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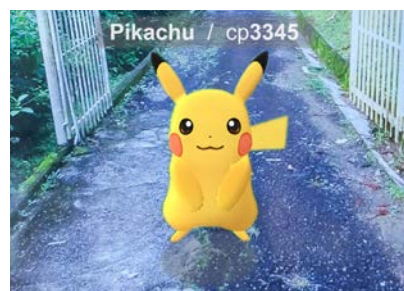
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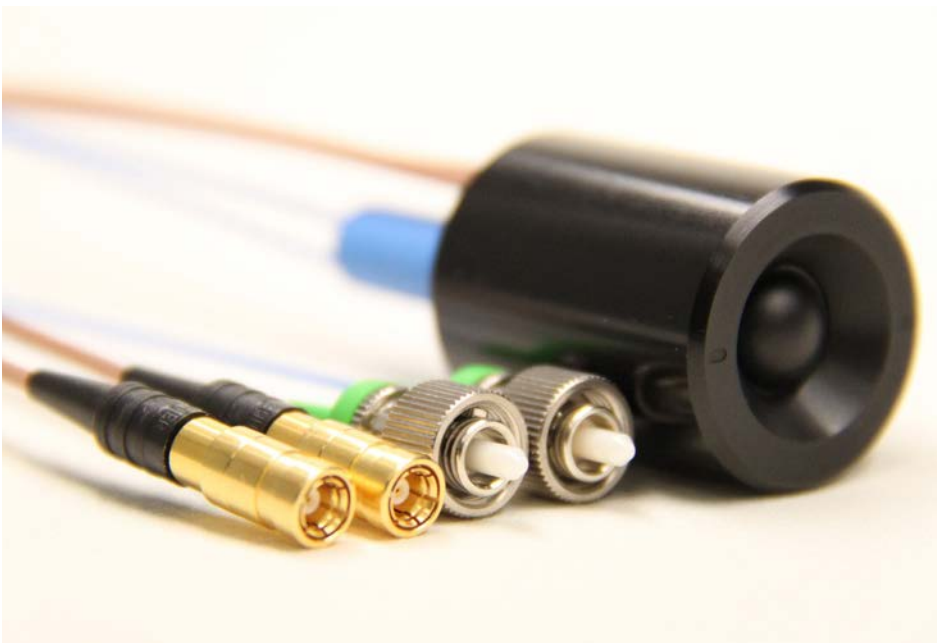
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WIPO's PCT publishes 3 millionth international patent application

By **Catherine Jewell**,
Communications Division, WIPO

Photo: Fraunhofer HHI



In February 2017, WIPO published the 3 millionth international application under its Patent Cooperation Treaty (PCT). This milestone in the history of the international patent system and WIPO is yet another indication that, amid a great deal of economic uncertainty, the global knowledge economy is thriving.

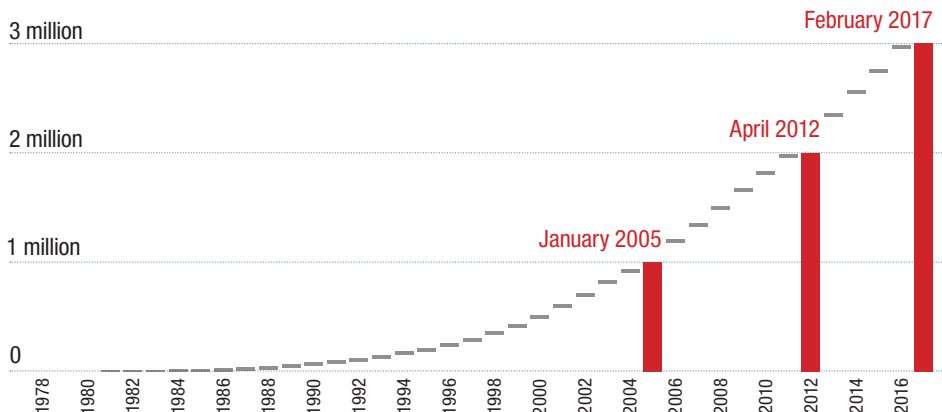
Since the PCT became operational in 1978, it has enjoyed remarkable growth. It took 26 years to reach one million international applications in late 2004, but less than 12 years to reach the three million mark. Apart from a blip in 2009 – the only year in which filings fell – PCT use has grown every year. In 2015, a record 218,000 international applications were filed under the system, with provisional figures for 2016 showing another year of strong growth.

ABOUT THE 3 MILLIONTH PUBLISHED INTERNATIONAL APPLICATION

The 3 millionth international application published on February 2, 2017, was filed by Germany's Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V. (Fraunhofer), one of the world's leading international applied research organizations. Fraunhofer is a major user of the PCT, averaging almost 300 international applications under the PCT over the last five years. The invention described in the application

The 3 millionth international application published under the PCT on February 2, 2017, relates to an innovative terahertz measuring system known as a "Vector Network Analyzer" that has practical applications in materials testing and components inspection. It was developed by researchers at the Fraunhofer Institute for Telecommunications in Germany.

CUMULATIVE NUMBER OF PCT APPLICATIONS 1978-2017



The PCT is a successful example of international cooperation in the field of intellectual property. It began operation nearly 40 years ago in 1978, and so far 151 countries have joined the System.

(WO/2017/017579), developed by the Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, HHI, one of Fraunhofer's 69 institutes across Germany, combines Fraunhofer HHI's expertise in two areas, namely terahertz radiation, which is a powerful imaging technology, and high-speed electronic data transmission. The invention, known as a "Vector Network Analyzer", is an innovative terahertz measuring system that packages the transmitting and receiving units for terahertz radiation into a tiny sensor head measuring just 25 mm by 35 mm. The invention has practical applications in materials testing and components inspection. While terahertz technology has been around for some time, for many years it was considered too expensive, bulky and difficult to use. Fraunhofer HHI's invention promises to change this and to give "terahertz technology a decisive boost". Made from standard, low-cost components, it makes it much cheaper and easier to test the viability of materials and components, such as plastic tubes.

WHAT THE PCT DOES

Companies and inventors like Fraunhofer use the PCT because it makes it easier and more cost-effective for them to seek patent protection for their inventions in international markets. By the end of January 2017, 151 countries had signed up to it. A single international patent application under the PCT System has legal effect in all the other countries bound by the Treaty.

It offers users a number of advantages. In particular, they can postpone the significant costs associated with obtaining patent protection in multiple jurisdictions by up to 18 months. Under the traditional patent system,

the so-called "Paris route", all relevant documents and fees are payable on the day a patent application is filed with a national office. By contrast, PCT users can benefit from valuable feedback about the potential patentability of their invention before deciding whether to continue pursuing patent protection – and pay the relevant fees – in their chosen PCT countries. This additional time and feedback creates opportunities for applicants to test the market for their invention and, if necessary, find new business partners. It also offers national patent offices a number of advantages, particularly in terms of simplifying procedures and streamlining workflow.

FRAUNHOFER'S TAKE ON THE PCT

"The PCT is an excellent way of creating intellectual property rights, in particular in cases where time is needed for strategic and cost-relevant decisions," notes Professor Alexander Kurz, Executive Vice President of Human Resources, Legal Affairs and IP Management at Fraunhofer. "The filing of a PCT application allows Fraunhofer to preserve its rights worldwide prior to identifying commercial partners and developing commercialization strategies for its inventions. A PCT application brings a large part of the world within reach without the need to file applications directly with individual countries, and allows us to postpone the major payments associated with internationalizing patent applications. But it also ensures that information about the value of the application is available at a relatively early stage. In summary, the PCT provides additional time for us to find the optimal partner and the most appropriate market for our inventions. In addition, relevant information about the patentability of a given application may be considered at an early stage."

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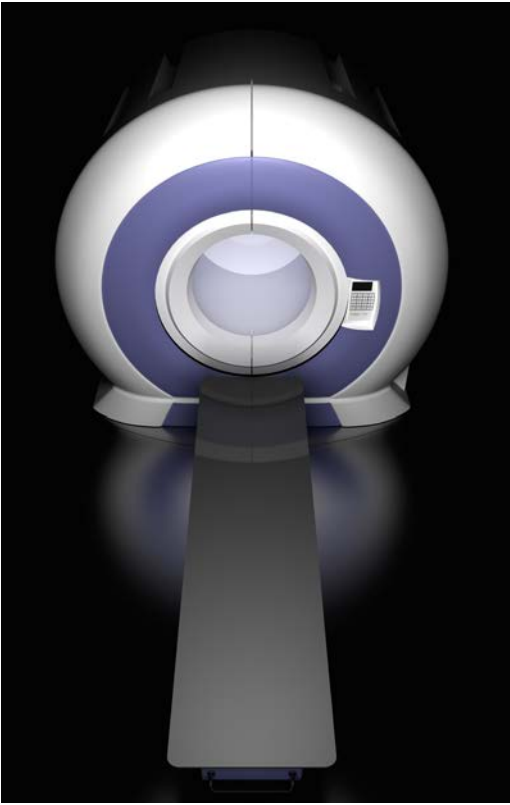


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The PCT helps inventors protect their technologies in international markets. Some of them have gone on to enjoy huge commercial success and have become an important part of our daily lives.

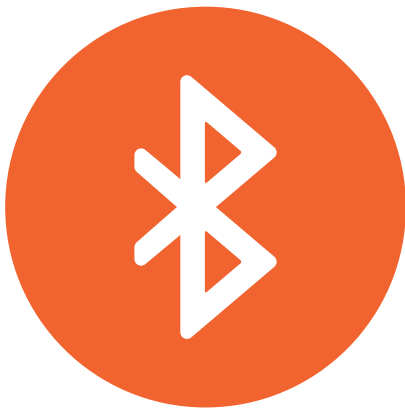


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“The PCT has reached three million applications in record time, underscoring the central importance of the system and its role in helping innovators reach global markets.”

WIPO Director General Francis Gurry

PATENT INFORMATION AND THE PCT

When companies and inventors embark on the process of obtaining a patent for their inventions, they are required to describe in detail what it is they claim to have invented. This information serves as the basis on which patent examiners in national offices decide whether an application meets the criteria for patentability as set out in national patent laws (i.e., novelty, inventive step or non-obviousness, and applicability). At a certain point in the process – both for applications submitted via the PCT and those made directly at national offices – the application is published and available for anyone to consult.

Patent applications contain a huge amount of technological information that is often not published anywhere else, making them an extremely valuable source of information. As such, every patent application that is published expands the amount of technical knowledge that is publicly available – the aim here is to inspire further innovations. These data, which also contain a great deal of business intelligence, are made available free of charge through public databases such as WIPO's PATENTSCOPE. With more than 50 million patent applications, PATENTSCOPE is one of the world's largest publicly available patent databases.

NOTABLE INVENTIONS THAT HAVE PASSED THROUGH THE PCT

For nearly 40 years, the PCT has helped individual inventors, some of the world's largest companies, as well as universities and research institutions (like Fraunhofer) to protect their innovations in international markets. While inventors cannot know the commercial value of their inventions when they apply for a patent – they will not have entered the market at that stage – a brief search through PATENTSCOPE shows examples of inventions in many sectors that have gone on to enjoy huge commercial success.

