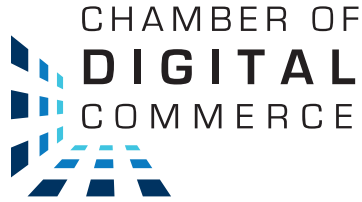


A BLOCKCHAIN INNOVATOR'S GUIDE TO IP STRATEGY, PROTECTING INNOVATION & AVOIDING INFRINGEMENT





ABOUT THE CHAMBER OF DIGITAL COMMERCE

The Chamber of Digital Commerce is the world's largest trade association representing the digital asset and blockchain industry. Our mission is to promote the acceptance and use of digital assets and blockchain-based technologies. Through education, advocacy, and working closely with policy makers, regulatory agencies, and the blockchain industry, our goal is to develop a pro-growth legal environment that fosters innovation, jobs, and investment.



ABOUT THE BLOCKCHAIN INTELLECTUAL PROPERTY COUNCIL

The Blockchain Intellectual Property Council (BIPC) is an initiative of the Chamber of Digital Commerce to promote blockchain innovation and help companies better navigate intellectual property decision-making processes. In a rapidly growing ecosystem largely built on open-source technology, but where the protection of intellectual property remains a vital concern, the BIPC helps balance the protection of proprietary information against the transparency required for innovation.

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PREFACE

Patentability, and the decision to patent an innovation, is central to the growth of any new technology or field. The blockchain ecosystem, unsurprisingly, is beginning to confront those questions. This Primer offers background information on the subject of intellectual property (IP) law and provides high-level guidance on how these critical questions impact individual innovators, groups of founders, or entities operating in the blockchain space.

While the issue of IP protection is extremely important in the context of this potentially transformational technology, the issue is not new or unique to blockchain. The considerations for blockchain may be similar to those faced following the creation of the Internet or the World Wide Web. Notably those innovations—like blockchain itself—were not patented.

The inventors of the Internet, Robert E. Kahn and Vint Cerf, faced the same questions regarding whether or not to protect their IP and how to protect it. Ultimately, they opted not to patent TCP/IP or their subsequent breakthroughs. Likewise, the inventor of the World Wide Web, Sir Tim Berners-Lee, did not seek patent protection for the World Wide Web. Satoshi Nakamoto did not seek to patent the blockchain concept. However, many subsequent innovations that relied on those technological breakthroughs did seek and receive patent protection. Thus, understanding IP rights and formulating a robust IP strategy is a sensible course of action for any inventor, developer, or business in the blockchain industry.

Perhaps the initial breakthroughs themselves are different in nature. As noted by Vint Cerf in 2011, “Bob [Kahn] and I started writing the specs for the Internet in 1973 [We] knew we could not succeed if we tried to protect the Internet’s design. As it turns out that worked out really well, and I think that’s still pretty good advice.”¹ Sir Tim Berners-Lee, inventor of the World Wide Web, subsequently made a comparable point, stating:²

[My book] is the story of those times – inventing it, and not so much inventing but the social process of trying to get everyone to use the same standards. The reason the Web took off is not because it was a magic idea, but because I persuaded everyone to use HTML and HTTP.

For these inventors, forgoing patent protection was deemed beneficial to fostering development within a new ecosystem.

Some participants in the blockchain space have also preferred the open-source approach. For example, several parties, such as Hyperledger, have released their blockchain software under an open source license. One startup, Blockstream, even created a “patent pledge” which states that it will not sue other innovators, as long as Blockstream’s software is not “used offensively”.³ In contrast, other companies have chosen

¹ J. O’Dell, *Vint Cerf: The government is going overboard in Internet copyright control*/VENTURE BEAT (NOV. 14, 2011, 11:03 a.m.), <https://venturebeat.com/2011/11/14/vint-cerf/>

² Joe Mullin, *TIM BERNERS-LEE TAKES THE STAND TO KEEP THE WEB FREE*, WIRED (Feb. 8, 2012), <https://www.wired.com/2012/02/tim-berners-lee-patent/>.

³ *Blockstream’s Defensive Patent Strategy* - FAQ: What is the Innovator’s Patent Agreement, Blockstream, https://blockstream.com/about/patent_faq/

to seek patent protection for their innovations. Bank of America and Nasdaq are but a few examples of companies that have obtained patents for blockchain innovations.

Several other non-open source solutions can serve to mitigate litigation risk. Some industry participants advocate for the development of a patent pool, similar to the Open Invention Network (OIN), which protects member firms against suits for using Linux, the popular open-source operating system. The OIN, created in 2005, acquires patents and then licenses them freely to its members, who agree to contribute certain of their patents to the pool.

Whatever the reason is for choosing to seek or forgo patent protection, it is sensible to understand the rights that are available, how to obtain them, and when they apply. Innovators must determine the correct course for their particular innovations, and seeking and utilizing IP protection can be a key resource for protecting their interests. This Primer presents a path for making that determination, and how to navigate the many decisions that follow.

In the future, the Blockchain Intellectual Property Council will continue to build consensus around the management of IP rights. The working principles established must benefit both inventors and the blockchain sector and must serve to support both individual entities and the vibrancy of the full ecosystem.

I. INTRODUCTION

Blockchain and Distributed Ledger Technology (DLT) promise to be a disruptive force in many areas. As a result, we are seeing a great deal of investment in this technology by industry and investors. In 2016, venture capital firms invested \$392 million in the maturing technology and closed 75 deals.⁴ Furthermore, alternative forms of startup capital, such as Initial Coin Offerings (ICO), have recently eclipsed venture funding. These innovators are safeguarding their innovation with legal mechanisms for protecting IP, patents being the most significant among them. It is critical that participants in the blockchain ecosystem have a basic understanding of IP protection, strategy, and risk. This Primer is intended to provide such a foundation.

Since the publication of the Satoshi Nakamoto Whitepaper⁵ in 2008, the number of worldwide published patent documents related to blockchain, distributed ledger technology, and digital or virtual currencies has skyrocketed. Chart 1 shows international patent filings, by year, as of late September 2017 for these technologies.⁶ Note that, since patents take approximately 18 months to publish after they are filed, the results for 2015, 2016, and 2017 are not complete because most of the filings in the last 18 months are not yet available to the public.

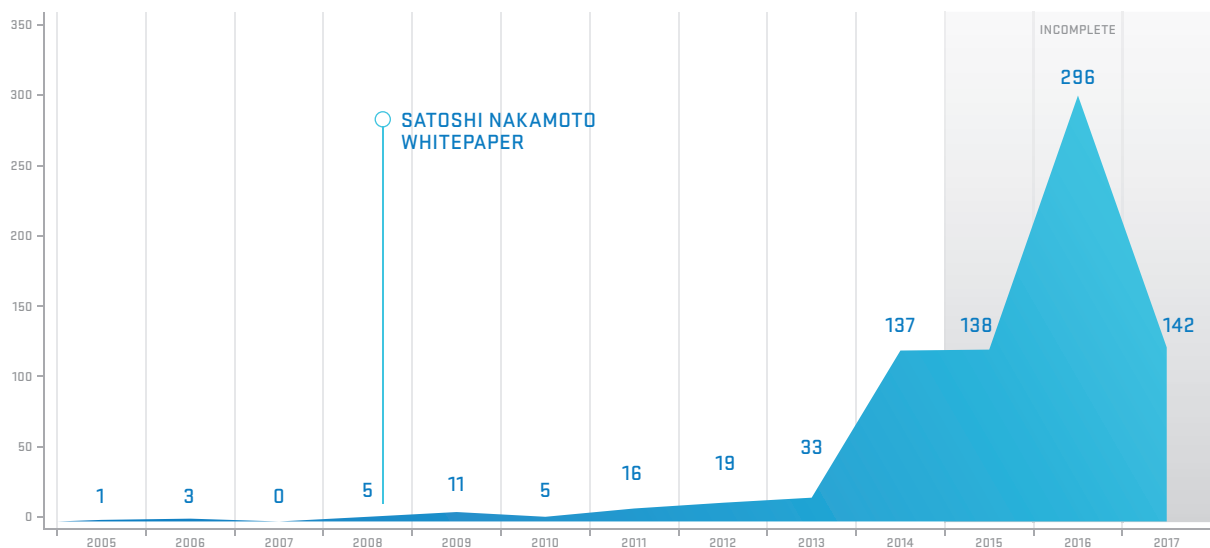


CHART 1:

International Patent Filings on Blockchain, DLT, and Digital or Virtual Currencies Since 2005 (as of October 2017).

This chart includes only the first priority date in a patent family. Therefore, it does not include later-filed applications that are part of the same patent family, and which may include filings in other countries.

⁴ KPMG, The Pulse of Fintech Q3 2017: Global Analysis of Investment in Fintech, p. 19.

⁵ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008), www.bitcoin.org.

⁶ All patent publication data are the result of a search of database records that was designed to focus solely on blockchain-related technology. As is the case in all patent searches, it is possible that some publications were missed.

To date, the primary sources for patent filings are in the United States, China, and the United Kingdom, as shown in Chart 2. However, other countries are expected to be added to this geographic profile over the next several years.

It is clear that the various players are already protecting their IP related to blockchain technology. Parties wishing to compete must understand the basics of IP—especially patents—and must have a strategy to protect their own innovations in a manner that promotes their business objectives. Furthermore, in order to foster innovation, players in the blockchain space should collaborate in a manner that balances IP protection with a basic level of freedom to operate.

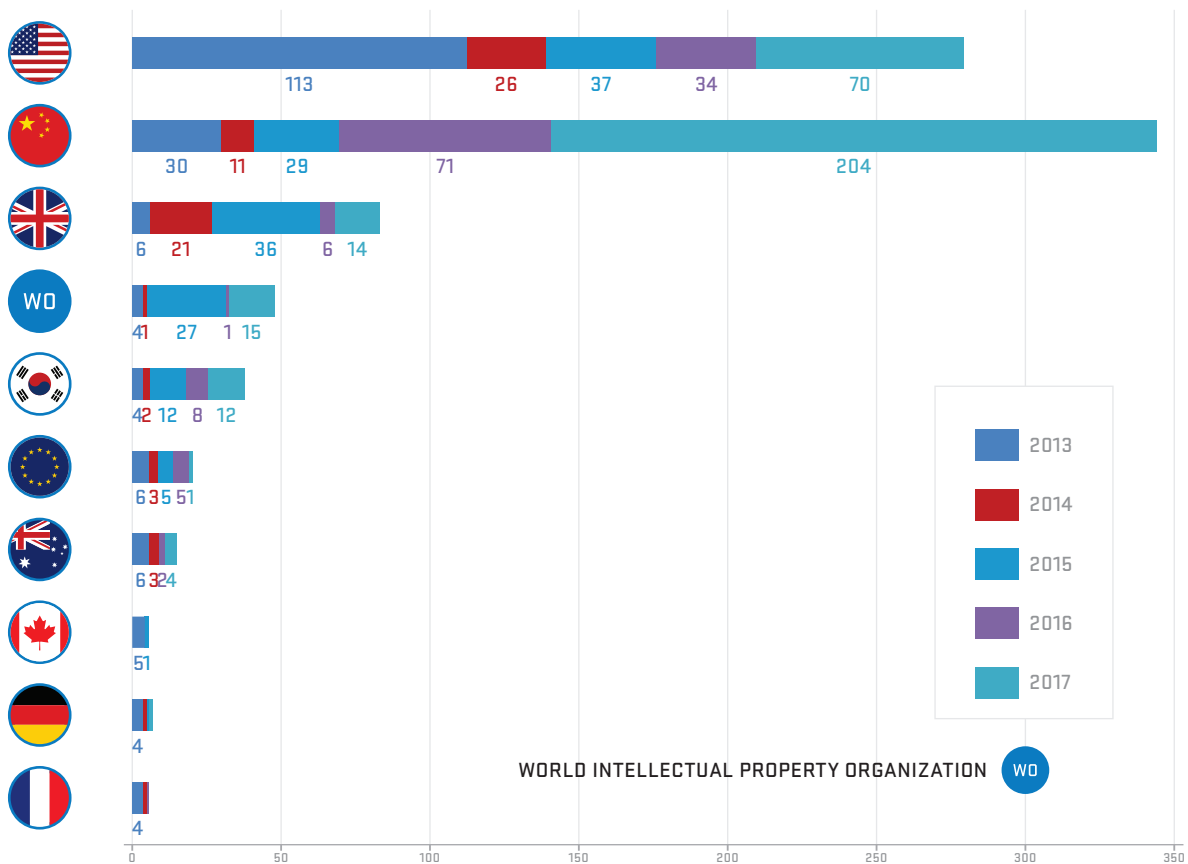
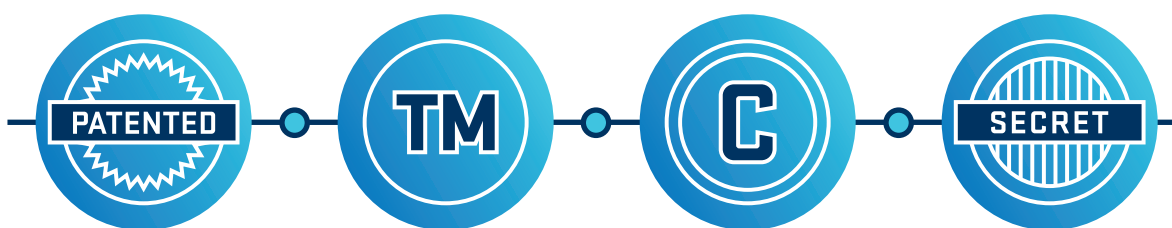


