

# Digital Intellectual Property Strategies for Universities and Faculty: A Primer to Maximize Success in the European Union and United States

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## INTRODUCTION

Intellectual property (IP) laws in the European Union (EU) and the United States (US) vary in both scope and application, especially with respect to digital innovations. Understanding the differences in each jurisdiction is crucial to maximize the likelihood of sound IP protection and to ensure promising commercialization outcome. To develop an appropriate IP strategy, it is necessary to know both the type of protection that patents, copyrights, and trademarks provide in each jurisdiction, as well as the intrinsic nature of digital works that can be covered under each jurisdiction's IP laws. Once these are understood, a comprehensive strategy can be devised to maximize potential for success.

The information presented in this primer is organized in three sections: IP Concepts, Digital Concepts, and IP Strategy for Digital Innovations. Each section notes important differences between EU and US IP practice – as well as valuable tips – for both innovators and technology transfer professionals.

## I. INTELLECTUAL PROPERTY: COMPARISONS OF PRACTICE IN THE EU AND US

Intellectual property is comprised of tangible and intangible assets that are developed in the process of creation and commercialization an innovation. These intellectual property assets are essential building blocks of commerce across all industry sectors. Developing the appropriate IP strategy to protect products requires at least a basic understanding of the nature of the different types of IP protection, and the differences in IP law between jurisdictions. Specifically, what can be protected, the nature of that protection, the manner in which the IP can be used and transferred, and how the IP rights can be enforced.

### Patents

Patents are exclusive property rights granted by governments to individuals for their inventions and creations. Patents confer the right to exclude others from practicing the patented invention. There are three types of patents – utility, design, and plant. Of these, only utility patents are germane to digital works.

General criteria for obtaining a patent is similar in most countries, but each jurisdiction has certain requirements that may be different. For example, patenting computer software in the US is determined under the criteria used for all inventions. This would effectively render most software patents unenforceable due to the limited scope of patent protection that can be obtained. In the EU, however, software that uses computers to improve data handling may be patentable. Similarly, business methods that incorporate software or other digital works may be patentable in the US, but are not easily patented in the EU.

#### *Key Legal Differences for Patents*

In order to obtain a utility patent, the most common type of patent granted, the patent application must prove the invention satisfies four basic requirements<sup>1, 2</sup>. These requirements are different in the EU and US but have similar criteria – with the first three US requirements easily remembered by the mnemonic “NUN,” which stands for Novel-Useful-Nonobvious – and outlined as follows:

- i. Novel/Previously Undisclosed: In the EU an invention must not have been previously disclosed or offered for sale. In the US this is similar to the requirement that an invention must be “novel.” In practice this means that any form of public disclosure, including offer for sale, will render an invention unpatentable.
- ii. Useful/Capable of Industrial Application: “Capable of Industrial Application” is the EU requirement most closely aligned with the US requirement that an invention be “useful,” or having utility.
- iii. Nonobvious/Distinguished by an Inventive Step: The EU requires that an invention be distinguished by an “inventive step” that is not obvious to a person skilled in the field.
- iv. Detailed Description: Both the EU and the US require patent applications to contain a detailed description of the invention.

There are key legal differences in each of these four requirements. For example, in the EU previous disclosure will result in “absolute loss” of patent rights. In contrast, US law gives a one-year grace period from the first date of public disclosure to file a patent application. With regard to industrial application, in the EU the term “invention” is not defined although there is a long list of exclusions<sup>3</sup> whereas in the US it is defined by the three NUN requirements.

The difference between the EU and the US is best demonstrated in the life science sector. For example, a DNA sequence can be patented in the US (within certain boundaries) but not in Europe. Likewise, a method to treat disease meets US utility requirements because it is a useful invention but not in the EU, since a method to treat is not considered to be an industrial application.

Other crucial differences between the EU and the US are “inventive step” versus “inventive leap” and the requirements for the detailed description. While in the EU requires an “inventive step” that is not obvious to an expert in the field, the US requires an “inventive leap” which is defined a clearly substantive distance – or leap – between it and prior inventions in the field. With regard to detailed description, the EU

requires a patent application to describe the “method of use” whereas the US requires descriptions of both a “best method to make” and a “best method to practice” the invention. Note the addition of the word “best” in the US requirement, which is meant to ensure a patent describes the best means to make and use an invention.

Perhaps the most remarkable difference between the EU and US patent systems is the “provisional” application. A provisional application is a unique category of protection available in the US but not in the EU. A provisional application can be filed one year before making a full patent application. Australia also permits filing a provisional application and Israel is in the process of creating a provisional system. US provisional applications can be a very valuable strategic tool. This is covered in more detail in Section III.

