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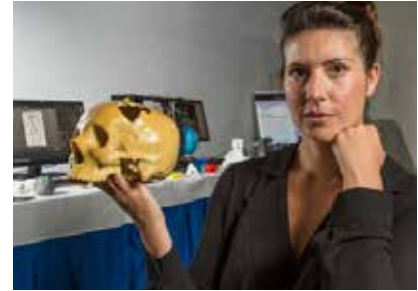
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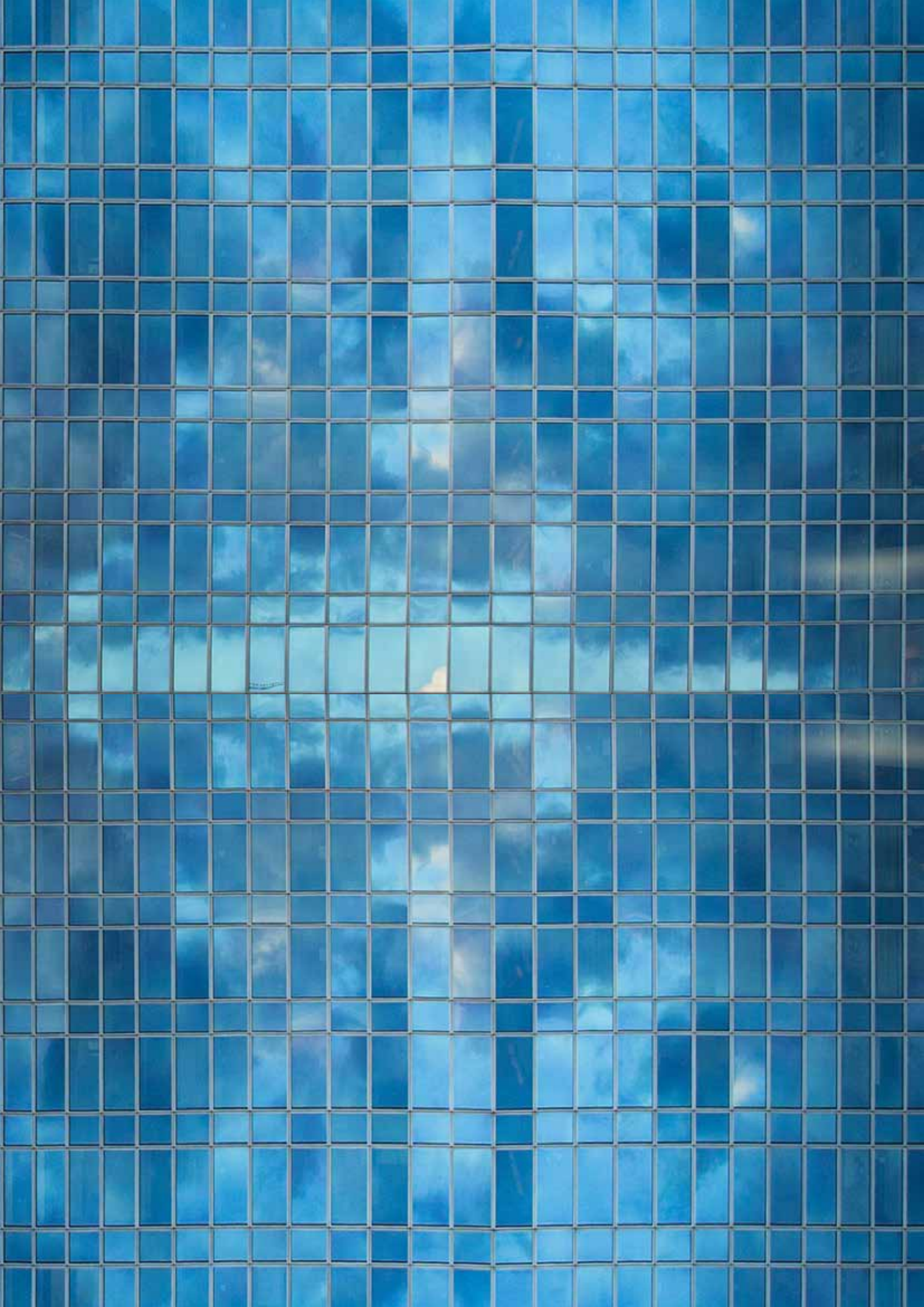
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Intellectual property in a data-driven world

“At the policy level, we are encouraging a conversation among Member States with a view to collectively formulating the questions that policymakers need to ask and then collectively discussing potential ways to ensure we create effective innovation policy settings for the new digital economy,” says WIPO Director General Francis Gurry.





