish under the same license terms any improvements or bug fixes and you can't sue people over patents you might have covering this code."

The foundation of open source software is thus in copyright law. If you follow the terms, you can make copies. If you don't follow the terms, you can be prosecuted under copyright law for what would be considered illegal use

or reproduction. But first, let's spend some time on the fundamentals and then return to the concept of open source.

The next sections provide basic information about the key IP protection mechanisms, followed by discussion and guidance. Our thanks to Michael Anastasio, law director and associate general counsel with Sun's Intellectual Property Law Group, for his contributions to these sections.

Patents

Patents really aren't what most people think they are. They don't give you the right to actually make anything. But they do give you the right to prevent others from making anything that uses your patented idea. That is, a patent gives you a right to *exclude others*. The simple reason it doesn't directly give you the right to make something is because that thing might also infringe upon someone else's patent, and that other person could exclude you! (And this has given rise to the whole area of patent cross-licensing.) But before we get too far, let's review the basic facts about patents.

- **What does it protect?**
A patent protects inventions (must have utility—e.g., computer logic, machines, tools, programs).
- **How does it function?**
It gives the holder a legal right to exclude others from making, using, selling, or offering to sell the invention.
- **How long is it valid?**
A patent is valid for 20 years from the date of application (in the United States).
- **Where is it valid?**
Typically, a patent is valid only in the country that granted the patent. A U.S. patent is not enforceable outside the United States.
- **How much does it cost?**
The absolute lowest you could pay for a single patent is \$1,200 U.S. Costs can easily exceed \$10,000 when you add legal fees and other associated expenses.
- **What's patentable?**
Any new and useful process, machine, article of manufacture, or composition of matter, and improvements thereof, can be patented.

Stated another way: You can patent a method, an apparatus, a system, a service, a business method, software, or an improvement to existing technology.

It must be novel: invented by you, not known or used by others, and not described in a patent, patent application, or publication.

It must be nonobvious to one of “ordinary skill in the art.”

It must be useful, not simply an abstract idea.

- **What’s not patentable?**

You cannot patent laws of nature; physical phenomena; mathematics; or literary, musical, dramatic, and artistic works.

- **Who owns a patent?**

Patents are granted only in the name or names of the actual inventors. An inventor may sell, will, transfer, lease, or give all or any percentage of the rights to a patent to anyone. This is called **patent assignment**. Patents can also be licensed exclusively or nonexclusively.

A Closer Look: Why Get a Patent (and Why Not)?

There are “defensive” reasons, “offensive” reasons, and other reasons to get a patent. Patents provide protection for 20 years, which gives you the right to exclude others from practicing the invention now and well into the future. Patents can be leveraged to generate revenue through licensing, give your company an exclusive or superior market share, or deter others who may be infringing on your patents from suing you for infringement of their patents. Patents can also generate goodwill and good PR—a reputation for innovation and thought leadership, good citizenship through shared innovation, and evidence of personal achievement for inventors.

A good mental model of a patent is that it is a time-limited monopoly on an idea, in exchange for publicly disclosing the idea. The hope is that by granting inventors this exclusive period, it creates sufficient “air cover” or market opportunity to make a profit on the millions or billions of dollars that were sunk into developing the idea in the first place. In exchange, the inventor must reveal the “secret sauce” in the form of an invention disclosure so that everyone else can see and learn from how it is done. The Latin root *patens* means “open.”

Patents can be purchased, sold, leased, or mortgaged, just like any other asset or piece of physical property. Businesses can even donate patents to charities in order to receive tax benefits. Start-up companies use patents,

often their only collateral, to lure investment from venture capitalists. Midsize businesses swap and barter patents, even with rivals, to build products they could not make on their own. And many companies license patents to bolster their balance sheets. In fact, the right to profit from a breakthrough idea can be so valuable that the contest over the concept can be more decisive than the competition for consumers, as Sony and Toshiba demonstrated in their tug of war over whose next-generation DVD patents would win out, with Sony prevailing.¹

And why not get a patent? Well, they can be expensive to obtain and maintain (they often cost tens of thousands of dollars). Also, you might have a business model that relies on free-flow technology, open source software again being a primary example.² Or you might not want to disclose your invention to the public, and believe you would be more successful by maintaining it as a trade secret, as The Coca-Cola Company has done with the secret formula for its popular soft drink. In addition, there is a growing movement that casts companies that routinely and aggressively enforce patents as anti-competitive or anti-innovative. Examples are accumulating, particularly in software and business processes,* which have led to reputational damage of the patent holder.

If you decide not to patent something, you still need to be proactive about surrounding IP concerns. If you choose to keep the idea a trade secret, you must avoid publication and take steps to protect it as a trade secret (e.g., by having suitable nondisclosure agreements covering conversations about the idea with third parties). Alternatively, if you are not interested in patenting your invention, but are concerned that another party may attempt to obtain or enforce a patent on the same or a similar invention, you might choose to be very open about your idea and publish it. The advantage here is that you put your idea into the public domain as *prior art*, which may effectively prevent someone else from coming up with the same idea, patenting it, and then going after you!

When to Get a Patent

You should consider applying for a patent when you're working on a new product, a project proposal, or a product improvement or update; when you are writing a technical paper that will be accessible to people outside your group or your company; when you're participating in a standards organization; or simply when you have a cool new idea.

* One example is the Amazon 1-Click Shopping concept: see <http://cse.stanford.edu/class/cs201/projects-99-00/software-patents/amazon.html>.

Ask yourself the following ten questions, and if you answer yes to any of them you should consider applying for a patent. (Note: Many technology companies have an Invention Disclosure process that you'll need to follow to avoid unnecessary legal entanglements with the patent process.)

- Have I developed a new product or method or a new/improved feature for an existing product or method?
- Did one of my ideas get added to the new-feature list for an existing product or method?
- Did my work produce results greater than expected?
- Have I used a known technology or process in an unusual way?
- Is my development a new step in a rapidly changing technology?
- Did I make an improvement to an existing technology or process?
- When I discussed my work with my coworkers, did they express surprise at the results achieved or the approach used?
- Did my work result in something being better/cheaper/faster (e.g., a more efficient algorithm implemented in software)?
- Did I implement a technical standard or open specification in an efficient, clever, or otherwise improved manner?
- Did my software maintenance work result in an interesting bug fix or significant performance improvement?

If you're trying to determine whether your invention is patentable, the current legal framework discourages you from reviewing other patents! The fact that you've read patents for similar technologies could be cited as evidence that your invention is in fact based directly on a previously patented invention and your application could be denied as a result. Moreover, practicing the invention could be construed as "willful infringement" of another party's patent, which could allow that party to claim dramatically increased damages in a patent infringement suit against you.