### *Patent Resources*

Resources for helping individuals and companies determine if their innovations are patentable, the patenting process, and what to expect in the patenting process are available from both the [European Patent Office](#)<sup>4</sup> and the [US Patent and Trademark Office](#)<sup>5</sup>. In addition, the Office of the United States Trade Representative published an annual report<sup>6</sup> outlining changes in intellectual property protection in different countries that can be used to assess if the effort of obtaining protection is worth the time, effort, and money.

## **Copyright**

Copyright protects expression – something that is fixed in a tangible media. It does not protect ideas, procedures, methods, systems, processes, concepts, principles, or discoveries. A copyright conveys economic rights (the ability to generate revenue) and “moral rights” (the protection of a claim of authorship and control of rights to make modifications).

Copyright laws cover a wide variety of works. They include written works, music, artistic works (paintings, photographs, etc.), recordings of music or performances, film or television recordings, software, databases, web content, architectural works, and mask works for chips. There are certain items that are not protected by copyright, such as company names and logos, common phrases, slogans, and ideas – which can be protected by other forms of intellectual property protection such as trademarks and patents.

Most importantly, a copyright occurs automatically. It is a right granted by law as soon as the work is fixed in a tangible form<sup>7, 8, 9</sup> (the instant it is created). For example, the minute that pen is put to paper or fingers to a keyboard, a copyright exists and provides the owner with all of the protection under the law.

Copyright laws across the globe have been harmonized through various treaties and conventions. The Berne Convention<sup>10</sup>, adopted in 1886 provides creators of copyrights the ability to control how their respective works are used. It is based on three basic principles:

- i. Works originating in a signatory jurisdiction are given the same level of protection as that of works originating in a signatory country.
- ii. Protection is automatic. (i.e. no compliance with any formality, such as registration, is required.)
- iii. Protection is independent of the existence of protection in the originating country.

Other international treaties have also helped to harmonize copyright laws on infringement and enforcement, as noted below in the “Copyright Resources.”

### *Key Differences in EU and US Copyright Law*

The length of copyright protection varies from country to country. However, in the EU and US (for works created after 1978 in the US) the length of protection has been harmonized. It is the life of the creator plus 70 years. Even so, and despite the various harmonizing conventions and treaties, there are discrete differences in certain concepts and categories of copyright law for each jurisdiction. Key differences between the copyright law of the EU and the US include:

- i. “Fair use,” a concept that is unique to the US that permits the unlicensed use of copyright material for certain purposes such as criticism, comment, news reporting, teaching, scholarship, and research.
- ii. “Work for hire” doctrine, also unique to the US, which states that works created by employees of a company within their scope of employment are owned by the company.
- iii. “Anonymous works” are those for which the author is not identified. In the EU, an anonymous work is protected for 70 years after publication. However, in the US, anonymous works are granted a term of either 95 years from first publication or 120 years from creation, whichever is less.
- iv. Works of “corporate authorship” are treated the same as anonymous works in the US but are treated as regular creators in the EU.
- v. Another key difference is the requirement of registration of the copyright in the US before a lawsuit is filed to enforce the copyright – there is no such requirement in the EU or any other country. Therefore, in accordance with the Berne Convention, EU citizens can sue for copyright enforcement in US courts without registration, something that US citizens cannot do.

### *Copyright Registration and Protection*

Copyright exists automatically, therefore copyright registration is not a requirement. However, depending on the nature of what needs to be protected, registration may be desirable. This is particularly important if the copyright is to be enforced against infringement.

“Infringement” is a concept that exists across all categories of IP rights. With regard to copyright law, it is important to understand the rights that copyright protection gives the owner to control the use and exploitation of their work – rights that provide protection against unauthorized use. Copyright owners can exert control of their copyrights by allowing, limiting or authorizing the use, performance, reproduction, distribution and sale, display, modification, and the ability make derivatives of their works. The owner can transfer any of these rights, or a combination of these rights to others under a contract or license.

### *Copyright Resources*

In the US, the registration process is through a US government office, [www.copyright.gov](http://www.copyright.gov), while in the EU copyright is automatic and no registration is necessary. The benefit of US registration is it establishes the date of creation and ownership, and it is not expensive.

















Following is a list of germane conventions with links provided in the footnotes:

- Universal Copyright Convention<sup>11</sup>
- Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations<sup>12</sup>
- World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement)<sup>13</sup>
- WIPO Performances and Phonograms Treaty (WPPT)<sup>14</sup>
- WIPO Copyright Treaty<sup>15</sup>









## **Trademarks**

Trademarks can be highly valued intellectual property assets and should not be overlooked when seeking protection for digital innovations. A trademark is the strongest mechanism available to establish, differentiate, and brand an innovation. But – importantly – a trademark is fundamentally different than patents and copyrights; trademarks protect the brand, not an innovation, idea, or expression of an idea.