WEB TECHNOLOGIES

International applications in the area of web technologies include applications filed by some of the biggest names in the online world, from Facebook (WO/2007/070676) to Google (WO/2004/008285), and from Ebay (WO/2000/025218) to Skype (WO/2005/009019).

Photo: iStock.com/emptyclouds



CONSUMER GOODS

Many of the technologies that make up our everyday digital reality have passed through the PCT, including the iPod (WO/2006/073891), Apple's wireless headphones (WO/2015/164287), early forms of word-processing (WO/1989/011695) and email (WO/1989/11695) as well as voice recognition (WO/1994/016435) and bluetooth technologies (WO/1999/014897).

CLEAN ENERGY

With growing interest in the development of alternative sources of clean energy, inventors have also sought to protect technologies in the areas of biofuels (WO/1994/010107), wind turbines (WO/1980/002056) and photovoltaic solar energy (WO/1982/003728) in international markets through the PCT.

HEALTH

Wide-ranging and potentially revolutionary medical technologies have also gone through the System. These include:

- medical resonance imaging (WO/1998/013821), better known as MRI – for detailed images of the body, and very useful in confirming patient diagnoses;
- magnetic nanoparticle imaging (WO/2016/156340), a new medical technology developed by researchers at Philips Research Laboratory which produces real-time 3D images of soft tissue for use in detecting and diagnosing cancers and cardiovascular disease;
- CRISPR (clustered regularly interspaced short palindromic repeats) (WO/2013/176772), a revolutionary gene-editing tool with huge potential to prevent many life-threatening diseases;
- bionic contact lenses (WO/2012/006691) which can be implanted into a human eye to restore or improve the quality of vision. The invention also includes a self-adapting system that allows the eye to achieve automatic sharp vision at distances from 25 cm to 10+ meters, and could make glasses a thing of the past;

- an artificial heart (WO/2007/038463), the AbioCor™, by ABIOMED Inc. and its collaborators in the USA, is “the first completely self-contained total artificial heart”; intended for use in patients with end-stage heart failure, it was first implanted in a patient in July 2001;
- an anti-HIV vaccine (WO/2001/047955) developed by the Kenya AIDS Vaccine Initiative (KAVI) and its partners to prevent HIV infection and AIDS;
- an artificial pancreas (WO/2000/074753) which allows insulin to be infused into the body continuously in response to glucose rates using a closed-loop system. The device offers patients greater control of their diabetic condition. According to the World Health Organization (WHO), diabetes is a leading cause of death in the world, with some 422 million adults living with the condition.

BUSINESS

Technologies that have transformed business processes and created opportunities for business development have also made their way through the PCT, from optical data-sensing systems such as bar codes and scanners (WO/1980/000628) to GPS systems (WO/2006/110805) and liquid crystals for display devices (WO/1979/001025).

And some international patent applications give a flavor of things to come. These include:

- Airbus's “ultra-rapid air vehicle” (WO/2011/076706), which it claims will travel at four times the speed of sound (Mach 4 to Mach 4.5);
- blockchain technology (WO/2007/118829), a tamper-proof data system that is creating quite a buzz in the fintech sector;
- 3D-printing (WO1994/019112), which has significant potential to transform how and where products are made.

And for those with a taste for space travel, there is even a winged spacecraft (WO/2004/092013)!

Patent protection for software-implemented inventions

By **Ania Jedrusik**, Consultant, IP and Innovation, Switzerland, and **Phil Wadsworth**, IP Consultant and former Chief Patent Counsel, Vice-President and Legal Counsel of Global IP at Qualcomm Inc., USA

Technology is the backbone of the digital economy and much of its value lies in software. Indeed, all economic sectors are becoming reliant on software to leverage growth. This has important implications for intellectual property (IP) laws.

Until the late 20th century, the functionality of most innovative products, particularly those relying on semiconductors, was primarily embedded in hardware. There was no doubt about their patentability. But today, increasingly sophisticated semiconductor technology and design tools mean that physical objects are no longer the sole basis of innovation. In other words, technical functionality is progressively migrating from hardware to software. And yet in many jurisdictions software-related inventions either do not qualify for patent protection or have a very limited scope of protection.

The huge economic growth and innovative potential of technology companies that develop products that combine hardware and software, and of the software industry in general, suggest the time is ripe to rethink IP statutes and bring them into line with present-day commercial realities.

THE ADVANTAGES OF SOFTWARE-INTENSIVE SYSTEMS

The great advantage of software is that engineers and designers have more flexibility in developing – and launching, or licensing to others to launch – products with new technical capabilities, and in fixing errors and releasing new software with simple downloadable updates. In many cases, implementing an invention in software rather than in hardware is more rapid and is the faster and more cost-effective way to get a product to market.

Consumers benefit from seamless and affordable access to the latest advances. And the relatively low capital investment involved in creating software solutions makes market entry easier for small businesses and startups. However, these companies still need effective IP protection to secure a reasonable return on their R&D investments.

WHICH IP RIGHTS ARE RELEVANT TO SOFTWARE PROTECTION?

Historically, IP laws have influenced the success of the software industry by providing software developers with a legal mechanism through which to capture at least some of their innovation's market value. Since at least the 1960s, the software industry has relied on three distinct IP protection regimes: trade secrets, copyright and patent law. The scope of protection offered by each has varied significantly over time, as has the software industry's reliance on them.

Today, increasingly sophisticated semiconductor technology and design tools mean that technical functionality is progressively migrating from hardware to software and yet in many jurisdictions software-related inventions enjoy only limited protection. Is the time ripe to rethink IP laws to bring them in line with present-day commercial realities.

History shows that patent law offers the most effective framework for protecting an invention's functionality. In many countries, however, a distinction is drawn between inventions implemented in hardware, which are patentable, and inventions implemented in software (i.e. computer programs), which are protected by copyright law. But in a world in which the Internet – and not hardware such as CDs – is the prime channel for software distribution, this legal distinction makes it difficult for inventors of software-related inventions to effectively protect and leverage the commercial value of their inventions through IP systems.

These innovative contributions are no less significant than hardware-based innovations. Computer programs, including software-related inventions, are products in their own right regardless of how they are distributed. Would it not be reasonable for such inventions to enjoy effective protection under patent law?

THE SOFTWARE INDUSTRY TODAY

Today, many technological innovations rely on software advances. Take the software-related innovations that have revolutionized the smartphone. Between 2009 and 2013, the total aggregate lines of code in the chips – the brains of the smartphone – shipped by Qualcomm increased from 330 million to 3.3 billion. These phenomenal and unprecedented developments were the result of years of high-risk R&D investment.

Software-implemented functionality is making an expanding range of everyday products safer and more efficient with higher performance. It is creating entirely new offerings and capabilities, such as intelligent power grids, digital manufacturing, real-time farm management systems, smart cities powered by interconnected (Internet of Things) platforms, and digital healthcare.

Estimates suggest that the digital economy – which relies heavily on software-related innovations – already represents 22.5 percent of the global economy.

Global R&D spending on software offerings has also grown rapidly, rising from USD 86 billion in 2010 to USD 142 billion in 2015, an increase of 65 percent.

The United States has one of the most software-intensive industries in the world (see Robert J. Shapiro, *The U.S. Software Industry: An Engine for Growth and Employment*, SIIA, 2014). In 2014 alone, the industry directly added an estimated USD 475.3 billion – and USD 1.07 trillion indirectly – to the country's GDP, directly employing 2.5 million people and indirectly supporting some 9.8 million jobs.

THE BENEFITS OF PATENT PROTECTION

As a general rule, new inventions in any field of technology qualify for patent protection if they are novel, non-obvious and useful (criteria of patentability



are set out in national patent laws). Patent protection offers significant benefits to innovators:

- ensuring inventors get a reasonable return on their commercially successful innovations;
- making it easier for innovation-based startups and small businesses to establish fruitful business collaborations;
- promoting the systematic sharing of knowledge through patent disclosure, itself an important driver of innovation; and
- helping attract investment partners and support business expansion.

Yet patent laws generally do not treat software-related inventions in the same way as other novel technology advances. This may be due to a lack of understanding either of the nature of software innovation or of the protection afforded by different IP rights.

ANSWERING THE CRITICS OF SOFTWARE PATENTS

Some commentators claim that the R&D expenditure associated with developing software-related inventions is not the same as that for other technology fields. Yet many such innovations, for example systems to improve energy efficiency, advanced medical diagnostic tools, smart car safety solutions and surgical robots, take years to research, develop and commercialize.

Others argue that software patents are of low quality or that they effectively grant protection to “mathematics”, and that copyright and trade secrets provide adequate and substantial IP protection for software.

While the advantage of copyright is that protection is automatic and free of charge as long as a work is original, reliance on copyright as a sole protection system only safeguards against the literal copying of the source or object code; it does not protect the underlying invention implemented by the software.

Similarly, trade secrets require no formal registration beyond non-disclosure agreements. But trade secret protection is one of the least developed areas of IP law. Even in jurisdictions that have trade secret law, it does not protect against innovations that are easily ascertainable by the public through independent discovery or reverse engineering. Moreover, trade secret protection is not appropriate for standardized technologies that facilitate interoperability such as smartphone communications technology, because standard-setting organizations require the nonconfidential exchange of technical information. Trade secret protection does not enable such information sharing.

So while copyright and trade secrets are complementary forms of protection, they do not provide the same benefits as patents nor the same incentives to invest in the underlying innovation.

The quality of an invention, rather than its mode of implementation, should be the litmus test for patent protection. The decision to employ an invention using software or hardware is often a design choice that should be left to technical experts, not circumscribed by patent laws. Relying on a distinction between software-related and non-software-related inventions to justify discriminatory treatment frustrates the purpose of patent law and could hamper technological progress.

If quality is the concern, the patent examination process is already designed to ensure that legal protection only extends to inventions that fulfill certain stringent criteria. Would-be inventors must present an idea that is novel, useful and non-obvious to someone “skilled in the art”. Patent examiners are empowered to consider whether the proposed invention represents a technical step forward. The focus should be on ensuring that examiners have the right tools to make that evaluation, not on excluding software-related inventions from patent protection.

A VARIETY OF NATIONAL APPROACHES

A glance at the international patent landscape reveals a variety of approaches in handling the patentability of software-enabled inventions.

In Europe, the European Patent Convention (EPC) (Articles 2(c) and 3) state that a computer program claimed “as such” is excluded from patentability. But an appeal by IBM (Case number T 1173/97) before the Board of Appeals for the European Patent Office provided useful guidance. The Board stated that a narrow reading of the relevant articles meant that not all computer programs should be excluded from patentability to comply with Article 27 of the TRIPS Agreement which deals with patentable subject matter. The Board concluded that “computer programs as such” referred only to those that were non-technical in character. It also acknowledged that “it does not make any difference whether a computer program is claimed by itself or as a record on a carrier”. In other words, as long as a computer program is technical, the medium in which it is recorded is irrelevant and is, in fact, patentable. Given the current widespread online commercial distribution of software, this is an especially important finding.