This is a rather twisted aspect of existing patent law. You would think that the whole idea behind the patent system is that we could all build off each other's work, with appropriate licensing when needed, or create new innovation by "inventing around" someone's patent. Sadly, the legal system punishes those who do. So, the best advice we can give is to work with a patent lawyer to figure out how your idea relates to other patents. Don't construe

this to mean that you should ignore other people's work. To the contrary, a good engineer should be quite aware of other ways that people have attempted to solve a problem.

Applying the Standard of Novelty

You'll notice that patents must adhere to a standard of novelty; the trouble is, it's a very subjective test—one that we ask our patent examiners to perform, backed up by judges and juries who are frequently not well versed in technology.

Until a decade or so ago the patent system in the United States didn't even recognize software patents, and there are still parts of the world that don't. For the most part, software is considered to be a creative work, like writing, and it is covered by copyright law, which provides a more certain and clearer form of legal protection for software versus patent law.

Do Patents Stifle Innovation?

It's important to note that software can be protected simultaneously by both patent and copyright law. That being said, there is also considerable debate about whether software patents are anti-innovative. Amazon's 1-Click patent provides an example.³ It's an idea. Amazon got a patent on it, so it doesn't matter what code you use to implement it. You can't use that idea, because a patent covers all expressions of the idea. Not surprisingly, the 1-Click patent was controversial from the start, and many of the patent's claims have since been reexamined and rejected, but as of the publishing of this book, other claims have remained valid pending final resolution.

When the system does work properly, it can actually foster collective innovation across competitors. Consider the case of Alexander Graham Bell and Thomas Edison. Bell obtained a patent for inventing the telephone, but the sound quality was awful. Edison came up with an improvement, the carbon button microphone, but he couldn't use it to build a better telephone because Bell had the patent on the telephone. By the same token, Bell couldn't build the better telephone because Edison had the patent on the carbon button microphone. So, what they did, essentially, was cross-license their patents to each other.⁴

When you apply for a patent, you must sufficiently describe your invention so that a person ordinarily skilled in the relevant art can make and use it. You disclose how you did it, and you show others how they can do it too. So, once the patent application is published or the patent is issued, the technology described in a patent is not a trade secret anymore. It's public. In

exchange for that, you get a limited monopoly—the right to exclude others for 20 years. More than that, you get control of the destiny of your idea.

“Patents and other intellectual property instruments can give engineers more power to ensure that their ideas are used only for certain purposes—not by tobacco companies, for example, or not in a way that you think would be suboptimal for the public good,” says Michael Falk, general counsel for the Wisconsin Alumni Research Foundation (WARF). “From an engineer’s perspective, it’s about control and it’s about prestige—getting credit for what you did and staking your claim on the future of your idea. It’s also a way for engineers to demonstrate their value-add to companies, to show that engineering can be a profit center as well as a cost center.”

Common Mistakes to Avoid

When the system works, patents are good for the inventor—and ultimately good for everyone—because they encourage inventors to publish their ideas. But you need to be careful. Here are a few common mistakes engineers make that impact patentability or create legal issues or other headaches for companies.

- **Publishing externally:** Engineers often write white papers, technical articles, blogs, or product specs that describe various aspects of a new product or technology. These publications can impact the engineer’s (or the company’s) ability to protect the IP described. A new product or even a new feature could contain several patentable inventions. Public release of the information makes the invention available to the public—and once that happens in the United States a patent application covering that invention must be filed within one year or the novelty requirement for obtaining a patent will not be satisfied. (In other countries, there isn’t even a one-year grace period, so publication before filing a patent application bars one from obtaining patent protection in those countries.)

To prevent the loss of patent rights, either don’t publish anything about a new invention before filing for patent protection, or obtain confidentiality/nondisclosure agreements with outside parties before disclosing any information to them (but do the latter with caution—see the upcoming discussion). Also, it’s always a good idea to have a patent attorney review any pending external publication if it may contain information about a patentable invention.

- **Offering customers a “test run”:** Sales and marketing will occasionally pressure engineers to give potential customers a sneak preview of

a new product before the general release date. These events can impact the ability to protect the IP incorporated in the product, depending on whether the actions constitute an “offer for sale.” Once an invention has been “on sale” in the United States the clock begins to tick on the novelty factor, and a patent application must be filed within one year to avoid an “on-sale” bar. Whether there is an offer for sale depends on the totality of the circumstances, and can often involve a complex analysis, even when confidentiality agreements are used. To avoid losing the patent rights, you should always use a confidentiality agreement. In addition, you should always try to make sure all necessary patent applications are filed before disclosing the invention to a customer; and if that is not possible, consult with a good patent lawyer before disclosure.

- **Defining rights for jointly developed IP:** Lots of good ideas arise in collaborative engineering projects, but disputes can arise over who invented what, and who has what rights to what. The “default rules” for jointly owned IP are often not what the parties would have negotiated in an agreement among them. For example, in the United States, absent a legally enforceable agreement to the contrary, each inventor is a co-owner of the entire patent, and each co-owner can freely exploit the patent without consulting with or paying the other owners. Foreign jurisdictions vary. To avoid any misunderstandings, surprises, or unmet expectations, you should always develop an agreement to define the respective rights and responsibilities of each party to a joint collaboration effort. There are many approaches that you can take, and many facets and considerations to such an agreement. You can divide ownership and/or license rights along technology lines or fields of use, you can create separate legal entities to hold ownership of the IP, you can (and should) define roles and responsibilities relative to patent maintenance and enforcement—the list goes on and is extensive. In any case, it’s important to clearly specify the contributions, rights, and obligations of each joint owner, and the plan for the exploitation of IP rights, including how they’ll be enforced, royalty and accounting duties, rights of assignment and sublicense for the invention, as well as improvements and derivative works, and so forth.

These are just a few examples of measures you need to take when dealing with patents. We’ll consider the “dark side” of patent law—and the need for reform—in greater detail later in this chapter. But for context, we first need to examine copyrights, and the interesting interplay between patents and copyrights.

PATENT MYTHS

These "myths" are derived from the experience of Sun's intellectual property attorneys in consulting with engineers.

Myth:

Software, open source software, open standards, and business methods cannot be patented.

Reality:

They can be and often are.

Myth:

A patent grants you the right to practice the invention.

Reality:

A patent grants you only the right to exclude others from practicing the invention.

Myth:

A U.S. patent provides worldwide protection.

Reality:

Patent rights are nation-specific. You must file in other countries to obtain patent protection in those countries.

Myth:

Joint owners of a patent can enforce the patent independently, but must share in any licensing revenue.

Reality:

The opposite is actually true under the default rules.

