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ALTRUISM AND ACUMEN



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INTELLECTUAL PROPERTY

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OPEN SOURCE

Creators face an evolving challenge

Protecting intellectual property and rewarding the creators of original works is a moving target as online technology continues to evolve

MARK FRARY

Art rock band Radiohead are an interesting case study in intellectual property (IP).

They signed to EMI in 1992 and released their first album, *Pablo Honey*, the following year, achieving double platinum status by selling more than 600,000 copies. Most of those copies would have been bought as physical CDs or vinyl. As album releases go, it was as old school as it gets.

Fast forward to 2008 to the release of the band's seventh studio album, *In Rainbows*. This was released as a pay-what-you-want download from a dedicated website, although physical copies were still available. The *BBC* reported that most people had paid a normal retail price even though they could pay nothing. Many diehard fans chose to buy a special "discbox" edition for £40. Within a year, the band had sold three million copies.

The challenge for creators of original works, whether that is music, images, software or other original expressions of ideas, is how to protect those creations and make enough money from them to fund future creative exploits. Radiohead showed how it could be done, but in the decade since, it has become even harder for creators.

Bill Lister, partner at IP firm Appleyard Lees, says: "Given that the internet now reaches into nearly every home in the developed world, there is an expectation that 'stuff' will be freely available if you input a search into Google. If you don't make it available, then all that is going to happen is that someone is going to do it for you."

It is why the music industry is now so strongly focused on the live experience of gigs and festivals, which cannot be distributed freely in the same way.

Other creators are starting to think like the music industry and embracing ideas such as "copyleft". This allows users granted licences to distribute and share a work freely, even if it has been modified. Creative Commons, which first appeared in the early-2000s, is the best known example of copyleft. It is a subtle twist on the idea of copyright, which grants creators of original works exclusive rights to its use and distribution typically for a fixed period after the creator's death.

The GNU General Public License, under which the operating system



Thom Yorke and Jonny Greenwood of Radiohead performing in Italy last year

Roberto Panucci - Corbis/Corbis via Getty Images

Linux and much open-source software is shared, is another example of copyleft.

Open-source software, where programs are worked on together by loosely connected developer communities rather than traditional software houses, show one way IP can be shared without stifling innovation. Linux, the mobile operating system Android and the database system MySQL have all achieved widespread adoption, and are continually innovating despite, or perhaps because of, being open source.

"Fundamentally, the IP world is about being able to protect the

person who puts the creative force into creating an intangible asset. None of these IP rights stop you from open innovation. You can take a copyrighted piece of software and make it available for free, and allow the public to change it and distribute it as they like," says Sean Jauss of Bristol-based IP experts Mewburn Ellis.

Mr Lister believes the right to be identified as the originator of a work and also the right not to have something wrongly attributed to you is imperative.

He says: "The advantage of some form of implied licence, even if it is gratis, enables the licensor to

obtain some control, even if limited, over how the innovation is actually used. It is saying 'I will let you use my ideas free of charge because it is in the public good. I am entitled to some control'."

Free does not have to mean free of charge either. Avi Freeman of patent attorneys Beck Greener says open source can be commercially successful. "There are commercial companies which make money by layering services on top of the open source which they patent," he says.

Julia Gwilt of Appleyard Lees says companies increasingly need to bring in expertise from different areas, particularly in artificial intelligence and machine-learning. "Not many people have the ability or resource to write their own software and are using open source," she says.

So does IP legislation need to change to embrace this new world? The UK regularly tops rankings for the quality of its IP legislation, says Dr Jauss. "IP law stays as up to date as possible, but inevitably the legislators are playing catch-up. Innovation is running ahead of the game, but generally the system works," he says.

Mr Lister says that part of the problem is that innovators themselves often don't understand what they have innovated and no one really understands the ramifications. "We have had Facebook 20 years, but there is a real problem only starting to emerge now," he says.

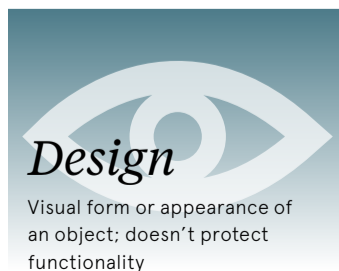
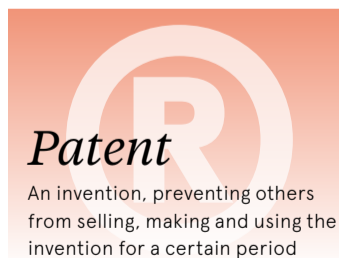
One of the main problems is not in the state of the legislation, but in the difficulty of enforcing it. "Someone in China really can't be legislated against," says Mr Lister. "If you come up with an innovation you have to benefit from that innovation as much as you can up front."

"You may be able to squeeze 60 per cent of the benefit out of it knowing that 40 per cent will be lost. It is the 40 per cent out there in the open market which then gives you a launch platform for your second innovation."

It may not be the law that needs to change, but how we use technology. Dr Jauss concludes: "The internet has revolutionised the distribution of much creative output, but it also promises to help make enforcement easier. We are moving towards digital rights management along with more sophisticated cryptography and the use of blockchain for creators to control the downstream use of their IP."

Radiohead are already looking at blockchain. No alarms and no surprises there. ♦

Common intellectual property rights



Commercial feature



EU-wide expertise is essential post-Brexit

A pan-European approach can ensure intellectual property holders protect their rights post-Brexit

Brexit presents a daunting range of challenges to businesses of all kinds. Increasingly important to the value of any business, intellectual property (IP) rights will be impacted in a variety of ways.

Much of the focus so far has been on securing those rights in the UK post-Brexit that are currently overseen by European Union systems. But there are wider implications for owners of IP. For example, UK attorneys or representatives might lose their right to represent clients before the European Union Intellectual Property Office (EUIPO).

"Anyone can file an EU trademark application or a community design application," explains Victor Caddy, leading partner, and trademark and design attorney at Wynne-Jones IP, a leading firm of patent and trademark attorneys. "The real question is what happens after Brexit given that only a national of a European Economic Area member state can represent you subsequently in prosecuting your application or dealing with other matters."

To overcome these difficulties, some UK firms plan to divert their EUIPO work to branch offices in the 27 remaining EU states. However, as Mr Caddy points out, many of these offices are best suited to serving local clients which is, after all, why they were originally set up.

"The challenge is to retain links between IP owners and their existing contacts in the UK, those attorneys they

already know and trust, while minimising problems caused by differences in national laws, languages, cultures and traditions – as well as the tricky question of who can charge the client for the work that's been carried out," says Mr Caddy.

As Brexit grinds on and as IP holders and attorneys struggle with these important issues, a Europe-wide IP business is attracting increasing interest. Formed in 2010, AIPEX, the leading European IP law firm, has offices in 13 of 27 EU states. As a Europe-wide operator it offers a tailor-made solution to managing the IP portfolios of pan-regional and international businesses.

The firm's team of more than 500 highly qualified professionals, over 200 of whom are qualified attorneys from the member firms, means it can work across a company's entire IP portfolio, including patents, trademarks and design, as well as key areas such as infringement, prosecution, renewals and strategy.

Through AIPEX, Wynne-Jones IP, which is a founding member, will be able to continue to represent its clients before the EUIPO. "AIPEX will be the address for service for all the community designs and EU trademarks on the books of Wynne-Jones IP, so we will retain complete control of all of our clients' affairs," says Mr Caddy. "Our clients in the UK will notice no difference from how things work now and there will be no double-charging."

The criteria for one AIPEX client looking to reduce the number of attorneys it was using across Europe, included cost, the quality of work produced and a good professional relationship. "What clinched the deal was AIPEX's 'hub-and-spoke' model – a multi-jurisdictional presence in Europe with a single point of contact," says the client.

Another company Rotork plc, which manufactures electric, pneumatic and hydraulic valve actuators and gearboxes, says: "As well as managing all our general IP requirements, Wynne-Jones



Victor Caddy
Leading partner
Trademark and design attorney
Wynne-Jones IP

IP provides a 'virtual IP department' service... whereby all our engineers globally can liaise directly with Wynne-Jones IP regarding their queries about patents, trademarks and designs."

The founders of AIPEX wanted the best member firms, according to Frank Reijnen, its chief executive, and in the UK that was Wynne-Jones IP. "We hear time and time again what a good reputation it has, and how its clients value its commerciality and commitment to client care. This, of course, benefits AIPEX," says Mr Reijnen.

