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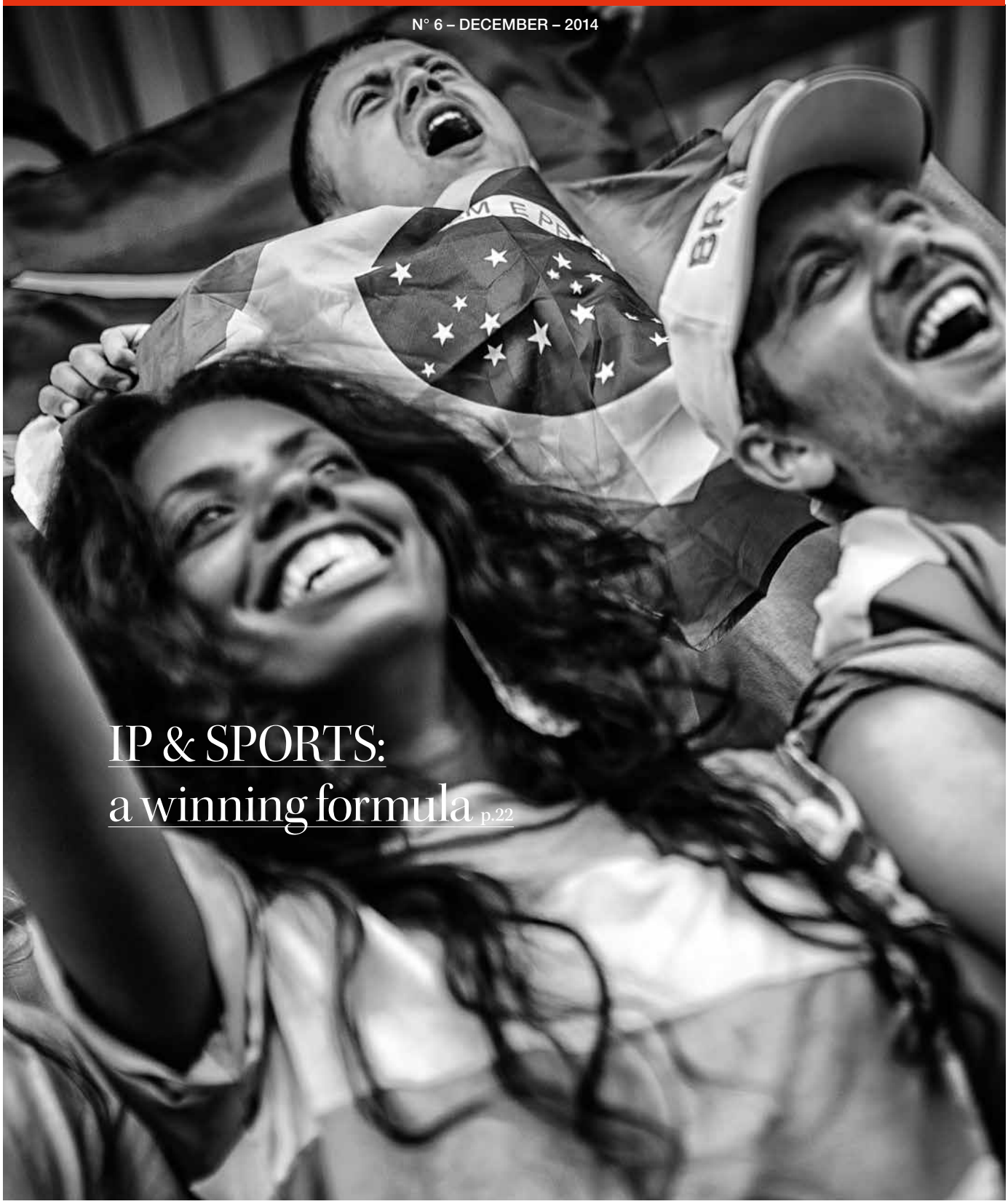

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Front cover:
Sports events generate a deep-rooted emotional response among the public making them a high value business proposition when supported by a strong intellectual property legal framework.
Photo: iStock©franckreporter

PIONEERS OF BLUE LEDS dazzle Nobel Committee

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

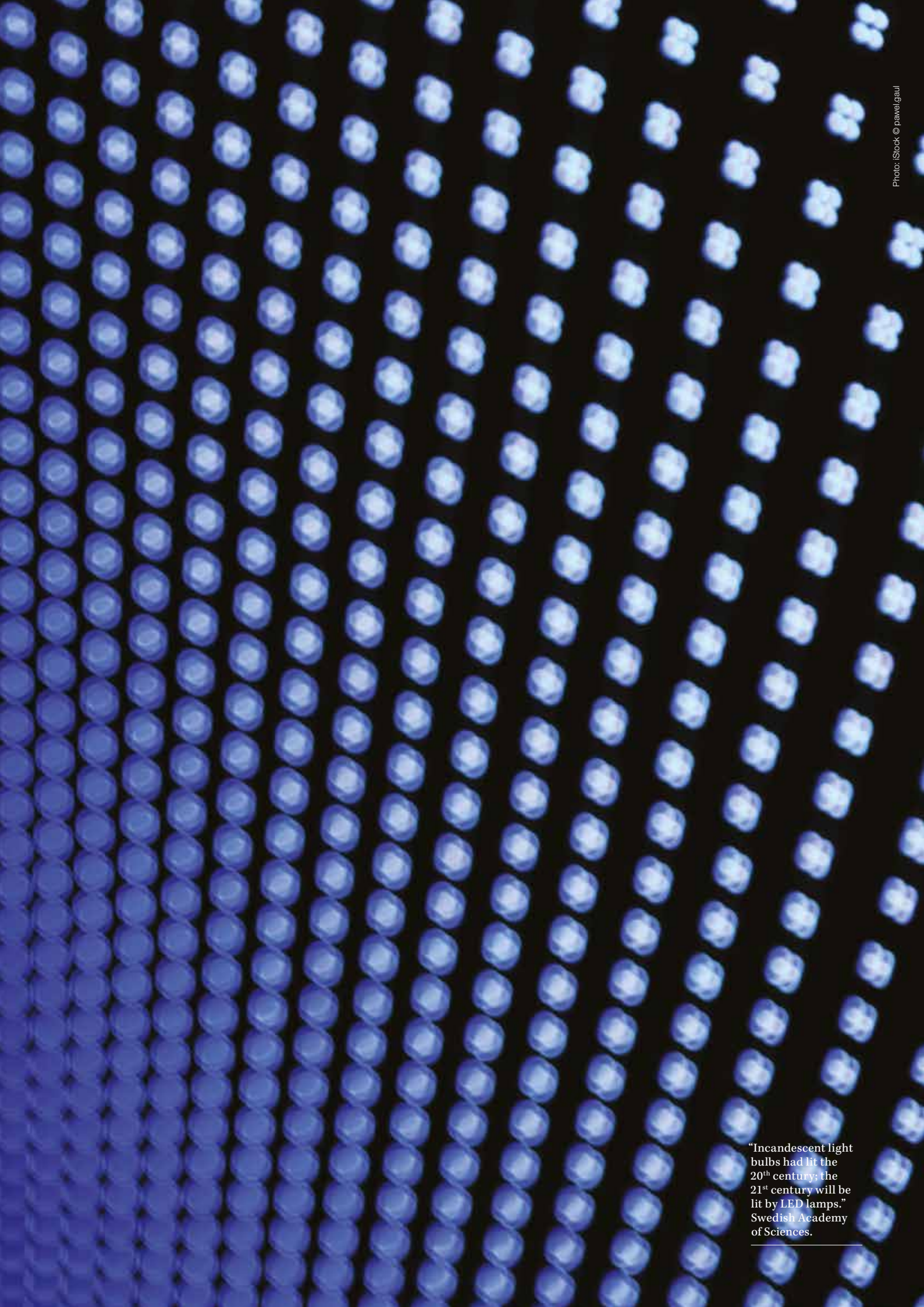
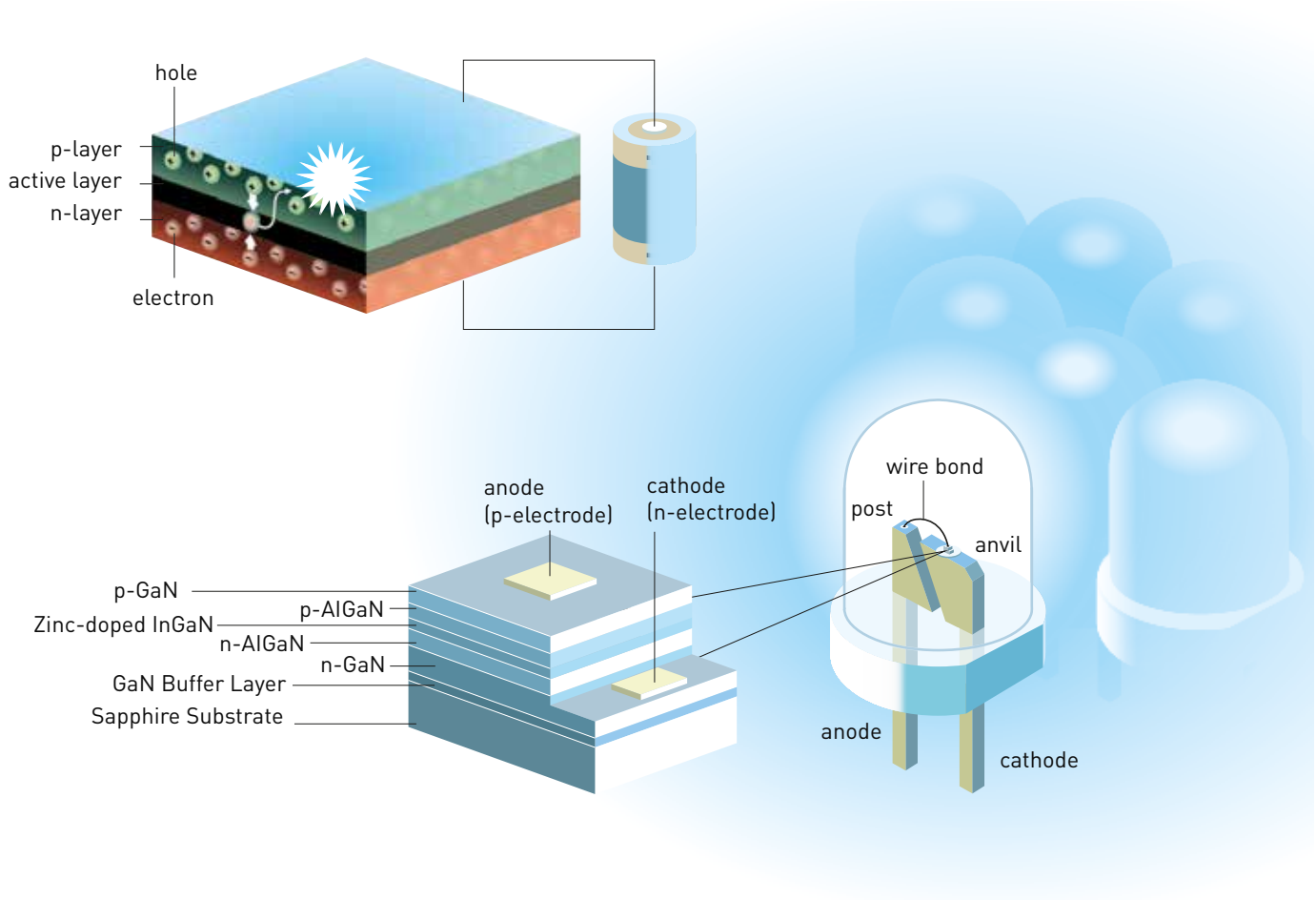