Myth:

A patent application provides patent protection as soon as it is filed.

Reality:

Enforceable patent rights come into effect only upon issuance of a patent.

Copyright

The term *copyright* is self-defining. It is the right to use, make, or distribute copies. If you write a book or article, you have a copyright on that. You have a right to use, make, distribute, or display copies of your work, and you can

license or sell that right to others, who may not do so outside the scope of rights you conveyed to them. Here's a quick recap of the basics about copyrights.

- **What does it protect?**

A copyright protects the expression of an idea (no functionality—e.g., publications, software).

- **How does it function?**

It gives the holder a legal right to reproduce an original work (make copies, scan, upload/download, etc.), adapt the work by making derivative works (translations, updates, revisions), distribute copies of the work to the public, and display and perform the work.

- **How long is it valid?**

Copyright duration is the life of the author plus 70 years; for corporate work the duration is 95 years from the first publication or 120 years from the date of creation, whichever expires first. Thereafter, the work reverts to the public domain.

- **Where is it valid?**

Copyright is internationally recognized and respected under Berne, the Universal Copyright Convention, the World Trade Organization (WTO), Trade-Related Aspects of Intellectual Property Rights (TRIPS), the World Intellectual Property Organization (WIPO), and others.

- **What's copyrightable?**

Original works of expression fixed in a tangible medium are copyrightable.

“Expression” is *not* facts, ideas, procedures, processes, systems, methods of operation, concepts, principles, discoveries, short phrases, individual words, or proper names.

Only minimal originality is required: Selection and ordering of data is not enough to be copyrightable, but collection and assembly of data in an original fashion embodying some level of creativity is copyrightable.

“Fixed” media include paper, tape, disks, hard drives, RAM, CDs, DVDs, MP3s, and similar media types.

Copyright is not available for work in the public domain. That means there is IP risk whenever software is claimed to be “donated.”

- **How is copyright claimed?**

Copyright attaches at the time of creation. In the United States, a copyright notice is not required, but affixing a copyright notice is in

the interest of the copyright holder, both for attribution reasons and for making it more difficult for others to copy your work and claim “innocent infringement” in defense. Copyright registration is also not required unless and until you seek to enforce your copyright.

Copyright is really automatic. If you are the original author, your work is protected under copyright law, regardless of whether you affix a copyright notice, though doing so is advisable. Copyright is, however, generally considered a weaker form of protection than a patent, because the protection of the particular expression of an invention or idea is less valuable than protection of all expressions or implementations of a patentable invention.

The history of copyrights has been very interesting. Consider the plight of early cartographers. They would go through all the trouble of making a map and others would simply copy their work. In the early days of the United States, Americans were unabashedly copying British maps. And that was fine with everyone here in the United States—at first. Then as these native industries started to grow up—map makers and writers of great American novels and so on—it was recognized that these works should be protected.

The duration of copyrights has an interesting and somewhat amusing history (or a disturbing one, depending on your point of view), summarized by this story related by Lawrence Lessig:⁵

[Initially] . . . copyright law granted protection for the limited time of 14 years. . . . Fourteen years, if the author lived, then 28, then in 1831 it went to 42, then in 1909 it went to 56, and then magically, starting in 1962, look—no hands, the term expands. Eleven times in the last 40 years it has been extended for existing works—not just for new works that are going to be created, but existing works. The most recent is the Sonny Bono copyright term extension act. Those of us who love it know it as the Mickey Mouse protection act, which of course [means] every time Mickey is about to pass through the public domain, copyright terms are extended. The meaning of this pattern is absolutely clear to those who pay to produce it. The meaning is: No one can do to the Disney Corporation what Walt Disney did to the Brothers Grimm.

Copyright infringement, like patent infringement, can be difficult to prove. What constitutes copying? There must be substantial similarity such that the work is recognizable as the original work of authorship. Also, under the doctrine of “fair use,” portions of copyrighted material can be used in derivative works such as criticism, commentary, news reporting, teaching, scholarship,

research, or parody—without liability for infringement, provided a rather subjective four-factor test is satisfied, which includes consideration of the

- Purpose of use
- Nature of copyright work
- Amount and substantiality of the portion of work that is used
- Economic effect

In general, it's advisable to include a copyright notice on your copyrighted work and not to affix a third-party copyright notice to third-party work that lacks a proper notice. Also, it is illegal to remove third-party copyright notices.

Copyright Using Creative Commons Licenses

For content creators who prefer a spectrum of choices in how others use their work, the Creative Commons provides licenses and tools that let them mark their creative work with the freedoms they want it to carry. Creative Commons is a nonprofit organization that offers alternatives covering the spectrum of possibilities between full copyright protection—*all rights reserved*—and no copyright protection—*donation to the public domain*.

Creative Commons was officially launched in 2002 to counter the effects of what the founders considered to be a dominant and increasingly restrictive permission culture. In the words of Lawrence Lessig, director, Safra Center for Ethics, Harvard University, and cofounder, Creative Commons, it is “a culture in which creators get to create only with the permission of the powerful, or of creators from the past.” Lessig maintains that modern culture is dominated by traditional content distributors that seek to maintain and strengthen their monopolies on cultural products such as popular music and popular cinema, and that Creative Commons can provide alternatives to these restrictions.

Creative Commons licenses apply to works that are protected by copyright (books, scripts, Web sites, lesson plans, blogs, and any other forms of writings; photographs and other visual images; films, video games, and other visual materials; and musical compositions, sound recordings, and other audio works). The Creative Commons licenses enable copyright holders to grant some or all of their rights to the public while retaining others through a variety of licensing and contract schemes including dedication to the public domain or open content licensing. The intention is to avoid the problems current copyright laws create for the sharing of information.⁶

You don't need to sign anything to get a Creative Commons license—and all such licenses are nonexclusive. This means you can permit the general public to use your work under a Creative Commons license and then enter into a separate and different nonexclusive license with someone else—for example, in exchange for money.

The original set of licenses grants “baseline rights.” The details of each of these licenses depend on the version, and comprise a selection of four conditions.

- **Attribution (by):** You let people copy, distribute, display, perform, and remix your copyrighted work, as long as they give you credit the way you request.
- **Noncommercial (nc):** You let people copy, distribute, display, perform, and remix your work for noncommercial purposes only. If they want to use your work for commercial purposes, they must contact you for permission.
- **No Derivative Works (nd):** You let people copy, distribute, display, and perform only verbatim copies of your work—but they cannot make derivative works based on it. If they want to alter, transform, build upon, or remix your work, they must contact you for permission.
- **Share Alike (sa):** You let people create remixes and derivative works based on your creative work, as long as they distribute them only under the same Creative Commons license under which your original work was published. (See also copyleft.)