CHART 2:
International or Patent Cooperation Treaty applications submitted to the World Intellectual Property Organization (as of October 2017).

The objective of this Primer is to impart a basic understanding of IP to the reader in order to facilitate strategic management of IP within the blockchain ecosystem. This Primer assumes no legal experience on the part of the reader. However, there are many citations to case law and other legal documents to provide a foundation for this information, and which serve as additional resources. Each section is intended to stand on its own, imparting some necessary redundancy between sections. While legal concepts and standards are discussed, nothing in this paper is intended to be, or should be construed as, legal advice. Persons seeking IP protection for their innovations should seek legal counsel.

II. WHAT IS THE DIFFERENCE BETWEEN PATENTS, TRADEMARKS, COPYRIGHTS, AND TRADE SECRETS?

There are four primary types of IP protection: patents, trademarks, copyrights, and trade secrets. Therefore, an IP protection strategy must include an understanding of the scope of each type of protection and how it can be applied to a specific innovation. Clients seeking the assistance of an IP attorney are usually able to identify the “property” that they would like to protect. It is often a product, feature, or business practice that differentiates them from their competitors. What is less intuitive to most parties is the exact type of IP protection, if any, best suited to protect their innovation.



With patents being popular plot devices in movies and television, not to mention alarming headlines warning of “patent trolls” and “pharma bros,” almost everyone knows that patents exist and may have a general understanding of their function. Copyrights and trademarks are similarly well-known, whether as the © or ® symbols, or the acronym TM following words in an advertisement, or perhaps from the repeated and dire FBI warnings preceding films. Less well-known—to the point where it is ironically (or maybe not) almost a bit of a secret—is a fourth type of IP, referred to as a trade secret. With four basic forms of IP protection, each with different, and sometimes overlapping, requirements, it becomes apparent why inventors frequently know what they would like to protect, but have little idea how best to protect it.

The above is especially true in the world of software and computer architecture innovations. For example, someone having general knowledge of IP will likely conclude that a novel mechanical object which performs a useful task, such as an exhaust header or brake caliper, is more likely to be protected by a patent than a copyright. Conversely, books are typically protected by copyright. But what if the novel creation combines both the authorship of original words in a fixed medium *and* a useful innovation, such as a new method for protecting a ledger from collusion-based manipulation (e.g., perhaps by monitoring for clustered geographical origination of inputs that challenge a consensus algorithm the blockchain uses)? The innovation performs a useful task, like a brake caliper, but the method is implemented using a written software code that can be read like a book.

When protecting software, it is common to rely on multiple forms of IP protection, either simultaneously or separately, at varying times during the software’s life cycle. To understand why this is the case, a brief description of the requirements and applications of the four basic types of IP is useful.

A PATENTS



A patent can protect a machine, process, or article of manufacture. A U.S. patent holder has the right to exclude all others in the United States from making, using, selling, offering for sale, importing, and, in some cases exporting, implementations of their claimed invention for the duration of the patent (typically, approximately 20 years).⁷ This is an exceptionally powerful right, granted by the U.S. government, that is given to the inventor in exchange for the public disclosure of their invention. While patents are a flexible and powerful form of IP, they are also usually the most expensive and most difficult to obtain due to the fact that a relatively protracted application process is required. Owners of pending patent applications may mark commercial embodiments of those inventions as “patent pending,” which can provide some competitive advantages against potential copiers during the patent process. However, the patent owner cannot sue for infringement and collect damages until a patent is granted.⁸ Given the costs, delayed enforceability, and relatively short duration of patent protection, it is well-suited for protecting highly valuable innovations that are likely to provide a competitive advantage for several years.

B COPYRIGHTS



Copyright exists in any original work of authorship (e.g., literary, musical, architectural, and pictorial works) that has been fixed in a tangible medium (e.g., a book, a photograph, a compact disc, or a digital memory device). *The holder of a copyright has the exclusive right to reproduce, distribute, perform, display, prepare derivatives of, and digitally transmit the work, and may also mark works with a copyright notice.* The moment that an original work is fixed in a tangible medium, copyright protection springs into existence and vests in the author of that work—so registering or applying for a copyright is not required. Importantly, in some cases where the work is for an employer or otherwise commissioned, the rights may vest in another party and not the individual(s) who participated in the creation of the work. The U.S. Copyright Office allows copyright holders to register their copyrighted works for a small fee, which provides advantages to the copyright holder in case of infringement. Many countries, however, do not require copyright registration for full rights. The duration of a copyright in the United States is the life of the author plus 70 years or for a copyright that vests in a corporation, the earlier of 120 years after creation or 95 years after publication.

Computer programs and databases are considered literary works as it relates to copyright laws. While it is useful to keep and maintain copyrights in software source code and database schema and contents, especially since there is little effort needed to obtain the copyright in the first place (e.g., original authorship and a fixed medium), the protection provided by a copyright is somewhat limited and primarily intended to prevent true piracy as opposed to mere imitation. For example, using source code that was copied and pasted would infringe a copyright, but using the same code as a guide to independently create a program

⁷ The basic requirements of a patentable invention are discussed in the next section of this paper.

⁸ Patent owners can also collect “provisional damages” when (a) the accused party practiced the invention after the application was published, (b) it can be demonstrated that the accused party knew about the pending application, and (c) the claims did not substantially change between publication and grant of the patent. Note that the concept of “provisional damages” has nothing to do with a “provisional patent application.”

that is functionally identical, but with different variable names and organization, might avoid copyright infringement (but not patent infringement). A single software application may be protected by both a patent (for its functional characteristics) and a copyright (for the arrangement of its source code and visual elements).

While somewhat limited, copyright protection is an important tool in protecting software and other works, especially in the absence of a patent. Occasional version- or milestone-based registration of website content and software source code can strengthen the protection that copyrights provide for a modest cost.

C TRADEMARKS



A trademark is a name, word, phrase, logo, symbol, design, image, color, or combination thereof that is used to identify the source of goods or services bearing the mark. *A trademark holder has an exclusive right to mark goods and services with the mark in order to put consumers on notice of their source, and the duration of a trademark that is continuously maintained and used by the mark holder is indefinite.* While copyright and patent laws primarily protect inventors and authors, trademarks are intended to protect consumers. For example, trademarks help a consumer identify a particular product or service that is sold in connection with a mark as coming from a known or trusted source (or even one that is not trusted) when compared to a similar good that does not bear the mark. As with copyrights, a trademark may be used without registration and will still provide some protection, but registration with the U.S. Patent and Trademark Office (USPTO), and its counterpart offices in countries throughout the world, provides increased protection and enforcement options. Trademark rights may be difficult or impossible to develop if the mark is deceptive (e.g., “Waterproof” brand electronics that are not actually waterproof), descriptive (e.g., “Float” brand life jackets), generic (e.g., “Tire” brand tires), or confusingly similar to trademarks that have already been registered, applied for, or used.

Some types of works, such as a logo or symbol, may be protected under both copyright and trademark law. There are no significant software-specific considerations with trademarks. Trademarks should be considered for software application names or logos that an owner would like to distinguish from other applications. This also applies to names, logos, services, and tokens in the blockchain arena as well. Developing unregistered trademarks for your business and for particular products or applications often occurs naturally as a by-product of business activities. Those with an eye toward associating strong brand value or loyalty with particular trademarks should have those marks evaluated by an attorney as early as possible in their business activities in order to improve the chances of a successful registration and avoid infringing the rights of others.

D TRADE SECRETS



A trade secret is: (1) any information (e.g., a process, formula, design, instrument, pattern, method, or compilation of information), (2) that the holder has taken reasonable measures to keep secret, and (3) that derives independent economic value from being neither publicly known nor readily ascertainable by proper means by those who can make economic use of it. *The holder of a trade secret may take legal action against another party who misappropriates their trade secret, and they may be awarded monetary damages and an injunction to prevent the defendant's use or disclosure of the trade secret to other parties.* However, a party who independently developed information that is held as a trade secret by another party has not infringed on the trade secret. Since maintaining a trade secret requires reasonable efforts to maintain secrecy, it is apparent that in some ways a trade secret is incompatible with a patent filing, which requires public disclosure. Nevertheless, some patentable inventions may be initially maintained as a trade secret, and then later protected by a patent filing. This may be the case where a patent application is filed for an invention accompanied by a request to not publicly disclose the application until a patent is issued. In this manner, the invention may be maintained as a trade secret while the patent is pending or if the patent is abandoned.

It may not always be appropriate or possible to protect an innovation as a trade secret while attempting simultaneously to commercialize it. For example, a new type of bicycle gear may not be commercialized with any level of secrecy since it is being sold to users who could ascertain its structure and function simply by observing it or disassembling it. This is also true of some software that may contain client-facing elements and features or client-side processes and scripts openly available to users. Server side elements, however, may be reasonably protected as a trade secret because they are largely invisible to users.

A software application should be evaluated early in its development to determine the extent to which it can be maintained as a trade secret. Where important software features are embodied in user-facing or client-side processes, relying upon patent protection may be the better option. Where features or databases containing important information are kept server-side, maintaining them with a high level of security, encryption, and access control may allow them to be kept as trade secrets indefinitely.

III. WHAT TYPE OF INNOVATIONS CAN BE PATENTED?

The threshold consideration for obtaining patent protection of an innovation is that the innovation must concern “patent-eligible” subject matter, *i.e.* the type of innovation that is legally recognized as patentable. The legal standard and the terminology for patent eligibility varies slightly between jurisdictions. The discussion below is based largely on U.S. law, but is generally applicable to many countries. The concept of patent eligibility is based on the statutory requirement that patents can only protect “useful” inventions.⁹ For example, a mere abstract idea or law of nature, not applied to a specific technological improvement, is not patent-eligible. Section A, below, describes the relevant state of the law for those that are interested. Those with merely a pragmatic interest can skip to Section B which addresses specific examples and recommendations.

