Lessons for the New Enterprise



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A Re-Think series publication

Spurring Creative Genius for Society's Benefit

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C enturies of history have proven that the surest way to encourage investment in innovation is the promise of a meaningful return on that investment when an innovation is successful. And that promise is fulfilled by Intellectual Property Rights (IPR). Patent, trademark, trade secret and copyright laws tell firms of all sizes — and indeed humanity generally — that innovation will be rewarded by offering an attractive bargain between innovators and society. While the first intellectual property protection is thought to have been granted in ancient Greece about 2,500 years ago (the equivalent of one-year patents were issued to chefs for select recipes), IP began to take on heightened importance in countries such as the United States as inventors came forward with transformative new products and had them patented. These products included the cotton gin (patented in 1794), the telephone (1876), and the airplane (1906).

Today, IP is considered an essential component of advanced and growing societies. Thus, it's easy to overlook that every aspect of modern life is the product of innovations rooted in intellectual property, from smart phones to hybrid cars to life-saving medical treatments, many of which would have been unimaginable 100, 50, or even 20 years ago. More broadly, IP is a source of wealth

and job creation. In the United States, IP-intensive industries accounted for 34 percent the country's gross domestic product (GDP) in 2010, and 27 percent of all jobs. In European Union countries, IP-intensive industries accounted for 39 percent of GDP during the years 2008-13 and 26 percent of all jobs. And those numbers will only grow larger with time.

A decade of change

Given the critical role IP plays in modern economies, it's useful to understand the ways in which the IP climate has evolved over the past decade.

First, as the world community has moved through the various economic ages — agriculture, industrial, information — IP has taken on a more important role in the global economy. In an economy increasingly driven by knowledge and information, ideas matter more and need more robust protection. It's also the case that the traditional sources of competitive advantage (e.g., commodities and labor, first-mover advantage, access to finance, advanced manufacturing techniques) have dissipated as potential competitors around the world increasingly have access to the same resources. With few or no other sources of competitive advantage available in the modern era, companies can achieve a competitive advantage either through legitimate means (such as developing a breakthrough product) or illegitimate ones (such as counterfeiting). This struggle can be summed up as "first movers vs. fast followers." As a result, IP laws have become the best way — and sometimes the only way — to protect innovation and fairly reward those members of society keen to improve the human condition through new approaches.

This increased emphasis on IP is not a north/south trend, or a developed/developing economy trend — it is a global trend. Chinese companies, for example, cite theft of IP by other Chinese companies as one of their top issues. Patent filings are increasing worldwide, including in Europe, Asia, and America. Those filings indicate that innovators increasingly view patents as an essential tool to protect their competitive advantage. Second, there has been a greater prevalence of IP abuse over the past decade, particularly related to patents, and these abuses have attracted more attention. The abuses are largely carried out by so-called "patent trolls" — individuals or companies that acquire patent rights merely to file lawsuits claiming patent infringement. While many of the claims go nowhere, and many of the lawsuits that get filed are dismissed, the legal wrangling still brings a significant cost — many millions of dollars per year in lawyer fees and lost productivity.

Third, there's been a backlash against the patent system generally, which has created the most hostile environment toward IP in the United States that I've seen during my 25+ year legal career. The hostility is found in the media, but also all three branches of the U.S. government. The Supreme Court heard more patent cases in 2014 than in any other year in U.S. history, and its decisions overwhelmingly curtailed IP rights. Also in 2014, members of Congress introduced more than a dozen bills related to IP, and most of them were meant to diminish the strength of the patent system in various ways. And the Obama Administration has called for cutbacks in the IP system, while also overruling a landmark IP-related order by the U.S. International Trade Commission — the first such veto in more than three decades.

Lastly, over the past decade, more and more content is being stored and distributed directly via the Internet using smart phones, tablet computers and cloud computing services. This has ushered in new benefits for the sharing of creative works and ideas, along with new challenges to the rights of content creators. As more content gets stored in the cloud and distributed directly to an individual's devices either by command or automatically, new IP challenges arise regarding copyright protection in the era of the Internet of Things.