Note that the “nd” and “sa” clauses are mutually exclusive. Also, valid licenses that lack the Attribution element have been phased out because 98% of licensors requested Attribution, but are still available for viewing on the Creative Commons Web site. There are thus six regularly used licenses:

- Attribution alone (by)
- Attribution + Noncommercial (by-nc)
- Attribution + No Derivs (by-nd)
- Attribution + Share Alike (by-sa)
- Attribution + Noncommercial + No Derivs (by-nc-nd)
- Attribution + Noncommercial + Share Alike (by-nc-sa)

Sampling licenses are also provided, with two options.

- **Sampling Plus:** Parts of the work can be copied and modified for any purpose other than advertising, and the entire work can be copied for noncommercial purposes.
- **Noncommercial Sampling Plus:** The whole work or parts of the work can be copied and modified for noncommercial purposes.

This book is covered by the Creative Commons Attribution-Noncommercial-Share Alike 3.0 license. We (the authors) want you (the reader) to use any or all of this as you see fit noncommercially, as long as you retain attribution. We have retained the commercial rights to support the business model of book publishers; we think publishers take risks in bringing (new, especially) works to market and thus should benefit from their success.

Additional Concepts: Copyleft and FairShare

There are two other notable copyright concepts you should be aware of.⁷ **Copyleft** is a play on the word *copyright*, and refers to the practice of a copyright owner or an original work requiring others to make copies of the original work as well as derivatives and modifications to the work available to third parties under the same freedoms as the original work. For this reason, copyleft licenses are also known as **viral** or **reciprocal licenses**. They are forms of licensing that may be used to modify copyrights for works such as computer software, documents, music, and art. A widely used and originating copyleft license is the GNU General Public License (GPL). Similar licenses are available through Creative Commons, called Share Alike.

FairShare is an idea for a voluntary investment-based patronage system to replace patents and copyright while still ensuring that artists are fairly compensated. It was designed by Freenet creator Ian Clarke, Steven Starr, and Rob Kramer in response to allegations that artists would not receive adequate compensation for their work without enforceable copyrights. In the FairShare system, the investor/patrons would provide venture capital. Clarke envisions that 45% of the money invested in a given artist would go directly to that artist, and another 45% would be given to previous investors. The remaining 10% would be kept by the maintainers of each FairShare service company.

In some ways, this model is similar to a pyramid scheme, but Clarke counters that a vital difference is that nobody would be promised a return on her investment. He argues that regardless of any profits, each patron would have

the satisfaction of knowing that she supported an artist whose work she appreciates. Also, earlier investors would profit more, thus rewarding them for investing in artists before they became more popular. The early investors would serve a similar role to studios' talent scouts.

Trademarks

A **trademark** is used to protect the name, word, symbol, or logo you use to identify your product and distinguish it from other products. Trademark laws help you prevent someone else from using your name to identify a similar or identical product. Whether you're building consumer products or open source software, trademarks can be an important weapon in your IP arsenal. Here are answers to key questions engineers have about trademarks.

- **How does it function?**
A trademark helps consumers identify the product and distinguish it from products supplied by competitors or other sources.
- **How long is it valid?**
A trademark is valid indefinitely.
- **Where is it valid?**
Both state law and federal law apply to trademarks, and typically both state and federal registration is advisable for trademark protection, although rights can attach without registration.
- **Why register?**
Registration puts people on notice of your claims and gives you grounds in case someone infringes on your mark.
- **What can you trademark?**
“Distinctiveness” determines the strength of the trademark. Arbitrary marks such as “Java™” are strong, whereas marks that merely describe the general nature or function of a product, such as “volume server,” are typically afforded no or little protection.

We've noted that trademarks protect the name you give to your creation. In software, for example, others may be allowed to use your code but not your name for the code (typically, the binary build). So, let's think more about the power of software distributions and names. This has nothing to do with how the code itself was generated. But there's something really important going on here.

The only company that has the right to call the Windows™ software bundle “Windows” is Microsoft, meaning it gets to describe the sets of code that come together to create that distribution. And that right of Microsoft has little to do with the fact that it owns the copyright to the Windows code base. For example, the only company that has the right to call a Red Hat™ distribution “Red Hat” is Red Hat, even though those binary distributions are built out from open source components. As it turns out, in the computing business, that’s really important because application software on top of operating systems are verified against very specific binary distributions.

Technically, CentOS (<http://centos.org>) is as close to a perfect reproduction of Red Hat’s server software distribution as you can imagine. That’s possible for the group of CentOS volunteers to do because Red Hat’s distribution is in turn based on freely available open source code. An application that runs on Red Hat almost assuredly runs on CentOS. But CentOS can’t claim that, or refer to Red Hat in a multitude of ways, precisely because of trademark law.

That is terribly important because most software packages that are certified to run on Red Hat are not certified to run on CentOS. If you were to call on one of these companies for help and explained that you decided to use CentOS rather than Red Hat, the company will likely tell you that your configuration is unsupported.

It’s also important to note that a trademarked brand should always be treated in written communications as an adjective, not a noun. For example, don’t call it a Kleenex—it’s a Kleenex™ tissue. Don’t call it a Snickers—it’s a Snickers™ candy bar. It’s not Solaris—it’s the Solaris™ operating system. Sometimes lawyers can get carried away trying to enforce this principle; for example, we were once advised by legal counsel to stop using the term *Java programmers* and instead refer to them as *Java technology enabled programmers*.

But the thing to keep in mind is that your brand—your good name—has real value. So, even though you give others the right to use your code, you can retain the rights to your trademarked name. That means you keep control over what goes into your distribution, and you live or die by how well it works and how well you support it. Because in the end, it’s all about trust and perceived value. Brand matters.

Trade Secrets

A trade secret is simply confidential information that derives economic value from not being generally known by others. The subject matter ranges from formulas, manufacturing techniques, designs, specifications, and test methods, to

customer, financial, vendor, and other forms of information. Here's a quick summary of basic facts engineers need to know about trade secrets.

- **What is it?**
Generally, a trade secret is information that is not generally known to the relevant portion of the public and that confers some sort of economic benefit on its holder because it is not generally known. The company must also make reasonable efforts to maintain its secrecy.
- **What is protected?**
A trade secret effectively allows a perpetual monopoly in the secret information.
- **How is it protected?**
Protection typically is very narrow and limited since anyone can independently develop and use information that may be a trade secret; however, theft, misappropriation, or unauthorized disclosure by a third party gives rise to liability, and if it is done with intent, it can result in criminal liability, including imprisonment.
- **How long is it valid?**
There is no set term, but also no minimum term guarantee. Once lost, it is lost forever.
- **Where is it valid?**
A trade secret is valid in the state in which the trade secret is kept (it is defined by state law, not federal law).