Mr Caddy concludes: "Brexit presents challenges for many thousands of UK businesses, some of whom haven't even realised it yet. But, with access to an IP pan-European law firm with expertise in all sectors across all EU states, they can turn that challenge into an opportunity."

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CHINA

Chinese state sees value in rule of IP law

Once a wild frontier where intellectual property was plundered, China is now cleaning up its act

SHARON THIRUCHELVAM

As the tit-for-tat trade war between China and the United States escalates, you might be forgiven for assuming that intellectual property (IP) rights and protections barely exist in China. Yet, despite its reputation as an inveterate bootlegger, trademark squatter and state sponsor of corporate espionage, China is on course to becoming an IP powerhouse.

"Over the past decade, China has demonstrated serious resolve to enforce an effective IP rights regime, and to bring the system in line with other developed systems in the US and Europe," says Xingye Huang, associate at trademark and patent attorneys Abel & Imray. Indeed, China is on track to achieving its 2020 strategic goal laid out in 2008 of attaining a comparatively high level in terms of the creation, utilisation, protection and administration of IP rights.

China has evolved from a produce-and-copy economy, which turned a blind eye to copyright infringements in the pursuit of growth at any cost, to one that is focused on high-quality development, as the current official Chinese government slogan puts it. According to the latest figures from the World Intellectual Property Organization (WIPO) from 2015, China filed the most patents of any country worldwide. In 2017, Chinese companies registered more than 1.3 million patents, an increase of 14.2 per cent year on year.

The top filing company at the European Patent Office in 2017 was the Chinese technology giant Huawei. And in high-growth sectors such as blockchain, China dominates as more than half of the 406 blockchain-related patent applications in

2017 were from China, WIPO reports.

As Chinese companies focus on global expansion abroad and high-tech innovation at home, they have increasingly called on the government for more robust IP protection. In fact, many of the issues raised by foreign companies operating in China have already begun to be addressed by legal reforms and stronger enforcement mechanisms.

Since 2014, China has opened specialised IP courts and tribunals in Beijing, Shanghai and Guangzhou, training attorneys and judges in technical cases. These courts accepted 109,386 civil IP cases in 2015, up 6 per cent on the previous year and which included more than 11,000 patent cases. Whereas in the past, barriers to IP progress stemmed primarily from lack of political will and prioritisation, present hurdles appear in the form of capacity, expertise and scale across the world's most populous nation, its second-largest economy and a leading global trader.

"China has a difficult task as it has huge numbers of applications to deal with, a consequence of the government's drive to increase numbers, but they are having trouble recruiting

Many of the issues raised by foreign companies operating in China have already begun to be addressed by legal reforms and stronger enforcement mechanisms

Brexit presents challenges for many thousands of UK businesses, some of whom haven't even realised it yet



Huawei

Top patent applicants in China

By Patent Co-operation Treaty applications in 2017

Huawei Technologies

4,024

Zte Corporation

2,965

Boe Technology Group

1,818

World Intellectual Property Organization 2018

knowledge and skills in the local Chinese market.

“I think this law will be carefully reviewed and cautiously reformed.” says Abel & Imray’s Ms Huang. “It will get more realistic and reasonable. But for political reasons, it will not be abolished outright.”

At the same time, pending legislation in the US will subject IP deals and technology transactions with foreign entities to even greater scrutiny. In early-April 2018, China announced that it too would follow a similar route. Under new regulations issued by the State Council, technology and IP transfers that are part of acquisitions made by foreign firms in key areas, such as patents, integrated circuit layout design, computer software copyright and plant varieties, will be approved on a case-by-case basis according to their impact on national security.

Foreign businesses operating in less commercially sensitive areas will find that if they make the effort and devote the resources to registering their IP in China properly, protection does exist and enforcement is improving. Less than 40 years ago, the concept of IP rights was unheard of in China – now China tutors other nations in its uses. ♦



VCG/VCG via Getty Images

01 Huawei’s research centre in Hangzhou; the telecommunications and technology giant was the biggest patent applicant in China last year

02 China’s first intellectual property court opened in Beijing in 2014

trade priorities. While US President Donald Trump’s administration’s most vocal condemnation has been directed at historic abuses and small-fry counterfeiting and piracy, experts observe that a far greater concern for Washington is Beijing’s strategic investments in the decisive technologies of the future. China is consolidating its position as a high-tech superpower in artificial intelligence, electric vehicles, chip making, semiconductors and bioscience.

One of China’s more controversial growth tactics is the practice of requiring foreign companies to partner with domestic firms and in some cases license or transfer their IP. For years the practice was reluctantly accepted by foreign firms as the price of doing business in China, but under the hawkish Trump administration it is again subject to scrutiny. China now bears little resemblance to its 1980s self when the policy was introduced, with a view to investing

enough examiners. You need experience to examine well,” says Nick Noble, counsel at patent and trademark firm Kilburn & Strode, and China lead at the Chartered Institute of Patent Attorneys.

To this end, China’s State Intellectual Property Office is making great efforts to improve the quality of China’s IP rulings. It sends frequent and large delegations to Germany, on whose legal system China’s is based, the UK and other markets to share and learn best practice.

To act as a deterrent to infringers and to justify plaintiffs’ court fees, the damages awarded by courts are growing. In 2017, amendments to IP legislation increased statutory damages five-fold to RMB5 million or \$727,000. In a landmark 2017 ruling that made foreign observers take note, three Chinese shoemakers were ordered to pay New Balance RMB10 million (\$1.5 million) for copying the sneaker brand’s logo.

Still, the spectre of corruption haunts China’s law courts. “China

has a reputation that local judges are more likely to find in favour of a local company than an overseas one,” explains Mr Nobel, who notes local officials would rather upset a foreign company that is headquartered further away than close-to-home companies in which local vested interests may be entangled.

Corruption rates, however, continue to improve under Premier Xi Jinping’s aggressive anti-graft campaign which began six years ago. Although foreign plaintiffs make up a fraction of the cases seen in China, those suing Chinese companies won some 81 per cent of their patent cases, roughly the same as domestic Chinese plaintiffs. A reputation for fairness is even making China a preferred arbitrator for patent litigation between non-Chinese companies. In 2015, 65 foreign plaintiffs won all their cases against other foreign companies before Beijing’s IP court.

China’s legal reforms and its anti-corruption push form part of a

consolidated effort to strengthen the reach and efficacy of the rule of law in China. While rule of law under a one-party state might seem oxymoronic, especially given the party’s historic intolerance of judicial independence as a potential threat to its authority, the current leadership recognises the need to provide predictable, fair and efficient dispute resolution mechanisms if China is to develop further.

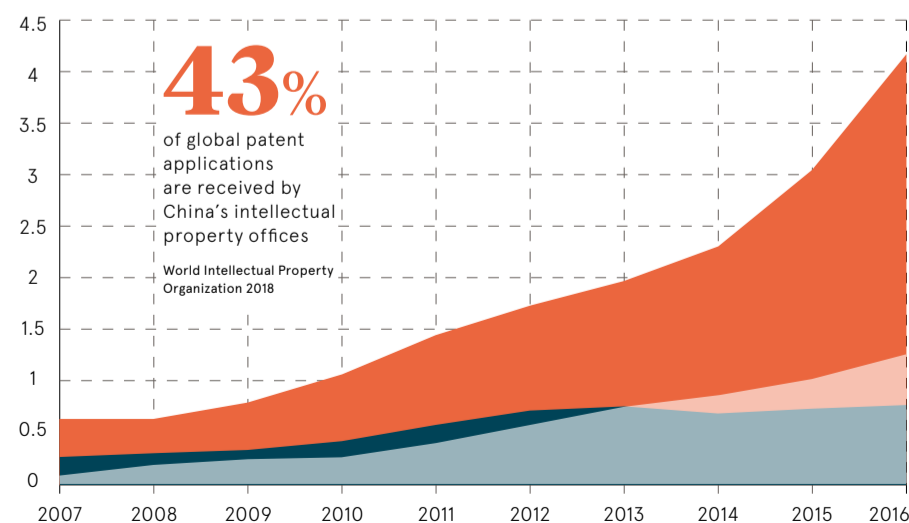
According to Professor Rachel Stern of the US University of Berkeley, the Chinese communist party’s approach to the law is quite different from that of Western democracies. For the party, the law is a tool to realise its policies and objectives. In this instance, the strong legal enforcement of IP will provide security and certainty for domestic and foreign investment and competition.