IP conflict and confusion

One recent dispute is emblematic of how IP issues are being thrust into new terrain and facing heightened scrutiny. The mapping of the human genome has unlocked extraordinary new levels of understanding about the human body and how to treat disease. Approximately 4,000 genes — about 20 percent of the genome — are covered by patents, which have been awarded to entities that discovered a gene or a sequence of DNA. For patented genes, licenses are needed by anyone conducting an experiment that involves these genes.

In 2009, two of those patents — for genes associated with breast cancer (BRCA1 and BRCA2) — were challenged by a collection of plaintiffs who argued that private companies should not be permitted to patent gene sequences. While genetics cases account for a small share of IP cases, the fundamental issues were the same as those pervading the current anti-patent environment: how to reward innovation (the patent holder in this case had pinpointed the location and sequence of both genes) while providing the public with access to the fruits of that innovation at a reasonable cost. In 2013, the U.S. Supreme Court ruled unanimously that isolated human genes could not be patented (though it also ruled that synthetic DNA could be patented). Then in a similar case brought in Australia, that country's highest court reached the opposite conclusion, based on what experts have viewed as policy and science at least as valid as that relied on by the U.S. Supreme Court. Regardless of whether one agrees or disagrees with the U.S. Supreme Court's decision, the case is a reminder of how IP can play a pivotal role in a wide range of debates, and how challenging it is to balance an incentive system aimed at spurring long-term, high risk technology investments (the patent system) with the natural inclination of the public to want today's successful technology solutions at the lowest possible cost.

The BRCA case is also a reminder that when "intellectual property" is in the news, the story is often about conflict: lawsuits between corporate giants fighting over smart phone designs, pirates distributing illicit copies of bestselling movies and music, and foreign hackers attempting to steal innovative compa-

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nies' valuable engineering know-how. Much of the conflict, while unfortunate, is a byproduct of something positive: societies that are highly dynamic and innovative. That dynamism and innovation inevitably unleashes efforts to appropriate technical breakthroughs, which in turn triggers litigation focused on protecting and enforcing IP rights. While IP-driven conflict would be greatly curtailed in a society with no innovation, such a society would inevitably confront many more serious problems than legal wrangling.

Media coverage of IP conflicts can leave the impression that the IP system is an impediment to innovation, benefiting patent holders to the detriment of the public. The reality is just the opposite. The system, and patents in particular, embody the timeless wisdom of Sir Isaac Newton: "If I have seen further it is only by standing on the shoulders of giants."

Newton was implicitly speaking to the compact that exists between a society and its inventors who are granted patents: the inventions are publicly disclosed so that any skilled person can understand and recreate them. Inventors cannot keep their inventions secret but must contribute their knowledge to the public. And while others are prevented from copying a patented invention for the term of the patent (as part of the bargain to the inventors), interested parties can learn from the published patent description and improve on the invention of others. In this manner, the IP system creates an ever-growing repository of knowledge for the benefit of humankind. That knowledge builds on the innovative ideas of others — ideas that can come from almost anywhere. Similarly, businesses based on those ideas can come from anywhere. Countless companies — if not entire industries — are the byproduct of creating consumer demand for a product, such as the touch-screen tablet computer, where none existed previously.

The decade ahead

When information and content are always available and transparent, innovators must be prepared to play offense *and* defense with their IP assets. That means seeking patents for innovations and ensuring these patents are enforced — in a climate marked by widespread infringement. As such, I expect IP disputes will continue to play a prominent — and pivotal — role across the world's economic and legal landscape during the next 10 years. Indeed, the stresses on the IP system will likely escalate, for a simple reason: technology is going to make it progressively easier to share and copy products, and laws preventing new forms of copying (like all laws) lag behind technological progress.

Looking ahead, I see six overarching "megatrends" — areas where a number of important patterns of activity are converging — that will have significant impact on the creative economy of the future.

The first megatrend is found in the changing means of access and consumption. Location and access are becoming increasingly decoupled — a particular song, for example, once downloaded to a single consumer's home server can be streamed to her office, to her car or to her mobile device while thousands of miles away — and intermediaries that were once part of the physical distribution chain from creator to consumer are playing a less obtrusive but invaluable (and more complex) role in the process. The shift in distribution models toward instantaneous and ubiquitous access are probable sources of friction, with delivery frameworks that cannot or do not embrace the full extent of capabilities offered by modern networks and mobile devices.