A THE LEGAL LANDSCAPE

The U.S. Supreme Court has stated that “anything under the sun” that is made by humans can be eligible for a utility patent.¹⁰ The subject matter to be patented does not need to be revolutionary or awe-inspiring. If the innovation can help do something better, faster, or more efficiently, then it is likely patent-eligible.

Specifically, any of the following may be patent-eligible:

- » a process (including data manipulation by software);
- » a machine (or structure);
- » an article of manufacture;
- » a composition of matter; or
- » any new and useful improvements to the above.

The key point that has driven patentable subject matter jurisprudence for over 150 years is that a patent must claim “the means or method of producing a certain result, or effect, and not [the] result or effect produced.”¹¹ The most helpful analysis in determining patent-eligibility, however, is to look at what is not patent-eligible.

⁹ 35 U.S.C. §101.

¹⁰ Utility patents protect the structure and/or operation of an invention, but not its ornamental design. This discussion relates to utility patents unless indicated otherwise.

¹¹ *Corning v. Burden*, 56 U.S. 252, 268 (1854).

The U.S. Supreme Court recognized in the “*Alice*” case that applications falling under the following categories are not patent-eligible ideas because they represent “the basic tools of scientific and technological work”¹²:

- » laws of nature (e.g., the concept of $E = mc^2$);
- » natural phenomena (e.g., the discovery of mineral); and
- » abstract ideas.

The prohibition on patenting abstract ideas has often been applied to software-based innovations. Given the intangible nature of the technologies that power our digital economy, many innovations relevant to our information age such as software programs may be patent-ineligible as “abstract ideas.” However, the Supreme Court observed that “at some level all inventions ... embody, use, reflect, rest upon, or apply ... abstract ideas.”¹³ Therefore, we need to be careful not to allow these bars to patentability to “swallow all of patent law.”¹⁴

In the realm of software patents, the decision in *Alice* made it easier to challenge a software patent on the grounds of unpatentable subject matter. In *Alice*, the Supreme Court articulated a complex and vague standard for proving that a software patent rises above an unprotected abstract idea.¹⁵ Specifically, the Supreme Court laid out a two-pronged test for evaluating patentability: (1) whether the claim is directed to an abstract concept; and if so, (2) whether it contains an inventive concept necessary to transform the abstract idea into a patentable innovation. The second step considers whether the claim involves new, unconventional material in a way that transforms the claim into an application of an abstract idea, rather than merely the idea itself.¹⁶ As a result, even if a claimed invention contains a patent-ineligible abstract idea, the innovation may still be patent-eligible if it contains an “inventive concept” that transforms the ineligible abstract idea into a technical innovation.

The *Alice* ruling greatly altered the playing field for software patent litigation, largely in favor of targets of patent assertions. With the application of the two-pronged test, invalidation rates immediately following *Alice* increased dramatically in the relevant courts and tribunals—the Patent Trial and Appeal Board (PTAB), the U.S. district courts, and the Federal Circuit. However, the law is still relatively unclear with regard to what qualifies as sufficient transformation of an abstract idea for a software patent. In three cases decided in 2016, the Federal Circuit clarified the limits of the holding in *Alice* and found software innovations to be patent-eligible. In *Enfish LLC v. Microsoft*, the Federal Circuit held that software improvements are not “inherently abstract.”¹⁷ Distinguishing the *Alice* case, which addressed processes “for which computers are merely invoked as a tool” and not a “specific asserted improvement in computer capabilities,” the Federal Circuit in *Enfish LLC* held that the claims that it was tasked with judging were “directed to a specific

¹² *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71 (2012).

¹³ *Mayo*, 566 U.S. at 71.

¹⁴ *Alice Corp. Pty. Ltd. v. CLS Bank Intus.*, 573 U.S. ___, 134 S.Ct. 2347, 2354 (2014).

¹⁵ *Alice Corp.*, 134 S.Ct. at 2355–56.

¹⁶ *Id.*

¹⁷ *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016).

improvement to the way computers operate, embodied in the self-referential table.”¹⁸ For that reason, the innovations were patent-eligible. In *McRO v. Bandai Namco*, the Federal Circuit upheld a software patent claim on the ground that it was “limited to rules with specific characteristics.”¹⁹ In *Amdocs v. Openet Telecom*, the Federal Circuit disagreed with the District Court’s finding that the claim attempted to protect the abstract idea of correlating two networks. Recognizing that while similar claims had been rejected, the Court found that, although the “components” needed were “arguably generic,” the components “had been used in an “unconventional manner” such that they led to “an improvement in computer functionality.”²⁰

B WHAT TYPE OF INNOVATION IS PATENT-ELIGIBLE?

The USPTO has determined that the following functions, in and of themselves, do not contain an inventive concept and thus are not patent eligible:

- » performing repetitive calculations;
- » receiving, processing, and storing data;
- » electronically scanning or extracting data from a physical document;
- » electronic record keeping;
- » automating menial tasks; and
- » receiving or transmitting data over a network (using the Internet to gather data).²¹

However, the law is not clear or precise on what is or is not patent-eligible. While the above functions are not eligible for patents, the list below includes a number of examples of innovations that are patentable. U.S. courts have determined that innovations that are patent-eligible include:

- » an automated lip synchronization & facial expression animation via computer-implemented rules;²²
- » a direct digital control of rubber-molding presses;²³
- » an enhanced computer memory system;²⁴
- » using sensors to more efficiently track an object on a moving platform;²⁵
- » a self-referential data table;²⁶ and
- » a method of retaining website visitors after the click on an advertisement.²⁷

18 *Id.* The *Enfish* Court also distinguished an earlier Supreme Court precedent, *Bilski v. Kappos*, 561 U.S. 593 (2010), in which the Supreme Court determined that a particular method for hedging losses (with the use of a computer) was not a patent-eligible process.

19 *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016).

20 *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1300 (Fed. Cir. 2016); see also Joe Mullin, *These Three 2016 Cases Gave New Life to Software Patents*, *Ars Technica*, (Dec. 27, 2016), <https://arstechnica.com/tech-policy/2016/12/these-three-2016-cases-gave-new-life-to-software-patents/>.

21 USPTO, *July 2015 update on subject matter eligibility*, 7 (July 1, 2015), available at <https://www.uspto.gov/sites/default/files/documents/ieg-july-2015-update.pdf>

22 *Bandai Namco*, 837 F.3d at 1314–16.

23 *Diamond v. Diehr*, 50 U.S. 175 (1981).

24 *Visual Memory LLC v. NVIDIA Corp.*, 867 F.3d 1253 (Fed. Cir. 2017).

25 *Thales Visionix Inc. v. United States*, 850 F.3d 3450 (Fed. Cir. 2017).

26 *Enfish*, 822 F.3d at 1339.

27 *DDR Holdings LLC v. Hotels.com LP*, 773 F.3d 1245 (Fed. Cir. 2014).

With respect to computer technology, the primary factor differentiating patent-eligible subject matter from that which is not patent-eligible is whether the innovation makes the computer operate differently and/or solve a problem that is rooted in computer technology. If the innovation does result in superior operation of the computer, the innovation is likely patent-eligible. In many cases, this is a matter of how the innovation is presented to the patent examiner. For example, it is helpful if the patent application sets forth a clear explanation of the limitations of the previous technology, describes the specific advantages of the innovation, and includes a detailed explanation of how the new technology represents an improvement. Therefore, in most cases, software-based innovations are patent-eligible if presented in the appropriate manner.

IV. HOW DO I DECIDE IF A SPECIFIC INNOVATION CAN BE PATENTED?

Although the laws differ between jurisdictions, the most important factors determining whether or not an innovation can be patented are (a) *the correct person(s) or entity(ies) apply* for the patent, (b) the innovation is the *kind* of thing that can be patented, and (c) *the innovation is “new”* in a particular way. While a patent attorney will be best suited to offer advice regarding these requirements, these conditions can inform an initial assessment prior to seeking advice from an IP attorney.

A patent application may only be filed in the United States by the person(s) who *conceived* of the invention sought to be covered or individual(s) or company(ies) that get their rights by way of the inventors. The most common example is of employees of a company who are hired to invent solutions to particular problems and do so as part of their job. In most cases, all patent rights in those inventions will belong to the employer, either by default (due to the applicable laws in the relevant jurisdiction) or by contract. However, the applicable laws may vary greatly from one jurisdiction to another.

As explained previously in this Primer, not every “new thing” can be the subject of a valid patent. For example, poems, musical compositions, and the creative (nonfunctional) aspects of architectural designs are in the realm of copyright; while brands, slogans, and other indicators of sources of goods and services are in the realm of trademark. Patents protect new and useful machines, methods, manufactured items, compositions of matter, and improvements thereof.

● PRIOR ART

/prī(ə)r/ /ärt/

noun

UNDER U.S. LAW, PRIOR ART IS GENERALLY ANY SUBJECT MATTER THAT WAS GENERALLY WELL KNOWN TO THE RELEVANT PUBLIC PRIOR TO THE FILING DATE OF A PATENT. PRIOR ART CAN BE EVIDENCED BY PATENTS, TECHNICAL JOURNALS, ADVERTISING MATERIAL OR PUBLIC USE, FOR EXAMPLE. THERE ARE SOME EXCEPTIONS, SUCH AS WORK OF THE INVENTOR THAT BECAME PUBLICLY KNOWN LESS THAN ONE YEAR PRIOR TO THE FILING DATE.

An innovation is considered “new” when no publicly available information, prior to the application’s filing date, shows the combinations of features, components, or steps that a patent applicant or owner is trying to cover. Furthermore, if publicly available information renders the combination obvious²⁸ to a person having ordinary skill in the relevant technology area(s), that combination cannot be protected by a patent. This requirement is very often the point at which applicants have to persuade patent examiners of the patentability of an invention because “obviousness” is hard to objectively evaluate in hindsight. Certain rules of thumb help with the analysis, such as the principle that well-known substitutions in prior art systems are not patentable, while demonstration of a “long-felt but unmet need” or commercial success tied to the identified invention weighs in favor of patentability. The more such evidence is available, and the less obvious it is for an informed person to bridge the gap between prior technology and the invention, the more likely an innovation will be found to be patentable.

Innovators can evaluate their own inventions with respect to the novelty and non-obviousness requirements by looking for public disclosures of similar technology and considering whether the differences between their innovation and previous designs would be apparent to those skilled in a particular field or area of expertise. Patent examiners focus primarily on prior patents and published patent applications, among other “prior art,” to determine if an innovation can be patented. In patent law, “prior art” refers to all public information such as academic and trade journals, textbooks, unsuccessful products, comments in forums, open-source projects, existing patents, and patent applications. This guidance serves to help an innovator identify 1) when an innovation might be patentable, 2) the subject matter surrounding the innovation, and 3) how the innovation differs from what came before it.

²⁸ In many jurisdictions, this requirement is considered in terms of whether the identified technical solution to a technical problem provides an “inventive step” over the prior art.