The deepening friction between the US and China over trade, technology and IP is evidence that we’re entering an era in which national security will override

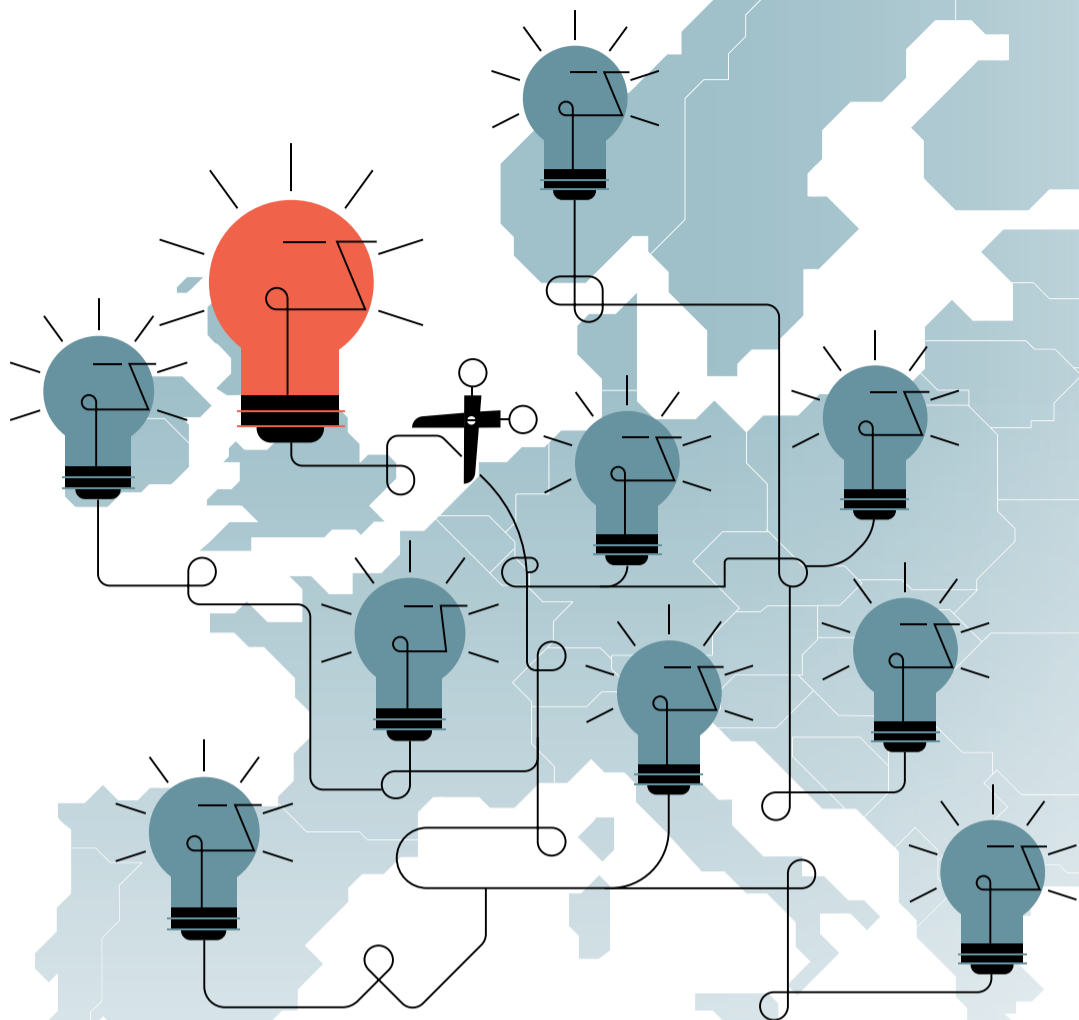
Chinese intellectual property filings (millions)

Includes both resident and overseas applications

■ Trademark
■ Industrial design
■ Patent



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Untangling UK from EU IP regulation

Britain's exit from the European Union poses potential problems for businesses owning intellectual property rights and for the lawyers grappling with possible solutions

CATHERINE BAKSI

With under a year to go, most have tired of the meaningless "Brexit means Brexit" mantra. Whether it is hard, soft or scrambled and whether we stay in the single market, a single market or find a whole new marketplace, what should a designer Brexit – one that works for the UK's flourishing intellectual property (IP) and life sciences industry – look like?

IP laws are pretty much harmonised across Europe, and the UK has played a pivotal role in creating a system that is widely regarded as offering an efficient, consistent and effective approach.

But, as Sally Shorthose, partner at international law firm Bird & Bird, explains, European Union laws are the heart of the European IP system. "Much of the UK legislative framework in this field is composed of directly effective EU regulations

and transposed EU directives," she says. Unless those regulations relevant to IP and life sciences are transposed into English or Scottish law post-Brexit, a "regulatory vacuum" may be created.

Unpicking some or all of those regulations and directives, adds Simon Miles, partner and head of IP at London law firm Edwin Coe, is going to be problematic for lawyers and, in turn, businesses.

The key need for the industry, says Alan Johnson, partner at London law firm Bristows, is continuity and certainty, and to ensure IP rights are not lost or prejudiced.

The preferred method to achieve this, he says, is the so-called Montenegro option under which all existing EU rights automatically transfer.

A degree of certainty was afforded by the colour-coded *Draft Withdrawal Agreement* in March indicating where the EU and UK negotiators are singing from the same hymn sheet. With the proviso that "nothing is agreed until everything is agreed", after the transition period owners of EU trademark registrations, community designs and community plant variety rights will become holders of a comparable registered and enforceable right in the UK.

Those who have obtained protection for international registrations of trademarks or designs designating the EU before the end of the transition period will continue to enjoy protection for those international trademarks and designs.

As an important aside, it should be noted that UK patent attorneys will be able to carry out European patent work after Brexit. Mr Miles explains: "The European patent system is not an EU institution and is unaffected by Brexit."

One key issue that the withdrawal agreement was silent on was the UK's involvement in the European

Unified Patent Court (UPC). It is designed to be located with central divisions in three cities – Paris, Munich and London – with local and regional divisions in each member country, and an appeal court in Luxembourg.

Not yet ratified by the UK and stalled by a German constitutional complaint, the UPC is unlikely to come into being before Brexit. But, says James Horgan, president of the IP Federation, there is a general desire for it to come into operation and for the UK to be in it, and in it for the long term. "Patent holders around Europe will benefit from predictable, well-reasoned decisions that apply across Europe," he says.

While the court is set up as "an EU club", says Mr Johnson, there is support for finding a way to accommodate the UK.

"And, if the UK can stay in the UPC after Brexit, it raises the possibility for other non-EU states to be members too," Mr Horgan adds.

While "leavers" may say Brexit provides the potential to streamline IP legislation and help innovative companies get their products to market faster, most in the industry see little benefit from the upset.

Ms Shorthose says there is a possibility after Brexit that the UK government may have greater flexibility in the way it provides a more favourable tax regime via the Patent Box scheme, whereby companies can apply a lower rate of corporation tax to profits earned after April 1, 2013 from its patented inventions.

While the scheme is incorporated with domestic tax law, some of the rules on implementation, such as the definition of a small or medium-sized enterprise and restrictions on state aid, are determined by the EU. "This regaining of control may prove to be good news for innovators," she says.