The second megatrend is a predictable one: new technologies. Big data, increasingly complex virtual content, 3D printing and technology convergence will be key drivers in how products and services are created and disseminated. These technological advances will lead to increases in efficiency, while also enhancing the creative process itself. And as technologies like 3D printing proliferate, there will be a lively debate (which will likely end up in the courts) as to whether there are sufficient incentives to pursue innovation in an era where replication is so easy. When will replication be legal and when will it be infringement?

The third megatrend is seen in increased user involvement. The creative process is more than ever a shared endeavor, a reality perhaps best exemplified by the 100,000 active contributors to the popular online resource Wikipedia. A range of new licensing choices provides a wealth of options from which usercontributors can tailor access to their IP. The potential blurring of traditional lines between content creators and users raises serious challenges with respect to ownership and rights to the resulting content.

The fourth megatrend lies at the convergence of shifting business models. Traditional business models will see increased pressure from new business models that rely on distributors' lower marginal costs of production and consumers' shift in preference away from ownership in favor of obtaining licenses to access the products they desire. A salient example of the impact of shifting business models is offered by the music industry. A combination of piracy and business model disruption reduced annual global music industry revenues from \$30 billion in 1999 to \$16.5 billion in 2012. And yet, as subscription services have rapidly expanded, 2012 brought the first year-over-year growth in the music industry since 1999, providing an indication that new models of distribution can meet consumer expectations while at the same time protecting the interests of content owners.

The fifth megatrend focuses on the increasingly global market for products and services. Globalized commerce, when properly leveraged, is a win-win for consumers and providers. Consumers will see a wider range of choices while providers will have access to larger and larger audiences — especially considering the growth of the middle class in emerging economies. Yet globalization also will test the limits of IP legal frameworks which are nationally oriented and were developed before the spread of high-speed global networks. Existing international agreements serve an important role but are unlikely to suffice as the creative and innovative economy increasingly comes to depend on cross-border licensing.

The sixth and final megatrend that has a critical bearing on IP development is the increased fragmentation of IP ownership. More than ever, thanks to the Internet and collaborative innovation between multiple parties, joint and derivative works are playing a central role in product and content creation, as existing works are increasingly adapted, excerpted, repurposed and incorporated into new works. Ensuring that the rights of original innovators and creators are respected will be essential in the context of this expanding "collaborate and remix" culture. The longstanding problem posed by licensing transaction costs and orphan works (works for which the copyright owner is unknown or unreachable) will become even more challenging in this context, and IP authorities worldwide can be expected to develop new solutions to address this exigency.

So what does all this mean at the country level, and how will IP owners manage through these changing times? I expect many countries in Europe and Asia to strengthen their IP systems. There is a growing awareness in these countries of the nexus between innovation and economic growth. And at a time when growth is slowing in many countries, there is renewed interest in fostering innovation. This sentiment will be even more pronounced in countries that have large numbers of highly educated scientists and engineers, such as India and China. While IP violations have been widespread in both countries for years, I think domestic industry in both countries is going to place renewed pressure on their respective governments to enact more robust IP laws and tighten enforcement so as to ensure their own newly created IP is protected.

Given market trends and developments this pressure is likely to come from the pharmaceutical and life sciences industries in particular. The traditional approach of relying on U.S. companies to pursue drug discovery, and then finding ways to access those new drugs (legally or illegally), will be insufficient. Health care-focused companies in both countries will see the demand for drugs that cater to a domestic clientele and will want protections for those drugs once they are developed. Given the size of the Chinese and Indian economies, their support for more robust protections will be a very positive development for the global IP regime, and more importantly for patients seeking treatment in those countries and elsewhere.

Building a better — and more global — IPR mousetrap

One of the under-appreciated realities of intellectual property is that while it's a key ingredient in the global economy, the legal regime supporting it is decidedly non-global. There has been some movement recently toward greater global collaboration, but intellectual property issues still tend to be addressed country-by-country. More and more we find ourselves struggling along with a "multinational" approach that needs to be rethought in the globally integrated era.