In the United States, patent protection for software-related inventions is limited to those on recordable media, not

Many technological innovations rely on software advances. Unprecedented software-related innovations resulting from years of high-risk investment in R&D by Qualcomm, for example, have revolutionized the smartphone. Between 2009 and 2013 the total aggregate lines of code on the chips – the brains of the phone – shipped by Qualcomm increased from 330 billion to 3.3 billion.

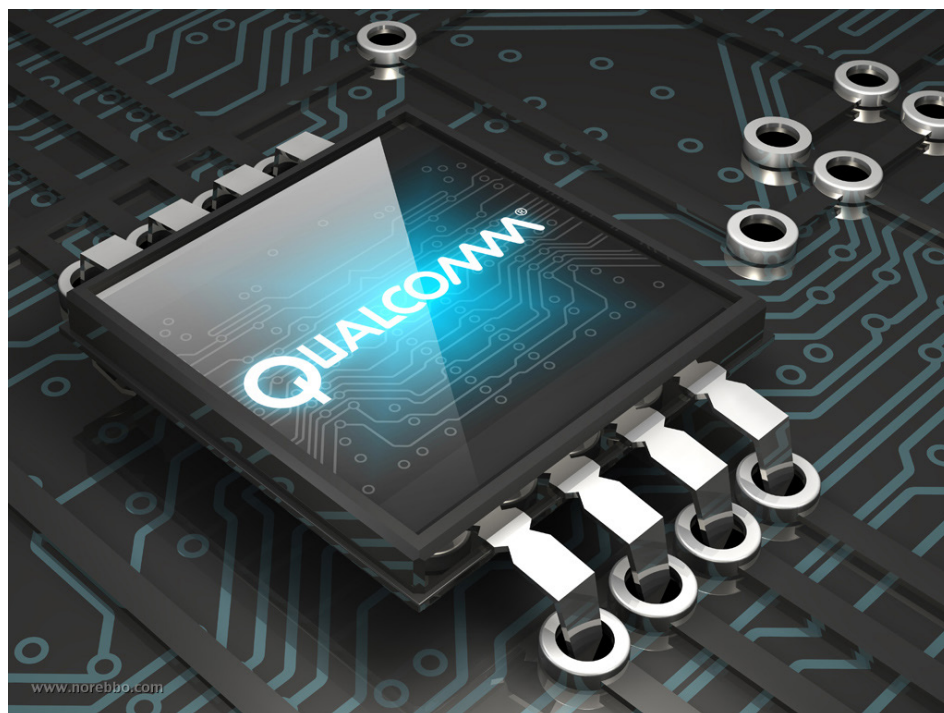


Photo: Courtesy of Qualcomm®

to computer programs themselves (see *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995)). This protection falls short when it comes to the online distribution of software. Unfortunately, the Supreme Court's decision in *Alice Corp. v. CLS Bank Int'l* (134 S. Ct. 2347 (2014)) and some subsequent cases have failed to provide clear boundaries for the patent eligibility of software-related inventions.

Japan's Patent Act (Article 2(3)(i)), on the other hand, explicitly refers to computer programs as patentable subject matter. The Act states that the claimed subject matter must be recognized as a "creation of technical ideas utilizing the law of nature" to qualify as a patentable invention. In general, according to the Examination Guidelines of the Japan Patent Office, to be patent-eligible, a claim for a software-related invention must demonstrate that software and hardware resources work cooperatively.

RISKS OF MAINTAINING THE STATUS QUO

Considering the extraordinary pace at which technology is developing, excluding software from patent protection may hamper technical development and lead to inefficient technical choices, reducing opportunities for technology transfer and collaboration. It may also disproportionately impact small businesses, whose only assets are generally intangible. What, beyond their IP assets, will protect them

from copycats or free riders with greater resources at their disposal? Moreover, current variations in national IP laws can make it difficult for the software industry to flourish, particularly if businesses choose to relocate to jurisdictions where their IP interests are better served.

FINAL THOUGHTS ON SOFTWARE-RELATED INVENTIONS

Patent protection is a proven means of supporting innovation, improving living standards and boosting employment. As the global economy becomes ever more digitized, with software increasingly forming the basis of innovation and business competition, can we afford to exclude or limit patent protection for software-related inventions?

The aim, surely, is to create conditions that allow innovators and engineers to dedicate resources to software development to find new ways to help us connect and do business. As digitization gathers pace in all areas of our lives, the time is ripe for the global community to re-examine the current state of play and to weigh up the merits of enhancing patent protection for computer programs that embody software-related inventions.

An extended version of this article is available at www.innovationinsights.ch.



Traditional knowledge: the challenges facing international lawmakers

By Dr. Marisella Ouma,
Intellectual Property Consultant, Kenya



Photo: iStock.com/hatresc

The neem tree has a variety of therapeutic uses. Neem oil is a safe and effective insecticide and a natural insect repellent. It is also used in a range of personal care products and has a wide range of medicinal uses. (See: www.discoverneem.com)

Local and indigenous communities have used traditional knowledge for centuries. It applies to everything from agriculture and food storage to construction, medicines, and the preservation of biological resources and the environment. The customary laws and cultural taboos of these communities have long served to preserve this knowledge and regulate its use.

But growing commercial use of these resources beyond the traditional context means they are increasingly vulnerable to misappropriation and misuse by third parties. That is why holders of traditional knowledge and many international policymakers are calling for new policies and laws in this area.

Some countries, including Costa Rica, Kenya, Peru and Zambia, already have laws that protect traditional knowledge. Others have focused specifically on protecting genetic resources. And some have joined ranks at the regional level to protect traditional knowledge. For example, the Swakopmund Protocol on the Protection of Traditional Knowledge and Traditional Cultural Expressions was adopted in 2010 by the 19 member states of the African Regional Intellectual Property Organization (ARIPO).

Although these developments are an important step in the right direction, such fragmented protection does not offer the custodians of traditional knowledge an adequate level of protection in today's globalized world.

WHY INTERNATIONAL PROTECTION IS NEEDED

National and regional laws that protect traditional knowledge have only a limited impact. For one thing, they only have legal effect in the country or countries in which they have been enacted. One way to extend the protection they confer is by establishing bilateral or plurilateral agreements between countries that share a common interest in protecting traditional knowledge and have similar national laws. But few countries actually have these laws in place. That is why it is so important to have an international regime that establishes minimum standards of protection and for countries to ratify and implement such a regime at the national level. Only then will it be possible to extend protection beyond national borders, for example to promote reciprocity in the treatment of traditional knowledge.

National and regional laws share a number of common objectives. They define what is to be protected and who is to benefit and how. They often seek to (a) ensure that control over traditional knowledge rests with indigenous or local communities, (b) preserve and protect against misappropriation and misuse by third parties and (c) promote equitable benefit sharing. Protection often goes well beyond intellectual property (IP) aspects of traditional knowledge (e.g. eligibility to acquire IP rights over traditional knowledge), encompassing all aspects of its use in a traditional context.

Drawing these shared policy objectives into an international agreement would offer a more adequate response to the unauthorized use of traditional knowledge, or acquisition of IP rights over that knowledge, by third parties who have no legitimate claim on it. At the very least, an international

This article is based on the keynote address by Dr. Ouma at the WIPO Seminar on Intellectual Property and Traditional Knowledge in Geneva, Switzerland, in November 2016.

Hoodia gordonii, also known as Bushman's hat, has been used for generations by the San people of the Kalahari desert as an appetite-suppressant. Drawing on this traditional knowledge (without the San's prior consent), researchers at the South African Council for Scientific and Industrial Research (CSIR) began developing an anti-obesity drug with plans to commercialize it. This triggered a legal battle that resulted in a groundbreaking benefit-sharing agreement that has supported the economic development of the San community.



Photo: iStock.com/Sprotniek

agreement that was implemented at the national level would ensure that the custodians of traditional knowledge have control over and can manage its use and are properly compensated.

INTERNATIONAL NEGOTIATIONS

Discussions on arrangements to preserve, promote and protect traditional knowledge at the international level are ongoing in different international forums. At WIPO, negotiations on IP forms of protection have been taking place within the Intergovernmental Committee on Intellectual Property, Genetic Resources, Traditional Knowledge and Folklore since 2011 (the Committee began its work in 2001, but formally began "negotiations" in 2010). While WIPO administers many international IP-related treaties, none of them specifically addresses the issue of traditional knowledge (although some do provide protection for the analogous areas of traditional cultural expressions and performances of them).

Developing an international IP regime to protect traditional knowledge is challenging. In many instances, traditional knowledge, including sacred and secret knowledge, does not fit neatly into the established IP system. For example, traditional knowledge values established practice over originality and supports the intergenerational transmission of knowledge and indefinite protection. It is also held by the community as a whole and its use is regulated by customary law which may or may not be codified. In view of the difficulties of mediating the relationship between established IP rights and traditional knowledge systems, international negotiations at WIPO are focusing on developing a customized or *sui generis* system of protection for traditional knowledge.

LESSONS FROM THE PAST

The history of international IP law-making offers some useful insights of relevance to policymakers involved in these negotiations.

For example, we see that changes in economic and technological circumstances can be an important trigger for developing new international laws. Indeed, the first international IP law, the Paris Convention for the Protection of Industrial Property of 1883, was largely a response to the expansion of cross-border trade in the late 19th century. At the height of the industrial revolution, companies were increasingly looking to commercialize their wares in other countries. This gave rise to the need to safeguard the interests of nationals operating in foreign markets, and *vice versa*. In response the Paris Convention (Article 2(1)) and the Berne Convention for the Protection of Literary and Artistic Works of 1886 (Article 5(1)) introduced the principle of national treatment. The principles of reciprocity, mutual recognition and most favored nation have also since been introduced into international law, including within the framework of the Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) (Article 4).

National treatment is unlikely to help in protecting traditional knowledge, however, because it is only applicable where such national laws exist. That means that the traditional knowledge of an indigenous community in Peru will be protected in Kenya and *vice versa*, because these countries have laws governing the protection of traditional knowledge. But it does not apply in countries where legislation to protect such knowledge is not in place.

It is also worth noting that many international laws tend to draw on the provisions of existing national laws. The Paris Convention, for example, sought to harmonize national patent laws, which proved inadequate in protecting inventors operating beyond national boundaries. Likewise, the Berne Convention drew on existing national copyright laws to establish minimum international standards for copyright protection. But when it comes to the protection of traditional knowledge, the limited number of countries that have national laws in place makes developing an international framework based on existing laws all the more challenging.

Any attempt to establish an international regime needs to carefully define international policy objectives, particularly in terms of what and who needs to be protected. Another important step is to clearly identify points of convergence in national laws.

One of the key advantages of establishing an international legal framework, of course, is that such arrangements provide for minimum acceptable standards of protection and thereby create greater legal certainty by offering some degree of harmonization of national laws. This makes it easier for rights holders, including custodians of traditional knowledge, to manage and trade their IP assets.