A trademark can be any word, phrase, symbol, design or a combination of them that identifies the good or services being offered. Trademarks are used for goods and service marks are used for services. In practice, it is possible to trademark any distinguishing aspect of goods and services including sounds, smells, color, trade dress, and images<sup>16, 17</sup>. The purpose of trademarks and service marks is to provide a means for the public to be able to easily identify the goods or services associated with a particular trademark or service mark.

Word Mark	Letters	Phrases	Shape
 	 	 	 
Figurative	Combination	Pattern	Color
 	 	 	 

There are several categories under which protection can be obtained in the EU and the US, as seen in the figure above. In addition to the those listed, trademark protection can also be obtained in the categories of sound, multimedia, motion, and holograms.

Generic	Descriptive	Suggestive	Arbitrary	Fanciful
<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Beer Company</div> <div style="border: 1px solid black; padding: 2px;">Bicycle Shop</div>	 	 	 	 
No protection			Strongest Protection	

The five general categories of trademarks are generic, descriptive, suggestive, arbitrary, and fanciful. A trademark should be distinctive – immediately identifiable and associated with the company or organization and the goods or services being offered. The strongest trademarks are suggestive, arbitrary, or fanciful.

Trademarks are always associated with specific goods or services. Each trademark application must adequately identify specific goods or services – or a suite of multiple goods and services – and each category of goods or service requires its own application fees. For example, the use of the term “Coca Cola®” on a bottle would be a separate class of goods from the use of Coca Cola® on a t-shirt; therefore, you would be filing an application with two classes of goods identified and would pay the respective associated fees.

#### Key Concerns Regarding Trademarks

It is important to have strong understanding of the types of goods or services for which trademark protection is sought. The list of uses – called classes – must be determined prior to application. The list should not be overly broad. Obtaining trademarks for multiple classes can be an expensive process and an extensive list of classes may increase risk. The greater the number, the longer the review and registration process, and the greater the risk of conflict with other trademarks. The latter may result in

cancellation of the mark. Cancellation can also be triggered by non-use of the trademark – a risk that increases with long lists.

The most common reason to have a trademark registration refused is the “likelihood of confusion” between the trademark being applied for and an already registered trademark of an already pending trademark application.

Selecting a trademark to represent your digital goods or services should not be undertaken lightly. The selection of a strong trademark can be a valuable asset but can also be difficult to define or create in the early stages of commercialization since brand, the primary protection offered by trademark, can be difficult to ascertain, particularly for innovations stemming from academic research.

### *Key Differences in Trademark Law*

Like patents, which are specific to a country or region, one must obtain protection in each jurisdiction in order to be protected. Although there are similarities in the trademark laws of the EU and the US, there are key differences that need to be considered when making application.

- i. One of the most important differences is that actual use of the trademark is required to achieve and maintain protection in the US. This is not the case in the EU, where use is not necessary and merely requires the payment of the appropriate fees.
- ii. In the US, goods and services can – and should – be marked prior to registration with “TM” or “SM.” Use of these marks establish precedent and satisfy the US use requirement for registration of the mark, which is designated by the use of the symbol “®” after approval.
- iii. Relative to this, in the US parties are not required to register their marks to obtain protectable rights.
- iv. Conversely, in the EU you cannot use a mark in any manner without risk of rendering your application invalid.
- v. Examination of the trademark application also differs. The US examines any and all prior US registrations to determine if similar trademarks have been registered whereas the EU only examines the applicant trademark to determine if it is unique and distinctive.

### *Trademark Resources*

The European Union Intellectual Property Office (EUIPO) website offers a comprehensive [guide](#)<sup>18</sup> and information as well as a [checklist](#)<sup>19</sup> to assist in the trademark registration process. The United States Patent and Trademark Office (USPTO) website provides a similar [guide](#)<sup>20</sup> and an [online application](#)<sup>21</sup> form.

In addition, the World Intellectual Property Organization (WIPO) is host to the [Madrid Union](#)<sup>22</sup>. The Madrid System provides a “convenient and cost-effective solution for registering and managing trademarks worldwide.” The Madrid System enables applicants to manage their global trademark portfolio through a centralized system. There are currently 109 Madrid Union members representing 125 countries – over 80% of world trading countries.