Photo: iStock © pawel.gaul

"Incandescent light bulbs had lit the 20th century; the 21st century will be lit by LED lamps." Swedish Academy of Sciences.



Photos: © Swedish Academy of Sciences

A light-emitting diode consists of several layers: an n-type layer with a surplus of negative electrons, and a p-type layer with an insufficient amount of electrons, also referred to as a layer with a surplus of positive holes. Between them lies an active layer to which the negative electrons and the positive holes are driven when an electric voltage is applied to the semiconductor. When electrons and holes meet they recombine and light is created. The light's wavelength depends on the semiconductor; blue appears at the short-wave end of the rainbow and can only be produced using certain materials.

Blue light emitting diodes (LEDs) are firmly embedded in our daily lives. They backlight the screens of mobile phones, TVs and computers; they illuminate homes, streets and vehicles and are used in an impressive array of other applications from Blu-ray discs and traffic lights to digital communication and dentistry. This high-quality source of light offers significant economic, social and environmental benefits. Some have put the impact of blue LEDs on a par with the transformations brought about by the invention of the traditional (incandescent) light bulb in the early 20th century. Others have heralded blue LEDs as the "most successful semiconductor material of the 21st century." So it seems only fitting that this year's Nobel Prize for Physics, an accolade that recognizes an invention of great benefit to humanity, has been awarded to its inventors – Professor Isamu Akasaki, Meijo University and Nagoya University (Japan); Professor Hiroshi Amano, Nagoya University (Japan); and Professor Shuji Nakamura, University of California, Santa Barbara (USA).

Their seminal work in the mid-1980s sparked an intensification of research and development in the field, triggering a surge in patent filings as well as the rapid evolution of the technology, the emergence of a global multi-billion dollar industry and numerous far-reaching social and environmental benefits.

BREAKTHROUGHS SPAWN FIERCE BUSINESS RIVALRY

In the early years, the two companies responsible for initially commercializing the technology – Toyoda Gosei (with whom Isamu Akasaki and Hiroshi Amano worked in partnership) and Nichia Corporation (Shuri Nakamura's employer at the time) – dominated the lucrative market for blue LEDs. The two companies locked horns in a fierce business rivalry as each fought for pole position. Despite multiple rounds of litigation over patent rights (which ultimately resulted in a comprehensive cross-licensing agreement), their race for market dominance fuelled the technology's rapid advance as each sought to outdo the other by producing brighter, higher quality blue LEDs.

The inventions of this year's Physics Nobel Prize winners have revolutionized lighting technology. LEDs are extremely flexible sources of light capable of producing many different colors at varying intensities, as required.

Breakthroughs in blue LED technology and its commercialization coincided with the growing popularity and explosive demand for mobile phones and liquid crystal displays. Huge sales and even bigger profits transformed the fortunes of both companies as well as those of Nagoya University. Thanks to Japan's adoption of a law akin to the US Bayh-Dole Act, whereby universities gained ownership of patents deriving from government-funded research, Nagoya University was able to generate significant licensing revenue from its blue-LED-related patents. New market entrants including manufacturers of consumer electronics (e.g. Philips and Samsung) and innovative lighting solutions (e.g. Cree and Osram), seeking to tap into the technology's huge commercial potential, added further impetus bringing about multiple advances in performance and an expanding range of applications which go far beyond those of conventional light sources.

LED TECHNOLOGY IN A NUTSHELL

A LED is a solid state lighting solution. Unlike traditional incandescent bulbs where light is produced by heating a filament, a LED consists of several layers of (man-made) semiconductor material which, through a process of electroluminescence, converts electricity into light particles (photons). The wave-length of the light generated by a LED – its color – depends on the semiconductor material used; blue light which appears at the short-wave end of the spectrum, and which is required to create white light, can only be produced using certain materials.

A white LED can be made either by mixing several colored LEDs or by using blue LED with a type of phosphor to create light that is white in appearance. A white LED bulb currently converts around 50 percent of the energy it uses into light compared to just 5 percent in an incandescent bulb. This makes it an increasingly favored, energy-efficient and environmentally friendly source of high-quality light.

A LITTLE LED HISTORY

Red and greens LEDs, invented in the 1950s and 1960s, were created using gallium arsenide phosphide; a material which proved unsuitable for creating blue LEDs. Recognizing the huge technological and commercial potential of blue LEDs (which would complete the palate of colors – red, green and blue - required to make white light), leading industrial labs invested significant time and resources into developing them, but to no avail. Harnessing the properties of the material gallium nitride (GaN), which is the basis for growing and mass producing the crystals needed to efficiently generate high-quality blue LEDs, proved difficult. It took some 30 years to crack the process. Researchers faced three key challenges: how to create high-quality crystals using GaN; how to change their conductivity; and how to boost their light emitting properties.

The lack of progress in working with the material caused many to abandon GaN research in favor of other seemingly more promising materials. But Isamu Akasaki, Hiroshi Amano and Shuji Nakamura remained convinced that GaN would yield the results they sought. Their dogged determination eventually paid off enabling them to succeed where others had failed.

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LEDs use less power to emit light than traditional lighting sources. As around one quarter of the world's electricity consumption is used for lighting, energy-efficient LED light sources can support efforts to tackle climate change.

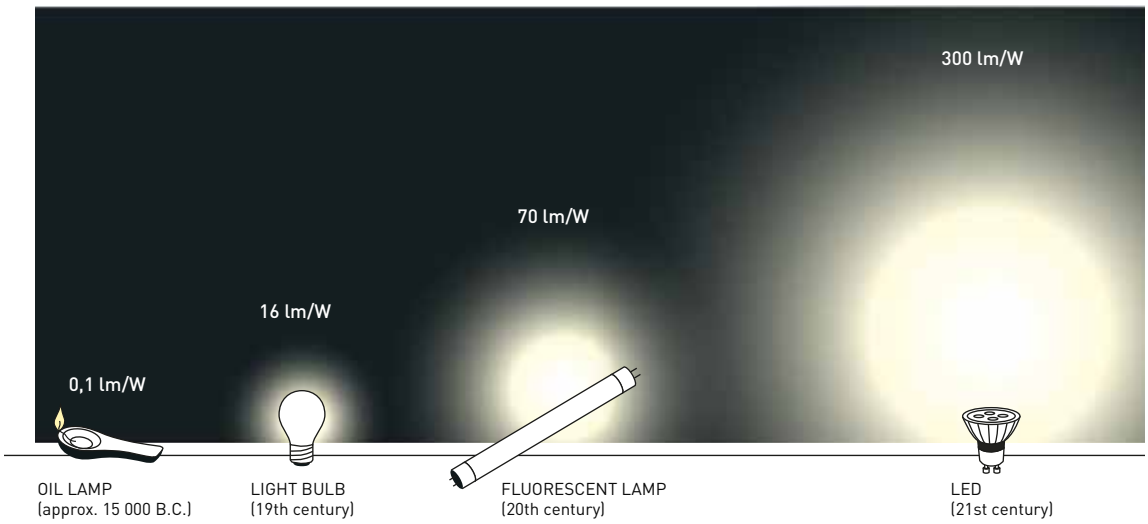


Photo: © Swedish Academy of Sciences

A NEW LED IS BORN

In 1986, Isamu Akasaki and his (then) doctoral student Hiroshi Amano were the first to produce and patent high-quality blue LEDs (US Patent 4855249). The following year, they went into partnership with Toyoda Gosei Corporation under a project funded by the Japan Science and Technology Agency (JST) to further develop GaN-related blue LEDs. Toyoda Gosei began commercial production of its blue LEDs in 1995.

Independently of the Nagoya researchers, Shuji Nakamura (then employed by Nichia Corporation) began developing his own blue LEDs (US Patent 5290393) and the techniques and processes for their large-scale production. In November 1993, Nichia became the first company to commercially produce high-quality blue LEDs.

A year later, drawing on its chemical expertise, Nichia produced the world's first white LEDs by combining yttrium aluminium garnet phosphor with blue LEDs (US Patent No. 5998925). These breakthrough developments spawned the growth of a multi-billion dollar global industry and triggered a seismic shift in the traditional lighting sector.

MULTIPLE BENEFITS; WIDE-RANGING APPLICATIONS

White LED light bulbs are a high-quality, energy-efficient and environmentally-friendly light source. They are around 20 times more efficient than conventional bulbs generating around 300 lumens per watt – a 40 watt incandescent bulb produces just 450 lumens – with a lifespan of around 100,000 hours – compared to around 1,200 hours for an incandescent bulb. They can also operate using cheap local solar power, making it possible to light up the lives of over 1.5 billion people who currently lack access to electricity grids.

As lighting accounts for around 20 percent of the world's electricity consumption (around 6 percent of greenhouse gas emissions), the widespread uptake of LED bulbs promises to significantly reduce global electricity consumption. In the US alone, if energy usage for lighting is cut by 40 percent with the uptake of LED lighting, the technology has the potential to reduce annual energy costs by USD53 billion according to a recent PricewaterhouseCoopers' report (*http://tinyurl.com/optdh6k*).