On the issue of geographic indicators (GIs), protecting the likes of Champagne and Parma ham, Ms Shorthose says that while in principle they may no longer be enforceable in the UK and vice versa post-Brexit, opening up a range of threats and opportunities, the EU has made it clear the UK is expected to continue to honour them. So at least it's potential good news for Melton Mowbray pork pies – and others. ♦

Patent holders around Europe will benefit from predictable, well-reasoned decisions that apply across Europe

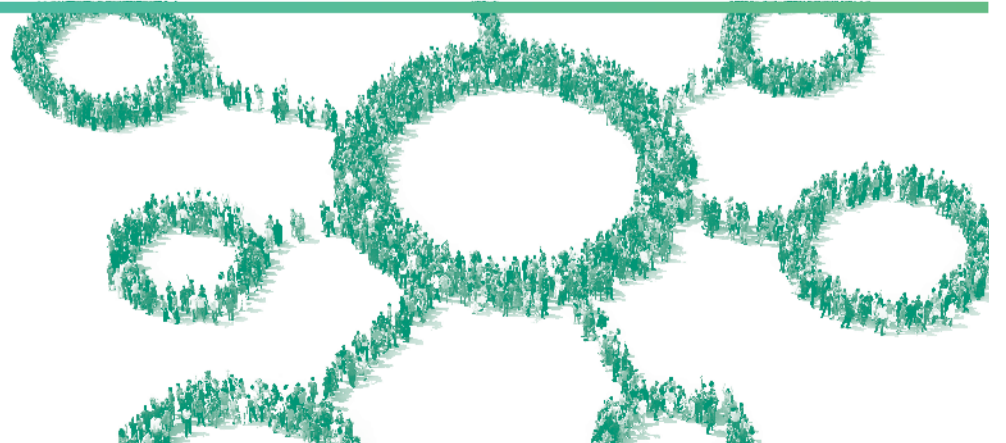
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‘Intellectual property will need to change if it is to keep pace with artificial intelligence’

Stephen Hawking warned that artificial intelligence (AI) could end mankind. Tesla’s Elon Musk has expressed similar views, warning that a handful of major companies will end up in control of AI systems, giving them extreme power over the remainder of humanity.

We live in hope that humans can learn to control AI, but we recognise the major changes it will cause for our society. Intellectual property, and the patent system in particular, will need to change if it is to keep pace with the rate of change in this area.

Computer-generated inventions are already a reality. “In silico” drug discovery aims to produce and screen new drug candidates or to simulate clinical trials using software. These new techniques can test thousands of possible candidates, far quicker than any chemist in a lab, and they have the potential to revolutionise the pharmaceutical industry.

In a more mundane example, AI has been credited with the invention of cross-bristled toothbrushes. A computer was provided with information about existing toothbrushes and the known issues caused by their bristles. Iteration and testing of different possibilities generated the cross-bristled design, which had never occurred to any human engineer.

These computer-generated inventions may be new and inventive in comparison to previous designs, and this means that they might meet the requirements for patentability. A patent granted to a non-human inventor raises a whole host of challenges to the traditional patent system.

One issue relates to inventors. The law requires that every patent application names at least one inventor, who must be a human being. There is no provision in patent law to deal with a non-human inventor. So who should be named on the Patent Office forms? Should it be the owner of the computer, the author of the software or the person who clicked “go” on the screen? Or should patent law undergo more fundamental reform to remove the need to name any inventors?

Inventive step is one of the cornerstones of the patent system and new developments in AI chip away at

our understanding of that key concept. For an invention to be patentable, it cannot be obvious to a skilled person. An idea may seem inventive when it is developed by an engineer. However, that same idea may look obvious when it has been developed by a machine testing a large number of possible options.

This issue is highlighted by the All Prior Art project, which is a website that attempts to create and publish new concepts algorithmically. Their concept is to “democratise ideas, provide an impetus for change in the patent system and pre-empt patent trolls”. Like an infinite number of monkeys with an infinite number of typewriters, the website churns out large numbers of nonsensical ideas in the hope that, occasionally, it will generate a combination of words that describes an inventive idea.

It is an open question whether an invention is really generated by such a system, and whether there is a difference between a machine that publishes a new combination of words and a human who identifies a concept, and then articulates it using the same words.

The Chartered Institute of Patent Attorneys are, of course, proponents of new technologies and we are excited about the possibilities offered by AI. Together with the Patent Office and government, we look forward to facing the challenges that these new technologies present to the traditional patent system.



Peter Arrowsmith
Chartered patent attorney
Chartered Institute of Patent Attorneys



Disruptive tech calls for smart IP strategies

A robust approach to managing intellectual property ownership and risk is essential as disruptive technology and new business models are introduced

Alleged misuse of intellectual property (IP), both information and inventions, has been making headlines worldwide. With the data scandal engulfing Facebook and Cambridge Analytica, and accusations of IP theft cited as reasons for US tariffs, the issue and IP more generally cannot be ignored.

IP is pervasive in every business. It underpins the monetisation of technology and data. It is increasingly driving business valuations, becoming a corporate’s most valuable asset. Yet many businesses downplay it, lacking a proper strategy. This needs to change.

Even though some executives see IP as essential to strategy, in many businesses education and awareness need to spread into the boardroom, and run throughout entire organisations.

“Your employees are IP powerhouses, using and generating it on a daily basis. It’s critical for that IP to be captured, managed and protected,” says Stephen Reese, partner at law firm Clifford Chance, which offers international cross-sector expertise in the area. “There has to be a proper understanding of the strategic use and value of IP, and the process around its capture, enforcement and exploitation.”

Businesses that have traditionally been dependent on inventions have

led the way. “Twenty years ago, general counsels would typically have been M&A or corporate lawyers, but now we’re seeing IP specialists in that role,” he says. “Such firms are very active in protecting and using their IP assets, not least the pharma and high-tech giants that have successfully instilled it into their culture.”

The high-tech and life sciences community invests heavily in IP strategy, driven by development expense, risk and a fast, competitive environment. Other sectors, however, now increasingly see the importance of investment as their businesses adapt with technology.

“The financial sector has already been impacted by the adoption of disruptive technology, such as blockchain and distributed ledgers,” says Mr Reese. “If a bank’s new system infringes IP, it could have devastating consequences. The integrated global nature of these businesses means that a patent injunction in one country could, depending on the blockchain system’s hierarchy, interrupt a bank’s payment system everywhere.” In the last two years, banks have rapidly expanded patent filing around these distributed ledgers.

The growing importance of artificial intelligence (AI) is also prompting IP strategy transformation. Existing efforts attempt to protect AI systems and their design, but when the systems start to invent and self-develop products, there will be questions around who owns the output and whether it qualifies for IP protection.

Meanwhile, with the relentless growth of big data, rights to and ownership of information are more important than ever. But while Europe’s new

GDPR regulations protect privacy and use of personal data, there are questions around broader information analysed by businesses to drive advantage. “Organisations need to know who owns those data pools, and equally what that means for acquiring, protecting and using them,” says Mr Reese.

Legislation continues to adapt, often out of necessity. “IP law around protection and exploitation of data will develop in the near term, as a consequence of the investment and value businesses ascribe to it,” Mr Reese predicts. “The growth of analytics and data-dependent business models is already driving creative exploitation strategies, and law will develop in this area.”

In terms of new technology, IP strategies are not always focused on a protectionist approach; they can be used to promote adoption. Companies therefore need to decide what they want to achieve. Mr Reese notes: “In some cases, products simply must have exclusive protection, while in others it is better to license or open up access to platforms to attract adoption.”

Getting IP strategies right is complex. But businesses increasingly appreciate that correctly identifying and managing IP rights is essential to establishing long-term profitability, competitiveness and reputation.

To find out more about IP trends and innovations please visit www.cliffordchance.com/TalkingTech

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\$13.9BN

predicted global market value of blockchain technology by 2022

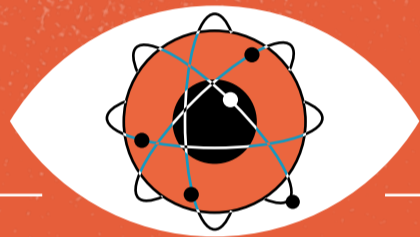
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WOMEN INVENTORS

From the dawn of computer programming to stem cell research, inspiring women have been behind some of the most groundbreaking inventions. While their share of total patentees remains low, the status quo is shifting in many high-tech industries such as biotechnology and chemistry. This infographic charts some of the most pioneering female inventors over recent history, and which sectors and countries are leading the charge in representation

1900

Marie Curie
Physicist and chemist



THEORY OF RADIOACTIVITY

Developed the theory of radioactivity and discovered polonium and radium; her research was crucial in the development of X-rays. First woman to be awarded a Nobel prize; only woman to win one twice; only person to win one in two different sciences

1947

Mária Telkes
Biophysicist

THERMOELECTRIC POWER GENERATOR

Known as the "Sun Queen", she was considered one of the founders of solar thermal storage systems; she is also credited with the invention of a solar water-distillation system for making seawater potable