## **II. DIGITAL CONCEPTS: KEY UNDERSTANDINGS IN THE CONTEXT OF DIGITAL IP**

Digital innovations are constantly evolving. A short time ago, they were defined primarily as software. Now, digital works include innovations such as blockchain and non-fungible tokens (NFTs). Following is a summary of the areas of digital innovation that are crucial to understand in the context of IP protection for digital works.

### *Software and Protection of Software*

Software is a set of instructions, programs, algorithms, and data used to operate mechanical or digital computers. Generally, there is a hierarchy of software complexity extending from the primary layer of the computer interface known as machine language (i.e. the language the computer uses to function; this will vary between different computers) to the highest-level programming languages (e.g. C++, Python, JavaScript, HTML, etc.). The types and varieties of computer software are potentially infinite and span many areas of interest such as operating systems, applications, middleware, applets, and more.



Algorithms are the precise instructions used in software to solve specific classes of problems and/or computations. Algorithms are embodied in software to allow specific functionality, and they provide a wide variety of functions from data input/output, sorting, mathematical calculations, and logical operations. A program is a set of one or more specific algorithms used to implement a function, and a set of one or more programs is a piece of software.

Because software is written and is a work of authorship, it is protected automatically by copyright, but in select embodiments and in some jurisdictions, it can also be protected through patenting. Software can also be offered for use under trademark. In the US, software is generally not patentable unless it contains a novel algorithm or algorithms.

Over the last couple of decades, the patentability of software has waxed and waned depending on case law. A full analysis of current case law is beyond the scope of this primer. See these relevant reviews for more details: [“Software Patent Law: United States and Europe Compared”](#)<sup>23</sup> and [“In the courts: five years after Alice - five lessons learned from the treatment of software patents in litigation”](#)<sup>24</sup>.

### Open Source Development

Software development can be either proprietary in nature or open source. In the former case, the developer(s) maintain a strict exclusivity to the authorship of the software code. The only code written is by the select developer(s) of the software and no outside authorship is allowed into the software development or software platform. The major benefits of this model include financial exclusivity, higher margins, less competition, focused developments, etc.

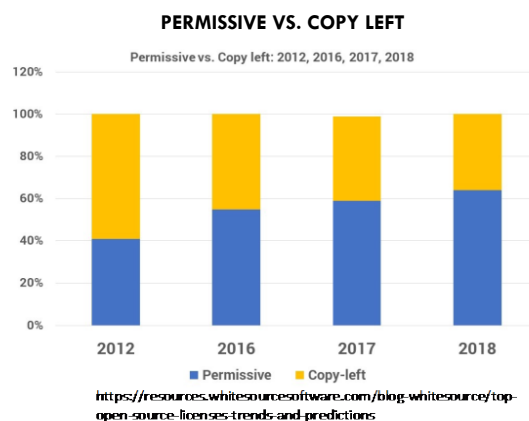
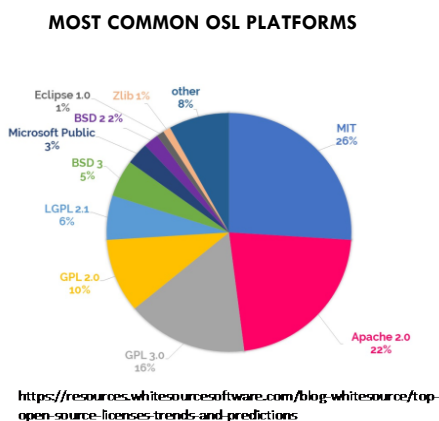
Open source, as the name suggests, allows for distributed authorship of a software development program. The benefits of open source development include lower cost of development, community-based development, and accessibility. From an IP protection perspective, however, the benefits of open source development is wholly dependent on the licensing scheme required for use of the open source software platform.

### Open Source Licenses

Open source licenses (OSL) are licenses that comply with the [Open Source Definition](#)<sup>25</sup> — in brief, they allow software to be freely used, modified, and shared. To be approved by the Open Source Initiative (also known as the OSI), a license must go through the [Open Source Initiative's license review process](#)<sup>26</sup>.

Open source doesn't necessarily mean free! Open source software can be used for commercial purposes so long as the organization commercializing the software abides by the terms and conditions of the specific open source software license connected to the open source programs and software.

The type of license is crucial if commercialization is an objective. OSL platforms fall into one of two licensing categories: permissive and copyleft. Copyleft allows the right to use, modify, derive, and distribute software with an obligation of reciprocity; users need to make any derivative code available under the same terms and license. Permissive guarantees the freedom to use, modify, and redistribute, while also permitting proprietary derivative works. There are minimal restrictions, making permissive the preferred form of OSL for commercial development.