V. WHAT INFORMATION WILL MY PATENT ATTORNEY NEED TO PREPARE A PATENT APPLICATION?

A patent is a right granted to a party in exchange for full disclosure of the protected invention and, at the time the patent expires, dedication of the invention to the public. As a result, many of the required sections or elements of a patent application stem from a need to describe an invention as completely and specifically as possible, such that a person having ordinary skill in the field of that invention would be able to make and use the invention without undue experimentation. A patent application has two primary components: (a) a detailed technical description of the invention, and (b) a set of patent claims that define the legal boundaries of the invention. Patent attorneys work with inventors to develop materials that meet these requirements. In most cases, existing development documents, such as functional specifications and flow charts, can be leveraged.

As with any writing, there is a varying amount of artistry that can go into crafting a patent application. While a patent application that simply recites the technical specification of an invention might be sufficient to meet the statutory requirements, it is often advantageous to draft the application in a way that both meets the statutory requirements and tells a compelling story outlining why the invention is deserving of patent protection. The fate of a patent application can be influenced by the applicant's ability to persuade a patent examiner that an invention is deserving of patent protection. Thus, it is to an inventor's advantage to provide his or her patent attorney with a high level of technical detail about the invention as well as the seeds of a compelling story that will allow the patent attorney to "sell" the invention to a patent examiner. The story should include the current state of the technology and how the invention overcomes limitations of the current technology.

A BASIC INFORMATION

A patent attorney will usually want to gain an understanding of the business and technology to obtain the proper background to handle your application. It is important for an inventor that his or her patent attorney understand the field of an invention well enough to ensure that it is described completely and accurately in the patent application. A discussion of the invention's development and use by the business, including any disclosure of the invention to others, will allow a patent attorney to determine whether there are any deadlines for filing the application, as public disclosures or uses of an invention can necessitate such deadlines. This discussion may also allow the attorney and applicant to begin developing a strategy for the patent application, including: whether it will be initially filed as a less costly "provisional application" to allow time for additional development, whether it will be filed with a non-publication request to maintain secrecy while it is pending, whether it makes sense to request prioritized examination, and whether the invention should be filed as a single application or split into multiple applications.

B DETAILED DISCLOSURE

Once the patent application strategy is determined, the applicant should provide the attorney with a sufficient level of information regarding the invention's development, purpose, advantages, commercial implementations, business considerations, future plans, and other similar information. The appropriate level of information may vary depending on the nature of the invention. This information may be available in pre-existing documents such as design diagrams, specifications, or in knowledge sharing sessions with or documents prepared specifically for the patent attorney. For software applications, design-related documents such as functional specifications, schema diagrams, class diagrams, and flow charts may prove useful. A patent attorney may be able to complete an application with a minimal amount of information. However, more information helps both to reduce the amount of time and money spent by the attorney reading between the lines and to ensure a more robust and accurate application. Once a patent application is filed, the breadth of the disclosure is largely immutable. In a worst-case scenario, an applicant may discover that a few simple concepts are missing from a patent application that could prevent the application from resulting in a patent, even after several years and thousands of dollars of investment in the application.

C IDENTIFYING INVENTORS

A patent attorney will also help a patent applicant identify inventors because each person who conceived any subject matter claimed in an application must be listed as an inventor for that application. Determining inventorship is not always straightforward, as the patent rules draw a distinction between someone who initially conceived a solution and those who reduced that solution to practice (that is, those who implemented it). In software terms, this distinction can be more easily understood as the difference between a software architect who designs, at a high level, a software solution in order to generate design diagrams, and a software developer, who uses those diagrams to create the source code that implements the software solution. Typically, the software architect who conceived of the solution would be listed as an inventor, while the software developer who reduced it to practice might not. However, software developers should still be involved in patent discussions, as they may have created a novel solution in their code that was not represented in the high-level design diagrams.

D PROACTIVELY ADDRESSING PATENT ELIGIBILITY

In order to tell a compelling story around an invention, it may be valuable to describe the advantages that an invention has as compared to what is conventionally used. As an example, this could include a new consensus algorithm that requires fewer resources or can be shown to be more resistant to manipulation when compared to conventional algorithms. In addition to helping narrow in on potentially novel features, this type of disclosure can also be an important tool in overcoming some software-specific rejections regarding patent-eligibility.

Another technique is to discuss the most significant problems that are addressed by the innovation. For example, if a software application largely uses pre-existing libraries and methods, it may not be a strong case candidate for patent-eligibility. However, if the application is a mix of pre-existing libraries or methods and completely original proprietary methods, one or more novel features may exist within the proprietary

portions. As an example, a blockchain software application may rely on commonly used components such as transactional queues or other collection objects, but may also contain a proprietary ledger writing method that reduces the overall size of the ledger while maintaining its integrity. In addition to being a novel feature, it can be argued that the proprietary ledger writing method is a technical solution to a technical problem (*i.e.*, as opposed to a business solution to a relationship problem). This type of argument can be persuasive to examiners in avoiding rejections based on patent-eligibility.

Another approach is to demonstrate that the invention contains anything that could be characterized as an improvement of the functioning of a computer or a computer system. An example could include a system memory manager that is tailored to perform blockchain operations more quickly by prioritizing memory register contents for memory addresses used by the blockchain-specific operations. Most software applications will probably not contain features that can be characterized as an improvement on the function of the computer itself, but where they are present and persuasively disclosed in the patent application, they can help to establish patent-eligibility.

VI. WHAT IS THE PATENT PROCESS? HOW LONG DOES IT TAKE AND HOW MUCH DOES IT COST?

While the cost of patenting an innovation can vary widely depending on a number of factors, the process for obtaining a patent (often referred to as “patent prosecution”) is relatively straightforward. Some applicants commission a patent search, or novelty search, to get an initial evaluation of the body of “prior art” that a patent examiner would likely consider if a patent application were to be filed. Start-to-finish costs for a patent depend on the complexity of the invention, the field of technology, the amount of resistance by the examiner, whether appeals must be pursued, and the countries in which patent coverage is pursued. The remainder of this chapter fleshes out each of these aspects. For illustrative purposes, the process in the United States is described below. Notably, the process in most other major patent offices are relatively similar.

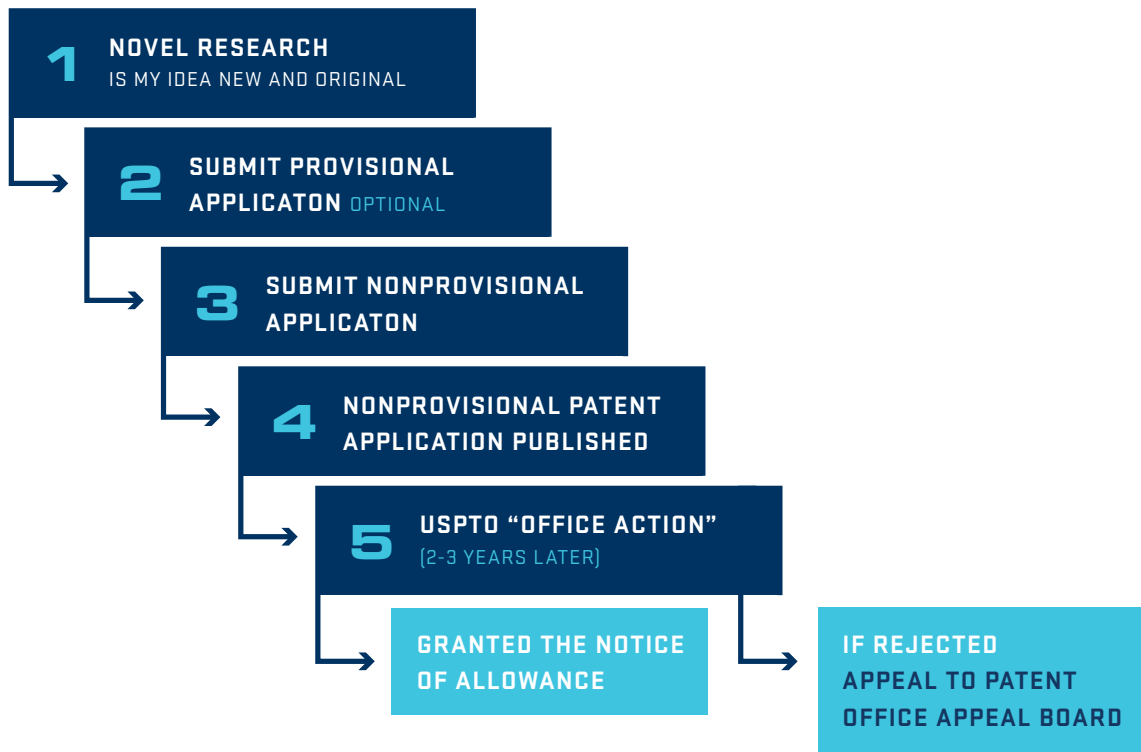
Conducting a novelty search before beginning work on a patent application is optional; however, in certain cases, it may be an efficient way to evaluate what an examiner would look for and to give the applicant (and their patent attorney) the opportunity to focus the patent application in a manner that is likely to be successful. More often than not, in the context of blockchain applications, the cost of conducting a search and evaluating the results of the same may approach the cost of preparing the patent application itself. Moreover, the search results may not include the most relevant “prior art,” as the search will not include unpublished applications. The decision regarding when a novelty search is appropriate depends on many factors that indicate whether the applicant is likely to be aware of the most relevant prior art.

When a novelty search has been completed, or omitted, a patent application is prepared. In the United States, the first actual filing related to an invention is often a “provisional patent application.” To perform its function, a provisional application must describe the invention in enough detail that a “person having ordinary skill in the art” (that is, in the relevant technology area) would be able to make and use the invention without undue experimentation. A provisional application does not need to call out exactly what combination of features, steps, etc. differentiate the invention from prior technology if the ultimate goal is coverage only in the United States. Nevertheless, if patent coverage in other countries is desired, the provisional application should sufficiently support statements and arguments to be made in favor of patentability during those jurisdictions’ evaluation of the eventual application. This might include careful statements regarding the problem solved by the invention and the technical solution provided. It might also include statements that resemble the “claims” that will be presented in subsequent applications. Provisional patent applications that adequately protect the applicant’s rights carry a filing fee of \$130.²⁹ While provisional applications establish an applicant’s “priority date” for all described subject matter, they are not examined, do not become public (unless a later, related application becomes public), and do not become a patent. They expire one year after filing.

29 All fees given in this chapter are updated as of November 2017 and include the discount that the USPTO gives for “small entities” (companies that have 500 or fewer employees and have neither transferred, licensed, nor become obliged to transfer or license any rights under the invention to an entity that would not itself qualify). Patent Office fees for larger entities are about twice those cited. In some cases, applicants with limited resources can qualify for further-reduced “micro-entity” fees.

In the United States, the first filing that has the capacity to become a patent is the nonprovisional patent application. Sometimes, there is no provisional application and the original filing is the nonprovisional application. Indeed, a provisional application in the context of software applications should only be relied upon in particular circumstances, such as an imminent public disclosure of the technology (e.g., publishing a whitepaper in a couple of days). If the applicant did file a corresponding provisional application, the nonprovisional application can include a reference to the provisional application and obtain the benefit of its filing date as the “priority date” if the nonprovisional application is filed by the date the provisional application expires and the provisional application provides adequate disclosure. Nonprovisional patent applications have many more “formal” requirements than provisional applications, including formatting of drawings, sections of the application, and “claims” that precisely define the scope of the protected invention. The filing fees for a nonprovisional patent application totals approximately \$730.

THE PATENT PROCESS



Once the nonprovisional application has been filed, a patent office clerk checks each nonprovisional application for the basic filing requirements and assigns the application to the group of examiners that handles applications in the technical area of the invention. Most nonprovisional applications are published³⁰ either about 18 months after their priority date or, for subsequent related applications, about four months after filing (if later than the initial 18 months). On the date of publication, the application content and all related Patent Office correspondence becomes publicly available through the USPTO website (www.uspto.org).