1942

Hedy Lamarr
Actress

SPREAD SPECTRUM RADIO TRANSMISSION

Spread spectrum telecommunications are used to transmit a signal on a much broader bandwidth than the original; Ms Lamarr co-developed the jamming-resistant radio guidance system to help Allied to aid Allied torpedo systems in the Second World War. Her work also contributed to the development of GPS, Bluetooth and wifi

1903

Mary Anderson
Property developer, rancher

WINDSCREEN WIPER

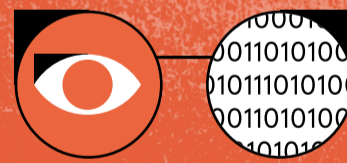
Came up with the idea after seeing someone reaching through their side window to clear snow from the windscreen by hand. She never profited from her design due to a lack of commercial interest; however, they became commonplace after the patent expired in 1920

1935

Katharine Blodgett
Physicist and chemist

NON-REFLECTIVE GLASS

Invented low-reflectance "invisible" glass, used widely in cameras and movie projects, car windscreens and computer screens



1952

Grace Hopper
Computer programmer

COMPILER

Credited with the invention of the compiler, a system that was able to translate instructions into machine code, enabling quicker programming; she coined the terms "bug" and "debugging" after removing moths from the device

1957

Mary Sherman Morgan
Rocket scientist

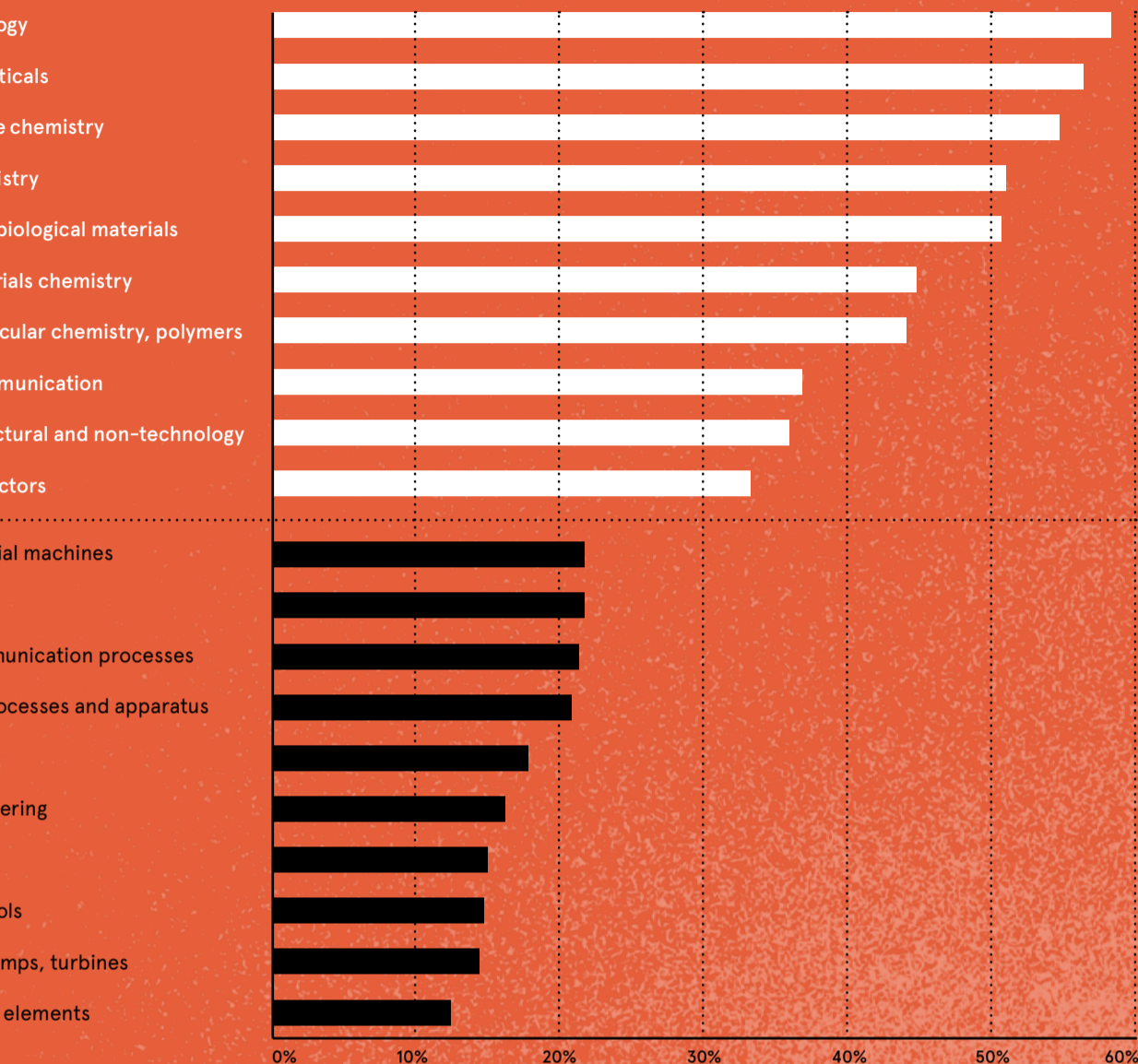
HYDYNE

Invented the liquid fuel that powered the Jupiter-C rocket to boost Explorer 1, the US's first satellite

BEST/WO
Share of Pat
Biotechnol
Pharmaceu
Organic fine
Food chemi
Analysis of f
Basic mater
Macromole
Digital com
Micro-struc
Semicondu
.....
Other speci
Control
Basic comm
Thermal pro
Handling
Civil engine
Transport
Machine too
Engines, pu
Mechanical

TOP SECTORS FOR FEMALE PATENT APPLICATIONS

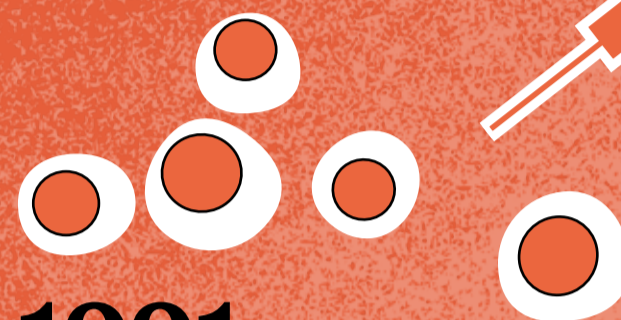
Patent Co-operation Treaty (PCT) applications with women inventors, by field of technology



3 in 10 **200%**

PCT applications have women inventors

increase in the number of PCT applications with women inventors between 2002 and 2016



1991

Ann Tsukamoto
Cellular biologist

STEM CELL ISOLATION

Co-patentee of a process to isolate the human stem cell, which has proved vital to cancer research and understanding the blood systems of cancer patients, she is co-patentee on more than seven other inventions



1978

Barbara Askins
Chemist

PHOTO-ENHANCEMENT

Developed methods of enhancing underexposed photographic negatives, used in particular for examining Nasa's deep-space images and developing underexposed X-rays, enabling patients to receive lower levels of radiation

1988

Patricia Bath
Ophthalmologist

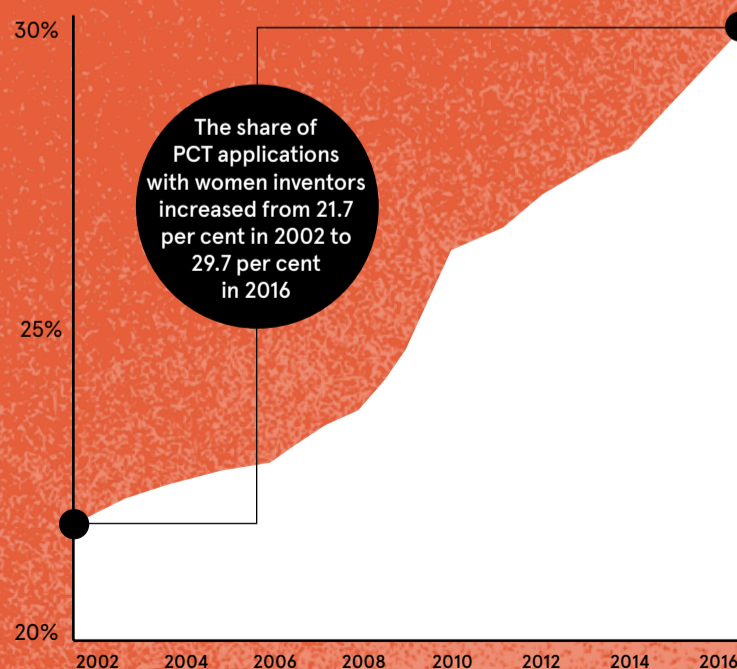
LASERPHACO PROBE

As a co-founder of the American Institute for the Prevention of Blindness, She patented a laser-technology device for the less painful, more precise treatment of cataracts; she was also the first African-American female doctor to receive a medical patent



PATENT APPLICATIONS BY GENDER

Share of PCT applications with women inventors



The share of PCT applications with women inventors increased from 21.7 per cent in 2002 to 29.7 per cent in 2016



Gender imbalance in patent applications

Patent holders are usually men as, for a number of reasons, women tend to go unrecognised as inventors



Anthony Harvie/Getty Images

HAZEL DAVIS

Where are the female inventors? Despite the recent fashion for children's books designed to redress the representation of historical female inventors, according to the Intellectual Property Office, women make up just 7 per cent of UK patent holders.