The graphs above describe the open source licensing trends associated with the major varieties of OSL programs currently available. There isn't a one-size-fits-all OSL program. There are 37 versions of OSLs currently being used. The most popular are Berkeley Software Distribution, Common Development and Distribution License, Eclipse Public License, General Public License, Microsoft Public Licenses, MIT License, and The Apache License. Of those, the most popular permissive licensing platforms are Apache, MIT, and Berkeley.

### Artificial Intelligence and Machine Learning

There is no universal definition of artificial intelligence (AI). AI is a discipline within the fields of computer science and psychology aimed at developing machines and systems that can carry out tasks considered to require human-level intelligence. Machine learning (ML) and deep learning are two subsets of AI.

Machine learning uses examples of input and expected output to continually improve decision-making without being directly programmed. This approach mimics the development of biological cognition. A child learns to recognize objects from examples of the same objects, over time, within their environments. Machine learning applications are numerous and include email spam filtering, machine translation, voice, text and image recognition.

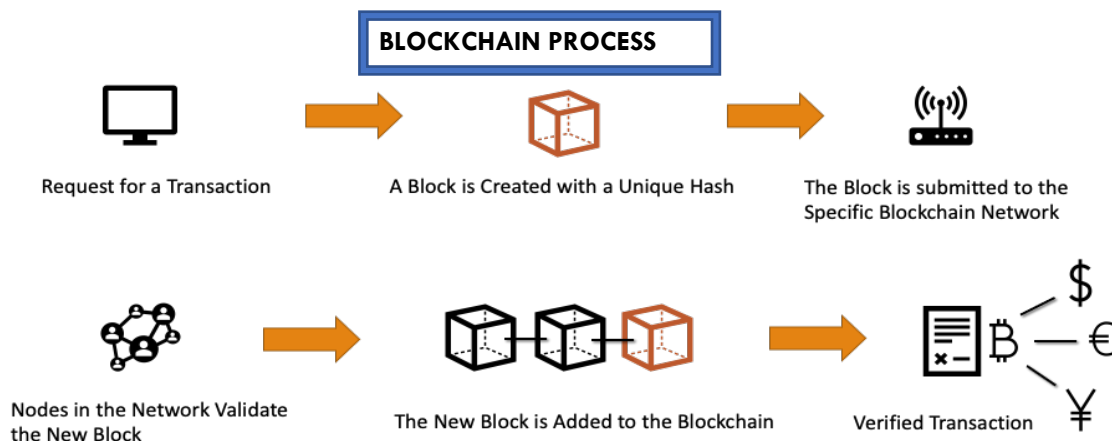
The IP issues surrounding AI and ML can be confounding. WIPO considers AI a "frontier technology." Per WIPO, "The field of frontier technologies is rapidly evolving and there is no agreed definition...They operate at the intersection of radical scientific developments and real-world implementation. Furthermore, they are changing the way we communicate, solve problems, provide goods and services, create and do business."

The increased prevalence of AI in technology and business has increased the debate and discussion regarding fundamental questions surrounding AI and IP. The main focus of the questions being posed are the need for modification of existing IP systems for the protection of AI, data (needed for AI systems to operate), and for machine created works and inventions.

### Blockchain

Blockchain technologies are based on the use of a distributed ledger duplicated across the worldwide network of participating computer systems. Key characteristics include:

- i. Programmable – allows for smart contracts that operate independently.
- ii. Secure – all records are encrypted and marked by a hash.
- iii. Distributed – all blockchain participants have a copy of the ledger.
- iv. Immutable – validated records can't be changed once added.
- v. Unanimous – all participants ultimately agree on any given transaction.
- vi. Time-stamped – records carry a transaction time/date as a component.





While blockchain is best known for its use in financial industries, its characteristics make it particularly interesting for use in IP-intensive sectors. Blockchain can be used to authenticate an item, determine provenance, establish and enforce IP agreements, and to manage and track digital rights management. As such, it is a potentially effective digital tool to enforce your IP rights.

#### *Non-Fungible Tokens*

“Non-fungible” means unique, one-of-a-kind content such as a song, a trading card, a photo, or any other digital materials; think digital memorabilia. The creation of NFT is a direct result of the rise of blockchain technology, and it is a new way to protect both copyright and other intellectual property strategies such as licensing, using the Ethereum Network – a blockchain platform – and its native token, ETH. Recently, other blockchain platforms are adding functionality to support NFTs. NFTs are powerful instruments that utilize all the capabilities of blockchain distributed ledgers. Although many current NFTs are whimsical offerings, the platform offers a glimpse of what will be possible with a wide variety of intellectual properties and their provenance.