Coca-Cola™ provides the best known example of how trademarks work: The formula is not patented but has been a trade secret for decades; it confers clear and obvious economic benefit on The Coca-Cola Company; and the formula is aggressively guarded and allegedly has not yet been discovered by any competitor, even though reverse engineering is allowable. And because of trademark law, even if someone made a cola that tasted exactly like Coke, that person still could not use the name “Coke” in describing his product.

Trade secrets are not protected by law in the same manner as patents or trademarks. In the United States, they arise out of state laws, though there are some federal laws such as the Economic Espionage Act of 1996 that also apply protections to trade secrets. Most states have adopted the Uniform Trade Secrets Act (USTA), and some with some variations, while a few states have their own statutes and continue to apply common law.

One of the most significant differences between patents and trademarks and trade secrets is that a trade secret is protected only when the secret is *not*

disclosed. Owners of trade secrets try to keep their special knowledge out of the hands of competitors through a variety of civil and commercial means, including the use of nondisclosure agreements and restrictive employment agreements that include noncompete clauses. Violations of these agreements can result in substantial financial penalties. Similar agreements are often signed by representatives of other companies with whom the trade secret holder is engaged, such as in licensing talks or other business negotiations.

There is no set expiration date on a trade secret. Trade secret protection can, in theory, extend indefinitely, which may offer an advantage over patent protection, which is of limited duration. However, a third party is not prevented from independently creating and using your trade secret information.

As noted earlier, trade secrets are protected from being stolen, disclosed, or otherwise taken without the owner's consent, referred to as **misappropriation**. Misappropriation can result in substantial civil liabilities for the party that engages in misappropriation, and if it is done with intent, it can result in criminal liability, including imprisonment.⁸

Even if your ultimate objective is to seek patent protection for an invention, trade secrets will play an important role. This is so because in order to preserve the novelty of your invention to meet the requirements of patentability you will need to maintain the invention as a trade secret. Nondisclosure agreements are a useful tool in this regard.

Nondisclosure Agreements

The way you can protect trade secrets and other confidential information from unauthorized use or disclosure is with a nondisclosure agreement (NDA). Here's a recap of the basics about NDAs.

- **What does it protect?**
An NDA protects the confidentiality of secret information disclosed during business-related transactions.
- **How does it function?**
Parties sign a contract agreeing to maintain the secrecy of specified information; violation can result in large liabilities.
- **How long is it valid?**
An NDA is valid for whatever period is specified in the contract.

NDAs can be either “mutual” or “one-way.” In a mutual NDA, both parties disclose confidential information to the other and the other must agree to

maintain the information confidentially and not to disclose or use it for any unauthorized purpose; in a one-way agreement only one party does so. An engineering team, for example, may require a new-hire engineer to sign a one-way NDA prior to disclosing to the new hire information that she will need to know in order to work on the project.

Many companies have standard NDA forms. Generally, these forms cover four key elements: defining what information is considered “confidential information”; defining what information is excluded from the definition of confidential information or from the confidentiality obligations; the obligations of the receiving party with respect to nondisclosure, nonuse, and disposition of confidentiality information; and the time periods of the confidentiality. Whether you’re asking others to sign your company’s standard NDA form or being asked to sign another company’s NDA form, always have a lawyer read it first. Make sure the terms do not effectively waive any claim of trade secret confidentiality, or operate to convey any ownership or license rights to your IP. Your inadvertent waiver could result in the loss of your company’s trade secrets or other IP and leave you with no legal recourse.

In the course of meeting with colleagues, participating in standards organizations, or attending presentations about emerging technologies, you may find yourself in a situation where you feel you’re hearing confidential information when you haven’t signed an NDA. For example, you may decide to sit in on a presentation about a new approach to asynchronous chip design and realize halfway through the presentation that their idea is similar to one you or your colleagues have been working on. What should you do?

First and foremost, you should do everything you can to avoid those situations. You can expose yourself and your company to infringement and/or misappropriation or similar lawsuits down the road even though the other party voluntarily disclosed the confidential information, and if you didn’t sign an NDA. In any meeting you attend where you know confidential information will be discussed, you should consult with counsel to get advice on the appropriate precautions to take, and also be sure that an appropriate NDA is in place.

Employment Contracts and IP Ownership

When you’re hired as an engineer at most companies today you’ll be asked to sign an employment contract. It will spell out your compensation, your benefits package, your required hours of work, the conditions under which you could be terminated, and—somewhere within multiple pages of dense

legalese—the company’s policies regarding who owns the ideas you come up with on the job. But what about the ideas you came up with before this job? And what about the ideas you may conceive while working on your own time, at home, on an open source project?

Many employment contracts today specify that **the company owns anything its employees conceive or develop** that are “*related to the business of the company*” or “*during the course of employment.*” And many contain clauses that stipulate you can’t do anything “*to the detriment of the company*” or that is “*in direct competition with the business of the company.*”

At first glance, these terms sound straightforward enough. After all, if you’re being paid to do engineering work, the company expects you to invent on its behalf—and the company stays in business by exploiting the innovations you come up with to create new competitive advantages. But when it comes to IP ownership in today’s engineering environment, the issues are seldom straightforward. Here are some examples.

- **When is “during the course of employment”?** In other words, when is company time and when is personal time? For most engineers there’s really no such thing as being “off the clock.” You have a company-supplied cell phone that you use to talk to friends and colleagues at all hours; you use your company-supplied PDA or laptop for both work and play; you have social networking accounts that include both professional and personal contacts (in one recent court ruling, a journalist was forced to hand over the contents of his Facebook contact list to his former employer after he left the company⁹). And ideas can pop into your mind at any time. What if you conceive an idea that could be a breakthrough for your company while you’re mowing your lawn? What if you’re working on an open source project and you have a brilliant idea that could also benefit your company? Or you’re sitting in your company-supplied office and you have a great idea that would help an open source project? What if your idea doesn’t relate to the company’s current business, but could possibly lead to the company getting into a new line of business?
- **What is “detrimental” to the company’s business?** What if the idea you have for an open source project winds up creating new competition for your company? What if your participation in an open source project takes away from your productivity at work?
- **When can you participate in an open source project?** Do you need to ask permission—and if permission is granted, who owns your contributions? And what if your company requests that you

work on a specific open source project? What rights do you keep and what do you give away?

As you can see, these issues are nettlesome. Here are some general guidelines to help you sort through it all (again, this is not legal advice; always consult an attorney for guidance about your specific situation).