LED technology is also being used within the healthcare sector to help reduce energy costs and inhibit the spread of infections within hospitals. Its use in managing pain, insomnia and various behavioral disorders and illnesses, including Alzheimer's, is also being explored.

It also holds promise in alleviating the "broadband crunch" resulting from current mass data usage. LiFi, the latest technique in the field of optical wireless communications, "focuses on establishing communication links via LED lighting networks," a report by the technology consultancy iRunway explains (*http://tinyurl.com/muz9crg*).

A FERTILE ENVIRONMENT FOR PATENTS

The Japanese-born scientists' groundbreaking work sparked renewed global interest in blue LEDs and a surge in patenting activity. Patents continue to be an important means by which companies involved in the development and production of LEDs are able to protect their intellectual property (IP) rights and their market position. "Patents are very important because they give companies a competitive advantage in the marketplace," notes Professor Nakamura.

A recent study by iRunway found that since the early 1990s in the US alone, around 22,662 patents have been granted in the LED field – 17,869 of those relating to LED technology and 4,793 of them relating to the application of the technology. "The breadth and complexity of technologies and applications of LED, and the innovation needed to bring them all together, have resulted in aggressive patenting activity over the years," the study notes.

PATENT LITIGATION IS COMMON

Patent litigation is a common feature of the LED sector. In the early days, Nichia Corporation and Toyoda Gosei set the tone, suing and counter-suing each other in some 10 LED

patent-related lawsuits over six years. From 1996 to 2010, 168 LED-related patent lawsuits were filed worldwide according a 2013 paper by Amy J.C Trappey *et al.* in the *International Journal of Automation and Smart Technology* (www.ausmt.org) The LED sector remains in "active litigation mode" with major players currently involved in "almost three active litigations per company" according to iRunway.

LICENSING AGREEMENTS

Licensing and cross-licensing agreements remain the means by which many patent disputes are settled within the industry. "Patent licensing has been one of the leading impetuses for international technology transfer," Amy Trappey *et al* note.

Patent licensing deals, however, also enable companies in a competitive market to avoid patent infringement and costly litigation. Toyoda Gosei, for example, has from the outset been favorably disposed to licensing its technologies to other companies. The company is currently licensing, in collaboration with its international partners, a white light technology patent using blue LED and silicate phosphor to over 30 LED manufacturers according to a recent report by *LEDinside* (*www.ledinside.com*).

While the most basic LED patents are currently controlled by key industry players – Philips, Nichia, Osram, Toyoda Gosei and Cree – enabling them to effectively "control the industry supply chain," and making it difficult for new market entrants, many of these patents (including US Patent 5998925) relating to white LED manufacture) are due to lapse in the coming years, signaling potential changes to LED market dynamics and structure.

TECHNOLOGY TRANSFER

Patents continue to be instrumental in transferring technology within and across the industry through licensing and cross-licensing agreements. They also enable the transfer of technology from university research labs to industry. For example, as holders of patents covering their breakthrough blue LED technology, Isamu Akasaki and Hiroshi Amano at Nagoya University were able to license it to their industrial partner, Toyoda Gosei. By 2006, Nagoya University's GaN-related blue LED licensing revenue rose to around JPY5.6 billion (around USD48 million in today's money) representing at the time around 90 percent of royalties from government-held patents. These revenues have funded the establishment of the University's cutting-edge semiconductor research facility. "Patents […] give universities a mechanism for transferring technologies they develop to the market through appropriate commercial partners. This way, important university innovations can be turned into products that will benefit society. Without the competitive advantage that patents offer, companies would not have the same motivation to commercialize these products," explains Professor Nakamura.

"Through the patent system, inventors and companies are able to retain exclusive rights to their inventions for a certain period of time, which allows them to present these inventions to the world via academic conferences and scientific papers. Without the patent system, I believe there would be no room for friendly competition between inventors or the advancement of science and technology," explains Professor Yasumasa Iwatani, a close colleague of Professor Akasaki at Meijo University.

BLUE LEDS AND THE PCT

A significant number of GaN-based LED patent applications, as well as key pioneering patents filed by this year's laureates have passed through WIPO's Patent Cooperation Treaty (PCT). This is a cost-effective mechanism for applicants (individuals, companies or universities) seeking patent protection in multiple countries. "The advantage of the PCT is that it is easy to expand the patent right to other countries in order to protect the right of the inventor," notes Nagoya University's Hiroshi Amano.

"University technologies are generally very early stage. The PCT is critical for these early stage technologies because it gives us the opportunity to protect our patents globally while allowing the market and the technology to mature further before determining which countries might be most valuable to commercial partners," Professor Nakamura explains.

A simple search of WIPO's Patentscope – a free public database hosting over 43 million patent applications – for GaN-related blue LED patent applications indicates that over 8,250 international applications were filed during the period 2004 to 2013. A similar search revealed that Professors Nakamura, Akasaki and Amano have filed 207, 65 and 53 patent applications respectively over the years.

The pioneering achievements of Professors Akasaki, Amano and Nakamura, are transforming the global lighting industry and have given rise to a broad range of applications in other areas, including, consumer electronics. "Incandescent light bulbs had lit the 20th century; the 21st century will be lit by LED lamps," notes the Swedish Academy of Sciences. LED lights are fast becoming the lighting source of choice. By 2020, LED bulbs are expected to occupy around 70 percent of the lighting market, the value of which is expected to rise to EUR83 billion (Mckinsey 2012). The impact of the achievements of this year's Nobel Physics laureates is far-reaching and dramatic, promising significant environmental benefits on top of significant energy and cost savings. The on-going technological and commercial dynamism of the sector suggests that the party is far from over. It may have only just begun. ◆

Consumers understand IP is THE KEY TO INNOVATION

*By **Don Rosenberg**,*
Legal Counsel,
Qualcomm Corp., USA

The state of innovation in our global economy is strong. For now.

Around the world, everyone loves and praises innovation. Corporations and governments, marketers and educators, promote it as the key to survival and prosperity. For consumers, it is the catalyst for individual product purchases that in total add up to swings in the gross domestic product of one economy or another. It is the key ingredient driving the following questions: is this product or service new-and-improved enough to make my life better or easier? Is it superior to rival products or services? Is it worth more of my money?

Cars, home appliances, information and entertainment electronics, business equipment, clothing – name almost any industrial sector and you will find rivals trying to out-innovate each other and repeatedly offering accolades to the power of "innovation."

But some kinds of innovation affect human lives more than others.

A dynamic the consumer rarely thinks about but that governments must consider is that the most exceptional kind of innovation, the result of inspiration and hard work and significant investments of time, money or both, can earn what is sometimes considered a more venerated name: invention.

WHAT IT TAKES TO INCENTIVIZE INVENTION

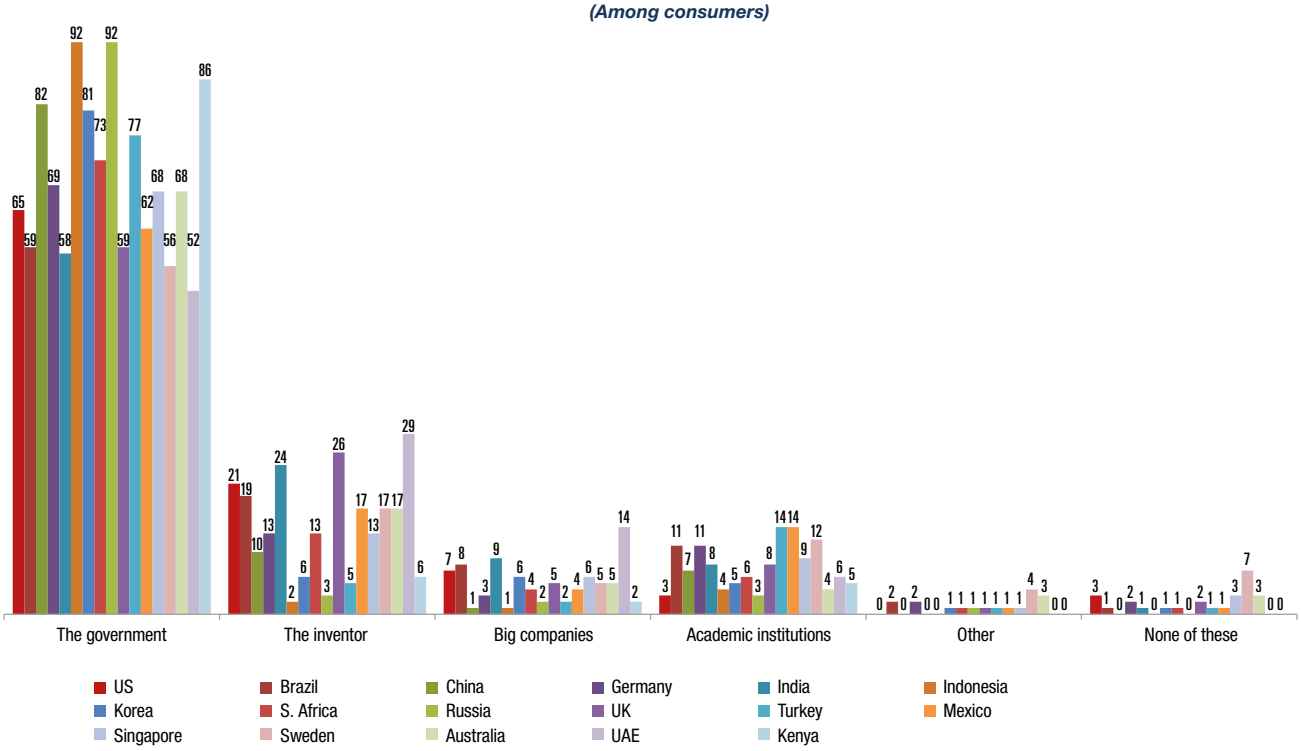
Yet far too many policymakers have forgotten what it takes to incentivize the hard work, investment and creativity that bring new inventions to life. Even as we celebrate the merits of innovation and laud the growing significance of a knowledge-based economy, it has become too easy to take for granted the legal and economic frameworks that made the technological wonders of modern life possible.