#### *Smart Contracts*

Another functionality of blockchain technology is the “smart contract”. Smart contracts present extensive possibilities for IP protection and transactions. Specifically, smart contracts are short programs or scripts which can encode and automate a variety of transactions (i.e., outputs) related to external events (i.e., inputs) ultimately affecting what happens with the linked intellectual property. For example, smart contracts could be embedded in a digital work to control, police, and manage ownership, licensing, and use of the IP. Smart contracts have profound potential to automate transactions, licensing, and fulfillment/delivery of product offerings. They can also be used to automatically terminate or disable use of digital works if there is tampering or if terms of use are violated.

### **III. IP STRATEGIES AND PRACTICES FOR DIGITAL INNOVATIONS**

Strategy for IP protection of digital innovations requires careful consideration of many factors. As noted in Section I, they are immediately and automatically protected by copyright. But significant jurisdictional differences between the patent and trademark laws make creating an “IP wall” that combines copyright, patent, and trademark protection can be complex and sometimes thorny. Depending on the software innovation for which protection is being sought, one must balance the potential life of the digital work, the level of protection, the timing, the cost, and the reasonable enforceability of the protection sought.

#### *Product Lifecycles*

Strategically, patents can create a valuable barrier to entry of competition, but they are difficult to obtain, take a long time to prosecute, and are costly – potentially longer than the product’s lifecycle and more expensive than reasonable for the estimated revenue to be derived from the product.

This is particularly the case for software, which often has a short lifecycle. If the life of a digital work expected to be short, patent protection is not likely appropriate. The rare exception would be if the anticipated revenue and the threat of competition are both very high and the estimated time to prosecute is short. For software with a brief lifecycle, trademark protection can also be problematic.

Trademarks can also be challenging given jurisdictional differences in trademark law (as noted above) and, as with patents, the decision must be weighed against competitive forces and revenue projections. It is also important to keep in mind that trademarks protect the brand and not the actual innovation. Therefore, while trademarks are an important part of IP strategy, they do not protect against infringement of the innovation. In the United States, parties are not required to register their marks to obtain protectable rights. In summary, copyright registration alone is generally best for digital innovations with short lifecycles.

#### *Viability of Digital Works Patents*

If the product lifecycle is expected to be long, there are situations in which patent protection may be warranted and achievable. But – very importantly – patents can be difficult, to impossible, for many digital

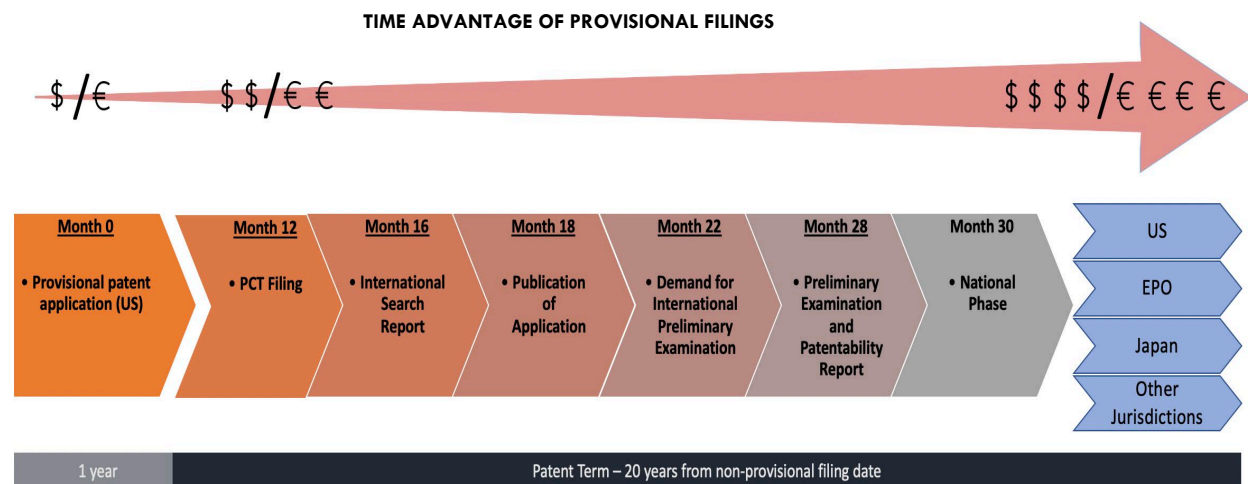
works under current patent laws. In most cases, a digital work can only be patented if it employs a novel algorithm or set of algorithms. For the latter, if the set of algorithms employs known algorithms, a patent application is likely to meet challenges, and it may be more difficult and expensive to prosecute unless it can be successfully argued that the combination would not be obvious to anyone “skilled in the art.”