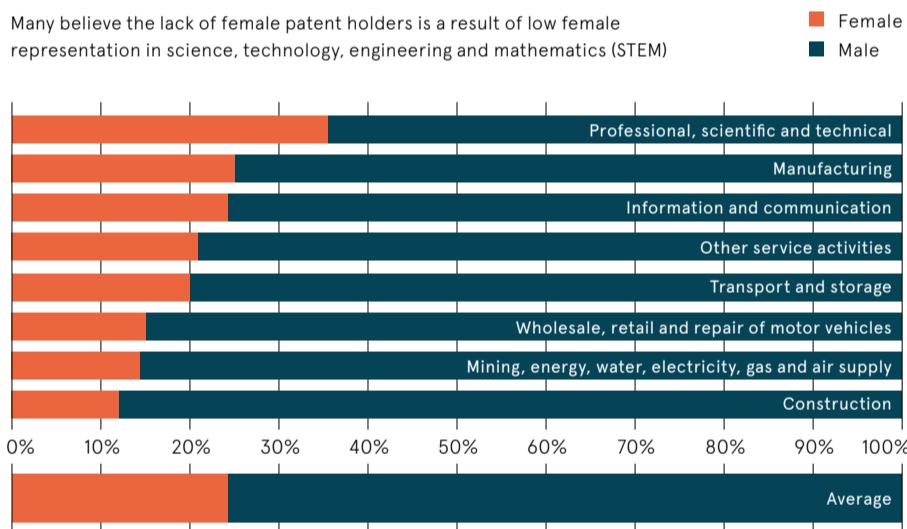
Though registrable intellectual property (IP) rights are typically held in the name of a company rather than an individual, explains Tania Clark, partner and trademark attorney at IP firm Withers & Rogers, "inventors are required to be named when filing a patent application and, in these instances, the majority are men".

Megan Neale, co-founder and chief operating officer of SaaS platform LIMITLESS Technology Limited, tried to protect the company's product, Crowd Service, a customer service platform. But the patent process isn't cheap and she struggled initially.

"As a self-funded startup, you're presented with a lot of tough decisions to make," says Ms Neale. "We were told that to patent the product just in the UK would cost at least £50,000. Our vision has always been for Crowd Service to be used globally, but to cover all countries this would cost a minimum of £150,000."

UK female employment by STEM industry in 2017

Many believe the lack of female patent holders is a result of low female representation in science, technology, engineering and mathematics (STEM)



WISE Campaign 2017

You have to be ballsy to get yourself named as an inventor, putting forward a case why your contribution is important

So the team built the software code and product as fast as possible and protected the IP as they went. "Within six months from concept creation, we were live with our first client Unilever plc," says Ms Neale. "Unilever also decided to invest in LIMITLESS through its Unilever Ventures business."

Perhaps women just take fewer risks. "When designing a new product and you're not sure you want to

go down the IP route, you need ask yourself whether your product is truly valuable enough to warrant a patent. If the patent isn't granted, how much money will you have wasted? You need to be comfortable with the risks," she says.

It could come down to semantics. Ms Neale says: "I've been called a creative and a solutioner, but never an inventor. I started inventing software solutions in the 1990s, but didn't realise it until recently."

Things are changing, says Penny Gilbert, partner at law firm Powell Gilbert. "While patent law might previously have referenced the 'man skilled in the art', it is now the 'person skilled in the art' that is enshrined in statute," she points out. In fact, there are no actual barriers to women filing patent applications and obtaining patents, Dr Gilbert says, "other than their educational and career choices, and the stereotypes around these".

Emma Graham, partner and European patent attorney at IP specialist law firm Mewburn Ellis, says: "The under-representation of women holding patents is not due to IP law itself. It is due to the lack of women doing the 'inventing'. Women are under-represented in science and engineering, and particularly in roles focused on the

inventing process, such as design engineering or product development. It's predominantly individuals in these roles who become patent holders."

However, interestingly, women are participating actively in IP law, says Dr Graham. According to the Intellectual Property Regulation Board, the proportion of female IP attorneys (28.5 per cent) is markedly higher than that of female patent holders.

Ruth Wright, senior associate at Gill Jennings & Every, has an interesting hypothesis: "The biggest patent-filing numbers are in fields such as telecoms and consumer electronics, where the inventors have degrees in subjects like engineering and physics, as opposed to life sciences where women are somewhat better represented. While patents certainly get filed in life sciences, many years of work can often lead to a single, crucial patent on a particular drug formulation.

"In contrast, in telecoms, thousands of patents go into each new telecommunications standard and, in consumer electronics, a new model of smartphone is developed every year and can have hundreds of patents associated with it. I'm willing to bet this disparity skews the overall numbers."

Ms Wright also believes that many patent filers don't understand the correct way to name inventors on patent applications. "That's a big problem – a US patent can be invalidated if the right inventors haven't been named," she says. "Inventor lists get compiled in the same breath as author lists for technical publications, especially in universities. This often means crediting in order of seniority, when in fact the crucial thing is who came up with the inventive concept.

"I wouldn't be surprised if this, coupled with the cross-industry problem of women not progressing to senior roles, has an impact on the number of women named as inventors.

"You have to be ballsy to get yourself named as an inventor, putting forward a case why your contribution is important. Women are often not good at that and suffer from 'imposter syndrome'." ♦

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WOMEN ENTREPRENEURS



Kelwyn Ornette/Sol Made/Unsplash

Small-business owners and entrepreneurs should take brand protection seriously

Fashioning a new look

Female bosses may be taking a different approach to protecting their business's intellectual property

HAZEL DAVIS

As many as 86 per cent of online sellers in the UK are women, according to global marketplace Etsy's *UK Seller Census*. However, as Tania Clark at IP firm Withers & Rogers points out, these businesses are among those least likely to own IP rights.

Ms Clark thinks it is possible that the women behind these micro businesses view IP ownership as too costly. "But they could lose out in the long run if their designs or inventions are copied by larger competitors," she warns.

This increase in female entrepreneurship is a positive trend, enriching the world of work and creating flexible working opportunities for many women with children. Such businesses are often internet based, making use of the rise of social channels such as Etsy and Pinterest to advertise and sell.

"In these cases, it is important for entrepreneurs to take brand matters seriously from the start, protecting their logos and corporate identities with trademark registrations and patents. If they fail to do this, they could lose out commercially," says Ms Clark.

There are likely to be just as many women working in branding and creative agencies that design logos and slogans for companies of all shapes and sizes, says Rachael Barber, IP partner at Kemp Little.

She says: "I am not convinced there is an industry or trade that suffers from a lack of innovation – it's how it's protected that makes them differ.

"Examining design and copyright laws is very important. Take the fashion industry, for example. Stella McCartney, Charlotte Olympia, Coco

Chanel, Vivienne Westwood, Sarah Burton at Alexander McQueen, Sandra Choi at Jimmy Choo – all these woman create IP just as often, but they create things protected by design rights or copyright rather than patents."

The fashion industry revolves around new and original designs, with companies investing significantly. As a fashion designer, if your IP is protected, you're in a position to license the design to other companies in exchange for royalties.