Take the mobile phone, which was found to be the most useful invention of all time by more than 70 percent of respondents to a recent global poll published in *TIME* magazine. Today's smartphone, in fact, is not just one invention but the product of hundreds if not thousands of them. Every week, it seems, new smartphones appear that have their own unique features that we, as consumers, value. And the marketplace is the metric we use to measure which feature is most preferred or which manufacturer does a nicer job designing it. Sometimes a new function wins consumers' hearts, and sometimes it's an original form – the look, the feel, the buttons – and sometimes it's a combination of the two. We base our decisions on these distinctions.

But what about the science and engineering that make smartphones possible in the first place, that allow hundreds of millions of people at any given moment to converse with friends located anywhere in the world or to call up key business

Who should protect intellectual property rights?

Whose job do you think it is to protect intellectual property rights?
(Among consumers)

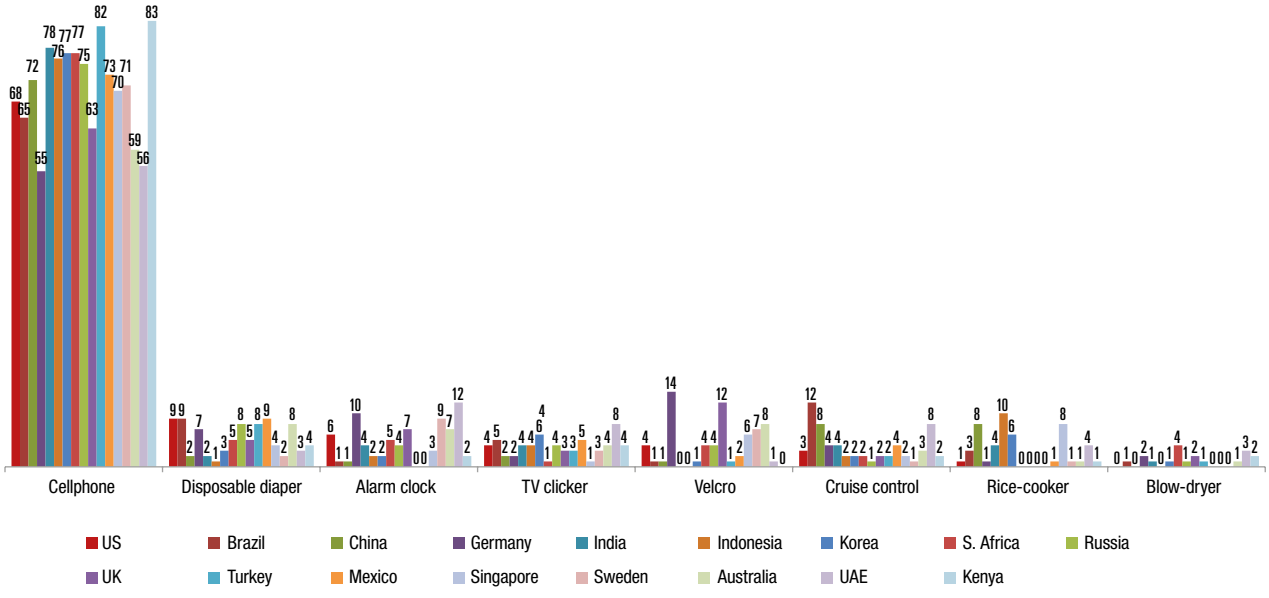


Charts: *TIME* magazine

Base: Consumers: US=400, BRA=200, China=400, DE=400, IN=400, ID=200, KO=401, S.Africa=220, RU=201, UK=401, TR=401, MX=401, SG=400, SW=401, AUS=400, UAE=400, KEN=507

The most useful inventions

Which of the following inventions do you believe to be the most useful? ***(Among consumers)***



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data or download a hit song or video – all using the same spectrum that less than two decades ago was limited to carrying a limited number of expensive, frequently interrupted voice calls? This is what I mean by invention. And as the general counsel of Qualcomm, whose inventions empower this technology, I take pride in describing them.

But I am a fan of invention far beyond the fields of communications technology.

INVENTION IS ENDEMIC

Invention is endemic to the human spirit, and the history of both anonymous and famous inventors is interwoven in the history of humankind. We are unique as a species in part because we have the means to discover how we can live better, happier, healthier lives. This has taken us from the wheel to the airplane, from the light bulb to the radio telescope, from the telegraph to the smartphone, and from penicillin to what we hope will be viable treatments for Ebola.

And if policy makers sometimes forget how we managed to rapidly accelerate that pace of invention over the past two centuries, I'm pleased to report many consumers and business leaders around the world have not.

Nearly 85 percent of the consumers who responded to the *TIME* poll said they think we live in an age of invention, and a vast majority said the more their country supports invention the more their country will thrive economically.

CONSUMERS RECOGNIZE IP PLAYS A KEY ROLE

What I found even more fascinating is the sophistication of survey respondents in their recognition that the key to this support is protection of intellectual property (IP). The poll found patents are considered crucial for the invention process because they offer the best incentive for inventors to create something new and useful and the only guarantee that inventors and their financial backers will recoup and profit from their invested time and money. Among the global business decision-makers surveyed, 84 percent said they want stronger IP protection, and respondents in emerging-market economies – expressing envy for the strong patent systems of industrial nations – were the most likely to seek stronger IP rights and the promotion of economic equality that comes with them.

PATENTS ARE NECESSARY FOR INVENTION

Worldwide, 90 percent of consumers said patents are necessary to promote invention.

The reasoning behind these poll results is clear: recognition that a patent represents a rule-of-law promise that for a limited time any inventor, large or small, owns the invention she or he has worked hard to create.

I make no secret of my interest in the public debate involving patents. Qualcomm would never have been able to create and then constantly advance the technologies empowering the world's wireless ecosystem without patents.

The revolutionary technologies we brought to market two decades ago were met with derision and commercial resistance from much of the wireless industry. Yet we were able to reassure our early investors with the promise that our patents would protect their investments. Now we are a company that employs more than 30,000 people – mostly engineers developing the next generation of mobile communications – as we continue to work collaboratively with nearly the entire wireless industry. Our patents allow us to keep introducing transformative technologies in ways that promote competition among handset makers and lower prices for consumers.

Patents are the key ingredient of our virtuous circle of investment in research and development, invention, licensing our invented technologies, and plugging much of that licensing revenue back into more research and development, which in turn produces new inventions. Patents allow us to take the risks of trying to do what no one has done before and to fail plenty of times until we succeed, because we know success will be rewarded.

This invention and innovation environment could be put at risk by some commercial interests and misguided government agencies whose goal is to weaken patent rights. They have a disregard for patents or a lack of understanding of patents' value that, as we see in the *TIME* poll, contrasts with the broader recognition of how vital patents are and have been to technological and societal progress.

It is time IP policy makers take a step back and consider what respondents to the *TIME* poll already appreciate: patents have made possible so much that we value in contemporary life, and the unintended consequences of weakening patent rights will be the loss of new innovations and new inventions that could have made a difference in our lives. ◆

Navigating DRIVERLESS CARS

*by **Emma Poole,***
Lawyer and Researcher,
Melbourne, Australia

The five levels of automation:

1. No-Automation – the driver is in complete control;
2. Function-Specific Automation – a function assists the driver (electronic stability control or brake-assist technology);
3. Combined Function Automation – two functions are designed to work together in certain scenarios – such as "adaptive cruise control … with lane centering";
4. Limited Self-Driving Automation – enabling the driver to give up control of the car in certain scenarios, with sensors to trigger the need to return control to the driver;
5. Full Self-Driving Automation – the car performs all driving functions and monitors road conditions without any input; a person will determine the destination and then give up all control of the car.

Photo: Google

Google's self-driving car project has dominated coverage of the emerging driverless car sector.

In September 2014, *The Economist* debated whether "completely self-driving cars" are "feasible in the foreseeable future". The 32 percent of readers who voted "no" have obviously missed the news that this staple of science fiction has already turned into science fact.

Whether we call them driverless, self-driving or autonomous, these cars have navigated downtown Parma and driven from Italy to China almost unaided (a human being had to drive through Moscow and pay the tolls). A Mercedes-Benz S-Class travelled between Mannheim and Pforzheim without driver input in August 2013 and, most famously, the Google Self-Driving Car Project has now completed over 700,000 test kilometres. The prototype cars cannot always navigate potholes, see a traffic light with the sun behind it or drive in the rain, but driverless vehicles are more than feasible, you can buy them.

WHAT IS A SELF-DRIVING CAR?

A car is self-driving if it can operate without the "active control and continuous monitoring" of a human being. According to the US Department of Transportation, this means that the car's operation does not require driver input to control the steering, acceleration or braking. However, automation is really a question of degree. The National Highway Traffic Safety Administration in the US has identified five "levels" of automation (see box).

ALREADY HERE?

Fully automated vehicles are now commonplace in certain controlled environments. You may have already travelled on a segregated railway or guideway (also known as light rail) system in Vancouver, London, Singapore or between terminals at airports around the world. The Park Shuttle vehicles in the Netherlands use dedicated bus lanes

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and mining company Rio Tinto has a fleet of autonomous trucks operating at its Pilbara iron ore mine in Western Australia. At the same time, an increasing number of mass-produced cars now incorporate semi-autonomous, driver assistance functions such as assisted steering, parking or braking; drowsiness detectors; and devices to detect, and help avoid, potential collisions with other vehicles or pedestrians.

The next generation of semi-autonomous car technologies coordinate two or more functions. Examples include Mercedes Benz's adaptive cruise control with steering assistance; Volvo's traffic jam assistance, allowing cars to automatically brake and follow cars in slow moving queues; and Audi's piloted parking. Many other carmakers including General Motors, Ford, Volkswagen, Nissan, Toyota and BMW are also testing advanced driver assistance systems (ADAS).

HOW THEY WORK

Exane BNP Paribas, an investment company, predicts that the tech and telecommunication sectors will see more benefit from the expected growth in the connected car market than the traditional automobile industry. The reason for this is simple – something is driving driverless cars and that something is software processing huge volumes of data.

Driverless cars operate by amassing information collected from cameras, sensors, geo-location devices (including radar), digital maps, navigation programming and communication from other connected vehicles and infrastructure. Operating systems and software then process this information and coordinate the mechanical functions of the car. These processes mimic the hugely complex task human drivers undertake when they monitor the road, the car and themselves in order to drive. Recent examples include Google's patent on reading traffic lights or Tesla's latest saloon, which adjusts its speed to comply with road signs.