Each group of patent examiners reviews new applications in order of receipt, often providing a first substantive evaluation 2–3 years after the filing date. The vast majority of applications are rejected for one or more reasons, and the USPTO provides a written explanation for its decision in what is called an “Office Action.” The applicant has three months to respond in writing with changes to the application and/or arguments in favor of patentability of the application (as amended). Applicants can usually schedule a telephone or video call with the examiner to discuss any apparent misunderstandings or ambiguities before the applicant prepares the response, and while a high-level summary of this “interview” will be made of record, it is very often a better way to clear up problems before exchanging more written arguments. There is no government fee for filing this initial response.

If this first response does not satisfy the examiner, another Office Action will be issued giving the examiner’s updated position, and it will typically be deemed “final.”³¹ If the applicant believes the examiner might be persuaded by further discussion, or if they want to further amend the application before appealing, they can file another response with further amendments and/or arguments. In most cases, a response after a final Office Action must be accompanied by a Request for Continued Examination (RCE), which requires payment of a \$600 fee.³² According to USPTO Rules, the subsequent Office Action after a proper RCE in many circumstances cannot be considered “final.”

If the application has not been approved after the second or subsequent rejection, the applicant may respond by appealing the rejection to the Patent Trial and Appeal Board (PTAB). A simple Notice of Appeal must be filed (with a \$400 fee) within the response period given in the Office Action, and a brief in support of the appeal must be filed within two months thereafter. The examiner prepares a responsive brief, known as the “Examiner’s Answer,” within the time specified by the PTAB. Within two months, the applicant must then pay a \$1000 fee for forwarding the appeal to the PTAB and may file a Reply Brief to address any new arguments raised in the Examiner’s Answer. The PTAB then docket the appeal for consideration, which usually takes 1–2 years. U.S. Government FY2017 statistics reflect that about 40% of appeals are successful at least in part.³³

30 An applicant can request that a U.S. nonprovisional application *not* be published unless and until it is granted by certifying on the date of its filing that no applications will be filed on the invention in other countries. This “nonpublication request” can be revoked in certain circumstances.

31 In the custom of patent procedure, the label “final” does not really mean “final”! The final rejection is not the end of the patent prosecution and several avenues for further examination are available.

32 The fee is \$850 for the second and subsequent RCE.

33 Patent Trial and Appeal Board, USPTO, *Appeal and Interference Statistics*, September 2017, 6 (Sept. 2017), available at <https://www.uspto.gov/sites/default/files/documents/Appeal%20and%20Interference%20Statistics%2020170930.pdf>.

When the examiner or PTAB deems an application to be patentable, the USPTO will issue a Notice of Allowance. The applicant has three months to pay the \$480 “issue fee,” and about 6–8 weeks later the patent is issued. While some patents are issued only 2–3 years after the application’s filing date, many take much longer, especially those that are appealed. The patent expires 20 years after the filing date of the earliest nonprovisional application to which priority is claimed, and maintenance fees of \$800, \$1,800, and \$3,700 must be paid 3.5, 7.5, and 11.5 years, respectively, after the issue date.

Up to one year after the filing date of the first application on an invention, one can file corresponding applications in most other countries around the world and/or an “international application” under the Patent Cooperation Treaty (PCT). Subsequent applications receive the benefit of the filing date of the first application. These corresponding applications require little additional preparation (except translation for filing in countries that do not have the same national language), but filing directly in another jurisdiction will require its own filing fee and a bit of professional time by a local attorney. Direct-filed applications are reviewed by that jurisdiction’s patent office, which conducts its own search of prior art³⁴ and reaches its own conclusions. Most countries outside the United States require payment of “annuities” every year, both while the application is pending and after a patent is granted.

An international application under the PCT is published about 18 months after the earliest priority date. Around that time a patent examiner performs a prior art search and sends the applicant an International Search Report and Written Opinion (ISR/WO) as to patentability. Up to two months after the date of the ISR/WO,³⁵ the applicant can amend the claims in the international application. Up to three months after the date of the ISR/WO,³⁶ the applicant can file a Demand for International Preliminary Examination that amends any portion of the international application and presents arguments for patentability to obtain a second, hopefully positive, Written Opinion. By 28 months after the priority date, the applicant will receive an International Preliminary Report on Patentability (IPRP) with the final evaluation of patentability from the international phase of the PCT application.

By 30 or 31 months from the priority date³⁷, the applicant can enter the national/regional-stage by filing one or more applications in any country or region that is a signatory to the PCT. Each of these applications requires another filing fee and perhaps a translation into an official language of the country/region, so if broad coverage around the world is sought, this group of filings can cost tens—even hundreds—of thousands of dollars. The jurisdiction’s patent office may supplement the prior art search from the international phase, but often uses the IPRP as a starting point for its analysis. As a result, if no additional amendments and/or arguments are filed with the national-/regional-stage application, the conclusion of the IPRP will often be adopted substantially verbatim. The applicant’s attorney may then work through local counsel to obtain a patent in each jurisdiction. Examination in each country may take years and cost additional thousands of dollars, especially where translation is required, and “annuities” must be paid to keep applications and patents alive in most countries.

³⁴ For the sake of efficiency, the patent offices in several jurisdictions have recently begun sharing search results and even patentability analysis.

³⁵ Or up to 16 months from the priority date, if this is later.

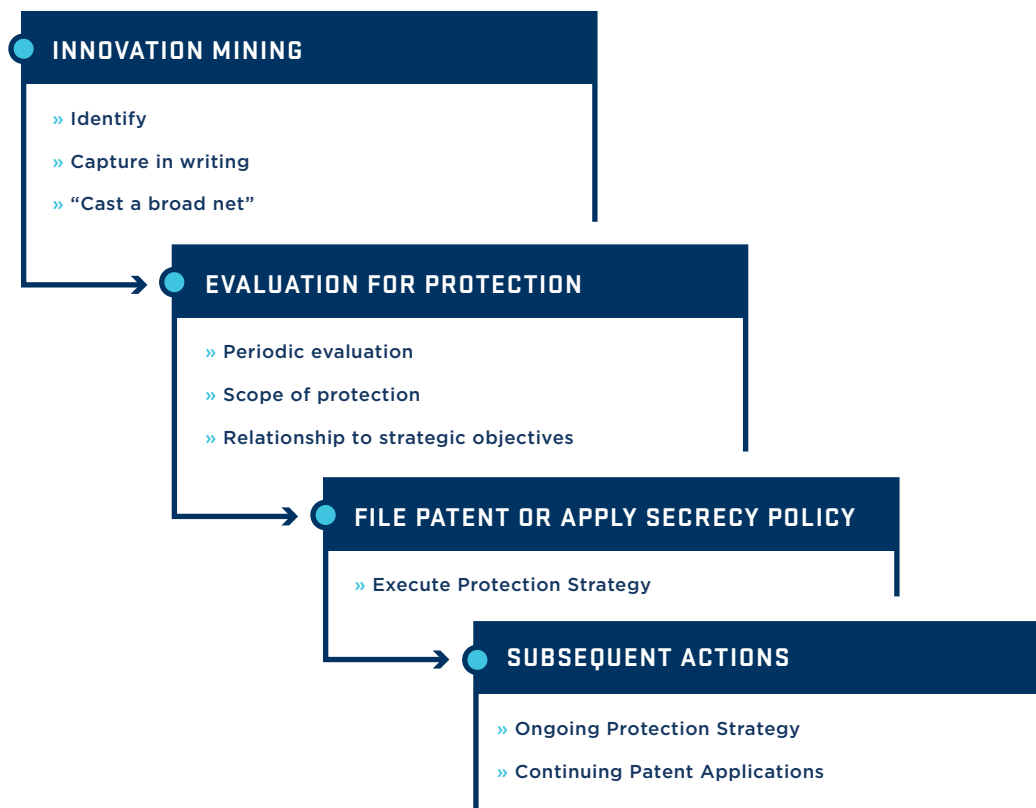
³⁶ Or up to 22 months from the priority date, if this is later.

³⁷ The actual deadline depends on the country and/or region in which the national/regional-stage application is being filed. For some countries in some situations the deadline is 20 months, and others have options for filing later.

VII. WHAT PROCESSES NEED TO BE IN PLACE TO IDENTIFY AND EVALUATE INNOVATION FOR PATENT PROTECTION?

In order to protect your innovation in a strategic manner and gain greatest value from your investment in IP protection, it is important that you have processes in place to identify innovation for potential protection and evaluate the type of protection, if any, that is appropriate for the identified innovation. This section is not intended to address the extensive topic of IP strategy; however, the foundational processes that must be in place before an effective IP strategy can be executed are discussed below.

Processes need to be established for each of the four essential stages of a patent strategy: (1) innovation mining, (2) evaluation for protection, (3) protective actions, and (4) subsequent actions. Each phase is presented in detail below.



A INNOVATION MINING

“Mining” has nothing to do with Bitcoin proof of work mining but, rather, refers to an ongoing process to identify innovation that might be protectable. While this may sound trivial, in a fast-paced innovative environment, innovation is constant and plentiful. To further complicate things, most innovators, especially software developers, tend to minimize the significance of their innovations. For example, a developer interfacing multiple systems when implementing a new digital currency transaction system might create a new data model that allows the system to operate faster or with less resources. While the developer might consider this to be routine implementation engineering, such an innovation could be protected and might be very valuable because it renders the system cheaper/better/faster than competing systems.

The legal team needs to tap into the development activity in such a manner that will allow monitoring of innovative activity. The process for doing so should leverage existing processes/activity to the greatest extent possible. For example, if a project team has periodic status meetings, a representative of the legal team should participate. Depending on the circumstances, this can be an in-house or outside IP attorney or a liaison who is comfortable with IP issues and who can identify potentially protectable subject matter. It is best to “cast a broad net” during the innovation identification, *i.e.* “mining”, stage. All possible innovations should be “captured” in writing for evaluation. At this point, the written document can be very brief, just enough to characterize the innovation to allow questions to be asked during the evaluation stage. Of course, related documentation produced in the development process, such as functional specification, class diagrams, and the like, can be used to supplement the innovation capture.

B EVALUATION FOR PROTECTION

An IP committee should meet periodically, typically quarterly, to evaluate the recently captured innovations. The IP committee should include, at least, an IP attorney, the head of technology development, and someone with a marketing perspective. Evaluation of each innovation should be based on business objectives, budgets, and the relationship of each innovation to the revenue model and should apply predetermined structured metrics. The IP committee applies predetermined rules and renders a decision as to the type and extent, if any, of protection required.³⁸ For example, the decision may be that a specific innovation warrants patent protection in the United States, the United Kingdom, and Germany, or that the innovation will be maintained as trade secret or released under a restrictive open-source license.

C PROTECTIVE ACTIONS

Once a protection strategy is determined by the IP committee, the IP attorneys can execute the strategy to obtain the required protection. For example, one or more patent applications might be prepared and filed.

³⁸ This evaluation is the essence of an IP strategy which, as noted above, is not discussed in detail herein.

D SUBSEQUENT ACTIONS

One of the most important protection processes, and one which is often overlooked, is what is referred to as “subsequent actions.” The protection strategy should not end with the filing of patent applications, trademark registrations, and the like. Markets are dynamic and IP protection must address changes in the marketplace.