However, in the US, a second possibility for patenting digital works exists: if the digital innovation is integral to a novel business method it may be possible to acquire a “business method patent,” a unique category that covers novel methods to conduct business. Business method patents can prevent competition from those who may wish to adopt your software’s problem-solving methodology. But, prosecution of these patents is neither easy nor inexpensive, in contrast to a novel algorithm which is relatively straightforward. And, enforcement may be challenging (more below). As such, this strategy must be used with care.

### Use of Provisional Patent Applications

Depending on circumstances, a provisional patent may be strategically compelling, particularly if: 1) it has been determined that your digital innovation is potentially patentable, 2) you are hopeful that further development will result in patentable features, 3) a public disclosure is pending and/or 4) your innovation exists in a highly competitive environment with a limited window of opportunity, a provisional application can be a quick, relatively low-cost strategy to proactively preserve your rights.

Provisional applications provide an absolute date of claim of ownership, known as a “priority date,” for a period of one year and can be converted to a utility or PCT, a “non-provisional,” as long as the non-provisional patent application covers the same subject matter as in the provisional application. Non-provisional applications must be filed before the end of month 12 from the priority date. Effectively, a provisional patent application will extend your patent life by one year. (As demonstrated in the figure below.) This strategy can be used for any innovation, not just digital works.



As previously noted, provisional applications are currently available only in the US and Australia, with Israel pending. Depending on the pace of research and development, provisional applications can be filed early and repeatedly. They are not published so they do not create a barrier to the novelty requirement. However, each new provisional resets the priority date.

Ultimately, in the debate about whether to file a regular patent application or provisional patent application, it comes down to this: unless a digital work incorporates considerable unconventional or inventive transformations or systems, the preferred form of IP protection is copyright.

### Timing and Strategy

Although copyright protection is immediate – it exists upon the creation of the digital work – the copyright should be immediately registered with the appropriate authorities in order to ensure enforceability against infringement by others. At the very minimum, any copyright subject matter should be marked with “©” and the year in which it is was created, along with the name of the person or entity that owns the copyright. Additional language, such as “all rights reserved” or a statement of prohibitions for use can be added to strengthen the protection and enforceability of a non-registered copyright. All copyright notices and registrations should be updated at regular intervals as the work is updated.

Patent timing is a different matter. A patent application must be filed prior to any public disclosure or offer for sale. The description and embodiment of the digital work must satisfy all of the requirements of the respective patent laws in the EU, US, or wherever patent protection is sought. Strategically, one of the most important aspects to consider, especially for software, is conception and reduction to practice. For example, novel algorithms and the written code for the software represent the conception and reduction to practice of the innovation versus algorithms by themselves may only represent the conception. As such, it is best to wait until you have a functional prototype before filing.

Trademarks may be filed at any time, subject to the laws for each jurisdiction. The key issue here is that if a trademark is used or registered first in the US it may not be eligible for trademark protection in the EU. So, timing in use of and application for trademarks is crucial to overall strategy.

### Cost and Value of IP Protection

The cost of intellectual property protection is one of the most important strategic considerations. Costs vary greatly by type of protection and by jurisdiction. The cost must always be weighed carefully against the potential revenue. Factors include a low expected sales price, a small market, low demand – and of course lifecycle – may render certain types of protection untenable, or even foolish.

#### RELATIVE COSTS OF OBTAINING COPYRIGHT, TRADEMARK, AND PATENT PROTECTION



Patents are the most expensive form of protection, followed by trademarks, with copyright the least expensive. But the level of protection offered by copyright, particularly with regard to software, gives the opportunity for others to rewrite or recreate a digital work that may compete.

The high cost of patent protection is driven primarily by the cost of legal counsel and it is virtually impossible to secure a strong and enforceable patent without a patent attorney or patent agent. Trademark protection also requires legal counsel, but because applications are considerably shorter, they are less expensive than patents unless there is a broad number of goods and services that must be covered. In this latter case the cost can be significantly higher. Copyright registration does not require legal counsel and fees charged to file are quite low. Copyright registration of digital works is always the least expensive and most accessible form of protection.