KEY BENEFITS – ACCESS AND SAFETY

Fully autonomous cars will negate the need for driving restrictions relating to age and ability because the only prerequisite for making a journey may be the ability to program a destination. A six year old may take himself to school or an older person stay independent for longer. This increase in access to mobility should facilitate the active participation of the 22 percent of the world's population who will be over 60 in 2050. To highlight the potential of driverless cars to assist people with disabilities a Google car has recently driven a blind man to Taco Bell for a take-out.

Increasing road safety will be the most critical benefit of driverless cars. At the moment there are 1.24 million road traffic deaths worldwide every year (50 percent are pedestrians, cyclists and motorcyclists) and road traffic accidents are the number one cause of death for those aged between 15 and 29 years. Around 90 percent of all traffic accidents are caused by human error whether distraction by phone calls or texts;

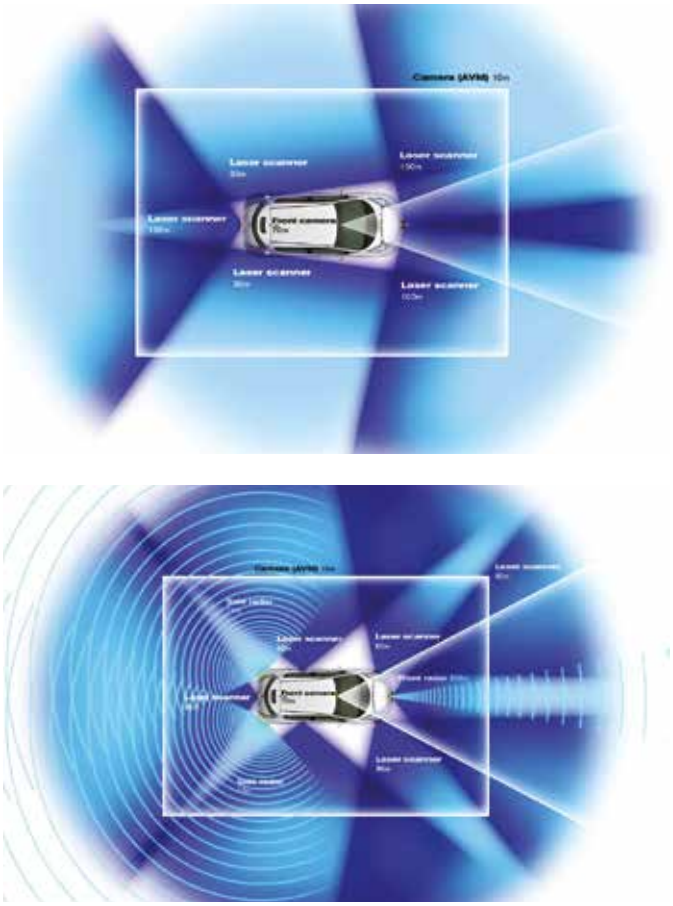

Photo: © Nissan

Driverless cars operate by amassing information from cameras, sensors, geo-location devices (including radar), digital maps, navigation programming and communication from other connected vehicles and infrastructure.

Photo: Ultra PRT

drowsiness; intoxication; or the effects of medical impairments or conditions. Fully automated vehicle technologies offer the potential to circumvent human driver error completely and combine robotically rapid responses with 360-degree perception. Equally, semi-automated, driver-aware vehicles could use sensors to detect changes in heart rate or skin temperature and then trigger extra safety or assistance measures. General Motors is already testing eye and head-tracking technologies to check for signs of drowsiness.

COMING SOON

The first radio-controlled cars drove in the US in the 1920s but development in the sector has been slow until very recently. Research by the Boston Consulting Group suggests that R&D investment by the automobile industry generally (including into driver assistance functions) has rapidly expanded in the past four years (*http ://tinyurl.com/l38od6r*).

As part of this pattern, purpose-built testing sites are popping up around the world : from AstaZero, Volvo's 2 million square meter (21.5 million square feet) testing facility in Sweden to a custom-made test town built outside Ann Arbor in Michigan in the US. Testing of autonomous vehicles on public roads has been facilitated by amendments to the Vienna Convention on Road Traffic and the introduction of legislation in the UK, France and various US states (including California, Florida and Nevada).

Public-sector tests include the EU's V-CHARGE consortium's automated valet system that will park and charge electric cars, the three LUTZ Pathfinder "autonomous pods" due to explore the pavements of Milton Keynes in early 2015 and "vehicle platooning" by the Safe Road Trains for the Environment (SATRE) project, funded by the European Commission (enabling cars to connect to, and follow, a lead vehicle driven by a professional driver in a particular highway lane).

Since 2011, London Heathrow Airport has been running a fleet of driverless electronic vehicles on a dedicated guideway. Designed by UK-based company Ultra PRT, these autonomous pods ferry around 1,000 passengers each day between the airport's Terminal 5 and its car parks.

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THE G-WORD

Google's self-driving car project has dominated coverage of the emerging driverless car sector. *The New York Times* outed the secret project in October 2010 and since then the resources of the world's third-largest company have been deployed to put Google at the center of autonomous vehicle R&D (including hiring influential scientists and engineers such as Sebastian Thrun).

This project from the company's Google X division forms part of Google's broader strategy of investment in the early stages of new technologies, demonstrated by a huge surge in patent applications. In 2013, Google was awarded around 2,000 US patents, almost double the number of all its previous patents and the company has clearly learned the importance of owning intellectual property (IP) in the building blocks of new technological sectors from the smartphone and semi-conductor patent wars.

This early investment gives Google a number of strategic options. It can build the first mass-market driverless cars or license the technologies that underpin the sector to manufacturers (hoping that at least a few are adopted as standards). Equally the company could follow the strategy it adopted with the open access release of its Android mobile operating system and continue to harvest the data generated by eager users of its systems.

THE BIG PROBLEM – CODE, ETHICS AND LIABILITY

As driverless cars emerge onto roads there will be a shift in legal responsibility for driving from drivers to manufacturers (and their suppliers). As the CEO of Renault-Nissan, Carlos Ghosen, suggested "The problem isn't technology, it's legislation, and the whole question of responsibility that goes with these cars moving around."

A car may end up in the wrong place due to an error in a digital map, a sensor malfunction, a glitch in the navigation software or a combination of all three. Another's programming may brake to avoid a pedestrian, killing the traveler or the occupant of the following car (in a variant of the famous "trolley problem" and Isaac Asimov's first rule of robotics). Yet another car may be subject to cyber-attack through an undiagnosed flaw in the underlying open-source architecture of the connected world (such as the recently discovered HeartBleed and Shellshock flaws).

Driverless cars will inevitably break, crash and hurt people. When they do, we will need to understand who to hold accountable: whether it be the traveller, the manufacturer, the various suppliers or the programmers who wrote the underlying code. This will be a question of software IP and as the recent *Alice v CLS Bank* decision of the US Supreme Court (see *Alice v. CLS Bank: United States Supreme Court Establishes General Patentability Test – www.wipo.int/wipo_magazine/en/2014/04/article_0004.html*) has shown us, the status of IP protection for software is vexed and in flux. While this question arises in relation to all kinds of digital architecture, driverless cars will be the one type of connected device where legal issues (such as the effects of collaborative creation, device interoperability, digital circumvention and the ownership of APIs) will almost always be life or death.

SAME, SAME BUT DIFFERENT

The first industries and business models disrupted by driverless cars may be involved in point-to-point transport and delivery like public transport, taxis, car hire, couriers, trucking and logistics. Improved safety will reduce demand for all the sectors that assist after road traffic accidents – towing, vehicle repair, auto parts suppliers and even ambulances and emergency services. Governments may lose revenue from parking charges or fines for infringements but develop new revenue streams such as GPS-based road pricing (a charge for using particular roads). Drivers may no longer need collision insurance but, as John Villasenor at the Brookings Institution has pointed out, as travellers or operators of driverless cars, they may need expanded forms of product liability insurance.

If the systematization of driverless cars becomes a reality (think of a real life version of the MAG-LEV electrical/magnetic horizontal and vertical roadway system that automotive designer Harold Belker helped design for the film *Minority Report*) then vehicles could become the ultimate connected devices allowing "Smart Cities" with integrated networks and infrastructure to move populations *en masse*. Mr. Belker described the overall goal of his fictional system as "individual transportation within a mass transport system" and it is possible to imagine that automated cars in a connected network would reduce the number of vehicles required to meet transport needs. Existing car share platforms provide the software and online environments necessary to match available cars with waiting travellers. Uber's digital architecture will clearly move seamlessly into this space and its economic model will only become more attractive as its most expensive input and liability, drivers, are phased out.

The industry that is likely to be most fundamentally disrupted by driverless cars is car making itself. Mass production of automated electric vehicles by additive manufacturing processes like 3D printing could transform the economics of car ownership, from financing, depreciation and fuel to insurance and maintenance. In that circumstance, it is not clear what design and branding elements will attract consumers to self-driving cars, except that they will affect how the car looks and feels to travel in, rather than to drive. Some may miss the romance of hot metal and the open road but as the *Wall Street Journal* memorably put it: "Give people a button that says 'Home' and I guarantee they will push it". ◆