Further, protection decisions must be periodically reevaluated. For example, during the protracted prosecution of a patent application, the technology and marketing experts should be consulted to adjust claims to better fit the marketplace. Trademark and copyright registrations should be reviewed and possibly updated to reflect new code versions and use of marks. Most significantly, the tool of “continuing patent applications” should be utilized liberally. A continuing patent application allows filing of a patent application based on an earlier application. The continuing application will obtain the filing date of the earlier application but can include claims that are directed toward current market conditions, so long as fully supported by the earlier application.

Players in the blockchain ecosystem should integrate IP protection processes into their workflow in order to protect their innovation in an efficient and effective manner. Failure to do so could result in a significant loss of value.

VIII. HOW DO I AVOID INFRINGING THE PATENTS OF OTHERS?

The short answer is that, unless you refrain from engaging in any commercial activity, there is no way to be certain that you will not face the allegation of patent infringement. Nevertheless, parties can take steps to minimize this risk.

A BEGIN EARLY IN THE DEVELOPMENT STAGE



Identifying potential infringement issues early in the product development process, such as at the product concept stage, allows for more flexibility to redesign around existing patents. Redesigning early can save costs before substantial resources have been devoted to research and development of an infringing product.³⁹

B CONSIDER CONDUCTING A THOROUGH PATENT SEARCH



A patent infringement search (also called a “freedom to operate” (FTO) search or a “product clearance search”) can determine the risk a certain product or service has of infringing upon patents owned by others. Direct patent infringement is a strict liability offense, meaning that unintentional infringement does not avoid liability. It is virtually impossible to conduct an exhaustive patent search of all patents that present a potential risk. However, a focused search of patents directed to similar innovations and/or owned by parties likely to be disrupted by your innovation may provide a good return on investment. In the blockchain space, the cost of conducting a search and evaluating its results may be significant. For that reason, some patent attorneys will advise against conducting an FTO search in all cases. Even if the search is not cost prohibitive, there are potential risks associated with conducting a patent search (e.g., the search may later be submitted as evidence, in support of an allegation of willful infringement, that the party had knowledge of a particular patent). Thus, a search should only be conducted after consultation with patent counsel.

The FTO search compares your product or process to patents already filed with the relevant patent offices, such as the USPTO and the European Patent Office. If the search finds no patent claims that seem to cover the subject innovation, then an attorney may advise that the client is free to proceed with development and commercialization of the innovation. If the FTO search reveals an issue, there are several steps that can be taken to minimize risk. For example, the innovator may decide not to commercialize the innovation, make modifications that avoid infringement risk (known as a “design around”), obtain a license from the patent owner, or obtain insurance coverage, all of which are discussed below.

³⁹ William H. Honaker, *Patent Infringement: How To Avoid A Nightmare*, Manufacturing.Net, (June 18, 2014 3:55 PM), <https://www.manufacturing.net/article/2014/06/patent-infringement-how-avoid-nightmare>.

As noted above, FTO searches are rarely exhaustive and thus are not 100% reliable -- there may be infringement risk despite a favorable FTO opinion.⁴⁰ Several reasons exist for potential patent issues to be latent. For one, pending patent applications are generally not published, *i.e.* made public, until 18 months after they are filed. Also, patent applications, as opposed to granted patents, are a work in progress and the final scope of any patent may change. Further, the patent's scope is ultimately defined through the vagaries of patent litigation. Therefore, while a search and an opinion on the scope of existing patents is very valuable, it is never a certainty.

C DESIGN AROUND PATENTS THAT PRESENT RISK



Even if an original version of a product infringes upon certain patents, a FTO search can help avoid those patents by directing modifications to the product to avoid patent infringement. To be covered by the patent, the allegedly infringing device or process must include each element of a claim in the original patent. Changing the product to avoid only one element of a patent claim will avoid infringement of that patent claim. Therefore, a FTO search can provide a roadmap to avoid infringement by eliminating non-essential features of the commercial product or changing features to accomplish the functions in a different manner.

D LICENSING OPTIONS



One mechanism for avoiding the risk of a patent infringement lawsuit is to attempt to license rights to the patent from the patent owner. Through the license, the patent owner transfers some or all of the patent rights to the licensee. Typically, these rights are limited, do not transfer patent ownership to the licensee, and are exchanged for some monetary compensation known as a “royalty.” This agreement can be a mutually beneficial arrangement, whereby each party to the agreement gains greater access to markets than either party would have achieved independently.⁴¹

For the licensee, in particular, the license can provide access to more technological capabilities and resources, reaping benefits that substantially outweigh the costs of the license. When licensing occurs between parties that own different features of a product, cross-licensing, an arrangement whereby each party grants the other rights to a certain aspect of the patented technology, may be beneficial. Royalty-free cross-licensing agreements offer many of the same benefits as other licensing agreements without adding a direct monetary expense for the parties.⁴²

⁴⁰ Vic Lin, *What is a freedom to operate (FTO) or infringement search?*, Patent Trademark Blog, <http://www.patenttrademarkblog.com/freedom-to-operate-fto-infringement-search/>.

⁴¹ World Intellectual Property Organization, *Licensing of Intellectual Property Assets; Advantages and Disadvantages*, available at <http://www.wipo.int/export/sites/www/sme/en/documents/pdf/licensing.pdf>.

⁴² *What is a Cross-Licensing Agreement?*, Gagnon, Peacock & Vereeke, P.C., <https://www.gapslegal.com/articles/what-is-a-cross-licensing-agreement/>.

E INSURANCE COVERAGE



With the rise of patent-infringement lawsuits, several insurance companies now provide protection to businesses against IP suits, called “intellectual property insurance”. Of course, “preexisting conditions” are not covered and thus parties must be proactive and obtain the insurance before a lawsuit occurs. In most cases, the insured party must also show that it conducted a FTO search and found the item not in violation of an existing patent.⁴³ While this form of “defense” coverage is a popular choice to cover the costs of defense of an IP suit and any resulting settlements and judgments, “enforcement” or “pursuit” coverage (*i.e.*, insurance that covers the cost of pursuing or enforcing rights against a potential patent infringer) is also available to protect a company’s patent portfolio.⁴⁴ Most IP insurance policies are customized for individual entities or small groups.

F DEVELOP A DEFENSIVE PATENT POSITION



Often, the most effective tool for minimizing patent risk is to develop a strong defensive patent position. Conceptually, this is simple. In practice, it requires a combination of strong legal, technical, and marketing expertise. The concept is to protect the innovation in a manner that, should it be the target of a patent infringement allegation by an aggressor, the invention is likely to have a counter patent infringement assertion against that aggressor. This facilitates a cross-licensing arrangement that is much more favorable than a settlement without the counter-assertion.

This strategy, like most business risk avoidance strategies, has uncertainties. Nevertheless, a well-developed and executed patent strategy can increase the likelihood of obtaining defensive patents and thus significantly reduce risk. Such a strategy requires an understanding of competitors, their markets, and their revenue models. As a very simple example, if a competitor has a very large client in India, a party may want to file for patent protection of certain innovations in India, even though the party has no interest in selling products in India. Also, parties might want to focus their patents on applications that are likely to be commercialized by litigious competitors.

43 Drew Hendricks, *3 Measures Small Businesses Should Take To Avoid Patent Trolls*, Forbes (Sept. 30, 2013 10:39 AM), <https://www.forbes.com/sites/drewhendricks/2013/09/30/3-measures-small-businesses-should-take-to-avoid-patent-trolls/#60419af53704>.

44 Sanford E. Warren, Jr., *Intellectual Property Coverage: Are You Naked?* (May 2001), <https://www.irmi.com/articles/expert-commentary/intellectual-property-coverage-are-you-naked/>.

IX. WHAT DO I DO IF I AM ACCUSED OF PATENT INFRINGEMENT?

There are several options to consider when facing a patent assertion by a rival patent owner. As a preliminary matter, the patent owner facing a patent assertion must assess the strength of its case in a court of law. While patent litigation should be avoided whenever practical, it is the relative legal positions of the parties that will set the tone for any settlement negotiation. Patent litigation suits relating to software patents typically take several years to resolve, not including appeals. The median time-to-trial is 2.4 years. Typical costs for a suit with \$1 million to \$10 million at stake is \$1.7 million.⁴⁵ Actual costs for a patent litigation can be much higher, often over \$5 million.

While some potential resolutions are litigation-oriented, such as filing motions to dismiss or for summary judgment, non-litigious strategies include settling, negotiating licenses, or designing around the patent to avoid infringement. A patent owner may also choose to pursue settlement through alternative dispute resolution, which would allow the patent owner to avoid the risk of losing a costly litigation. A licensing agreement potentially can be negotiated to settle the dispute, as is typically done in many patent litigation suits. In some instances, the rival patent owners may consider joining forces and working together on future projects.

PATENT LITIGATION SUITS RELATING TO SOFTWARE PATENTS TYPICALLY TAKE SEVERAL YEARS TO RESOLVE, NOT INCLUDING APPEALS. THE MEDIAN TIME-TO-TRIAL IS 2.4 YEARS. TYPICAL COSTS FOR A SUIT WITH \$1 MILLION TO \$10 MILLION AT STAKE IS \$1.7 MILLION.⁴⁵ ACTUAL COSTS FOR A PATENT LITIGATION CAN BE MUCH HIGHER, OFTEN OVER \$5 MILLION.

A DESIGN AROUND THE PATENT

Similar to the patent infringement avoidance strategy noted in the prior section, it may be possible to avoid infringing by redesigning the product to avoid the scope of the patent, *i.e.*, not embody at least one element of the claims of the patent. For instance, if the patent owner is only claiming rights to a particular feature that is non-essential, removing or changing that feature may lead to settlement or dismissal of the

⁴⁵ Malathi Nayak, *Cost of Patent Infringement Litigation Falling Sharply*, Bloomberg BNA (Aug. 10, 2017), <https://www.bna.com/cost-patent-infringement-n73014463011/#!>.

case without substantially affecting the product's value. Even if you design around the patent, however, you may still be liable for past damages and will need to settle that dispute either in court or via a settlement agreement.

Factors to consider in determining whether it is worth modifying a product include the straight-forwardness of the original patent, the cost of modification, the effect changes will have on the business and consumers, and the patent expiration date (if the original patent will soon expire, the case may resolve itself without necessary changes).

B CHALLENGE THE VALIDITY OF THE PATENT AT THE PATENT OFFICE

The USPTO has procedures for challenging the validity of a patent. Responding through the USPTO is often a cheaper alternative than going to court. Notably, the America Invents Act ("AIA"), signed into law on September 16, 2011, made the USPTO an even more attractive option.⁴⁶

The burden of proving invalidity at the USPTO is lower than in court because patent claims are given their broadest possible reasonable interpretation. This makes the claim easier to invalidate by more prior art (patents, publications, work by others, and other legally defined materials that predate the invention of the asserted patent). Courts will often "stay" (which simply means to "delay" or put on hold) an infringement action until the conclusion of the proceeding in the USPTO. If the USPTO rules that the patent claims are valid, however, the expenses incurred are largely wasted and it may be more difficult to successfully challenge the patent's validity in court. The proceedings can take about 18 months to complete, making it a useful way to delay costly litigation.