History also shows us that international IP laws have, over time, moved from policy guidance toward more detailed substantive provisions regarding eligibility for protection, subject matter, criteria for protection, scope of rights, exceptions and limitations, and more recently enforcement and other administrative provisions. International treaties should, however, not be too prescriptive in terms of how they are to be implemented. As long as minimum standards are in place each member state has the flexibility to decide on how to make their provisions operational. The overriding goal should be to ensure that the stated objectives are achieved.

WHAT AN INTERNATIONAL REGIME NEEDS TO DO

Traditional knowledge is increasingly under threat. Its appropriation and use by third parties who seek to acquire IP rights in it are on the rise. Examples include traditional knowledge associated with neem, turmeric and hoodia. In each case, the knowledge held by indigenous and local communities was crucial in the subsequent pharmaceutical use of these plants, yet in each case, this contribution was not initially recognized or rewarded.

In this context, international policy objectives might include the preservation of traditional knowledge, control of its commercial use, safeguards against third-party

claims on IP related to traditional knowledge, access and benefit sharing, equitable remuneration, facilitation of innovation using traditional knowledge and provisions on prior informed consent.

THE ADVANTAGES OF A *SUI GENERIS* SYSTEM OF PROTECTION

A *sui generis* system of protection, based on IP principles as adapted, would make it possible to accommodate the peculiarities of traditional knowledge systems and ensure that the custodians of such knowledge are able to manage and exploit it in line with customary practice.

It would provide a means of defensive protection to stop third parties from acquiring IP rights over traditional knowledge. India, for example, has established a traditional knowledge database (TKDL) which has significantly reduced the number of erroneous patents derived from traditional knowledge.

A *sui generis* system would also provide for positive protection of traditional knowledge, empowering communities to promote their knowledge, control its use and benefit from any commercial exploitation. Several national laws and the ARIPO Swakopmund Protocol provide such protection but the impact of these laws is limited to the countries in which they are enacted.

To develop a *sui generis* system, policymakers can build on the existing legal frameworks. For example, Article 8(j) of the Convention on Biological Diversity (CBD) requires parties, subject to their national laws “to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity”. The Convention also addresses the issues of access and benefit sharing.

Similarly, the Nagoya Protocol to the CBD on Access and Benefit Sharing deals with traditional knowledge associated with genetic resources, and addresses issues like prior and informed consent, equitable remuneration and maintenance of community laws and procedures as well as customary use and exchange.

Likewise the UN Declaration on the Rights of Indigenous Peoples (Article 31) provides for the rights of indigenous peoples to “maintain, control, protect and develop”, among other things, their traditional knowledge and genetic resources as well as their IP over such knowledge.

Such provisions provide a solid foundation on which to develop an effective system of protection.



Photo: iStock.com/inkomelet

About Prior Informed Consent and Equitable Benefit Sharing

According to the principle of prior informed consent, holders of traditional knowledge, traditional cultural expressions or genetic resources should be fully consulted before their knowledge is accessed or used by third parties. An agreement should then be reached on appropriate terms and the holders should be fully informed of the consequences of the intended use. The agreed scope of use may be set out in contracts, licenses or agreements, which may specify how benefits arising from the exploitation should be shared.

In WIPO discussions, many argue that the use of protected subject matter ought to be subject to prior informed consent, especially for sacred and secret materials. However, others fear that granting exclusive control over traditional cultures could stifle innovation, diminish the public domain and be difficult to implement in practice.

The idea of equitable balancing of interests is common to many legal systems. In IP law this is often phrased in terms of balancing the interests of right holders and the general public. According to this principle, holders of traditional knowledge, traditional cultural expressions or genetic resources receive an equitable share of the benefits that arise from their use. This may be expressed in terms of a compensatory payment or other non-monetary benefits. See: *Intellectual Property and Genetic Resources, Traditional Knowledge and Traditional Cultural Expressions: An Overview*.

In the late 1990s and early 2000s, the Indian government won a number of landmark legal battles to revoke patents relating to the country's traditional knowledge, including in relation to the use of turmeric (for its antiseptic properties) and neem (for its properties as a pesticide). India has since established a Traditional Knowledge Digital Library which catalogues its wealth of traditional knowledge to guard against its misappropriation.



Policymakers also need to consider the nature and diversity of existing traditional knowledge systems when crafting an international framework.

A relevant and effective framework will also take into account the trans-boundary nature of traditional knowledge, which is often widely shared by communities across national boundaries.

SOME OPTIONS

Policymakers have various options when it comes to developing an effective international regime to protect traditional knowledge. International protection can take various forms. These include a legally binding international agreement – all countries joining the agreement would be bound by its provisions – that draws on commonalities in national and regional laws and policy objectives. It is important to stress that a “binding” instrument is, in fact, only binding on those countries which choose to ratify and implement it.

Another option would be to develop a non-binding joint recommendation. Such soft-law instruments provide guidelines for the implementation of existing international laws. For example, the Joint Recommendation Concerning Trademark Licenses aims to harmonize and simplify the formal requirements for recording trademark licenses under the 1997 Trademark Law Treaty. But a joint recommendation is unlikely to be helpful in protecting traditional knowledge, first because it is non-binding and second because it requires a pre-existing international legal framework. On the other hand, many more countries might be enticed to follow a non-binding instrument, and, over time, it could have significant influence in practice, as the trademark recommendations have shown. It might also pave the way for a more “binding” outcome in future.

A third option could be to bring together the basic principles embedded in existing international treaties dealing with aspects of traditional knowledge, such as the CBD and the Nagoya Protocol. But these agreements only deal with selected aspects of traditional knowledge (i.e., in relation to biodiversity and genetic resources) to the exclusion of others, and they do not cover all the IP issues.

The ideal outcome of current international negotiations would be a legally binding international treaty with clear substantive clauses underpinned by well-defined policy objectives – a treaty that builds on existing laws, leaves enough space for national flexibility and addresses both the characteristics and diversity of traditional knowledge systems. This would provide protection beyond national borders, help to harmonize national laws and promote international cooperation. If sufficiently balanced and sensible, all countries should hopefully ratify it, because an instrument only binds countries that do so.

While reaching a balanced international agreement on complex issues is difficult, history shows that it is possible and can generate benefits. An international agreement to protect traditional knowledge would enable indigenous and local communities to control, manage, preserve and use their traditional knowledge assets. It would also open up access to a mine of knowledge – currently held almost exclusively by those communities – for innovation and development. Developing a balanced, robust and flexible international IP framework to protect traditional knowledge is in all our interests.

Protecting traditional knowledge: a grassroots perspective

By Catherine Jewell,
Communications Division, WIPO



Photo: Courtesy of Lucy Mulenkei

Lucy Mulenkei (center left) with community members receiving water tanks and energy-saving stoves. Ms. Mulenkei notes that in “the traditional context everything is interrelated” and that “only by informing people and enabling them to make their own decisions is long-term change possible”.

Lucy Mulenkei is a member of the Maasai people of Kenya and has been working with Maasai pastoralists for many years, first as a government official, then as a journalist, and for the past 18 years as Executive Director of the Indigenous Information Network. In her current role she works with indigenous communities across Kenya and the East African region to ensure they have the information they need to thrive in the modern world. A passionate advocate for the rights of indigenous peoples and local communities, Ms. Mulenkei is an active voice in the international negotiations at WIPO’s Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC). She tells *WIPO Magazine* why achieving international agreement to protect traditional knowledge is important to the communities she works with.

Can you tell us about your work with indigenous communities?

Our aim is to ensure these communities have the information they need to move with the times. This involves empowering them to make informed decisions about the way they live and how their community develops. As soon as you explain why it is important for them to adapt the way they do certain things, they are extremely receptive. But of course this needs to be done in a way that does not interrupt their core cultural values. When we meet with villagers the conversation inevitably touches on a bundle of issues, from environment, education and health to medicinal plants and traditional knowledge, including folklore like songs and dances. In the traditional context everything is interrelated. All cultures have positive and

negative aspects. The aim is to maintain positive cultural practices but to give up the negative ones, especially when they no longer serve a community's interests. Only by informing people and enabling them to make their own decisions is long-term change possible. The moment you try to impose changes on their culture you become a threat.

Why did you get involved in international negotiations on the protection of traditional knowledge?

I joined these discussions after seeing that there is a lot of interest around the world in protecting traditional knowledge. By being part of it, I am in touch with indigenous representatives from other regions who share similar concerns. And this helps us push the protection of traditional knowledge further up the political agenda.

The participation of indigenous representatives like me gives us an opportunity to influence and shape policies to address the needs and interests of our communities, which often go unseen. Although indigenous peoples are citizens of a country, generally speaking they have few opportunities to voice their concerns, engage with policymakers or even benefit from social programs. So having a place at these tables is very important.

Why is it important to protect traditional knowledge?

First, it is a question of identity. People everywhere, even in Europe and the United States, have traditions that identify them and where they come from. Similarly, each indigenous community has its own distinctive identity, even if they share similarities. In Kenya, for example, the Maasai and the Samburu, although related – they are cousins – are distinct. There are small differences, for example in the design of their beadwork, ear piercing, the way they dress and their dialect, that distinguish them from one another.

In Swahili we say that without your language or traditions you are like a slave because you don't know how to behave in your community and you don't belong any more. So valuing and protecting traditional knowledge is critically important to ensure that future generations can learn to be members of their community. If our history and our traditions are lost, who are we and where do we belong? It is really encouraging to see that some governments are recognizing the importance of protecting traditional knowledge. After all, you can't write the history of a country without looking at the unique traditions of its people.

Second, traditional knowledge is under threat. It is disappearing. As young people migrate to urban areas and become more interested in mobile phones, computers and television, they are no longer interested in maintaining traditional practices. For some, even wearing traditional clothes is considered "uncool" and primitive. On top of this, many elders are not transmitting their knowledge to someone within the community who can hold it when they are gone.

Third, an increasing number of researchers turn up unannounced with a government license in hand to do research and collect genetic resources or other information from local communities without any prior consultation. This occurs because there are often no institutional structures in place – or where they exist they are weakened – for researchers to consult with the communities before turning up to do their research. Since genetic resources are sovereign, many consider that a government license is all the researchers need. But this practice kills the morale of villagers.

If we do not put proper structures in place, a great deal of this knowledge risks being misused or lost forever. If communities are empowered to control and manage their resources and traditional knowledge, they can work together with government to protect it and leverage its value and utility.

Governments, as the competent licensing authority, are well placed to consult with and obtain the prior informed consent of communities before granting these licenses. Such a practice would help ensure that mutually agreed terms are discussed and respected, and that these communities are willing partners in the process. But if the rights of indigenous peoples are not respected it will never work. Effective dialogue between governments and indigenous peoples is critically important. If all concerned parties sit down and work out an agreement together, everyone feels respected.

What kind of traditional knowledge do you expect to be protected from an international agreement at WIPO?

Every time I am asked this question, I hesitate because there are many types of traditional knowledge. For example, it may be public, sacred, secret, or it may simply be embedded within the community. All types of traditional knowledge are important.