COMMERCIALIZING IP: CHANGING ACADEMIC MINDSETS

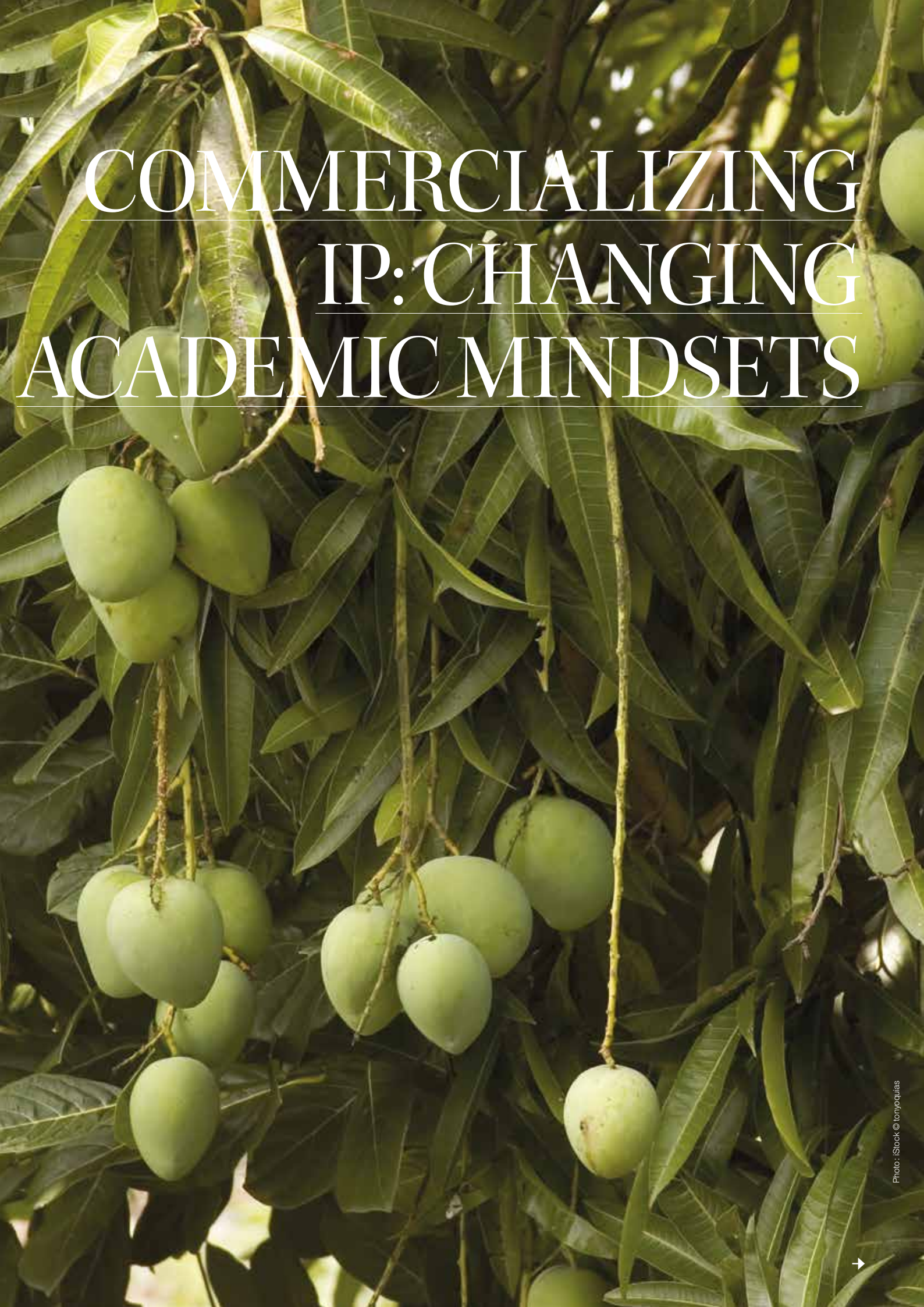

Photo : iStock © tonyoquias

*By **Danilo B. Largo, Ph.D.,** Director, Office of Research and Manager of the Innovation and Technology Support Office (ITSO) of the University of San Carlos, Philippines*

The "publish or perish'" mindset has governed academic research for years, both in the Philippines and beyond. Consequently, copyright was widely regarded as the single most important intangible asset held by universities. However, thanks to the drive by the Intellectual Property Office of the Philippines (IPOPHL), with the support of WIPO, to establish Innovation and Technology Support Offices (ITSOs) in universities and research institutes across the country, a new mindset is emerging. A new mantra – "patent, publish and profit", which emphasizes the broad use of intellectual property (IP) to leverage the knowledge generated by university researchers to solve society's problems – is gaining currency.

A few years ago, technology transfer was not part of the business plan of the University of San Carlos (USC). It was a foreign concept. Today, however, IP commercialization is creating quite a buzz around the campus, as the University strengthens its ability to supplement tuition fees – its sole revenue source for many years – with revenues from the commercialization of technologies developed from USC research using the IP system.

The idea of IP commercialization first took hold within the BioProcess Engineering Research Center (BioPERC) which is part of USC's Chemical Engineering Department. BioPERC houses the University's most advanced laboratory, specializing in chemical analyses of natural and fermentation products. The Center's research focus on waste and energy has spawned a number of breakthrough technologies that improve the management of solid waste. The treatment of sanitary and mango waste, one of the most pressing challenges facing government authorities in the University's home provice of Cebu, is a research priority for BioPERC. The aim is to generate environmental and cost savings and create livelihood opportunities for local citizens by converting the significant mountain of waste generated each day in Metro Cebu into useful and marketable products.

A NEW START-UP IS BORN

Mango peel is commonly regarded as a waste by-product in fruit processing and typically ends up in landfills or open dumpsites. Around 1,000 tons of mango waste (some 10 percent of all solid waste) are generated every day by the mango processing industry in Cebu. Research undertaken by BioPERC, however, revealed that mango peel has significant health benefits. It contains high quantities of carbohydrates and crude fiber, can be an excellent source of pectin and has good antioxidative and antimicrobial qualities.

BioPERC developed a novel way to recover the beneficial elements of mango waste and to convert it into high value products. BioPERC's researchers, Dr. Evelyn Taboada, and Dr. Francis D. Siacor, filed a patent application with IPOPHL in 2012 and subsequently filed an international patent application under WIPO's Patent Cooperation Treaty (PCT). On the strength of these applications, the University has entered into a joint venture with a local investor to create a small start-up company, Green Enviro Management Systems (GEMS), Inc. which has an exclusive license to use the process and produce products for a wide range of applications in the food, pharmaceutical, personal care, and energy industries.

The University's implementation of a fully-fledged IP policy (covering trademarks, designs, copyright and trade secrets) promises new and significant revenue streams. The inventors and departments responsible for these inventions will also benefit from

Photo: USC

BioPERC's researchers, Dr. Evelyn Taboada, and Dr. Francis D. Siacor (above), developed a new way convert mango waste into high value products. They filed a patent application with IPOPHL in 2012 and through the PCT. As a consequence, a small start-up, Green Enviro Management Systems (GEMS), has been established.

Photo: iStock © digi_guru

the University's IP policy royalty-sharing scheme. Slowly but surely, IP commercialization is becoming a reality. As some of the big names in Philippine business take an interest in the University's work, the promise of long-term financial sustainability is taking shape.

PATENTS AS THE CORE OF BUSINESS

The University's commitment to IP commercialization will put it in a stronger position to get a return on its R&D outputs. It is currently exploring a variety of means, including joint ventures, licensing and sub-licensing arrangements, to expand the application of its waste management technology to other cities and jurisdictions with waste management challenges. The University's success to date, in terms of filing patent applications and sealing deals with local businesses to commercialize its technology, is demonstrating the income-generating potential of an effective IP strategy. This, in turn, is opening up the academic mindset to the countless possibilities that can derive from building bridges with business through strategic use of IP.

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MAKING A DIFFERENCE THROUGH THE ITSO

Established in March 2013, USC's ITSO was the first to file its two patent applications under IPOPHL's Patent Protection Incentive Package (PPIP). In another historic move, USC was also the first ITSO to file an international patent application (for BioPERC's waste management technology) under the Patent Cooperation Treaty (PCT). The USC ITSO team's invaluable support in advising the researchers who developed the technology that is now core to GEMS' business has been central to the University's success in this area to date.

Under the ITSO franchising agreement with IPOPHL, USC committed office space and hardware and also assigned staff to perform a variety of IP-related tasks, including patent searching, patent drafting, patent prosecution and IP management. These skills were acquired over a rigorous, three-year training program provided by IPOPHL and its partners. USC's ITSO services cater to internal clients, mainly from the engineering and science departments.

While its main focus is patents, the office also engages in IP education. ITSO staff give seminars and lectures to increase IP awareness among faculty, students and administrative staff. USC is unequivocal about the crucial importance of a fully operational ITSO to any educational institution seeking to generate, adapt and transfer knowledge and technology for national development and global competitiveness.

BUILDING A CRITICAL MASS OF EXPERTISE

Despite USC's early success, much still needs to be done to improve the University's overall capacity to protect its IP assets. The skills and knowledge acquired since the establishment of its ITSO offer a sound basis for building and strengthening its IP capabilities. On top of the solid foundational learning provided by IPOPHL and its international partners, the continuous capability training and distance learning courses offered by WIPO, have produced a critical mass of patent searchers and patent drafters within universities across the country. A number of these trainees have gone on to pass the European Patent Office's Patent Agents Qualifying Examination (PAQE).

Growing numbers of universities are recognizing the potential and benefits of IP commercialization and are seeking to host an ITSO. So far ITSOs have been established in around 70 universities and research institutes in Luzon, Visayas and Mindanao. With sustained government backing, the expertise and services provided by ITSOs will continue to re-cast the innovation landscape in the Philippines, improving levels of competitiveness and the economic performance of the country as a whole.

By empowering universities to own and exploit any IP assets with commercial potential, the Technology Transfer Act of 2009 (R.A. 10055) has paved the way for this transformation. Although the day will come when universities are able to generate significant revenues from royalties derived from commercializing their R&D outputs, today, there is a continuous need for university research funding to fuel university R&D efforts. Without on-going government support it is difficult to see how universities will be able to generate patentable, commercially viable innovations and fully harness the benefits of IP commercialization. ◆

THE THREAT OF SIGNAL PIRACY

to broadcasters serving minority communities

*By **Christopher Wood**, Senior Vice President and Associate General Counsel, Univision Communications Inc., USA*

Univision Communications Inc. (Univision) is the leading media company serving the Hispanic community in the United States (US). Our programming services feature two over-the-air Spanish-language broadcast networks, *Univision* and *Unimás*, and a suite of cable television networks that includes *Univision Deportes*, the leading Spanish-language sports channel in the US. With the tremendous growth of the Hispanic population in the US over the past decade, *Univision* has evolved from a niche service into a leading content provider. Our flagship Univision Network is now one the most-watched broadcast networks – in any language – in the US.

Univision is a content creator, producing thousands of hours of national and local news, public affairs, sports, daytime entertainment, special events, music specials and other programming. But we also license marquee entertainment programming from other producers, particularly Televisa, the world's leading Spanish-language content producer. Further, Univision licenses live sports programming such as Major League Soccer in the US, the *Liga MX* (the premier soccer league in Mexico), the US and Mexican national teams, boxing and Formula One.