## *Scope and Enforceability*

The scope of a patent protects the novel aspects of the innovation, the processes, and design of the system to achieve a desired result. Patents give the patent holder the right to exclude other from practicing the invention covered by the patent thereby creating a reverse monopoly. A patent can be enforced against an infringer that is using or selling the covered invention without a license from the patent holder. However digital works enforcement can be challenging and expensive. The enforcement of digital works patents begins with an in-depth analysis of the claims of the patent to determine the enforceability of the claims. The infringing digital work does not have to exactly follow the steps outlined in the patent but has to be sufficiently similar. The problem lies in the question of how “sufficiently similar” is defined – a problem that relies on the variability of courts, case law, and jurisdictions.

In contrast, copyright protects the source code, the exact instructions written by a programmer implementing the architecture. Copyrights give the owner clear ability to control the use, performance, reproduction, distribution and sale, display, modification, and the ability make derivatives of their works. Also, in contrast to patents, where only the first inventor is allowed to own the patent, it is possible for two individuals to own the copyright on identical works if they were created independently and without knowledge of the other. Therefore, it is possible for two individuals to have copyrights on identical or similar works.

With regard to trademark, the scope of protection assures the owner exclusive rights to use the trademark to identify the goods or services. Trademarks, like patents, are a strategic weapon for the registered owner to stop the others from illegal use. But enforceability is a nuanced form of brand protection with numerous variables ranging from geographic region of use, type or class of product or service branded, and specific use of colors, shapes, and fonts. No two marks may be identical, but similar marks may exist, particularly across geographic regions and product classifications.

### *Value and Valuation*

IP protection can provide great financial value to its owner, whether individuals, not-for-profit institutions and academics, or for-profit corporations. This is uniformly true for copyright and is often the case for trademark as well. But for patents, the case is less clear. Particularly for individuals and not-for-profit institutions – primarily due to the costs associated with the process. However, if the individual or not-for-profit institution seeks to commercialize the IP, they must consider the perspective of corporations.

For corporations, the case for IP protection, and in particular patenting, is driven by valuation of corporate assets. Corporate valuation increases based on the breadth and depth of the portfolio of intellectual property. Copyright and trademark provide important value, but a digital work that meets patent benchmarks confers the high financial value of all. Startups and small to medium enterprise in particular often base their valuation – and their overall potential for success – on their IP holdings. This driver has led to an increase in digital works patent filings over the last decade despite the high cost and questions regarding enforceability.

Strong IP provides owners and investors with security. The exclusivity granted by IP is an asset that can be monetized strategically through sales, patent enforcement, licensing, and cross-licensing – all of which are features that investors desire. For individuals and not-for-profit-institutions seeking to commercialize their innovations, strong IP protection is a must to maximize revenue from the innovation.

### *Last Words on IP Strategy for Digital Works*

The case for copyright protection is clear. Copyright, whether by a visible statement on the work or through formal registration, is always the first and most necessary step to protect digital works. The decision to file for trademark, on the other hand, is subject to greater variation by jurisdiction and is dependent on market size and anticipated end use. For an individual or institution, establishing a trademark can potentially add value, especially if the mark is truly catchy and distinctive. Alternately, the mark you choose may be completely meaningless to a future owner or licensee.

The strategic decision to file a patent depends on whether an innovation has both 1) patentable properties and 2) a market potential for revenue that far exceeds the cost of prosecution. If so, patent protection provides the greatest protection and the greatest potential for return on investment.

Finally, the decision to protect via copyright, trademark, patent is not an either/or decision. A single digital work can be protected by one, two, or by all three forms of protection in combination. Ultimately, and above all else, the decision to pursue any IP strategy must be based on the laws and case laws for each jurisdiction, an understanding of the potential markets and product lifecycle, a sound valuation of projected revenue, and an analysis of cost of protection versus the potential to extract value from the innovation.

## **ABOUT INSTITUTE FOR INNOVATION ECOSYSTEM DEVELOPMENT (I2ED)**

I2ED was launched in the summer of 2019 with a mission to support the development of innovation ecosystems worldwide. The four pillars of I2ED are education, advocacy, research, and policy.

The Institute was spun out from the for-profit company Apio Innovation Transfer (APIOiX), an innovation, entrepreneurship, and technology transfer consultancy that has conducted trainings across the globe. Over the course of the last seven years, APIOiX has developed an extensive speaker's bureau and suite of educational programs designed for nonprofits, government agencies, and universities worldwide which are being transferred to I2ED. This transfer will allow mission-oriented training, advocacy, and education programs to continue under I2ED while APIOiX focuses fully on its for-profit work.

The goal of I2ED is to serve as a global "innovation ecosystem" think tank and training organization. While there are many organizations that serve separate aspects of the innovation ecosystem, there is a gap in understanding at the intersection, or overlap, of innovation ecosystem components: intellectual property rights, entrepreneurship, academic technology transfer, venture capital, industry collaborations, and regional economic development.

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