But as a starting point, every country and every community needs to identify those areas of traditional knowledge that are disappearing most quickly. In Africa, for example, traditional knowledge aspects of genetic resources are

A close-up profile photograph of a woman with a shaved head, wearing a vibrant red garment and multiple layers of colorful beaded necklaces. She is looking slightly to the left with a gentle smile. The background is a blurred outdoor setting with dry earth and some greenery under a clear sky. A quote is overlaid on the lower right portion of the image.

“Effective dialogue between governments and indigenous peoples is critically important. If all concerned parties sit down and work out an agreement together, everyone feels respected.”

being championed, but if you speak to the people in the communities they will tell you that all aspects of traditional knowledge are important and need to be protected.

The good thing about the negotiations at WIPO is that they are more holistic in nature and openly embrace traditional knowledge that is held and maintained by communities. They are also placing emphasis on developing legal and practical ways of protecting traditional knowledge, for example through documentation. Other international forums are dealing only with specific aspects of traditional knowledge. We need to draw all these different strands together to find workable solutions. But the process has to be participatory and has to include indigenous peoples and their local communities. I would like to see many more indigenous representatives from different regions. That would really get ideas flowing.

What are the main concerns surrounding documentation of traditional knowledge?

They are really tied up with the participatory nature of the process. Documentation that is done exclusively by government raises a number of questions. Where did they get their information? How is it to be protected? Who is going to access it? Will indigenous peoples have access to it? How will it be used, and who gives permission for its use by third parties?

There is a great deal of concern and anxiety about who controls this knowledge because once it is publicly available it is impossible to manage or control its use or misuse. And we see a great deal of misuse these days. But despite these concerns, for which solutions can be found, I think it is really important to document traditional knowledge. Documentation can take many forms. India's Traditional Knowledge Digital Library, for example, which catalogues the country's traditional medicinal knowledge, has been set up with great success. Documentation may also be important when recording secret knowledge by simply writing it in a book which is only accessible to eligible individuals. Everything is going digital, so it is really important that we start documenting this knowledge before it is lost. It will be a long process, but policymakers have to really study the issue and come up with workable solutions.

What difference would an international agreement make on the ground?

It will make a huge difference because governments will start putting appropriate legislation in place. This is what happened when the Convention on Biological Diversity, the Nagoya Protocol to the CBD on Access and Benefit Sharing and the UN Declaration

About the WIPO Voluntary Fund

Many indigenous peoples and local communities stress that they encounter insurmountable difficulties in financing the participation of their representatives in the WIPO IGC, and that those costs prevent them from participating effectively.

To address this concern, the WIPO General Assembly decided in 2005 to create the **WIPO Voluntary Fund** to finance the participation in the IGC of accredited observers representing indigenous and local communities. Initially, the Fund was generously supported by a number of member states and others, but, it is now depleted and contributions are urgently sought. Further information is available at www.wipo.int/tk/en/igc/participation.html.



Photo: Courtesy of Lucy Mullenkei

Lucy Mullenkei (center right) works with indigenous representatives with similar concerns from other regions to push the protection of traditional knowledge up the political agenda.

on the Rights of Indigenous Peoples were adopted. An international agreement will help remind governments of their duty to reach out to the unique communities in their countries. And it will create additional opportunities for indigenous communities to be recognized and for their needs to be addressed.

What message do you have for your counterparts?

If we are to succeed, we need to work together. If we work in isolation, we won't get anywhere. We don't want to make life difficult for future generations or for our elders, so we need to work with governments; they make the decisions. We need to talk and negotiate with them so they better understand our needs and concerns and why it is important to protect our knowledge systems and our rights. That is the only way we can move forward.

And what message for governments?

We urge governments to respect the rights of all citizens equally, including those of indigenous peoples. We also encourage them to develop a better understanding of the indigenous communities in their countries and to take

their concerns seriously, especially when formulating national development strategies and policies. A human rights-based approach to the process is very important.

And for donors?

I really urge donors to support the participation of indigenous representatives in these international discussions. A chronic lack of funding is making this increasingly difficult. For example, the WIPO Voluntary Fund is depleted. The implications of these discussions go well beyond traditional knowledge, human rights and the recognition of indigenous peoples. At the end of the day it is about protecting humanity's resources, and that should concern us all.

Pokémon Go: augmented reality tests IP



Geo-location is an integral part of Pokémon Go. The tagging element of the game raises a number of interesting legal questions, including in relation to intellectual property in terms of who owns rights in these data.

By Dr **Andres Guadamuz**, Senior Lecturer in Intellectual Property Law, University of Sussex, United Kingdom

Pokémon Go is an augmented reality app produced by U.S. developer Niantic. With over 500 million downloads worldwide and an impressive number of active users, it has quickly become the most popular mobile game in history.

Beyond its success as an app, the game marks a milestone in technology history in that it is the first successful mainstream example of augmented reality – a technology that combines “real and virtual objects in a real environment”.

THE GAME

The game consists of monster-like characters called “pokémon” which players try to catch by throwing a “poke-ball”. Through augmented reality, the game encourages players to interact with their environment using realistic maps of their surroundings that highlight or tag landmarks, monuments and public buildings. These locations are called stops and contain in-game goods, such as pokémon eggs and potions, for use in battling opposing teams. The game also features “gyms”, where users can combat other pokémon for control over a location, usually a church, park or business.

LEGAL QUESTIONS

The tagging element of the game has prompted a number of interesting legal questions about the role of augmented reality. Niantic, the developer of the game, is using a combination of data from Google Maps and user-generated tags collected from an earlier augmented reality game called Ingress. This data is used to identify real-life spots as either a stop or a gym. So far, many of the legal questions arising from the game have centered around privacy, but it also raises a number of interesting issues relating to intellectual property (IP). For example, the game relies on user-generated content to populate the “Pok” world with locations and points of interest, but who owns that content? And perhaps more importantly, do individuals have any right over virtual spaces? Could someone object to their house being used as a Pokémon gym on IP grounds?

WHO OWNS THE CONTENT?

As outlined above, geo-location is an integral part of Pokémon Go. Players search out Pokémon characters in the real world using maps of their immediate surroundings which tag specific locations and points of interest. But who owns those data? While it is not clearly stated in the Pokémon Go documentation, these maps appear to be generated using data from Google Maps.

Beyond ownership of the map data, of greater interest is who owns all the valuable geo-location data, including the pictures and place names that are an integral part of the game. Most commentators agree that initially Niantic collected the data for Ingress, which predates Pokémon Go. Ingress is a futuristic geo-location game where players take over portals in another dimension. These portals are the same points of interest used in Pokémon Go. Some websites even suggest that players who want a new gym established in their location simply submit a portal request through Ingress. Portal data can be quite detailed, and can include a place name, its GPS coordinates and a picture of the location. Again, the question is: who owns these data?

In its terms of service for Ingress, Niantic has included the following clause covering data and content uploaded by players:

“By making any User Content available through Services you grant to Niantic a nonexclusive, transferable, sublicenseable, worldwide, royalty-free license to use, copy, modify, create derivative works based upon, distribute, publicly display, publicly perform, and distribute your User Content in connection with operating and providing the Services and Content to you and to other Account holders.”

This language is very much like that used by most services that rely on user-generated content. It means that while players retain all copyright in the content they upload, they grant Niantic a non-exclusive license to that content, and more importantly, they allow Niantic to make derivative works out of that content, and even to sub-license it to other users. By including this clause in its terms of service, Niantic has been able to include thousands and thousands of user-generated photos in Pokémon Go without paying a single penny to those who took them. It also explains why Niantic has been able to use this content in its new programs.

OWNERSHIP OF VIRTUAL SPACES

Beyond the question of the ownership of user-generated data, the issue of the locations tagged as game stops or gyms could also have important legal implications. For example, what happens if someone objects to their property being tagged as a gym or a stop in the game?

This was the case when U.S. web designer Boon Sheridan’s house was tagged in Pokémon Go. Mr. Sheridan lives in an old church in Massachusetts, USA. As the location had been marked as a church in an old database, it was tagged as a gym in the game. Following the game’s release a large number of visitors began hanging around Mr. Sheridan’s home. He expressed his frustration on Twitter, saying “Do I even have rights when it comes to a virtual location imposed on me? Businesses have expectations, but this is my home.” His experience raises an important question about the rights ordinary citizens have in the virtual world.

On top of legal implications relating to privacy, data protection and tort, IP issues arguably also arise in relation to rights over data held about an individual’s property in a database.

The content of databases can be protected under copyright law as a literary work. In the UK, for example, the Copyright, Designs and Patent Act of 1988 (Section 3A) defines a database as a collection of independent works which “are arranged in a systematic or methodical way” and “are individually accessible by electronic or other means”. In other jurisdictions protection of databases is a *sui generis* right. For example, the European Union Database Directive creates an exclusive right for database producers if “there has been a substantial investment in obtaining, verifying or presenting the contents of the database”.

However, both the copyright in databases and the *sui generis* database right are held by the creator of the database and do not cover the interests that the owner of a physical space may have over data held about a particular property or location.

THE COMMERCIAL VALUE OF DATA

This may sound like a non-issue today, but as augmented reality gains traction, data about a business held in a database is likely to become very valuable, and any misrepresentation could compromise the reputations of businesses.

The commercial value of these data is already evident. For example, Niantic recently entered into an agreement with Starbucks for thousands of its coffee shops in the United States to be tagged as Pokémon Go stops. Other companies are following suit, with mobile telephone companies Sprint and Radio Shack also becoming points of interest in the game.

These developments hint at a future where virtual spaces will have considerable commercial value. They also give some indication of the types of problems that could arise when this occurs. Imagine a future where your house is tagged in a global database without your permission; or imagine a commercially sensitive database where your business is identified by incorrect or outdated data that are not fit for purpose and you cannot reach the developers; or worse, you contact them but they refuse to act. Such problems are likely to be further compounded by the inevitable launch of additional user-generated content platforms, which may well heighten potential for abuse of third-party interests.

Photo: iStock.com/KeongDaGreat



Pokémon Go, an augmented reality app produced by U.S. developer Niantic, has quickly become the most popular mobile game in history with 500 million downloads worldwide and an impressive number of active users. It is the first successful mainstream example of augmented reality.

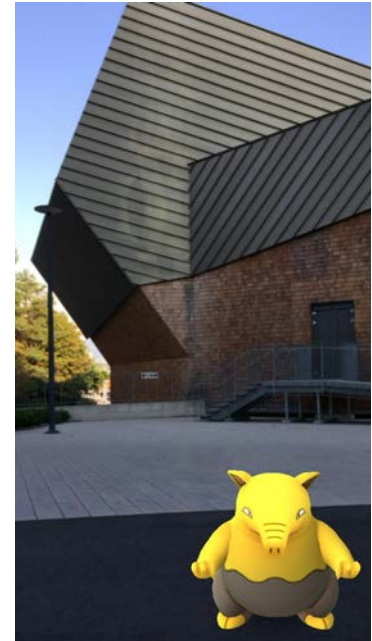


Photo: WIPO/de laza

Pokémon Go has even made an appearance at WIPO's headquarters in Geneva, Switzerland!