In the lead up to the 2019 meetings of WIPO Assemblies, WIPO Director General Francis Gurry reflects on the implications of big data for intellectual property (IP) policy.

How is the digital transformation fueled by advanced technologies like artificial intelligence (AI) re-shaping the global IP landscape?

Our understanding of the impact of the digital transformation on the global IP landscape is very preliminary. However, we can observe that it is fast moving and profound and will have a significant bearing on the administration of IP systems and IP policy. Navigating the impact on IP administration is relatively straightforward. To a large extent, it involves evaluating the benefits of applying and using these technologies to improve the operational efficiency of IP offices. The harder part is working out how these technologies will affect IP policy. The IP rights we have today were developed during the Industrial Revolution to encourage the development of technologies that enable mass production. One of the big questions we face today is whether these existing IP rights provide the incentives required to promote innovation in the digital age.

Is the classical IP system still relevant in the new data-driven economy?

For the moment, business tells us that the classical IP system is far from obsolete. Statistics show unprecedented use of the classical IP system, with growth rates far outstripping global economic performance. However, we do have to take note of the fact that advanced data-driven digital technology is clearly the dominant force in economic production and distribution within the digital economy. We also have to ask if the statistics reveal increasing use in relation to the industrial economy or if they also apply to the digital economy. How effective the classical IP system will be in addressing all of the issues arising from the data-driven technologies that dominate in the digital economy remains unclear. Undoubtedly, these will pose significant challenges for IP policymakers.

Is there any evidence that countries are starting to adapt their innovation policies to the digital economy?

Yes. A number of countries have initiated policies to enhance access to data. Examples include the Executive Order on Artificial Intelligence issued by United States President Trump and the European Directive on Copyright and Related Rights in the

“One of the big questions we face today is whether existing IP rights provide the incentives required to promote innovation in the digital age.”

A decorative graphic in the bottom right corner of the page, consisting of a network of blue dots connected by thin blue lines, resembling a molecular or data network structure.

Digital Single Market (EU 2019/790). Advanced digital technologies, including AI, are capable of developing new and beneficial products and services through the manipulation of data. Some of them, notably AI, improve their performance when they have access to greater quantities of data. At present, there is broad agreement that making data available is a good thing for the development of useful and beneficial products and services. However, governments cannot reasonably require companies to share their confidential data with competitors. What they can do is to make public service data, such as that gathered by public transportation services, and data flowing from publicly-funded research, available to enterprises for whom it may have value. Certain private actors, including scientists, who believe in making data publicly available, are adopting similar practices. So far, that's the extent of the policy in this area. There are still many complex policy questions surrounding data in the digital economy.

What are important next steps for policymakers in creating an effective IP policy framework around data?

We need to define appropriate and legitimate practices with respect to the collection, storage and use of data. In other words, we need to identify what restrictions are appropriate for the collection and subsequent use of data and we need to understand why these restrictions are necessary. Although exceptionally powerful means of collecting data of all types (e.g. voice, text, image, etc.) exist, we still need to identify appropriate means of collecting and using those data. Just as we need to define the scope of the restrictions that need to be in place to regulate such collection and use.

What factors come into play when establishing possible restrictions on data use?

Privacy is perhaps the factor that has received the most attention to date. The European Union's General Data Protection Regulation (GDPR) is a consequence of this. The Universal Declaration of Human Rights (Article 12) recognizes privacy as a human right. Interestingly, however, the current lack of policy clarity around privacy has resulted in some businesses using it as a competitive tool. Apple Inc., for example, claims to offer better privacy safeguards than its competitors. One can imagine others entering the market with similar offerings, each potentially involving restrictions on the collection, storage and use of client data.