With 61 stations across the continental US and in Puerto Rico, Univision is also one of the largest TV station owners in the country. Our flagship station in Los Angeles, KMEX, is the most-watched station in the US among adults aged between 18 and 49 – in any language. Univision TV stations also serve African American viewers on their digital multicast streams, as one of the largest affiliates of Bounce TV, a television network co-founded by Martin Luther King III.

Photo: Univision Communications Inc.

Univision's programming is pirated every day of the year. The company is joining ranks with other broadcasters around the world to raise awareness among international policymakers about the detrimental effects of signal piracy, and the need for a new international treaty to protect broadcast signals.

As a 21st century broadcaster, Univision delivers its programming to viewers on multiple platforms, including *Univision.com*, the most visited Spanish-language website in the US, and *UVideos*, the first bilingual digital video network serving the US Hispanic community. In short, we go where our viewers go, in order to serve them the best we can.

PIRACY OF UNIVISION PROGRAM STREAMS

Univision's programming is pirated every day of the year. For years, Univision has received reports that certain cable companies across Latin America and the Caribbean have distributed its broadcast signals without permission, particularly the signals of our Puerto Rico TV stations during the FIFA World Cup™. With the advent of the Internet, however, signal piracy is no longer just a regional phenomenon that flares up during major soccer tournaments, but a global and *ongoing* occurrence. Univision's broadcast signals are streamed across the world by websites that never received, or even asked for, authorization to do so.

For all its benefits, digital technology has made broadcast signal piracy easy and inexpensive. Using a home computer, a pirate can capture a television station's broadcast signal with a simple tuner card or the station's signal streamed on line. The pirate can then stream that station's signal on his or her own "channel," using one of the popular sites that enable live streaming of what is supposed to be user-generated content. These unauthorized live streams are aggregated and distributed to a much larger universe by sites that link to or actually embed them. Some of the larger aggregation sites actually provide directories of the pirated signals. Sites that host and aggregate pirate broadcast signals are able to generate significant revenue by selling banner ads, pop-up ads, and pre-roll ads that appear before those streams, which are often placed by automated systems without regard to their legality. The consumer advocacy group Digital Citizens Alliance reports that "content theft sites are making millions in revenue, at high margins, from advertising" *(http ://tinyurl.com/ofx7gtb*).

PIRACY AND THE FIFA WORLD CUP™

Although the FIFA World Cup™ is the most popular sporting event in the world, perhaps no one enjoys the tournament as much as signal pirates. The online protection firm NetResult has reported that, during the 2010 FIFA World Cup™ from South Africa, it found over 15,000 live user-generated content streams on 17 sites with pirated content (*www.wipo.int/export/sites/www/ip-sport/en/pdf/piracy_report_2011.pdf*). And during the FIFA World Cup™ in Brazil this year, Univision's content protection firm reported 1,736 unauthorized live streams of Univision's coverage of 64 matches and the opening and closing ceremonies. These streams originated on sites in at least 20 different countries around the world. Only a small number of these sites allowed us to utilize live takedown tools to remove pirated content. Univision sent the remaining sites take down notices but, despite these efforts, over 800 pirated streams failed to comply, representing almost half of the pirated streams detected throughout the tournament.

INSUFFICIENCY OF CURRENT LAW

In many jurisdictions, if a streaming site or other distributor refuses to comply with a "take down" request, a foreign broadcast company lacks effective remedies to tackle signal piracy. NetResult has described domestic copyright litigation accurately as a "remedial tool available only in limited circumstances."

A broadcaster may not be able to bring a copyright action for an unauthorized live transmission prior to any fixation of its signal. In addition, domestic laws may not permit a program licensee to bring an action for copyright infringement when its rights are derived from a third party, as when we license the broadcast of matches in a soccer tournament. Domestic laws may be unclear. And, of course, there is no unified standard across all jurisdictions. Clearly, these are serious impediments for program licensees seeking to protect their rights with respect to live sporting events, where time is of the essence.

THE IMPORTANCE OF BROADCASTING

There should be no doubt today that broadcast signals are worth protecting and preserving. Broadcasting is important to our society. Our signals deliver not only soccer and dramas, but also news, election coverage, political and social commentary and important information about weather emergencies. Broadcasting helps bring the citizens of a large and diverse country together. In the US, Spanish-speaking families come from 20 different countries of origin. Univision's broadcasts in Spanish give them a common forum and a bridge to the larger society.

Television station signals are not a natural occurrence. They are the result of significant investments by broadcasters in the creation of news, public affairs and other programming with important societal benefits. Broadcasters also invest in the acquisition or licensing of programming from third parties, which they arrange and package with their own content in creating their program schedule. Moreover, broadcasters invest in the equipment and infrastructure required to transmit that schedule as an electronic signal. If financial returns are diverted to signal pirates, then it becomes difficult for a broadcaster to continue to make these significant investments in its signal. The loss of licensing revenue does not just hurt the broadcast organization, but everyone else in the supply and distribution chain.

To better protect our rights, Univision has joined with broadcasters and broadcast associations from around the world. We are a member of the Ibero-American Broadcasting Alliance for Intellectual Property (ARIPI), made up of Spanish language broadcasters from North, Central and South America and Europe. We are also a member of the North American Broadcasters Association (NABA), representing broadcasters in Mexico, the US and Canada. Working together, our goal is to help raise awareness among international policymakers at WIPO about the importance of broadcasting as an intellectual property right, the detrimental effects of signal piracy, and the need for a new international treaty to protect broadcast signals – and the viewers who depend on them.

A new broadcast treaty for the digital age is long overdue. Internationally, broadcasters are still operating under the Rome Convention which reflects the analog, black and white television technology that existed in 1961 when the treaty was concluded. While, since that time, WIPO's member states have successfully updated the rights of authors, performers and producers under other treaties, no such developments have occurred with respect to the rights for broadcasters. Discussions relating to updating those rights have been on the agenda of WIPO's Standing Committee on Copyright and Related Rights (SCCR) for many years. It is time to bring these discussions to the next level, at a diplomatic conference to conclude a new international agreement on broadcasting. ◆

IP & SPORTS: a winning formula

When supported by a strong intellectual property legal framework, sports events become high value business ventures.

Photo: iStock © franckreporter

Photo: iStock © Grafissimo

Top-tier sports events such as the FIFA World Cup™ and the Olympic Games are largely funded by revenues from the sale of TV broadcasting rights and marketing rights.

*By **Simone Lahorgue Nunes**, Senior Partner at Levy & Salomão Advogados, Rio de Janeiro, Brazil*

Sports events are no longer simply a means of entertainment, they are also big business. Top tier events attract significant investment, involve large numbers of stakeholders and generate a great deal of employment. They are, however, high-value business ventures only when supported by a strong intellectual property (IP) legal framework.

UNIQUE COMMERCIAL OPPORTUNITIES

Sports events offer companies unique commercial opportunities. They generate a deep-rooted emotional response from the public. This transforms them into a globally accessible "product"; a valuable vehicle that companies can use to position and promote their logos and branded goods in relevant markets. Companies also have the opportunity to reach an unlimited territory and benefit from being associated with the success of a particular event, factors that undeniably increase the importance of such investment.

In associating themselves with sports events, companies can benefit from a number of marketing opportunities. For example, they may choose to sponsor a specific event or a particular team or invest in static merchandising (where products are displayed on virtual 2D displays) in the arena. They may also seek to boost sales through virtual advertising via television transmission (where advertising images relevant to a particular national audience are inserted into a live TV broadcast); or by choosing to buy naming rights (of arenas or specifically related to a given competition).

From information provided on the websites of the Fédération Internationale de Football Association (FIFA) and the International Olympic Committee (IOC), it is clear that the FIFA World Cup™ and the Olympic Games are largely funded by revenues derived from the sale of TV broadcasting rights and marketing rights.

FLAGSHIP EVENTS FUNDED BY IP RIGHTS

Approximately 88 percent of the total revenue generated by the FIFA World Cup™ competitions in 2010 and 2014 came from the sale of these rights. For the 2011 to 2015 financial period, FIFA estimates total revenues of USD5billion, of which USD2.7 billion will come from the sale of TV broadcasting rights (54 percent) and USD1.9 billion from marketing (38 percent). Revenue from the sale of marketing rights is made up of investments from commercial partners (described below) and licensing revenue.

FIFA and the IOC realized early on that their ability to generate revenue from their flagship events (e.g. the Confederations Cup and the World Cup and the Winter and Summer Olympic Games) is directly related to offering their commercial partners a better "product." It is no coincidence that in the early 2000s these two iconic sports bodies developed structured, formal marketing projects. Organized on a quadrennial basis, these strategies are designed to attract commercial partners by offering them opportunities for maximum brand exposure in return for their financial support.

FIFA'S MARKETING PROJECTS FOR THE WORLD CUP

FIFA divides its World Cup marketing projects into three categories: (i) FIFA Partners; (ii) FIFA World Cup Sponsors; and (iii) National Supporters. These partners have the right to: (i) associate their brand with FIFA's IP during the quadrennial time period; (ii) associate their brand with FIFA events and publications for which rights have been acquired, offering a powerful means of boosting brand dissemination both within stadia and beyond; (iii) promote special events in the host country for the Confederations Cup and World Cup; (iv) obtain preferential access to purchase advertising packages related to the event from media outlets owning transmission rights to the event; (vi) obtain preferential rights to purchase advertising spots in the exclusive areas; and (vii) obtain preferential rights to VIP ticket purchase and boxes and to set up hospitality lounges in the arenas.

Experts observe that no other such extensive and effective marketing exposure is available to interested companies. For example, the 2014 FIFA World Cup Brazil™ Preliminary Draw – an event which took place in Rio de Janeiro to establish team groupings – was transmitted live to over 80 countries. During this event, the marks and logos of FIFA's commercial partners were in the spotlight and visible to audiences around the world throughout the televised event which lasted approximately two hours.

IP protection underpins this critically important revenue source. A significant proportion of the revenue that supports the organization of large sports events comes from the sale of broadcasting rights protected by international copyright treaties and national laws; and from marketing projects and licensing deals underpinned by rights relating to trademarks, industrial designs and patents (which protect innovative technologies).