While such concerns do not directly infringe IP rights, business reputation is one of the values protected by IP through trademarks. At present, Niantic offers people the chance to highlight any problems with a location, making it possible to resolve many of the potential data problems associated with augmented reality. But Pokémon Go is just the beginning. It is the proof of concept of a technology that will have far-reaching implications which we have not yet even started to think about. The wild success of location-based gaming may well give rise to a horde of “me too” games, so expect a new generation of augmented-reality gaming to hit the app stores soon.

THE POTENTIAL FOR AUGMENTED REALITY

The potential for augmented reality goes well beyond gaming, and we can expect many future applications built around geo-tagging. The possibility for innovation in this area is staggering in areas such as wearable technology, car displays and Internet of Things devices, to name a few.

To avoid future problems of the type discussed here, we need to start thinking about potential ways to help businesses and individuals safeguard their data. Something akin to moral rights, which are perpetual and which allow the creator to dictate the non-economic use of a work, or even a right over metadata, along the lines of existing arrangements under copyright laws could be helpful. In particular, rights management information, an element introduced by the 1996 WIPO Copyright Treaty, could provide a framework, as it protects information about the author and the rights held over a work.

History shows that IP law changes in response to technological developments. Games like Pokémon Go offer a glimpse of the shape of things to come and are likely, once again, to test the flexibility of IP law in the future.

3D printing and IP law

By **Elsa Malaty**, Lawyer, Associate in the law firm Hughes Hubbard & Reed LLP, and **Gilda Rostama**, Doctor in Private Law, Paris, France



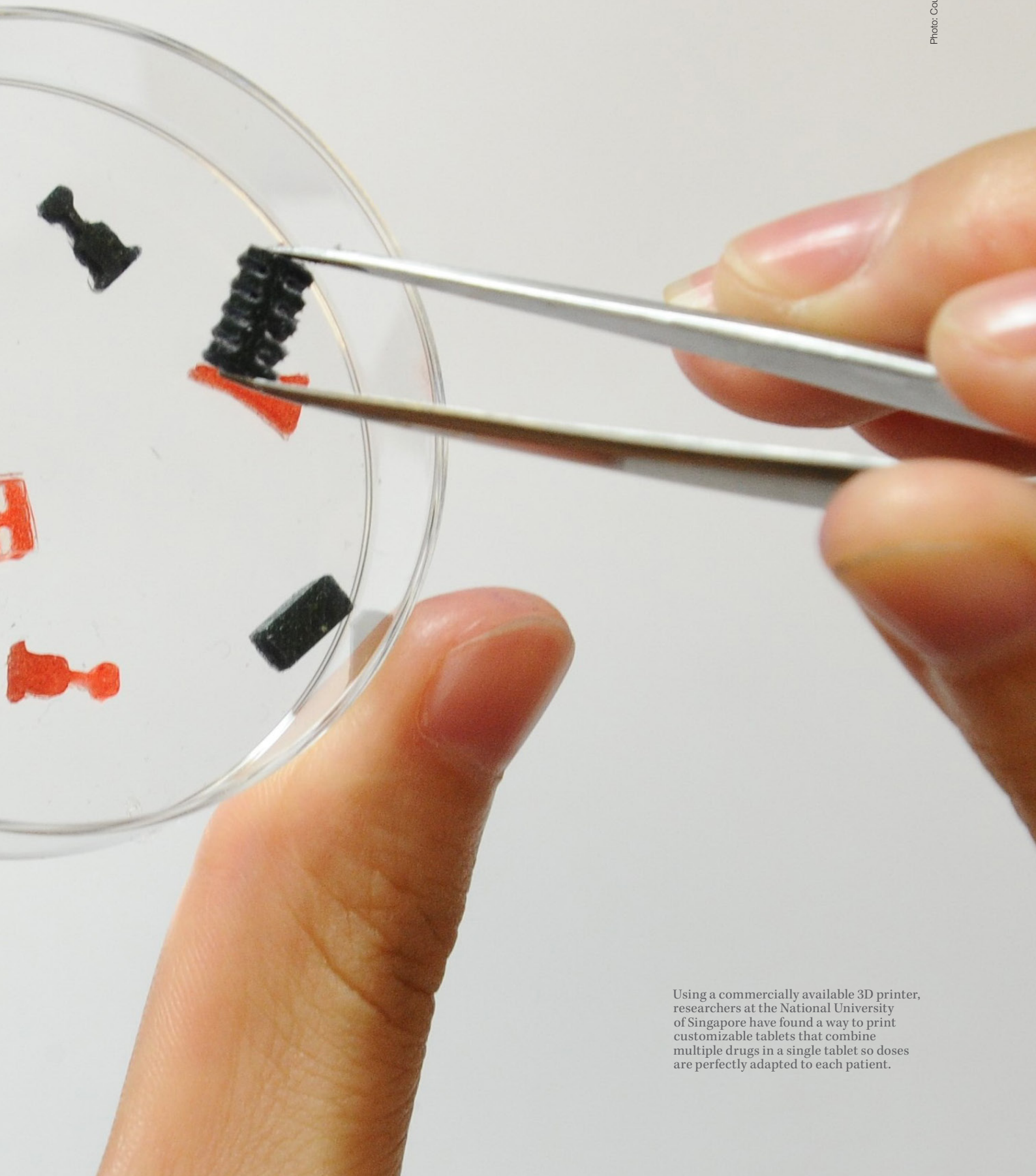


Photo: Courtesy of the National University of Singapore

Using a commercially available 3D printer, researchers at the National University of Singapore have found a way to print customizable tablets that combine multiple drugs in a single tablet so doses are perfectly adapted to each patient.

3D printing technology emerged in the 1980s largely for industrial application. However, the expiry of patent rights over many of these early technologies has prompted renewed interest in its potential to transform manufacturing supply chains. The availability of low-cost, high-performance 3D printers has put the technology within reach of consumers, fueling huge expectations about what it can achieve. But what are the implications of the expanding use of this rapidly evolving and potentially transformative technology for intellectual property (IP)?

3D PRINTING IN A NUTSHELL

The 3D printing process starts either with a digital file in which the object to be printed is digitally formatted using either 3D print software, or a 3D scanner. The file is then exported to a 3D printer using dedicated software, which transforms the digital model into a physical object through a process in which molten material is built up layer upon layer until the finished object emerges. This process is also referred to as additive manufacturing.

The 3D printers available today use a variety of materials ranging from plastics to ceramics, and from metals to hybrid materials. The technology is evolving at a breathtaking pace. For example, MIT's Computer Science and Artificial Intelligence Laboratory recently developed a 3D printing technique to print both solid and liquid materials at the same time using a modified off-the-shelf printer, opening up a huge range of possible future applications.

The expanding range of materials used for 3D printing means that the technology's application is having an impact on a whole range of industries, fostering new opportunities for innovation and business development.

Within the medical field, for example, researchers at the National University of Singapore have found a way to print customizable tablets that combine multiple drugs in a single tablet, so that doses of medicines are perfectly adapted to the needs of individual patients. 3D printing is also making its mark in the fashion industry, as evidenced by the unveiling at New York Fashion Week in September 2016 of "Oscillation", a multi-colored 3D-printed dress by threeASFOUR and New York-based designer Travis Finch. Even the agro-food industry is exploring the potential of 3D printing for customized food products.

ADVANTAGES OF 3D PRINTING

The potential advantages of 3D printing are numerous for innovation-intensive companies. In particular, 3D printing allows them to reduce their overheads when developing, designing and testing new products or improving existing ones. They no longer have to pay for costly prototypes but can rapidly and cheaply undertake multiple iterations of complex elements in-house using 3D printers.

3D printing technology is evolving at a breathtaking pace, with applications in areas ranging from food and fashion to regenerative medicine and prosthetics.

FOSTERING THE DEVELOPMENT OF 3D PRINTING

Recognizing the transformative potential of 3D printing, many countries have already adopted, albeit unevenly, different strategies to create an economic and technological ecosystem that favors its development. The European Commission, for example, has identified 3D printing as a priority area for action with significant economic potential, especially for innovative small businesses.

Lawyers in many countries are considering the capacity of existing legal provisions to orient this new technology, particularly with respect to intellectual property (IP). 3D printing technology affects virtually all areas of IP law: copyright, patent law, design law and even geographical indications. The question is, can IP laws in their current form embrace such an all-encompassing technology or do they need to be reformed? Does existing IP law ensure adequate protection for those involved in 3D printing processes and the products they make? Or would it make sense to consider creating a *sui generis* right for 3D printing to address emerging challenges, along the lines of arrangements in place in some jurisdictions for the protection of databases?

HOW CURRENT IP LAW HANDLES 3D PRINTING

One of the main concerns about 3D printing is that its use makes it technically possible to copy almost any object, with or without the authorization of those who hold rights in that object. How does current IP law address this?

Protecting an object from being printed in 3D without authorization does not raise any specific IP issues as such. Copyright will protect the originality of a work and the creator's right to reproduce it. This means that if copies of an original object are 3D printed without authorization, the creator can obtain relief under copyright law. Similarly, industrial design rights protect an object's ornamental and aesthetic appearance – its shape and form – while a patent protects its technical function, and a three-dimensional trademark allows creators to distinguish their products from those of their competitors (and allows consumers to identify its source).

Many commentators believe that a 3D digital file may also be protected under copyright law in the same way that

software is. The justification for such protection is that “the author of a 3D file must make a personalized intellectual effort so that the object conceived by the author of the original prototype can result in a printed object,” notes French lawyer Naima Alahyane Rogeon. With this approach, the author of a digital file that is reproduced without authorization could claim a moral right in the work if their authorship is called into question. Article 6*bis* of the Berne Convention for the Protection of Literary and Artistic Works, which establishes minimum international standards of protection in the field of copyright, states that the author has “the right to claim authorship of the work and to object to any distortion, mutilation or other modification of, or other derogatory action in relation to, the said work, which would be prejudicial to his honor or reputation.”

If the printed object is protected by a patent, certain national laws, for example the Intellectual Property Code of France (Article L 613-4), prohibit supplying or offering to supply the means to use an invention without authorization. Following this approach, patent owners should be able to seek redress from third parties for supplying or offering to supply 3D print files on the grounds that these are an “essential element of the invention covered by the patent”.

WHAT IS THE SITUATION FOR HOBBYISTS?

But what is the situation with respect to hobbyists who print objects in the privacy of their own home? Are they at risk of being sued for infringement?

The standard exceptions and limitations that exist in IP law also naturally apply to 3D printing. For example, Article 6 of the Agreement on Trade-Related Aspects of Intellectual Property (TRIPS), which has been transposed into EU law (EU Directive 2008/95/CE, Article 5), limits trademark protection to use “in the course of trade”. Similarly, with respect to patent law Article 30 of the TRIPS Agreement states that member countries “may provide limited exceptions to the exclusive rights conferred by a patent”. Some national laws consider that the rights of the patent holder do not include acts performed in private for non-commercial purposes. In other words, when an object that is protected by a trademark or a patent is printed for purely private use, it is not considered an infringement of IP rights.

Photo: Courtesy of www.naturalmachines.com



Even food is being 3D printed! It makes it possible to automate certain time-consuming aspects of food preparation and assembly, makes it easier to create freshly made snacks, has huge scope for food customization and can convert alternative ingredients like proteins from algae, beet leaves and insects into tasty meals!