Consider research and development. Over the last generation, it has become truly global. Scientists in London are collaborating in the course of a single business day with counterparts in Guanzhou, Bangalore, Stuttgart, Sao Paulo, and Sunnyvale. Together, these scientists generate brilliant new ideas that lead to wonderful new products and services and, of course, patent filings — in at least some of the countries in which collaboration is taking place and frequently in many other countries. But that is where the neat modern system of globally integrated R&D ceases to be neat, modern or global. At this intersection of patent law and cross-border collaboration on research and development, there is a conundrum: where to file an initial patent application for an invention derived from multinational resources?

The root of the problem lies in the nation-based regulatory environment of patent law (*see table on page 75*), with the laws of multiple countries each requiring the filing of affected patent applications first in that country. Protective patent filing laws are easy enough to comply with when only one jurisdiction is implicated. But in the case of inventions developed in various places or by various inventors working together, these protective provisions can quickly come into direct conflict with one another. Indeed, these competing provisions can make filing a patent application in any country a violation of at least one other country's laws.

While the patent regime is a long way from being truly global, there are some important signs of progress. In 2006, the intellectual property offices of the United States and Japan launched a joint program designed to bring greater speed and efficiency to the process of getting patent applications from one country examined in the other. Under the program, which now includes 17 countries, intellectual property offices share information, with the objective of accelerating patent approval times while simultaneously improving quality. Known as the Patent Prosecution Highway, the program has proven very popular with patent applicants, experiencing triple digit growth multiple years running, and savings for patent applicants and patent offices valued in the hundreds of millions of dollars. Some of the countries participating in the effort also belong to a patent work-sharing program known as ASPEC that includes nine nations in ASEAN (the Association of South East Asian Nations). The goal is the same: for patent applicants from participating countries to obtain patents faster and more efficiently, by making it possible to share search and examination results between participating IP offices.

The current patchwork of multinational patent coordination leaves much to be desired. A system that more accurately reflects the global nature of the way business operates would lower patent processing costs for governments while improving economies of scale for innovators. This chart shows the current levels of patent cooperation among 85% of the world's economy as represented by the G-20 (and Singapore).

Country	PCT	CPCS	Global PPH	PPH 2.0	Outsource Search & Examination
Argentina					
Australia	~		~	~	
Brazil	V				
Canada	~		~	~	
China	V	Partial	~		
EU	~	~	~	~	
France	V	🖌 (via EPO)	🖌 (via EPO)	🖌 (via EPO)	
Germany	~	🖌 (via EPO)	🖌 (via EPO)	🖌 (via EPO)	
India	V				
Indonesia	~				
Italy	V	🖌 (via EPO)	🖌 (via EPO)	🖌 (via EPO)	
Japan	 ✓ 		~	~	
Mexico	v				
Russia	~	Partial	~	~	
Saudi Arabia					
Singapore	~		~	~	To Australia
South Africa	V	~			
South Korea	~	Partial	~	~	
Turkey	\checkmark	🖌 (via EPO)	🖌 (via EPO)	🖌 (via EPO)	
UK	v	V	V	~	
US	~	~	v	V	

PCT - Patent Cooperation Treaty PPH - Patent Prosecution Highway CPCS - Cooperative Patent Classification EPO - European Patent Office

The U.S. and the European Union have also made important progress on bringing greater efficiency to the patent system. For more than a century, patent offices throughout the world have used different methods to classify and sort patents (roughly akin to the Dewey Decimal system used in American libraries). When I was director of the U.S. Patent and Trademark Office, we began working with the European patent authorities to harmonize our systems and migrate toward a common classification scheme. That harmonization process is now complete, and the Cooperative Patent Classification (CPC) system has greatly simplified — and accelerated — the patent search process, again while improving quality by ensuring all applicable international prior art is found through a single classification search. It represents an important step toward global IPR recognition and integration.

This emerging shift toward a more cooperative cross-border approach to patent reviews and approvals is akin to the technology sector's decades-long evolution from proprietary standards to open standards. In both instances, there's a focus on building from a shared foundation of knowledge — and not dupli-

cating the work of others. This will be of great value to the IP system, which as I noted earlier is non-global in its operations, with patent offices throughout the world typically repeating the work of their counterparts in other countries before issuing new patents. It is highly inefficient — for both patent applicants and the offices reviewing their applications.