ORGANIZERS SEEK ASSURANCES FROM HOST NATION

Knowing the structure of such business is important in understanding why organizers of iconic sporting events take certain precautions. For example, in organizing the 2014 World Cup in Brazil, FIFA sought assurances from the host nation – provided for in the Bidding Agreement and reinforced in the Hosting Agreement – that its IP and that of its partners would be respected and protected by national legislation. These agreements affirm that: "We also represent and guarantee to FIFA, and will ensure, that there are and will be no legal restrictions or prohibitions on the sale, advertising or distribution of Commercial Affiliates' products, including food and beverages, in the Stadiums or other Sites for the duration of the Competitions and that there are and will be no legal restrictions or prohibitions on the exploitation of Media Rights, marks or other intellectual property and commercial rights of FIFA. We agree that any media laws or regulations which interfere with or impinge upon FIFA's exploitation of the Media Rights are suspended in respect of the Competition and that FIFA may exploit the Media Rights unfettered in Brazil in a manner of its choosing."

The Brazilian government's commitment in this respect was enforced through the enactment of special laws, such as the General Law for the World Cup which served to protect the exclusive right of FIFA's commercial partners to associate their marks or products with the valuable World Cup "product". These special laws include punitive clauses targeting the unauthorized use by third parties of FIFA-related IP (arising from its role as the event organizer); the delineation of an exclusivity zone in the neighborhoods surrounding tournament arenas; and the prohibition of ambush marketing along with other measures aimed at securing a return on investment for FIFA's partners.

The success of the 2014 FIFA World Cup Brazil™, beyond the overall quality of the games themselves, which attracted record attendance (some 3,429,873 spectators at 64 matches), is entirely related to the capacity of FIFA, the local organizing committee (LOC), and the host country, Brazil, to grant FIFA's commercial partners the right to exercise a set of prerogatives for which they paid considerable sums. This is what makes it possible to finance and stage these iconic events. ◆

IPAN: improving IP awareness and understanding in the UK

*By Professor **Ruth Soetendorp**, Chair of the Intellectual Property Awareness Network and of IPAN's Education Group*

The Intellectual Property Awareness Network (IPAN) is a unique, independent network of organizations and individuals committed to improving awareness and understanding of intellectual property (IP) and its impact on business in the UK. Members include a wide range of commercial, financial, professional and academic organizations, all with a shared enthusiasm for IP and a passionate belief in its critical role in the developing "knowledge" economy.

IPAN seeks to strengthen understanding of IP to improve the functioning of the knowledge market. Drawing on the experience of its members which spans a broad range of sectors, the Network offers a unique source of IP intelligence. No other group in the UK brings together such a wide range of IP champions.

IPAN is not a lobbying organization and does not represent the view of any particular sector. It sees itself as an independent thought leader, ready to ask the questions other institutions may not be in a position to address or may seek to avoid.

Photo: IPAN

Members of the IPAN Board and Yoshiyuki Takagi, WIPO Assistant Director General, at IPAN's World IP Day event in April 2014.

WORKING GROUPS ON EDUCATION, PARLIAMENT AND FINANCE AND ECONOMICS

The Network's activities are organized around three working groups: on education, parliament, and finance and economics. The Parliamentary Group seeks to ensure that IPAN's voice is known to parliamentarians and businesses as an unbiased authoritative IP resource. It co-ordinates the Network's range of short briefing documents that provide a balanced introduction (primarily for the benefit of parliamentarians and policy makers) to a range of topical IP issues. These evidence-based *Issue Briefs*, (available at *www.ipaware.net*) are written by experts from the IPAN community and are designed to inform and aid basic understanding of issues. They offer snapshots of important and often complex IP issues and provide external references for further reading or research.

IPAN's important work is recognized at the highest levels of UK government. In a message to IPAN's fourth World IP Day celebration in April 2014, UK Prime Minister, David Cameron, said, "The inventive spirit is hard-wired into us. Finding easier and better ways of living lives and doing business is at the heart of everything we do – and at the very heart of our economic success. That's why it matters that UK businesses, inventors and creators benefit from a world class environment for creating and using IP".

IPAN
Intellectual Property Awareness Network

"The inventive spirit is hard-wired into us. Finding easier and better ways of living lives and doing business is at the heart of everything we do – and at the very heart of our economic success. That's why it matters that UK businesses, inventors and creators benefit from a world class environment for creating and using IP".

David Cameron, UK Prime Minister

The Finance and Economics Group addresses issues relating to IP financing. Small and medium-sized businesses face a range of challenges when it comes to financing and managing their IP. The Group works with financial institutions, IP valuation specialists and organizations representing the interests of business to develop tools that facilitate the identification, valuation and management of IP assets as part of the business wealth portfolio.

IPAN's Education Group has long championed the need to improve IP education across UK higher education and not just for those studying law. The Group has worked with the Engineering Council UK (*http://www.engc.org.uk*) and the Association of Chartered Certified Accountants to include IP as part of their membership accreditation. Such professional bodies are uniquely placed to influence academic faculties in their IP teaching and IPAN plans to expand this work.

Recognizing the need to evaluate the extent of IP education across UK higher education institutions (HEIs), IPAN's Education Group decided to research student attitudes to IP, with the expectation that this would stimulate awareness of IP rights across the higher education sector.

SURVEY ON STUDENT ATTITUDES TO IP

Funded by the UK IP Office, a steering group led by IPAN worked with UK IPO and UK National Union of Students (NUS) researchers to survey student attitudes to IP. The data generated points to the need to re-think IP education in UK universities and HEIs. It reveals that students have a real enthusiasm for IP, but little awareness of its commercial potential. Most students believe that the way they are taught about IP does not equip them for their future careers and that universities and colleges focus too much on negative behavior, such as plagiarism, and not enough on the benefits of IP rights, such as patents, trademarks and registered designs. "It is concerning how little is known about the attitudes and experiences of IP education within the UK student body," commented NUS Vice-President, Rachel Wenstone, in her foreword to the research report (*www.nus.org.uk/PageFiles/12238/IP%20report.pdf*).

In welcoming the findings of the report, David Willetts, former UK Minister for Universities and Science said, "It is vital that we have an IP literate workforce to meet the challenges of a rapidly changing workplace. I believe the key to success is to garner support from professional bodies responsible for accrediting courses, as well as university and industry and to use that support to bring about changes to the curriculum."

The research, which has been widely cited, was presented at an NUS summer conference in 2013. NUS participants acknowledged that since students visit NUS on-campus offices for assistance in handling a diversity of problems, it would be useful if these offices were also able to offer them access to IP advice. The resource implications are great, but it is a possibility which NUS and UK IPO have agreed to consider further. The 40 academics at the 2013 European Intellectual Property Teachers Network EIPTN (*www.eiptn.org*) meeting in Lisbon discussed the report and were encouraged that 77 percent of students felt

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Photo : iStock © PeopleImages

Recognizing the need to evaluate the extent of IP education across UK higher education institutions (HEIs), research spearheaded by IPAN's Education Group points to the need to re-think IP education in UK universities and HEIs. While students have a real enthusiasm for IP, they have little awareness of its commercial potential.

About IPAN

IPAN was formed in 1993 on the initiative of Dr. John Reid, then President of the Chartered Institute of Patent Attorneys (CIPA). Its initial aim – to improve IP awareness among parliamentarians and government policy makers and in the higher education sector – has recently expanded to the finance and economics sectors. With a view to improving IP awareness, IPAN targets three interest groups: parliamentarians, the finance and economics sectors and IP education.

The network currently has 40 member organizations, largely represented by non-specialists rather than IP lawyers. It operates on a not-for-profit basis and meets quarterly at CIPA's offices in London to assess progress with on-going initiatives and to discuss topical IP issues, such as the work of the CREATe Centre for copyright and new business models in the creative economy.

IP was relevant to their future career. They were less impressed to learn that only 52 percent of students felt their tutors were informed about IP "to some degree".

IP POLICY STATUS IN UNIVERSITIES

Neither IPAN nor NUS has been able to identify similar research undertaken elsewhere which aims to capture the student voice on the subject of IP education. On the basis of insights generated by its first collaboration, IPAN's Education Group is continuing to work with NUS to assess understanding of IP issues among the student population in HEIs. The second research collaboration will examine the IP policies that are required by the UK government to be in place at all HEIs. These policies determine ownership of student IP rights in the creative, innovative or inventive work they produce while registered on a higher education program. Currently, there is no standard IP policy nor is there a tradition of HEIs informing students of the content of their IP policy. As a result, before they enroll on a course, students do not have a clear understanding of what the situation might be regarding any commercially valuable IP they may create in the course of their studies. This can be particularly discouraging for students of design and other creative disciplines. This research project will seek to determine the extent to which students (and academic staff) are aware of the IP policy in operation on their campus, and students' opinions about the effectiveness of such policies to support their understanding of IP and its protection.

Eminent UK design industry players have expressed interest in this work. Mandy Haberman, (*http://www.mandyhaberman.com*) an IPAN board member, inventor, entrepreneur and designer of the Anywayupcup®, is a regular visitor to graduate design shows. Her dismay at the poor levels of IP awareness among graduating students was a catalyst for the research.

Sebastian Conran, of the eponymous design associates *www.sebastianconran.com*, is supporting the research because he feels "UK universities rarely protect or exploit student IP extensively. If they do, and revenue results, they treat the student as if they were an employee. But these fee-paying students don't get salaries, pensions or other employee benefits, quite the opposite now they have to pay significant amounts for their further education. To make matters worse for fee-paying design students, universities who run degree shows often disclose unprotected ideas to the public, making a patent application or design registration impossible afterwards."

EMBEDDING IP EDUCATION IN CURRICULA

IPAN has members from, and links with, a number of UK business schools. The Education Group is keenly aware that even in a business school with an IP enthusiast on its staff, the challenge to embed IP education in the school's curriculum is great. Gradually, however, business schools are waking up to the need for their postgraduates to be able to offer employers IP intelligence and wisdom. The Group will be looking for ways to encourage them to embrace IP in their programs.

In all its endeavors, the Education Group benefits from being able to draw on the wide experience of IPAN's membership in the area of IP education and examines how it (or the lack of it) affects graduate career prospects.

Whatever the future, wherever the next big ideas come from, IPAN is working hard to ensure that future generations will be introduced to IP rights as part of their higher education in the UK.

Keen to build on its 21-year heritage, and to expand its network and deepen understanding of the importance and value of IP across a variety of economic sectors, IPAN is eager to hear from anyone operating similar networks in other countries. For those who would like to set up an IP awareness network in their own country, or who would like to learn more about IPAN's research work, please contact the Network at: *ipan@ipaware.net* ◆

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