Photo: Courtesy of i.materialise.com



3D-printed sunglasses co-created by fashion student Dávid Ring and Materialise's consumer 3D printing service, i.materialise, featured in the fashion show of the Royal Academy of Fine Arts in Antwerp, Belgium, in 2016. The sunglasses are fully 3D printed "as a total concept with no need for hinges or assembly".



Photos: Courtesy of i.materialise.com

Conventional eyewear design usually begins with the frame into which corrective lenses are fitted. This can have a negative impact on lens alignment and performance. With custom software developed by Materialise, the Yuniku platform uses 3D scanning, parametric design automation and 3D printing to design the customer's chosen frame around the optical lenses they require for a perfect look and fit.



3D Oscillation dress by threeASFOUR in collaboration with Travis Fitch, 3D printed by Stratasys, a leading 3D print solutions company based in the United States, was unveiled at New York Fashion Week in September 2016. "3D printing is transformative for designers aiming to take complex designs and realize them as a wearable garment," explains threeASFOUR's Adi Gil.



Photo: Elisabet Davids, Jan Klier

The world's first 3D-printed consumer wheelchair by Benjamin Hubert from the Layer design agency. The GO wheelchair prototype was developed in collaboration with Materialise, a leading 3D print software, engineering and services provider based in Belgium.



Photo: Courtesy of i.materialise.com

In the area of copyright, the rights granted to authors can be limited according to the so-called three-step test. Article 13 of the TRIPS Agreement states that “members shall confine limitations or exceptions to exclusive rights to certain special cases which do not conflict with a normal exploitation of the work and do not unreasonably prejudice the legitimate interests of the right holder.” Accordingly, some countries have established a “right to private copying” authorizing a person to reproduce a work for private use. Countries often then levy a fee on storage devices to compensate any losses incurred by the rights holder; some countries are exploring the idea of levying a fee to offset private 3D copying. However, some lawmakers consider it premature to extend such a fee to 3D printing, as this would constitute “an inadequate response or even a negative message for companies” and would put a brake on the development and uptake of 3D printing.

GAPS IN THE LAW

IP law in its current form, therefore, appears sufficient to effectively protect both 3D files and those using 3D printing technologies for non-commercial purposes. That said, the specificities of the 3D printing process mean that there are a number of questions that the courts will inevitably need to address. For example, who owns an object when it is first conceived by one individual, digitally modeled by another, and printed by a third? Can the person who designed the work and the person who digitally modeled it be considered co-authors of a collaborative work under copyright law? And if the object qualifies for patent protection, would these same individuals be considered co-inventors?

Other important questions include the type of protection that should be available to owners of 3D printers. Since their financial investment enables the creation of an object, might they qualify for the same type of related rights protection as that enjoyed by music producers whose investment enables the creation of sound recordings? And is the digitization of a pre-existing object considered an act of infringement simply because it is printed or its base file is loaded onto an online sharing platform for downloading? These issues still need to be ironed out.

MEASURES TO CURB UNAUTHORIZED USE

In the meantime, to curb unauthorized use, if the object is protected by copyright, rights holders can make use of technological protection measures, the circumvention of

which is expressly forbidden under the WIPO Copyright Treaty (Article 11). These measures make it possible, for example, to mark an object and its associated 3D print file with a unique identifier to monitor use.

Close collaboration between rights holders and 3D printer manufacturers in applying these measures to models intended for 3D printers could be beneficial. Similarly, partnerships with sharing platforms that make 3D files publicly available could help curb unauthorized use.

With such measures in place, it would be possible to set up a legal offering of downloadable 3D print files or 3D-printed objects. While online 3D printing services such as i.materialise are now readily available, one can imagine that their future evolution will follow that of online music delivery with the emergence of subscription models that allow users to download 3D print files in return for a monthly fee. Indeed, these are already available for 3D printing software, for example through Fusion 360, Autodesk’s cloud-based product innovation platform.

The experience of online music streaming platforms suggests that such arrangements could have a positive impact on infringement levels. The 2016 Australian Consumer survey on Online Copyright Infringement, for example, showed a 26 percent decrease in the number of Australian internet users accessing unlawful content online and a marked increase in the uptake of streaming services.

3D printing technologies have many life-enhancing, even revolutionary, applications, from regenerative medicine to prosthetics and from complex airplane components to food and fashion. As the use and application of this exciting technology gathers pace and digital transformation continues to gain momentum, 3D printing is likely to become deeply embedded in our daily lives. Beyond the IP-related questions outlined above, the use of 3D printing raises other important legal questions, for example in relation to quality assurance, legal liability and public order. All of these issues still need to be resolved and they can be.

But as the potential of this fascinating technology continues to unfold, the real challenge will be to fully understand the implications of its uptake and use on manufacturing processes across the economy and its impact on our daily lives.

Fletcher v. Doig: a case of refuted authorship and a role for alternative dispute resolution

By **Andrea Rush**, Partner, Blaney McMurtry LLP, Toronto, Canada

An unusual story from the fine art market offers both explicit and implicit reminders of the critical importance of exercising vigilance in protecting global product identity. The story emerges from a recent United States court case concerning a painting, *who* really created it and therefore what its value was – or was not.

A CASE OF REFUTED AUTHORSHIP

By all media reports *Fletcher v. Doig* is one of the first of its kind, a case in a U.S. court arising from refutation of “authorship” of a painting that was created in Canada. When an internationally renowned artist, Peter Doig, denied authorship of a painting, he was sued for damages for interfering with the market for a painting which was “his”.

At time of writing, the decision had been widely reported in Canadian and other media based on the oral remarks of District Judge Gary Scott Feinerman of Northern Illinois. The written reasons for the decision had not yet become available.

THE VALUE OF A GOOD NAME

To understand the implications of refutation of authorship, one needs to understand the commercial value of a good name.

Take an old violin, a work of artistic craftsmanship, and place it in the hands of an anonymous musician on King Street in Toronto, Sherbrooke Street in Montreal or 56th Street in Manhattan. Watch the passersby move along with barely a glance or a pause. Listen to the same violinist on the stage of the Roy Thomson Hall in Toronto or the Lincoln Center in Manhattan. When the program identifies the lineage of the rare instrument and the name of the celebrity performer, box office sales make the point: reputation matters.

The visual arts market rises and falls with artist identification, as do other markets in relation to product identity. Depending on whose signature appears on a canvas, the price of a work can vary dramatically. Authorship affects market prices. This is a truism that correlates with the production,

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reproduction and licensing of works that are protected by copyright and moral rights. Within the market for content, which is international, reasonable minds may differ and applicable laws may clash over how to value that content. But few would disagree that identification of authorship is critical.

THE PARTIES AND THE STORY

Well-known artist Peter Doig was sued for damages because he denied he had painted a canvas signed “Pete Doige 76”. He was believed, first by the market, which sank the sale price, and then by the US trial court, which dismissed the claim for damages on August 23, 2016. An appeal is expected.

Peter Doig was born in Scotland. He went to high school in Ontario, Canada. Over time, his reputation grew. His paintings have sold for millions. Upon learning that a canvas signed *Doige* was offered for sale as one of his works, he refuted that connection. The effect on the sale price of the canvas was dramatic and immediate – it allegedly dropped by some USD 7 million.

Pete *Doige*, the signatory of the disputed canvas, was deceased at the time of trial. He was born in Scotland. He spent some time during his high school years in Thunder Bay, Canada. While incarcerated in Thunder Bay for possession of LSD, he took art classes and completed a canvas which he sold to his correctional officer. Authorship of this painting is the subject of the litigation.

Fletcher, a co-plaintiff, is a former correctional officer and the alleged owner of the canvas. He purchased the disputed painting from Pete *Doige*, who, he alleges, is the very same person as the defendant, Peter Doig. Fletcher claims he has suffered damages because Peter Doig has refuted the assertion that he, Peter Doig, is “Pete *Doige*”. Peter Doig says he never created the painting, never met Fletcher, and never went to prison while in Canada. Fletcher finds motive in Peter Doig’s refutation of authorship: a desire to distance himself from the venue of creation and the context of the initial sale.

Both Fletcher and his co-plaintiff, the gallery that was retained to sell the painting, allege financial harm arising from Peter Doig’s refutation of authorship. The co-plaintiffs, Fletcher and the gallery, dispute Peter Doig’s refutation, vigorously maintaining that “Pete *Doige*” and Peter Doig are one and the same.

Obviously, there is no word to be had from the alleged artist, Pete *Doige*, who has since died. Similarities in style between the Pete *Doige* canvas and the corpus of artwork in circulation by the well-known artist Peter Doig were drawn by experts retained by the co-plaintiffs. Pete Doige’s sister filed statements on behalf of the defendant, Peter Doig, recalling that her late brother told her of a landscape that he completed while in a Canadian prison.

Peter Doig, whose artwork sells for millions, had the resources to mount a solid defense to the claims for damages. More resources could be necessary as reports of an anticipated appeal continue to surface. He clearly has an ongoing interest in defending his reputation and perceptions surrounding the quality of his work. But in resolving such unusual and unforeseen problems, is litigation the best option?

PROTECTING WHAT YOU OWN

As the owners of international brands know well, vigilance is critical to sustaining and enhancing global identity, exclusivity, differentiation and, ultimately, dominance, and the long-term profitability that goes along with them. Businesses of all types and sizes need to manage their reputation and their brands in disciplined and systematic ways to protect what they own and sustain their viability.

Sometimes, this means seizing counterfeit items at the border to prevent entry into a jurisdiction. Sometimes it means writing to an Internet service provider to provide notification and/or require takedown of infringing or disparaging content. Other times, it may mean differentiating oneself from offensive activities through litigation, whether as a plaintiff or a defendant – or, preferably, to find alternative forms of dispute resolution. Litigation is rarely the preferred solution in an international market, regardless of whether the economic implications of a dispute are large or small.

THE CASE FOR ALTERNATIVE DISPUTE RESOLUTION

Individuals or companies that face litigation in international markets must contend with a complex legal landscape associated with variations in national laws. For example, in some common law jurisdictions the right of personality/publicity may establish a cause of action whereas in other civil law jurisdictions no such right may even exist. In some jurisdictions multiple forms of protection may



Photo: Wlitten Sabbatini

WIPO Alternative Dispute Resolution (ADR) for Art and Cultural Heritage

In an unusual court case in the United States, this painting was at the heart of a legal battle in which internationally renowned artist Peter Doig was sued for damages for having refuted ownership of the work, which resulted in a dramatic and immediate fall in its market price.

The WIPO Arbitration and Mediation Center offers a range of ADR services tailored to specific services, including for disputes arising in the area of art and cultural heritage, without the need for court litigation.

Art and cultural heritage disputes can relate to various specific areas of subject matter including copyright, traditional cultural expressions and cultural property. Parties in such disputes are often from different jurisdictions and cultural backgrounds.