- **Read and understand the terms of your employment contract.** This should go without saying, but it's astonishing how often engineers later find themselves dismayed by the terms they've agreed to. Read the fine print and know exactly what you're signing.
- **Assume "my time" and "company time" are indistinguishable.** The notion of personal time is becoming increasingly difficult to isolate from work time, and today you'd be taking a huge risk if you expected a court to side with a premise that you conceived and developed a novel idea entirely on personal time. Your company may have a clear definition of what constitutes personal time as opposed to company time, but chances are it doesn't matter "when" or "where" creative genius struck; the more relevant issue is whether your idea pertains to the company's business. If it does, the company will probably own the rights to it unless there is some explicit, written agreement to the contrary. If your work doesn't relate to the company's business, beware the possibility that the company may one day get into that business. Often there are **skunkworks projects** or small teams working on specific innovations secretly; don't assume you're privy to everything that's going on in your company.
- **Document your work thoroughly—even work you consider to be on nonrelated activities—to establish exactly what you did and when.** This could be important in the future to establishing intellectual property rights (particularly if you file for a patent). If there's a possibility that your company may get into the "business" of what is currently your "hobby," make sure your previous work can be carved out in your employment contract or specifically identified as predating the company's interest.
- **Consult an IP attorney if you have any questions or concerns.** If your employment contract is unclear about any aspect of IP ownership—whether it concerns participation in open source projects, carve-outs for previous inventions, or other terms and conditions—talk to an

attorney. Your local bar association can usually help you find a qualified IP law specialist.

Previous Inventions

Many engineers are owners or joint owners of multiple patents, copyrights, or other forms of intellectual property, and accounting for these “previous inventions” can become complicated as engineers change jobs or roles within an organization. Here are some specific suggestions and guidelines pertaining to previous inventions.

- **Take the time to itemize every innovation for which you own a patent, a copyright, a trademark, or any other form of IP ownership—before you even interview for a new job.** Typically previous inventions can be “carved out” in your employment contract, or specifically separated from any additional innovations you come up with on the job. Include all intellectual property you co-own with others. Be sure you have full documentation for everything you claim as your IP. This could also become important in establishing the novelty of future inventions; it can be used in comparisons to “prior art.”
- **Don’t disclose previous inventions that could violate a prior confidentiality agreement.** Instead, you may simply disclose a “cursory name” for the invention, a listing of the party(ies) to whom it belongs, and the fact that full disclosure has not been made for that reason.
- **Expect your company to claim a license to your prior invention if you use it in a new product.** Many employment contracts specify that if you incorporate your previous invention into a “product, process, or machine” of the company’s, the company will have a “nonexclusive, royalty-free, irrevocable, perpetual, worldwide license” to “make, have made, modify, use, and sell the prior invention,” or other words to that effect. This is quite reasonable from the company’s perspective; otherwise, it would be at risk of employees purposefully including its previous inventions in products, then demanding the company pay a license fee once it is too late. If licensing your prior inventions is not acceptable to you, you must ensure that you do not incorporate them into your new company’s products; you must negotiate different terms in your employment contract or not sign the contract.

Participation in Open Source Projects

In recent years, participation in open source projects has become increasingly common among software engineers. This has opened new avenues for creative expression and participation in diverse projects, but it has also made life more complicated from an IP ownership perspective. Here are a few IP guidelines for those who wish to contribute to open source projects while an employee of a commercial enterprise.

- **If you want to participate in an open source project, check your IPR clauses first.** Examine the intellectual property rights (IPR) clauses of your employment contract and make sure you are explicitly permitted to participate in an open source project. Then be sure you understand and agree to your company's policies regarding ownership of your contributions to that project. Some employers have set policies regarding open source projects but are open to discussion about specific projects and IP ownership/exploitation rights; others actually encourage or even mandate participation in open source projects.
- **Know the open source community's policies on IP ownership.** Remember that source code for software is copyright; code contributed to open source projects remains the copyright of the original copyright holder; and copyright holders have the right to dispose of their material any way they see fit. Some open source projects, notably Apache and Samba, have policies that prevent individuals—hence the companies that hired those individuals—from retaining copyright ownership. Other projects insist on the assignment of copyright. In some projects, every contributor owns the copyright for his contribution. In any case, only the copyright holder has the power to reassign his copyright or license his copyright material. If you are not the copyright holder, you must obtain the explicit consent of the copyright holder for anything you wish to do with his material.
- **Know your company's policies on IP ownership for open source contributions.** Find out whether your company has a policy that dictates who owns the copyright for open source contributions by engineers. Is it owned by the company, the employee, or both? In most cases, the company will retain the copyright ownership (or acceptable license) so that it can implement dual licensing should the need arise.
- **If you ask permission to work on an open source project, get the response in writing.** If you agree to an IP ownership arrangement with

your company that is different from the terms contained in your employment contract, you should make sure both your request and the company's response are thoroughly documented. In one case that made headlines recently, DDB Technologies, a holding company, sued MLB Advanced Media (MLB) for allegedly using its patented technology without a license on many of its online games. What happened, in a nutshell, is that an employee of Schlumberger approached his company's legal department and requested verbal permission to work on computerized replays of sporting events on his own time (implying that the employee would own any IP he created in this technology). He subsequently patented his work, left Schlumberger to create his own company (DDB Technologies), and wanted to license the patented work to MLB. Allegedly, MLB at first showed no interest, but later used the inventions in some of its online games without compensation. The former Schlumberger employee claimed that Schlumberger had granted his request for permission to develop and "retain ownership" of the new technology; however, he did not have adequate documentation of Schlumberger's response, and as such, Schlumberger retained IP ownership. DDB Technologies then sued MLB because the employee's employment agreement automatically assigned the patent rights in question to Schlumberger. In the end, MLB paid a licensing fee to Schlumberger, not to the former employee whose innovations were used.

Sun's acquisition of MySQL AB in December 2007 provides a good example of why IP ownership issues have become so complex in the open source era—and how established enterprises are becoming more accommodating to engineers who wish to participate in open source projects.

MySQL is the world's leading open source database and has always been a leading advocate of the "open source lifestyle," where contribution to open source projects is not only accepted but actively encouraged. At the time of the MySQL acquisition, Sun was also a leading open source advocate, but tended to be very selective about the projects in which its employees were encouraged to participate. Understandably, Sun had concerns about allowing its engineers to contribute to projects such as Linux, where they could potentially create something that was detrimental to Sun's core business, or to other projects where they would not own or control the IP they created on behalf of the project.

Sun's answer: Rather than create a "white list" and a "black list" of open source projects, and rather than require engineers to get explicit permission to participate in an open source project, Sun essentially opened the door and allowed engineers to contribute to any project—on the simple condition that

they let Sun know. There is now an easily accessible Web site and a standard disclosure form engineers can use to keep the company posted about their activities in various communities.