You will be able to enter into commercial collaborations using your IP in conjunction with another label, brand or retailer. You'll be able to prevent other companies from damaging your label's reputation by copying your designs and it also makes you a more attractive investment proposition as a small business.

They could lose out in the long run if their designs or inventions are copied by larger competitors

If a fashion designer has not registered a trademark, the greater the risk of someone else registering it in other countries, the consequences of which could be significant.

And it works both ways. Even subconscious derivation, where the infringer does not consciously realise they are copying an existing design, can result in copyright infringement. ♦

86% of online sellers in the UK are female, compared with...

20% of small business owners and...

57% of independent professionals
Etsy 2017

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Ledger tech to help solve IP problems

Global businesses have spotted the potential to stamp out patent and copyright infringements using blockchain technology

JOE McGRATH

Intellectual property (IP) crime is a thorn in the side of British industry. Some 480 people were successfully prosecuted for patent, copyright or trademark infringements in 2016, according to the most recent government *IP Crime and Enforcement Report*.

The report, released in September 2017, notes that 433 people were found guilty of offences related to the Trademark Act and a further 47 under the Copyright, Designs and Patents Act, during the previous year. While this was marginally down on 2015 totals of 490 and 69 respectively, it again highlighted the vulnerability of corporate IP assets to opportunist criminals.

Although the figures may look startling, companies may be about to gain the upper hand in the battle to protect patents, trademarks and licences from fraudsters. The solution, it seems, is from the

much-hyped, but lesser understood, technology of blockchain.

In the simplest of terms, blockchain allows many parties to work on one central database. Once a transaction is entered on the database, it is unable to be altered or updated by anyone else. While applications for this technology are widespread, the implications for IP are significant, according to experts in the sector.

“The main benefit of blockchain is that it is distributed, accurate and immutable, so you can’t overwrite what is there,” explains Richard

It is fast moving, but it is difficult to say what the landscape will look like in five or ten years’ time

Top five things that would encourage people to stop accessing content illegally online

Survey of UK internet users who download music, films, TV shows, computer software, e-books and video games illegally

If everything I wanted was available legally

22%

If it was clearer what is legal and what isn't

22%

If legal services were cheaper

21%

If everything I wanted was available as soon as it was released elsewhere

17%

If a subscription service I was interested in became available

16%

Intellectual Property Office 2017



John Phillips/Getty Images for TechCrunch

Tatham, a patent attorney at IP rights law firm HGF.

“Compared to other hype words that you hear now, such as artificial intelligence and quantum computing, I think blockchain has a lot more near-term relevance, in terms of intellectual property and elsewhere.”

If the concept of this modern technology is tricky to grasp, the scope for blockchain is perhaps better illustrated through the applications already playing out in industry. In the music industry, for example, it is already being adopted to crack down on piracy, and to improve tracking of distribution and revenue.

Simon Jupp, an associate in Taylor Wessing’s IP and media team, explains that artists have been struggling in recent years to track who is using their music and monitor the associated revenues.

Mr Jupp’s comments are underscored by a 2017 report from the UK’s Intellectual Property Office, which found that 6.7 million or 15 per cent of UK internet users consumed at least one item of online content illegally during the first quarter of 2017. However, he believes that artists, producers and songwriters are waking up to the potential in blockchain technology to keep better control of their work.

“One bold thing would be for artists to not have the need for streaming services or record companies and publish their own works, and track use and remuneration themselves,” he says.

A British singer-songwriter is doing just that and in doing so

Imogen Heap founded the MyCelia platform which uses blockchain to track listeners, rights and authorised distribution of music

Imogen Heap has become as well known for her pioneering approach to music distribution as she has for the music itself.

In 2017, she spoke out in the *Harvard Business Review* after a rival artist was accused of stealing her copyright. As a result, the artist had his material removed from a prominent distribution site for using a 30-second sample of her work.

Ms Heap said her record label had probably used an over-eager robot to monitor potential infringements. She said situations like this could be avoided in future, however, by embracing blockchain technology for rights and payments. Since then she has encouraged musicians, producers and recording artists to take inspiration from her online platform, MyCelia, which uses blockchain to clarify who has the right to use samples and tracks listeners, rights and authorised distribution.

Despite the widespread attention that members of the music industry have captured through backing blockchain innovation, there are those who believe the best application of the technology for IP purposes has yet to be identified.

“We are at an early stage for most areas of blockchain technology,” says Philip Horler, patent attorney and senior associate at Withers & Rogers. “It is fast moving, but it is difficult to say what the landscape will look like in five or ten years’ time.”

Mr Horler acknowledges the widespread hype around creative solutions like those of Imogen Heap, but

suggests a more practical application for the technology might be in supply chain tracking to prevent the counterfeiting of goods.

“The general principles are fairly clear. If it is possible with blockchain to record an individual item at the very start of the supply chain, each time that item changes hands, it can be recorded on the blockchain by each party,” he explains.

Mr Horler cites blockchain group Everledger as an example of a trailblazer. The company specialises in tracking valuable assets, such as precious stones, using blockchain, smart contracts and machine-vision. This, he says, could have a significant impact in the fight against counterfeiting.

“For diamonds, it means you can be satisfied the diamond is not a blood diamond, that it has a good history. It is doing something that has not been done before and it could be quite useful in preventing counterfeiting,” he says.

While Mr Horler acknowledges the system is reliant upon the different parties updating the blockchain ledger, he still believes the potential to reduce counterfeit crime is huge.

“I would be amazed if we didn’t see some fraudulent behaviour around blockchain, but the technology, from a technical perspective, is pretty strong,” he concludes. “It is currently very difficult to modify, to the point of being practically impossible. How easy it is to act dishonestly will come down to how it is set up and how it is utilised.” ♦

15% of all internet users in the UK consumed at least one item of online content illegally during the first quarter of 2017

Intellectual Property Office 2017

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Q&A UK businesses must adapt to catch up with IP

UK companies accounted for just 3 per cent of patent applications in Europe last year. According to the European Patent Office, the UK files fewer patent applications per capita than Puerto Rico. A new approach is needed as Britain exits the EU, says **Ilya Kazi**, partner at intellectual property law firm Mathys & Squire

Why is the UK so far behind on IP?

To some extent, people have historically associated patents with the development of physical products. The UK is now less of a manufacturing economy and with many developments arising around data, software and other intangibles, intellectual property (IP) often gets overlooked.

In addition, businesses often have a financially biased leadership team and, while there is often a keen awareness of the cost of acquiring and protecting IP, there is less understanding of how it can contribute positively as an asset. The process can be lengthy and complicated, but approached properly IP can be an asset of enormous value.

Where does this attitude leave British businesses as we exit the EU?

Government and industry recognise that we have to perform well in numerous fields post-Brexit, especially given that our financial sector and supply chains are likely to be negatively affected. Well-managed IP has the potential to make a major difference. The beauty of IP is that it, and licensing revenues, can be transferred electronically; they won't be sitting at Dover waiting to cross the Channel. The more innovation we capture and maximise, the more we can derive profit. It will, however, require a concerted effort.

How should industry improve its management of IP?

Chief executives and other managers need to realise that IP is fundamental for growth and adds competitive advantage; IP has independent value and can serve as an asset in itself. For example, a small manufacturing company in the UK that has a strong IP portfolio but is only able to serve a particular segment of the market, could license its IP to build a market in other sectors and countries, and derive greater profit with minimal extra investment.

What else can be supported by understanding IP?

When businesses understand the value of their IP, they can use it like any asset. For example, loans may be based on it as collateral and we see banks increasingly lending on this basis. Having proper appreciation of IP and its value is also important for establishing effective joint ventures; when businesses use well-tested and robust methods for valuation, they can

engage in a successful negotiation process with a partner. Universities and research organisations can also use IP to spin out brilliant ideas to be developed by others, but with a return.

What moment usually makes businesses appreciate the importance of IP management?

It depends on the company. With startups, they need investment and investors almost always ask about the IP first, so that this means many startups become quite well clued up. Startups, not unreasonably, question their resources to enforce IP against a larger competitor. However, the reality is that nobody relishes a patent battle; the bigger company is more likely to offer to acquire the startup and provide a welcome exit. With bigger businesses there's a lot of inertia; they often have established products and don't always look to capture IP as they evolve slowly. But those established firms can sometimes have a big wake-up call when they are caught on the wrong side of someone else's patent with nothing useful to trade.