“We need to define appropriate and legitimate practices with respect to the collection, storage and use of data.”

Security is another factor, in particular where there is a desire to ensure that data are not publicly available, for example, for reasons of personal privacy or to maintain a competitive advantage. Security poses particular challenges because under normal circumstances, the State would not impose such a restriction. In general, the State approaches security in terms of an individual not being permitted to trespass – to use the words of the physical economy – on another’s property. Policymakers now have to decide how that applies to the digital economy. Their conclusion will likely result in further restriction on the collection and use of data.

Insofar as data are a fundamental input to production and distribution in the digital economy, the concentration of market power and its effect on competition will also give rise to a restriction on the collection, storage and use of data. Competition policy guards against any abuse of market power by economic agents with a dominant market position. While related policies are under development, policymakers do not yet fully understand the digital market, or what anti-competitive behavior looks like in that context.

Taxation in the digital economy is another big issue. In the physical economy, the source of goods, residency, and citizenship are generally the bases on which governments assert the right to tax. How can these concepts be applied to the digital economy where a platform operates in one part of the world and sells and makes goods available online for download elsewhere? How can tax authorities track such transactions? Should taxes be levied at the place of offer (where a platform’s headquarters are located, for example), or in the country in which the goods are purchased? Who has the right to tax the value created from that transaction? The OECD is working to develop a better understanding of these questions.

And then of course, property and intellectual property, in particular, is a big factor. Under the classical IP system, any data that an economic agent has taken reasonable steps to keep confidential and which have perceived economic value constitute a trade secret. Within the digital economy, trade secrets have become a dominant means of protecting unpublished data of economic significance. But do trade secrets adequately protect such data? Trade secrets are not a property right in the classical sense, they are relational rights in the sense that individuals do not have the right to intrude on or abuse another’s trade secret. For example, if a company gives data to a sub-contractor for a specific purpose, the sub-contractor cannot use them in any other way. Policymakers will need to examine whether trade secrets adequately address or regulate all of the issues that may arise in relation to data protection in the digital economy.

Do you foresee the emergence of new property rights for data?

At this stage, I do not foresee a new registrable property right for data. If a new right emerges, it will result from society coming to a position on the legitimate collection, storage and use of data, with anything outside that sphere being deemed illegitimate. Once in place, that restriction will then translate into a property right. By way of illustration, consider the Babylonian Code of Hammurabi dating from 1754 BC. That law does not confer a property right for sheep; it simply states that it is unlawful and punishable to steal a neighbor's sheep. In this way, when we create restrictions on the free flow of data in its collection, storage and use, it will, at some stage, amount to a property right.

What are your views on whether a machine can acquire a property right?

This question is currently attracting a lot of attention. In addressing it, we should not forget that a starting point for developing IP policy, and indeed innovation policy, is to identify desired outcomes. What is it that we want to achieve? This is a fundamental question. If society considers innovation will be encouraged by giving a right to a machine, then such a proposition may gain traction. But how would such a right work in society? At some point, a human being has to make some money or otherwise benefit from that right. Moreover, inventors and scientists already use a whole range of technologies to develop inventions and achieve results that would not otherwise be possible, so in my view, this whole debate is a red herring.

Are there other more relevant questions that IP policymakers need to consider?

Yes. Far more important questions arise in relation to restrictions on the use of data with respect to AI-based algorithms. For example, is it an infringement of copyright to feed copyrighted data into an AI algorithm for learning? This is a difficult question because first, we are not sure what the impact of such a restriction will be, and second, it is not clear that we will ever know whether a work produced by a deep learning algorithm is created using copyrighted data. So we need to carefully examine the outcomes we want to achieve and the arrangements that need to be in place to achieve them.

How is WIPO gearing up for the digital economy?

At the policy level, we are encouraging a conversation among Member States with a view to collectively formulating the questions that policymakers need to ask and then collectively discussing potential ways to ensure we create effective innovation policy settings for the new digital economy. Although we are light years away from any international position on these issues, the exercise is important and has a lot of value. It will improve our understanding of the IP policy implications of the dominance of data-driven technologies in the digital economy and will support the development of national positions on these questions.