As a flexible and confidential mechanism, ADR allows consideration of such issues and helps parties to adopt sustainable, interest-based solutions that may go beyond monetary relief (e.g., compensatory provision of artworks, long-term loans, co-ownership). ADR allows parties to choose a mediator, arbitrator or expert with specific expertise in art and cultural heritage and understanding of the relevant cultural background(s). It provides a neutral forum in which an international art and cultural heritage dispute can be resolved through a single procedure. Further information is available at: www.wipo.int/amc/en/center/specific-sectors/art.



be available – under laws of trademarks, passing off, unjust enrichment and misleading advertising – whereas in others prerequisites to asserting such claims (such as the need to prove use of a trademark) may impede access to justice by reference to such torts.

Alternative forms of dispute resolution (ADR), such as arbitration and mediation, make it possible to circumvent these complexities and the time and costs associated with handling them. Cost, consistency, certainty and expeditious conclusion are all reasons for considering mediation as an alternative to litigation when the stakes are highest, as undoubtedly they are within the global market for brands. ADR is a quick and simple route to resolve a dispute.

HIGH STAKES IN GLOBAL REPUTATION MANAGEMENT

The value of a reputation can be analyzed from many perspectives, each of which affects authors (and producers of other goods), buyers and sellers. When an artist denies that he or she has created a work, the dip in market value that follows can be rapid and irreversible. Refutation of authorship highlights the uncertainties that inform and plague artists, creators, valuers, buyers and sellers of their works.

The art market takes careful note of the clear link between artist identification and value. The implications of this extend well beyond the visual arts market. A personal name can acquire recognition as a brand – whether associated with a product or a service – and can be protected as such through trademark registration, as recognized in trademark laws around the world. Extraterritorial application of these laws, however, is the exception rather than the rule. This means that a court which takes jurisdiction will apply local laws and render a decision of local application. As such, legal actions in multiple jurisdictions are likely to require analysis of different laws which are inconsistent in result. Lack of consistency and certainty

of outcome diminish the attractiveness of litigation and make alternative forms of dispute resolution, such as mediation more appealing.

REPUTATION MATTERS

Reputation is the currency of the artist and, indeed, all brand owners. The reputation of an artist supersedes any one work or dispute, and the damage to his or her reputation is potentially unbounded. As observed in Shakespeare's *Julius Caesar*, “the evil that men do is remembered after their deaths, but the good is often buried with them.”

Registration, licensing and enforcement of goodwill through contracts and litigation can be critical strategic elements in brand management. These steps maintain the integrity of the work product, the reputation of the artist as a brand owner and the stability in the market on which investors depend.

The costs of litigation may seem daunting. While an artist or other brand owner may choose to refrain from litigation, a defendant swept involuntarily into litigation over authentication loses the *choice* whether to participate. As an involuntary defendant, Doig was thrust into litigation for having refuted authorship. It was necessary to preserve the market value of his artwork. For Doig, his name and signature are his brand. As an artist, he knows that key components of reputation/brand management are monitoring and enforcement.

Fletcher v. Doig sets a new benchmark for the high stakes in global reputation management. Artists and others have no choice but to preserve the market value of their brands. In the world of branding and reputation management, marketing entails monitoring and the preservation of value requires enforcement.

The old adage “use it or lose it” is as true as ever in the global market.

FerMUN 2017: young people debate IP issues UN-style

By **Benjamin Phillips, Amélie Bernard Beeckman, Edward Barnes, Maria Lalain, Manon Michel, Jan Hulsebosch, Lucie Parrinello** and **Mailis Fontani**, chairs of IP-related committees at FerMUN 2017

In early January 2017 more than 600 pupils from 21 countries took part in FerMUN, an annual bilingual conference modelled on the United Nations (UN). FerMUN is organized by the *International Lycée* in Ferney Voltaire, France, and UN organizations based in Geneva, Switzerland. The 2017 edition was hosted by WIPO.

The Conference simulates UN-style international negotiations and gives young people a chance to explore complex policy issues and seek solutions for a better future. Our presence at WIPO was an ideal opportunity to learn about intellectual property (IP) and its relevance to issues such as indigenous peoples' rights, innovation and health, and competition. Before this year's Conference, none of us knew much about IP. It is not something we learn a great deal about at school. So this was a fantastic opportunity to find out about it and how it touches so many aspects of everyday life.

Of the Conference's 10 committees, four focused on IP-related issues. The wide-ranging debates gave students an opportunity to examine a range of viewpoints and to experience first-hand the challenges – and frustrations – associated with reaching common agreement on specific issues of global relevance. The students who took part in FerMUN 2017 were highly motivated and worked hard to come up with recommendations to tackle a range of topical issues. The way everybody worked together was quite remarkable, and the whole experience will stay in our memories for a long time. We all learned that achieving consensus among diverse groups on complex issues takes a lot of time, hard work and concentration. This article highlights some of the key things we took away from the experience.

ILLEGAL DOWNLOADING OF COPYRIGHT-PROTECTED WORKS

The discussion on illegal downloading was particularly lively, with many students holding strong views on the subject. We learned that the copyright system is designed to ensure that creators are recognized for their work and have the opportunity to earn a living from it, but that they and other owners of IP face many difficulties because their rights can be bypassed or abused so easily online.

We explored different dimensions of the issue: the need for people to be able to access online content for educational and social (entertainment, etc.) purposes; the need to safeguard the economic interests of creators whose revenues are under threat; and the role of governments in regulating the issue.

We looked at ways to dissuade pirates from creating online platforms like PirateBay, for example by using sanctions inspired by France's Hadopi law. Although it has since been put on hold, France adopted Hadopi in 2009 to encourage users to respect copyright by imposing fines and other sanctions on repeat infringers. The debate made us aware of the tensions that exist around the world in relation to IP and the challenges and trade-offs associated with finding effective ways to tackle them. One notable recommendation students came up with was to develop a program to facilitate the sharing of information relating to online content (music, videos, pictures) among law enforcement agencies, Internet service providers and copyright owners, to better control the illegal downloading of these works.

THE RIGHTS OF INDIGENOUS PEOPLES

IP and the rights of indigenous and local communities was another topic that attracted a great deal of interest. This issue has been at the forefront of international law and politics for many decades.

Indigenous and local communities hold a rich body of knowledge about the natural world, health, technology and techniques, rituals and other forms of cultural expression. This knowledge has been accumulated over generations. But all too often, their knowledge, practices and creativity are exploited without their consent and without their getting a fair share of the benefits derived from their use.

We discussed the implementation of the Nagoya Protocol, an international agreement that supplements the Convention on Biological Diversity. The Nagoya Protocol clearly spells out arrangements for access to genetic resources and benefit sharing, so that both providers and users of these resources know where they stand legally. One of its main aims is to create incentives for the conservation and sustainable use of genetic resources.

The issues were hotly debated. Students unanimously adopted three resolutions which sought to better regulate relations between industry and indigenous communities to ensure that indigenous people receive a fairer share of the benefits associated with the use of their knowledge. Students called for greater political representation of indigenous populations within their respective nations, and called on international organizations to work together to better protect and promote indigenous cultural heritage.

These discussions gave us a taste of what it takes to negotiate an agreement on an issue that involves many different interests.

CLIMATE CHANGE

Climate change and the role of IP in promoting green innovation and supporting the development and sharing of green technologies dominated many discussions, reflecting strong concern among students about this major global challenge.

Students noted that green technologies not only improve the quality of our lives, but also have an impact on our very existence and that of our planet. Aware of the importance of supporting green innovation, students tabled various proposals including mechanisms to speed up the process of examining whether green technologies merit patent protection. We also recognized the important role played by platforms such as WIPO GREEN in ensuring that green technologies reach the places they

are most needed. And we recommended the creation and use of a certification label for green technologies to discourage so-called “greenwashing”, when companies claim to be green but in fact do little to reduce their environmental impact.

THE FOURTH INDUSTRIAL REVOLUTION

The fourth industrial revolution was also on students’ minds. The fourth industrial revolution builds on the digital revolution and is characterized by the World Economic Forum as “a fusion of technologies that is blurring the lines between the physical, digital and biological spheres”. Students emphasized the need to ensure that IP laws keep pace with emerging technological, economic and social trends, noting the huge potential for advanced technologies such as robotics and artificial intelligence to improve our lives. They also highlighted the importance of developing global IP systems to encourage and support innovation and creativity in the digital or virtual world. A more collaborative approach to IP regulation was also recommended, and the need for stronger protection against cyberattacks was highlighted.

ACCESS TO HEALTHCARE

Access to healthcare was another hot topic at the Conference. It is an emotional issue that is of direct interest to us all.

Students were particularly concerned about the difficulties facing patients in developing countries in getting the medicines they need. Debates explored the tension between the need to ensure broad access to healthcare and the importance of respecting the IP rights of medical researchers to ensure long-term investment in the development of new and improved drugs. Students recognized that the process of developing high-quality drugs and effective treatments takes many years and is very costly – drugs have to go through a rigorous approval process to ensure they are safe to use before they even arrive on pharmacy shelves. But they also recognized that the situation of patients is precarious, particularly in developing countries, because they are unable to access the treatments they need. Many developing countries are not in a position to develop and produce essential medicines at a price patients can afford. Students stressed that the needs of patients must come first despite the difficulties associated with balancing these competing interests. In support of this they passed a resolution calling for the creation of a World Health Organization (WHO) Commission to monitor the price of medicines, especially in developing countries, and to ensure that corporate interests do not overshadow patient needs. The resolution also proposed the development of a national fund to help purchase expensive medicines



In January 2017 WIPO hosted FerMUN, an annual bilingual conference for young people that simulates UN-style international negotiations and gives young people a chance to explore complex policy issues and seek solutions for a better future. More than 600 pupils from 21 countries took part in this year's event.

such as those required for the treatment of cancer and genetic-related illnesses.

On a related issue, students noted that the counterfeiting of medicines was a global problem that was further complicated by the high cost of drugs and by healthcare systems that are under-resourced in many countries. They noted that vulnerable patients are often duped into buying counterfeit medicines that expose them to increased health risks and even death. Students recognized the difficulties associated with reducing the counterfeiting of medicines and welcomed Interpol's "Pangea" actions, which take down thousands of online pharmacies selling counterfeit medicines every year.

AN ENRICHING EXPERIENCE

The debates that took place at the FerMUN 2017 Conference broadened our knowledge of a range of topical issues. In particular, it opened the minds of hundreds of students and teachers to the role the IP plays in our

everyday lives. For many of us, it was the first time we had thought seriously about IP. We came away from the Conference with a much better understanding of how a balanced IP system can promote the innovation that is crucial in tackling so many global issues, from access to health to climate change to the protection of traditional knowledge. We also came to appreciate the importance of the work of the United Nations in bringing people together to discuss issues of common concern, and the challenges involved in reaching agreement among groups with diverse views and interests.

The Conference inspired young people from across the globe and made us realize that we have the power to shape our world. As Jeremy Bingham, Secretary General of FerMUN 2017, noted in his opening speech: "The Conference is more than a simple high school activity, more than a simulation – it's an opportunity to embrace and acknowledge the voice we have and to feel empowered to speak up about the environment, inequalities, corruption, discrimination and war. It teaches us to advocate for change."



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