How can businesses ensure they put an accurate value on their IP?

Valuations can seem a bit of a black art. There are many ways in which companies try to establish the value of their IP, even including questionable online valuations that spit out a number. What companies need is a robust process. We recently acquired strategy and valuations firm Coller IP to broaden our approach, including and helping businesses build efficient data-capture processes. We look at the whole picture of the numbers, the technology, the people, the ideas, defensibility of the IP and the business models. As the company's valuation director Fernando Da Cruz Vasconcellos says, valuation is forward looking and there is not a single answer; it is a negotiation tool. The key is to be able to justify your sums. If you

“IP valuations can seem a bit of a black art. There are many ways in which companies try to establish the value of their IP – what companies need is a robust process

can show proper methodology and the rationale for your assumptions, then your valuation holds up.

What is the culture like in businesses that really understand IP?

When companies truly harness IP and spread awareness, rewarding staff for inventions, everybody starts thinking: “How can I innovate?” When people at all levels realise it is valuable, they try to create more. Even if this does not always result in protectable patents, it can foster a more creative culture. This is essential as our economy evolves towards relying on more intangibles. Those companies that generate a lot of ideas are often associated with high financial performance, excellent strategies and broader economic growth.

Mathys & Squire is a full-service IP firm with offices throughout the UK and Europe, and a dedicated team in China. To find out how to identify, capture and maximise your IP value please visit mathys-squire.com



Ilya Kazi
Partner, Mathys & Squire

FREE PATENTS

Openness can be altruism and acumen

Careful co-operation over patents can sometimes be a good business move or a benefit to society

ADAM FORREST

Adjusting to climate change will require a lot of good ideas. The need to develop more sustainable forms of industry in the decades ahead demands vision and ingenuity. Elon Musk, chief executive of Tesla and SpaceX, believes he has found a way for companies to share their breakthroughs and speed up innovation.

Fond of a bold gesture, the carmaker and space privateer announced back in 2014 that Tesla would make its patents on electric vehicle technology freely available,

dropping the threat of lawsuits over its intellectual property (IP). Mr Musk argued the removal of pesky legal barriers would help “accelerate the advent of sustainable transport”.

The stunning move has already had an impact. Toyota has followed Tesla by sharing more than 5,600 patents related to hydrogen fuel cell cars, making them available royalty free. Ford has also decided to allow competitors to use its own electric vehicle-related patents, provided they are willing to pay for licences.

Could Tesla’s audacious strategy signal a more open approach to patents among leading innovators? And if more major companies should decide to adopt a carefree attitude to IP, what are the risks involved?

Paul Loustalan, patent attorney and partner at Reddie & Grose, thinks it’s important to understand Tesla’s main motivation: building a much bigger market. According to the International Energy Agency, electric cars still account for less than 1 per cent of the total number of vehicles in circulation.

“It doesn’t feel like it was a purely altruistic thing to do, even if it was wrapped up in the language of openness,” says Mr Loustalan. “It was a smart move because it benefits Tesla



David Paul Morris/Bloomberg via Getty Images

It was a smart move because it benefits Tesla if it helps others develop the infrastructure for the wider adoption of electric cars

if it helps others develop the infrastructure for the wider adoption of electric cars.”

Electric vehicles aside, patents remain an extremely popular way of safeguarding original work from business competitors. According to the World Intellectual Property Organization (WIPO), 243,500 patent applications were filed last year, a 4.5 per cent increase on the previous year. In Europe, there was a 3.9

per cent rise in patents filed with the European Patent Office. Even Tesla has continued to file for some of its battery inventions, leading some to accuse the company of hypocrisy.

If corporate giants still value patents, startups and smaller companies depend upon them to assure investors their venture can be profitable. A free-for-all in the patent world could prevent entrepreneurial types from getting the funds necessary to keep coming up with bright ideas.

“I think inventors and people in research are motivated by intellectual curiosity; they want to discover new things,” says Marianne Privett, senior associate at IP law firm A.A. Thornton & Co. “But you need finance to do the research and securing IP is part of that process. In the pharmaceutical industry, for instance, the cost of doing clinical trials, and research and development is very high.”

There is another risk associated with greater openness, which is the loss of hard-won dominance. IBM maintained an open-architecture strategy when developing the PC at the end of the 1970s. Although the company helped create the boom in home computers, compatibility between systems allowed other companies to muscle in and reduce IBM’s share of the market.

IBM was partly influenced by the open-source software movement and its idealistic belief in a free exchange of code. Although this philosophy did not blossom in the wider world of telecoms and internet technology, there has been a shift towards a careful kind of co-operation over patents in recent years.

Some of the biggest players in mobile and computer products have led the way in forging cross-licensing deals, which are a neat way of trading patents with each other. Patent pools have also been set up to make sure multiple parties can utilise complementary discoveries.

Will Elon Musk eventually come to regret his free-for-all policy on Tesla patents?

Vicki Strachan, patent attorney and partner at Wynne-Jones IP, says these kinds of agreements have enabled “cross-pollination” of ideas. “It’s been essential in a lot of complex digital technology,” she says. “Sometimes companies have to be willing to put some of their cards on the table to create a shared standard.”

The WIPO GREEN initiative is designed to make sure there is a healthy balance between protecting new ideas and making them available where they are needed most. The international body promotes patent licensing deals to make sure there is a “speedier diffusion” of sustainable technology, particularly in the developing world.

Frank Tietze, lecturer in technology and innovation management at the University of Cambridge, believes both open and closed IP strategies have their place.

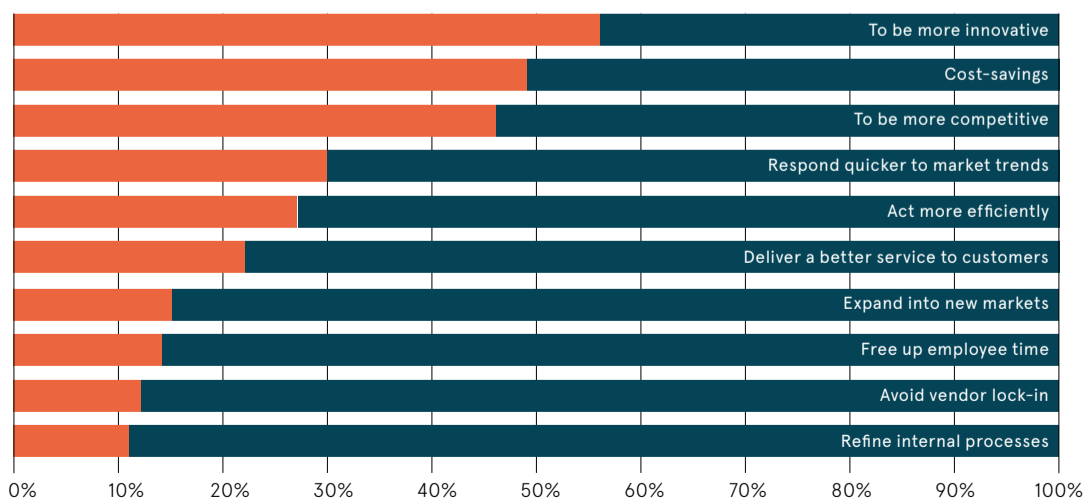
He points to Nutriset, the inventor of a peanut-based paste filled with vitamins, called Plumpy’Nut, widely used by NGOs to treat severe malnourishment. The French company initially protected their creation with patents, arguing rivals might have replicated the paste. But it then began licensing the patent for the life-saving product to affiliates in the developing world.

“When it comes to IP, it’s not a question of good or bad; there is a whole spectrum of approaches,” says Dr Tietze. “There are situations, like with Tesla, where using an open model can be potentially helpful in accelerating technological development. But there are situations where using a closed model can be helpful to society too.”

Elon Musk’s patent giveaway was not done recklessly. Any company thinking about imitating the open IP model adopted by Tesla must learn the subtle art of knowing when to guard good ideas and knowing when to share them. ♦

Drivers of open-source technology

Percentage of IT decision-makers from large UK enterprises



Vanson Bourne/Rackspace 2016

You know you work
in IP Formalities when...

Due date

...means something entirely different

You are the backbone of the IP industry. You care more,
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passionate. Not everyone has what it takes.
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