The response from Sun engineers has been overwhelmingly positive so far. There is a sense that Sun is actively encouraging participation rather than “allowing” it; engineers have more outlets and options for expressing their creativity; Sun is finding it easier to retain talented engineers; and potential sources of conflict of interest have been reduced.

Tip Sheet: Inbound and Outbound IP

Remember that IP law is there to protect both your use of the ideas of others (inbound IP) and the use of your ideas by others (outbound IP). Table 12–1 is a quick-reference guide to using the key IP protection mechanisms responsibly—whether you’re the source of the IP or you’re using someone else’s IP.

TABLE 12–1 Reference Guide to IP Protection Mechanisms

PATENTS

- | | |
|-----------|--|
| Inbound: | <ul style="list-style-type: none"> • Don’t do your own patent searches or read other patents to determine whether your invention is patentable, without first seeking the advice of patent counsel. • Perform a good-faith investigation to avoid inadvertent patent infringement under the direction of patent counsel. • Avoid making any written or email comments about the patentability or potential infringement of a patent, except under the direction of patent counsel. • Don’t make, use, or offer to sell any invention that you know is covered by a patent held by another party unless you are sure you have an adequate license from the holder. • Cut the risk of willful infringement by notifying your legal department immediately if someone informs you of a potential patent issue. |
| Outbound: | <ul style="list-style-type: none"> • File for patent protection immediately before the invention is made public or disclosed to a third party. • Avoid the default rules for jointly owned patents. • Clearly define IP ownership, rights, contributions, and obligations in joint development projects. • Create specific plans for enforcement, duty of royalty and accounting, and assignment and license of rights for the IP and any improvements/derivative works. • Avoid previews, test runs, or external presentations involving potentially patentable IP until all patent applications have been filed. |

Continues

TABLE 12-1 Reference Guide to IP Protection Mechanisms (*Continued*)

COPYRIGHTS

- Inbound:**
- Don't assume that a work is not copyrighted because it doesn't carry a copyright notice.
 - Never remove a third-party copyright notice.
 - Most open source software is copyrighted—make sure you know and comply with the precise terms of the license before you use or incorporate any part of it in your work.
 - Before you rely on “fair use” as a defense to infringement or a reason not to seek a license from the copyright holder, consult with an IP attorney, and remember the four-factor test (purpose of use, nature of copyright work, amount and substantiality of work used, and economic effect).
- Outbound:**
- Always use a proper copyright notice in your copyrighted work.
 - Remember that the company owns the copyright, not the individual, absent an agreement to the contrary (development agreement, contribution agreement, etc.).
 - Try to avoid co-ownership of copyrights.
 - Consult an IP attorney before mixing open source software with different licensing mechanisms.

TRADEMARKS

- Inbound:**
- You cannot use an existing trademarked product name as part of the name of a new invention or in a manner that could create confusion as to the source of a product.
 - Your written materials do not need to acknowledge third-party trademarks.
- Outbound:**
- You don't need to register a trademark to attach rights, but registering a trademark can strengthen your trademark protection and claims.
 - When writing about a trademarked product, use the trademark as an adjective, not a noun; for example, “Solaris operating system,” not simply “Solaris.”

TRADE SECRETS

- Inbound:**
- Remember that theft or misappropriation of a trade secret is a violation of the law, and if done with intent, can constitute a federal crime.
 - Never use other employers' trade secrets at your company, or use your company's trade secrets at other employers.
- Outbound:**
- Keep trade secrets physically and digitally secure.
 - Always use NDAs in any oral or written discussion of a trade secret.

NDAs

- Inbound:**
- Avoid participating in nonpublic discussions about an invention, product, or technology that is similar to anything you're working on, unless you have first consulted the advice of counsel and implemented appropriate measures to avoid claims of infringement, misappropriation, or the like.

TABLE 12-1 Reference Guide to IP Protection Mechanisms (*Continued*)

| | |
|-----------|---|
| Outbound: | <ul style="list-style-type: none"> • Always require anyone who will be receiving information about an invention, product, or technology enhancement that is nonpatented or nonpublic to first sign an NDA. |
|-----------|---|

How to Protect Your IP in Emerging Markets

The WTO's Agreement on Trade-Related Aspects of Intellectual Property Rights, or TRIPS,¹⁰ has made strides in harmonizing IP laws worldwide, but the legal regimes protecting IP still vary widely from one country to the next. China, India, Brazil, and other emerging markets still have rather murky IP reputations—places where enforcement of patent, trademark, and copyright law is uneven or minimal and counterfeiting and piracy can run unchecked.

However, there is reason for optimism. Countries with fast-growing consumer classes have a growing interest in protecting their own IP rights, and recent victories in Chinese and Indian civil courts by global companies highlight a commitment to improving IP protection.

- In April 2006, 3M successfully sued a Shanghai-based manufacturer for infringement of 3M's Chinese patents for respirator masks.
- The following June, a Chinese court upheld the validity of Pfizer's Chinese patent for Viagra and issued an injunction against two infringers.
- On May 23, 2007, the Supreme Court of India in a landmark ruling ordered Dabur to stop using a package design that is deceptively similar to Heinz's Glucon-D packaging.

While the slow march toward uniform IP law and enforcement continues, there are steps engineers and companies can take to safeguard their IP in emerging markets. Alicia Beverly, chief IP strategist with IP Wealth, offered the following tips for protecting IP in China, the largest emerging market.¹¹

- China is not a DIY (Do It Yourself) country. Get professional help.
- China is a “first to file” country with no recognition given to use or ownership by other parties. It is therefore essential that you file for your rights—trademarks, patents, etc.—*before* you enter China. Failure

to do so is an invitation to the manufacturer or distributor you are working with to do it themselves.

- Contracts must be translated into Chinese, cannot be common law-centric (the United States, England, Canada, and Australia are all common law countries), and must cover everything because anything omitted is fair game.
- Investigate whether your current trademark is useful for the Chinese market, conduct searches, and then protect several versions of your trademark—the English version, the Chinese translation, and even a phonetic version of the English version.
- Design products that are harder to imitate and commit to continuous innovation to keep one step ahead.
- Consider splitting elements of your production in different locations.