A shared system, with what operationally amounts to "open standards," will lead to higher-quality patents (since patent examiners will be building on the information collected, and the work conducted, in other countries) issued with greater efficiency and at lower cost for both applicants and patent offices. Just as the open standards of the Internet have made it possible for virtually any company to integrate seamlessly into the Internet and Web infrastructures, more open standards for patents can help foster the spread of technology to more places around the world.

Why shouldn't we have an IPR system, with the appropriate safeguards, that reflects the way the global economy operates and creates value 24/7?

The leadership challenges ahead

There are four leadership challenges I see coming. Leaders are well served to begin preparing themselves and their enterprises to gauge the impact these challenges will have on business and financial models.

Expanding the focus on IP

IP has simply become too important to leave to the IP lawyers, or any lawyers for that matter. Lawyers live in a world of risk minimization. IP is about value creation and value extraction, not merely risk minimization. The fruit of IP protection — patents, trademarks, copyrights, know-how — is now tradable for value. IP has become an asset class for which deals of all shapes and sizes can be made. It impacts product pricing, product development, marketing and sales, strategy, finance and budget, research and development. Said differently, IP impacts the entire business. The business leader in an innovation-reliant industry who ignores or fails to understand the place and value of her IP in her business does so at her own considerable peril. Just ask Apple and Samsung, who have spent billions fighting over patents in recent years.

Balancing the short term and the long term

Amid evolutions in the patent regime, there is a fundamental leadership challenge facing publicly-traded companies: making investments in innovation that may take years to pay dividends while also balancing short-term earnings pressures that come from financial analysts who focus on quarterly earnings. These pressures can tempt companies to curtail their R&D investments in order to juice their stock price. The effect can be lethal, leading to misguided corporate strategies and even a bending of accounting standards. As the noted scholar W. Edwards Deming once observed, "People with targets, and jobs dependent on meeting them, will probably meet the targets — even if they have to destroy the enterprise to do it." The incrementalism that is a hallmark of innovation today, with few big-bang breakthroughs, is a byproduct of the short-termism that has infected so many companies. While I'm proud that my former employer, IBM, has been the leading recipient of U.S. patents for 22 consecutive years, and was awarded more than 7,500 patents in 2014 alone (a single-year record for any company), I also know that R&D is not as embedded in the DNA of all public companies. I expect this challenge of maintaining long-term investments while meeting short-term earnings targets is only going to grow.

Time for a truce in the IP arms race?

Set against that leadership challenge is a related one: whether companies should continue with the IP equivalent of a nuclear arms race — filing for

more patents every year, and incurring significant expenses, while realizing gains that are often quite modest. There is no simple answer, and it's made more interesting by the emergence of entities such as ipCreate (led by former IBMers Marshall Phelps and John Cronin) that can help a company create IP on-demand, or buy or license IP that's been developed elsewhere. Thus the decision facing leaders: invest in innovation or acquire what's needed only when you need it and when it fits your precise purpose?

The price of IP protection

Another leadership challenge for companies is determining the level of IP protection they will realize in specific countries and whether the expense associated with securing a patent can be justified. Specifically, leaders facing IP decisions must ask themselves, "what do I get and when do I get it?" The answer will be different for every product in every country, of course. But it's clear that in some countries, such as China, there's a high likelihood of having one's product copied, and absolutely no recourse if it doesn't have a Chinese patent. That's what happened a few years ago when an American manufacturer of recreational camper trailers discovered that an exact replica of its product was being sold in China. The company had not filed for a Chinese patent, and later discovered that the copyist of its camper trailer had patented the product in China.

Conclusion

The patent system is all about expanding the body of knowledge for society's collective benefit. The investments made in the form of temporary exclusive rights have reaped handsome returns for countries around the world — helping breakthrough technologies spread and contribute to a dramatic rise in living standards. While some countries have had more success with innovation than others, in the modern global economy no country or region can be the sole source of the world's new ideas. Continued success in promoting innovation requires international cooperation and a global perspective — one that bridges cultural and legal differences regarding IP systems and encourages innovators around the world to continue investing in innovation.

If the required rethink of the patent regime sparks progress toward a more globally integrated system, I believe countries everywhere will experience a new era of innovation. This "innovation era" can bring forward new transformative products that help overcome many of the world's most pressing challenges, spanning from disease to depletion of the ozone layer, while also unlocking new opportunities to achieve greater growth and prosperity.

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