C LITIGATE THE ASSERTED PATENT(S) IN COURT

Of course, another strategy is to proceed with the litigation in hopes of either getting the case dismissed or winning on the merits. With a strong, straightforward case, the target of a patent assertion can attempt to avoid lengthy, costly litigation by filing a motion to dismiss. A motion to dismiss can be based on procedural (improper venue or lack of personal jurisdiction) or substantive grounds. A recent Supreme Court case may have made it easier to succeed on motions to dismiss due to improper venue.⁴⁷

Filing a motion to dismiss is useful if the complaint is faulty as a matter of law. For example, the motion would succeed if the plaintiff does not have sufficient rights in the patent to bring suit (lacks standing). Another defense is to assert that the patent is invalid or covers unpatentable subject matter, such as an abstract idea or laws of nature. Questions of patentable subject matter are often contentious in the context of software patents or patents relating to financial transactions. Therefore, this defense may have significant relevance to blockchain-related patents, which are likely to be implemented in software and may relate to business transactions. However, a properly drafted patent pertaining to blockchain innovation may likely be patentable and should not be viewed by a reasonable court as constituting merely an abstract idea. Therefore, the viability of a motion to dismiss on such grounds should be carefully considered before filing.

⁴⁶ Patent Reform Act of 2011. Pub. L. No. 112-29, 125 Stat. 284 (2011).

⁴⁷ See *TC Heartland LLC v. Kraft Foods Group Brands LLC*, 581 U.S. ___, 137 S. Ct. 1514 (2017).

Another option is to answer the complaint and continue to litigate the case on the merits.⁴⁸ In the answer, you must assert any affirmative defenses including non-infringement, invalidity, and federal and state statutory and common law counterclaims.

The most prevalent defense to a patent infringement claim is noninfringement. To prevail on a patent infringement claim, a patent owner must show that each asserted patent claim limitation is found in the accused product or process. Noninfringement means that the accused product or process does not include or perform one or more of the required claim limitations.⁴⁹

For software related patents, such as patents related to blockchain solutions, the responder should analyze its source code to find out what claim elements are not met. During litigation, parties often hire a software expert who will analyze the code in depth and provide an expert report explaining the reasons why she or he believes there is no infringement.

Challenging the validity of a patent requires a thorough investigation of the prior art through a prior art search. Many companies perform such searches. Prior art includes sales, written descriptions, and public uses of similar products before the patent was filed and preferably more than a year before the patent was filed. If there are public disclosures, printed descriptions or offers for sale more than a year before the patent was filed, the patent is invalid. A challenger can also attempt to show that the subject matter is not patent-eligible because it is merely an abstract idea or naturally occurring phenomena.

Depending on the results of the prior art search, the challenger can assert that the patent is invalid because it was anticipated by or obvious from prior art.⁵⁰ This happens only when the prior art has all of the claimed elements of the asserted claim. In other words, the innovation was not really new. An “obviousness” defense asserts that a “person of ordinary skill in the art” at the time of filing the patent application would have considered the claimed invention to be obvious based on the state of the art at that time.⁵¹ Thus, while the innovation may have been different from the existing art, one with skill in the art would have been motivated to make the innovation without undue experimentation. An obviousness defense is typically alleged based on a combination of two or more references—which together meet all of the claim limitations of the asserted patent claim(s).

48 An answer to the complaint must be filed within either 21 or 60 days after service, depending on waiver of service. Fed. R. Civ. P. 4. In the answer, targets must admit or deny each allegation, state all defenses in short and plain terms, assert possible counterclaims or assert any Rule 12(b) procedural defenses.

49 Michael J. Kasdan, *Patent Infringement Claims and Defenses*, Practical Law Intellectual Property & Technology, Note 0-507-2685 (2017) (Hereinafter “Patent Infringement”).

50 35 U.S.C. §§ 102-03.

51 Patent Infringement at 4.

Other defenses include “inequitable conduct” (that the patent applicant committed fraud in order to obtain the patent), actual or implied license (that the circumstances indicate that the alleged infringer was within their rights to use the patented innovation), and equitable estoppel (the alleged infringer was led to believe that the patent holder did not intend to enforce a patent because of the patent holder’s assurances or non-enforcement activity and relied on that belief to its detriment).⁵² There are also a variety of related federal and state counterclaims that can be asserted, such as infringement by the party making the infringement accusation.

If the decision is made to litigate the case, the target of a patent assertion may consider some options to promote efficiency and save costs. If there are multiple defendants in a case, the cases may ultimately be consolidated and counsel can join together to defend the case and pool resources. Teaming up can substantially reduce legal fees and increase the chance of success; however, it is critical to consider divergent interests and conflicting incentives (these parties are also likely competitors). Generally, counsel should focus energy on the dispositive issues, framing discovery requests in specific terms, and requesting the plaintiff to identify the infringing product at the beginning of the case.

In summary, no single course of action is required when accused of patent infringement. Many tools exist that may be called upon to defend actions, and use of these tools should be determined only after consulting patent litigation counsel and considering the entirety of the circumstances.

⁵² *Id.* at 5.

X. I HAVE OBTAINED SEVERAL PATENTS; HOW CAN THEY BE LEVERAGED TO PROVIDE A COMPETITIVE ADVANTAGE?

Patents and other IP can be some of the most valuable assets owned by a company or entrepreneur. Patents specifically award temporary monopoly rights over inventions to their inventors. As such, businesses can gain from strategically accruing and leveraging patents. In today's knowledge-based economy, those businesses that view patents not merely as legal instruments but also as business tools stand to succeed.

A ASSESSING THE VALUE OF A SINGLE PATENT OR PATENT PORTFOLIO

Before leveraging a patent or patent portfolio, it is important to engage experts to analyze the quantity and quality of existing patents. Although a single patent may be valuable, a patent portfolio, particularly one that contains patents with demonstrated uses, is likely more valuable. It is also worthwhile to distinguish between a party's patents that protect the core of their business as opposed to tangential patents. Selling off those individual patents that are not core to the business can be especially beneficial because companies can offset a sunk cost by selling or licensing them to another party.

B LEVERAGING PATENTS: COMPETITIVE ADVANTAGE

Companies can save costs and gain a competitive advantage by conducting their research and development (R&D) with an eye on IP strengths and closing out competitors. Two ways to achieve this are by "clustering" or "bracketing." Clustering occurs when a company builds a patent wall around a product, for instance by patenting the key design features in every part of the product. This is particularly effective if the patents interlock in such a manner that competitors cannot duplicate the product. Bracketing is the process of using patents to hamper a competitor's initial market advantage. By patenting the other essential components of a product or technology, even if a competitor has one aspect protected by patent, bracketing can lock the competitor out of the market. This can provide a competitive advantage or negotiation tool.

Companies can achieve a similar effect by defensive publication (e.g., disclosing and releasing into the public domain a reference that serves as a prior art), thereby preventing competitors in similar areas from obtaining patents on the same or similar inventions. A strategy to use patents to close out competitors can also inform an R&D initiative. Without even going to litigation, companies can effectively leverage the existence of patents and the threat of infringement suits to ward off competitors and gain competitive advantages.

C LEVERAGING PATENTS: LICENSING

In addition to threatening or initiating infringement lawsuits, patent holders can also leverage patents to gain revenue through licensing. Patent licenses, contractual relationships allowing a non-patent-holder to use the patent, are a primary tool to commercialize patent rights. If drafted properly, patent licenses can benefit both the licensor and the licensee by generating income and business opportunities.⁵³

Licenses can be drafted in many ways depending on the parties' goals. Some significant issues to consider when drafting a licensing agreement include exclusivity, sublicensing, and joint ownership. Licenses can be created to cover the patent only. Or, licenses can be so-called "hybrid" licenses which include not only patent rights, but an additional bundle of rights to help the licensee fully utilize the patent rights.⁵⁴ For any licensing agreement, drafters should be cautious to prevent a patentee from collecting royalties for an expired or invalid patent. Otherwise, the royalty agreement may constitute misuse.

Patent holders may also participate in or create "patent pools" in which several companies with patents that relate to a specific technology agree to bundle the patents and license them as a group. Although this approach can yield faster rates of return, lower administrative costs, and a single royalty rate, there can be downsides such as sharing royalties and FRAND (fair, reasonable, and non-discriminatory, discussed below) licensing commitments.⁵⁵ Licensing is resource intensive but can be extremely profitable. For example, IBM grew its patent-licensing royalties by 3,300% from \$30 million in 1990 to \$1 billion in 2000.⁵⁶ Thus, licensing can prove a profitable venture for patent holders looking to leverage patents outside of the litigation process. However, an effective licensing program will often require at least the threat of litigation to convince potential licensees that they should pay for a license.

D LEVERAGING PATENTS: FINANCING OPPORTUNITIES FOR ENTREPRENEURS AND ESTABLISHED COMPANIES

Entrepreneurs and start-ups can leverage patents to increase the probability of securing venture capital, obtain loans, and boost sales and growth. With a first patent grant, a start-up is 53% more likely to secure venture capital funding, 76% more likely to secure loans by pledging the patent as collateral, and twice as likely to raise funds from public investors through an initial public offering (IPO).⁵⁷ Within a five-year period after a first patent grant, start-ups experience on average 79.5% increases in sales. The impact of holding patents is particularly strong for those start-ups in the information technology industry and entrepreneurs operating in dense markets like Silicon Valley, Boston, and New York because patents help reduce

53 R. Gwen Peterson, *Patent Licensing Considerations*, Association of Corporate Counsel (Aug. 27, 2013), <http://www.acc.com/legalresources/quickcounsel/qcplc.cfm>.

54 *Id.*

55 Terry Ludlow, *Building, Maintaining and Leveraging Your Technology Patent Portfolio: A Qualitative Approach*, IP Watchdog (May 3, 2016), <http://www.ipwatchdog.com/2016/05/03/building-maintaining-leveraging-technology-patent-portfolio-qualitative-approach/id=68772/>.

56 Kevin G. Rivette & David Kline, *Discovering New Value in Intellectual Property*, Harv. Bus. Rev. 4 (Jan. Feb. 2000).

57 Joan Farre-Mensa, Deepak Hedge, & Alexander Ljungqvist, *What is a Patent Worth? Evidence from the U.S. Patent "Lottery,"* (Dec. 17, 2015), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2704028.

information asymmetries.⁵⁸ Holding patents can facilitate licensing agreements, reduce investors' concerns about a firm's ability to monetize an invention, reduce barriers to sharing details of inventions with investors, and serve as a quality signal to investors.⁵⁹

Larger, more established companies can leverage patents to obtain financing or revive defunct ventures. First, companies can use patents as securitized assets to obtain financing on more favorable terms. Patent grants increase the probability of securing a loan from a bank or specialized patent lender by 8.6 percentage points.⁶⁰ Companies can pledge pending patent applications (after first-action but before final approval) and even rejected patent applications.⁶¹ Furthermore, the stock prices of companies whose patents were frequently cited in other companies' patents tended to rise more rapidly in comparison to those companies with less frequently cited patents.⁶²

Second, companies can use patents to monetize bankrupt ventures. For example, in 2011, Nortel Networks sold its patent portfolio out of bankruptcy to a consortium including Apple, Microsoft, Sony, and BlackBerry for 4.5 billion dollars.⁶³

Third, companies can invest patents in promising startups to strengthen market position, encourage venture funding, and help drive growth or market success. The company-investor has the advantage of sharing in the equity upside of these ventures, while also encouraging development in new technologies.⁶⁴

Patents can be leveraged in a myriad of ways. The specific strategies of a company or individual(s) depend on their patent holdings, resources, risk profile, and market specifics.

58 *Id.*

59 *Id.*

60 *Id.*

61 *Id.*

62 Rivette & Kline, *supra* note 55.

63 Peg Brickley, *Nortel \$4.5-Billion Patent Sale to Apple, Microsoft, Others Approved*, *The Wall Street Journal* (July 11, 2011, 3:14 p.m.), <https://www.wsj.com/articles/SB10001424052702303812104576440161959082234>.