You can also find general information and guidance for protecting IP in emerging markets in a variety of places, including “The Protecting Product IP Benchmark Report: Safeguarding Design Intellectual Property in a Global Market” by Aberdeen Group.¹² In addition, here are a couple of specific suggestions from David McHardy Reid and Simon MacKinnon, who have considerable business and research experience in China.¹³

- **Be quick with patent and trademark registration.** Foreign companies entering the Chinese market are sometimes surprised to find that patents on key elements of their products or technologies already have been filed by someone else. This is an entirely legal maneuver, as patents are awarded to the first to file, not necessarily to the originator of the product or technology. Usually these patents have been filed by a Chinese company that uses them either to gain an edge against foreign competition or to negotiate a lucrative agreement to transfer the rights to a company that wants to enter the Chinese market. Trademarks present similar problems. Most products sell better in China if they are given a Chinese name. Some companies in China register trademarks that would be suitable translations of the names of foreign products, again either to sell a competitive product or to negotiate the rights with a foreign company. The only solution for foreign companies is to file patents and Chinese-language trademarks in China as soon as possible.
- **Research and keep up with best practices.** Many foreign enterprises fail to adequately search for and keep up with best practices

in protecting intellectual property in China. Information is readily available through the many chambers of commerce and trade associations operating in China. One group dedicated to this issue is the Quality Brands Protection Committee, whose members include many major multinational companies.

For more about protecting your IP in China, check out “China’s Trademark Laws—Simple and Effective” (www.chinalawblog.com/2006/09/chinas_trade-mark_laws_simple_a.html), which talks about how Chinese trademarks are indeed good protection, and “Nike on China IP Protection: Just Do It with Green Tea” (www.chinalawblog.com/2006/07/nike_on_china_ip_protection_ju.html). Both contain a number of additional good suggestions for protecting your intellectual property in China.

Back to Patent Protection: The Good, the Bad, and the Ugly

In previous sections of this chapter, we discussed that software can be patented and/or copyrighted. There are some intriguing interplays here that engineers should be aware of. When you take a closer look at current patent laws, the decision whether to patent or to copyright isn’t always as clear-cut as it seems.

In the software industry, copyright appears to be (mostly) better for balancing the interests of individual innovators and the general public. Copyright puts the licensing control clearly and explicitly in the hands of the developer. And a copyright notice can include a license for any related patents the developer may have obtained. Some of the most effective of these are “patent peace” grants, such as what Sun has done with the Common Development and Distribution License (CDDL): You get a grant to our patents as long as you follow the copyright license, including the provision that you won’t prosecute for any patents that you might have. If you do prosecute, our patent grant is revoked.

So, in a way, the utility of a software patent here is that it can put more teeth into the potential enforcement of a public license. That’s fine when used in this way. But any developer is always open to attack from a patent troll.

In such cases, it’s rare that the patent holder is actually putting the idea to use himself; he just wants to charge you an exorbitant fee. So, patent peace doesn’t come into it. At least we at Sun have some resources to combat this. In 2004, we paid \$92 million to Kodak to immunize the entire Java

community from infringement claims on mechanisms that Kodak itself doesn't use—the patents were acquired from a third party. This felt like insanity, but we determined that we had to pay in order to indemnify the whole Java community.

A patent is a far blunter instrument than a copyright and tends to teach us far less than the code itself. Developers don't sit around reading patents to understand some new software pattern or idea, and remember, the limited monopoly we grant a patent holder is in exchange for teaching others how to do it so that when the patent expires everyone is better off.

Another hitch with the patent process is that today's patent system has also proven to be easy for opportunists to manipulate. In recent years, there has been a huge influx of new patent applications. The total number of patent applications filed around the world has increased steadily, particularly since 1995, according to WIPO. The United States had more than 900,000 patents pending in 2005. The Japanese Patent Office also had more than 800,000 patents pending in 2005, and the workload at certain patent offices has increased faster than the capacity to examine patent applications.¹⁴

Part of the growth in patent applications is predictable given the growth in worldwide engineering activity. But part of the growth is also due to new forms of patent system exploitation—people filing for patents on marginal ideas simply because they believe (often rightly so) that the patent will be granted. In effect, they're exploiting the backlog of applications and the increasingly technical nature of many patent applications.

Why would people do this? One reason is an exploit called **patent trolling**. If you've been issued a valid but overly generic patent, it may be possible to use it to secure cash settlements from companies that are seeking to develop products incorporating a similar technology or innovation. Microprocessor designs, for example, can incorporate thousands of individual patents. Someone who holds a patent on a technology that could be construed as similar to a technology being used in a new microprocessor design could claim patent infringement and demand compensation. The result for the microprocessor company could be an unexpected cash outlay, or significant delays in the product development cycle and missed market windows.

So, the challenge is to create a system that promotes innovation, not simply "patent pooling" or accumulation of the deepest stack of patents. If the system is too easily manipulated, or if the potential consequences of making an IP mistake are too great, inventors are disheartened.

"In general, the patent system works pretty well—both in terms of spurring innovation and in protecting inventors," says Michael Falk, general counsel for WARF. "I do think, however, that there are cases where the patent system can cause excessive friction and inhibit innovation. In the area of wireless

technology, for example, there may be some companies that weren't funded because there were too many IP issues and potential investors were afraid to move forward. That's a cost of the system—without the friction you'd have more innovation—but more often the benefits outweigh the costs.”

We believe the patent system in the United States needs reform, and we're far from alone. In the words of David Evans, senior vice president at NERA Economic Consulting, Inc.:¹⁵

The U.S. Patent Office lacks the resources to distinguish inventions that deserve protection from those—the silly, the obvious, and the hardly new—that do not. That problem is exacerbated by the legal system. Once granted, patents are hard to void, and juries and judges tend to favor the patent holder. Uncertainty over the scope and even existence of patents also creates expensive litigation. For instance, holders of “submarine patents” have launched huge royalty claims after having kept a patent secret, quietly waiting until the technology or business process becomes an industry standard. . . . In changing the system, policymakers ought to remember that extremists from both ends of the protection spectrum cannot be trusted. Recommendations to grant blanket elimination of patents in certain industries—such as the claim that there should be no software patents—should be treated as skeptically as demands for blanket extension of patent rights to areas where they do not now exist.

And patent reform is underway, albeit excruciatingly slowly. According to the *New York Times* (January 13, 2008):¹⁶

Congress is expected to take a hard look at the nation's patent laws this year in what could result in the biggest change in generations. . . . The House passed the Patent Reform Act in 2007, with the Senate expected to pass its own version in a matter of months. A key element in the debate centers on whether to limit damage awards in patent infringement lawsuits—a provision sought by a host of the giant technology companies, including Microsoft, Apple, Intel and IBM. . . . The real question for lawmakers this year is how to rewrite the patent laws to best protect innovation while limiting needless litigation and abuse of the patent system. Stay tuned: the fight has been engaged, and there will be heated arguments about who is right, who is wrong and how technology advancements should be protected at a time of rapid change in the industry.