64 *Id.*

XI. HOW DOES OPEN SOURCE “OS” LICENSING EFFECT MY ABILITY TO PROTECT MY INNOVATION WITH PATENTS?

Developing a sound IP strategy and seeking patent protection, where appropriate, is also important for open source projects. The proceeding paragraphs explain why.

The term “coopetition” characterizes today’s research and development models for emerging technologies. Initially coined by Ray Noorda of Novell, businesses need to cooperate on the joint development and licensing of free and open-source software (OS) on an open, decentralized, and collaborative global basis. However, these businesses also need to compete amongst each other through the individual strengths of their respective IP portfolios that are proprietary and closed. Of course, the blockchain ecosystem has a strong basis in OS software, Bitcoin and Ethereum being two of the most prominent examples.

A THE RELATIONSHIP BETWEEN OS LICENSING AND PATENT PROTECTION

Coopetition is often desirable for mitigating the burden and impact on a single entity of faster product life cycles, expensive R&D investments, convergence of emerging technologies and the development of important technological standards. The old “silo” model of developing IP in isolation from global collaborative efforts is increasingly becoming outdated in light of these new commercial and technical demands.

The majority of the world’s larger companies are engaged in OS developments and use resulting technologies under a variety of OS licenses.⁶⁵ When an original author releases software under an OS license, it typically grants those who receive the software a royalty-free right to copy, distribute, and produce derivative works of the software on the condition that they, in turn, distribute the software and any improvements they make to the software under the same license and make the source code of the improvements freely available.

The OS licensing model does not undercut the importance of closed proprietary IP. Having a patent is still one of the best ways to defend your business and its inventions. There are commercial reasons for patenting an invention to be licensed on an OS basis such as the ability to create, promote and foster an ecosystem for a particular interoperable standard for a product, service, process, or protocol. Regardless of the underlying business reason, the decision to distribute software as open source merely limits how the original author may be able to exploit its patent rights. It does not determine whether the original author ought to apply for patent protection.

B MANAGING THE IMPLICATIONS OF PATENTS AND OS LICENSING

There are important implications arising from the relationship between patents and OS licenses that need to be carefully managed. Innovators should be mindful of three major situations:

⁶⁵ *Licenses and Standards*, Open Source Initiative, [http:// www.opensource.org/licenses/](http://www.opensource.org/licenses/).

1 PATENTING AN INVENTION INCORPORATING OPEN SOURCE TECHNOLOGY

If a party patents technology embodied in software licensed on an OS basis, then, depending on the terms of that license, certain royalty-free patent licenses may be granted to third parties using such technology. The patent holder cannot prevent the creation of such patent licenses if the terms of the OS license require it to do so. For example, the preamble of the popular GNU Public License (GPL) states that “any patent must be licensed for everyone’s free use or not licensed at all.” It will be very hard for the patent owner to know how many other parties will eventually become patent licensees (assuming they are covered by the same OS licensing agreement).

The potential of being forced to grant royalty-free patent licenses to an unlimited number of licensees is daunting if the goal of the underlying patent is to help the inventor monetize its invention. Therefore, innovators need to make sure that the coders of their software are not using OS software in a manner which would make the software subject to the terms of an OS license and therefore freely distributable (*e.g.*, as an improvement to the OS software).

2 LICENSING A PATENTED INVENTION ON AN OS BASIS

Depending on the strategic value of the project, a party may choose to open source an invention and file for a patent on it. The party would need to scope the patent and the OS license terms so that the ecosystem can use the inventive software without rendering the patent useless. If software embodying the patented functionality is licensed on an OS basis, the patent owner may not be able to assert such patent against the users, modifiers, and re-distributors of such software. This depends on the terms of the applicable OS license. For example, the Apache 2.0 OL license contains a royalty-free license of patent rights that are necessary to use the software and its modifications. The Apache 2.0 OL license, however, does not grant permission to use a broader idea in the patent for other uses. It may be good to include a defensive termination clause that allows the patent owner to terminate a license if the licensee sues.

3 PATENT LICENSEE INCORPORATES THIRD PARTY PATENTED INVENTION INTO OL LICENSE

Sometimes an original author or modifier of a software (to be licensed on an OS basis) needs to incorporate technology covered by a patent licensed from a third-party patent owner. Such a person may do so only if granted the right to sublicense such technology. In such case, the person may be able to sublicense such technology under an OS license so that downstream users and modifiers can use the patented technology as part of an OS product. However, this depends on the terms of the original patent license between the original author or modifier of such software and the patent owner. The terms of the OS license would not usually determine issues of patent sub-licensing by an existing patent licensee.

In summary, OS licensing and patent protection are not mutually exclusive. However, parties must understand the interplay between the two and strategically use each to forward business objectives. Without such an understanding, the party risks losing valuable rights.

XII. WHAT IS THE IMPACT OF FRAND, RAND, STANDARDS ESSENTIAL PATENTS, AND OTHER COMPULSORY PATENT LICENSING ARRANGEMENTS?

“RAND” stands for Reasonable and Non-Discriminatory, also known as fair, reasonable, and non-discriminatory terms (FRAND). A FRAND licensing structure suggests a commitment on the part of a patent owner to license the patent that is often deemed essential to a widely adopted technology on such terms that are fair, reasonable, and nondiscriminatory. Often FRAND approaches are applied to patent pools that are associated with patents developed by standard-setting organizations. A standard-setting organization is an industry group that sets common standards for its particular industry to ensure compatibility and interoperability of devices manufactured by different companies.

“Fair” relates mainly to the underlying licensing terms. “Fair” terms are not anti-competitive. A fair term would not be considered unlawful if imposed by a large powerful company in the relative market. However, the following situation could potentially be deemed a violation of the “fair” element of FRAND. A company engaged in “bundling” may be deemed to have acted unfairly when, for example, the company requires its licensees to buy licenses for products that they do not want in order to get a license for the products they do want or when the company requires licensees to obtain licenses to certain unwanted or unneeded patents to obtain licenses to other desired patents. “Grant backs”—*i.e.*, requiring licensees to license their own IP to the licensor for free—and “mandatory exclusivity”—*i.e.*, including restrictive conditions on licensees’ dealings with competitors—are also examples of unfair practices that would violate the principles of FRAND.

“Reasonable” refers mainly to the licensing rates. According to some, a reasonable licensing rate is a rate charged on licenses which would not result in an unreasonable aggregate rate if all licensees were charged a similar rate. According to this view, aggregate rates that would significantly increase the cost to the industry and make the industry uncompetitive are unreasonable. Similarly, a reasonable licensing rate must reward the licensor with adequate compensation for contributing its essential patents to a standard. As noted above, however, for one industry standard, such as MPEG, a reasonable rate for a patent pool may differ from a reasonable rate separately negotiated with a patent holder outside of the pool.

“Non-discriminatory” describes the terms and the rates associated with a licensing agreement. Licensors must treat each individual licensee in a similar manner so individual licensees do not obtain an unfair advantage in the marketplace. Rates and payment terms can change, however, depending on the volume and creditworthiness of a given licensee. The underlying structure of a licensing agreement must be the same regardless of the licensee. This obligation maintains a level playing field with respect to existing competitors and ensures that potential new entrants are free to enter the market on the same basis. Some interpretations

of “non-discriminatory” can also include time-oriented licensing terms. An “early bird” license can be offered with terms of a RAND license that are more favorable for initial licensees or for licensees who sign a license within the first year of its availability, for example.

The following example is used to illustrate the application of the non-discriminatory principle in actual use and practice, and how the principle might apply to third-parties. In the 1990s, the MPEG-2 standard, which is required for digital television applications, including DVD technologies, faced a “patent thicket.” One challenge to the adoption of MPEG-2 was the fact that a number of essential patents for the standard were owned by different parties and it became impractical for users to negotiate the number of licenses necessary to use the standard. An organization called MPEG LA offered the first modern-day patent pool as a solution to address the market needs for transactional efficiency.

Under the MPEG LA patent pool, parties believing they owned standard essential patents would have their patents evaluated by a third-party to determine if the patents were essential to the standard. A patent becomes standard-essential when the patent is necessarily infringed through practice of the standard in its entirety. If a patent was found to be essential, the patent pool organization would include the patents in the patent pool and participants in the standard could, in a single transaction, receive a fair and reasonable licensing rate that was nondiscriminatory across participants who deployed the standards-based technology. Companies that participated in developing the technology that becomes part of the standard also had obligations to notify the standards body of their patents. U.S. courts, and other courts, have found that an implementer of a standard—that is, a firm or entity that uses a standard to render a service or manufacture a product—can be an intended third-party beneficiary of a FRAND agreement. In this case, the beneficiary can be entitled to certain rights conferred by that agreement.

Because a patent generally grants its inventor an exclusive right to use the patented technology, a standard-setting organization typically obtains permission from the patent holder to include a patented technology in its standard. So, it will request that a patent holder clarify its willingness to offer to license its standard-essential patents on FRAND terms. If the patent holder refuses upon request to license a patent that has become essential to a standard, then the standard-setting organization is likely to attempt to exclude the technology covered by the patent from the standard. When viewed in this light, the FRAND commitment serves to harmonize the private interests of patent holders and the public interests of standard-setting organizations.

In some cases, patent holders could also implement FRAND licensing programs outside of a standards body. For example, AT&T implemented a MPEG-4 Patent Licensing program which could have been part of the MPEG LA program. However, AT&T decided to implement an independent patent licensing program and to negotiate individual licenses with the various companies implementing MPEG - 4. AT&T declared its commitment to license the portfolio on reasonable and nondiscriminatory terms. Because of AT&T’s program, a first group of patents that are essential to MPEG-4 are available for licensing through the MPEG LA patent pool and a second group of patents, the AT&T patents, were available for licensing outside of the MPEG LA

patent pool. Both the MPEG LA patents and the AT&T patents are licensed on FRAND terms. However, AT&T was able to negotiate higher terms than they would have obtained if they had simply included the AT&T patent portfolio within the MPEG LA patent pool because AT&T was able to convince licensees of the quality of its portfolio. The FRAND terms are not based on the royalty rates for the MPEG-LA portfolio but are based on nondiscriminatory rates of those patents across the licensees for standards-based or commonly implemented technology.

While there are relatively few granted patents related to blockchain technology at this time, the ecosystem could soon face an impractical patent thicket in the next several years if patent filings continue to grow at current rates. The players in the ecosystem could investigate the possibility of a patent pool to facilitate freedom to operate and innovation.

XIII. CONCLUSION

IP is a valuable asset that can directly (e.g., monopoly rights, licensing revenue, etc.) or indirectly (e.g., access to capital and new markets) drive the success of a business. Whether innovations are to be held as proprietary software or shared on an OS basis, understanding patent protection is important for all innovators and technology-based businesses. A thoughtfully considered plan concerning IP rights can make all of the difference with respect to whether an innovator is able to monetize their innovation and recoup their investment or, in the alternative, become subject to a lawsuit and prohibited from selling their product as a result of a patent infringement. As is the case with any Primer, this guidance does not cover the many nuances and complexities of the law surrounding patents and patentability. This guidance is merely a starting point to help you think about your potential IP rights and patent portfolio, or how the IP rights of others may impact your business strategies and decisions. For that reason, bringing to the table the specific facts of your individual case and consulting with an IP attorney, when appropriate, is the best way to formulate a sound strategy concerning your rights and IP. As IP law continues to unfold and develop around the blockchain space, the Chamber of Digital Commerce, along with the BIPC, will continue to analyze and highlight relevant developments that may be critical to your IP strategies.

**A BLOCKCHAIN INNOVATOR'S GUIDE TO IP STRATEGY,
PROTECTING INNOVATION & AVOIDING INFRINGEMENT**