At the operational level, as a multilateral organization, WIPO also has to address the question of distributional justice and the impact that the rapid evolution of the digital economy is having on the capacity of developing countries to participate and compete in the digital economy. Inevitably, this will change the nature of WIPO's development program.

In terms of the Organization's services, the scale of WIPO's digital transformation is significant. The Organization is continuing to invest in improving its online platforms and in developing new AI-based tools for them. Examples are WIPO Translate, WIPO's image-search technology for the Global Brands Database and a suite of new tools, including speech-to-text technology to improve the quality and speed of WIPO's conference services. Various other tools are in the pipeline.

Subject to approval by member states, WIPO is also proposing to establish a digital time stamping service, a sort of digital notary service, that will help innovators and creators prove that a certain digital file was in their possession or under their control at a specific date and time. This is a small but significant step towards helping inventors and creators better protect their IP interests in the digital economy. It is also an important part of moving WIPO's services to the reality of the digital economy.

It is so easy to represent these developments as a series of cool new products and services, but we must not lose sight of the need to find policy solutions to address these profound and transformative developments.

A photograph of a man in a field of corn plants. The man is on the right side of the frame, looking down at the crops. The field is filled with rows of green corn plants. The background shows a vast landscape under a cloudy sky. The text is overlaid on the left side of the image.

Boosting business competitiveness in Africa with IP and innovation

By **McLean Sibanda**, Managing Director, Bigen Global Limited and Professor **Tom Peter Migun Ogada**, Executive Director, African Centre for Technology Studies and Chairman of the Kenyan National Commission for Science, Technology and Innovation

Most jobs in Africa arise within the agricultural sector. Manufacturing, the sector with the greatest scope to add value to raw materials accounts for just 6.5 percent of jobs. The development of vibrant innovation ecosystems supported by balanced and effective IP systems is essential to ensuring that African economies are able to create employment opportunities compete in the global knowledge economy.



“Economic diversification is a priority for African countries, especially in sectors with the potential to create employment and produce high-value outputs.”

Estimates suggest that by 2050, Africa's population will double, rising from 1.2 billion today to 2.4 billion, with over 60 percent of people under the age of 25. Such a large young population presents significant opportunities and challenges. On the one hand, with a higher proportion of economically active people, African countries could benefit from accelerated economic growth. On the other hand, low levels of industrialization in most African countries, and associated high youth unemployment, are of growing concern.

How can policymakers in Africa ensure inclusion of Africa's youth in the global economy? What initiatives are needed to develop the requisite skills and expertise for Africa's youth to participate in innovation and tomorrow's knowledge-based economy? What should African governments do to accelerate the transition from natural resource-intensive to knowledge-based economies? And how can policymakers promote innovation through better understanding and greater use of intellectual property (IP) rights to boost the competitiveness of African businesses and put the continent's economy on a sustainable footing?

OPPORTUNITIES AND CHALLENGES

Over the past two decades, countries in Africa have achieved rapid and sustained economic growth rates. Projections by the International Monetary Fund (IMF) and African Economic Outlook 2019, suggest this trend will continue. Uganda, Benin, Kenya, Tanzania, Senegal, Ivory Coast, Ghana, Rwanda, Ethiopia and Libya are set to enjoy growth rates ranging from 6 percent to 11 percent. High demand for African exports, relatively easy access to finance, microeconomic reforms and improvements in the business environment are important drivers of this growth. The concern however, is that the number of jobs available to the expanding working-age population – projected to be almost 1 billion by 2030 – has not kept pace with this economic growth. Data for 2017 show that unemployment rates (7.5 percent) in African countries are well above the global average (4.3 percent). Only 40 percent of the workforce is engaged in productive employment, of which 70 percent are in vulnerable employment.

Most employment opportunities (65 percent) arise within the agricultural sector, which represents over 15 percent of the continent's GDP, followed by services, particularly financial services and telecommunications. Close to 80 percent of jobs are found in the informal sector. However, manufacturing – the sector with the greatest scope to add value to raw materials – accounts for just 6.5 percent of jobs. This is not surprising given the low levels of industrialization in African countries compared to the rest of the world.

Unemployment, therefore, is a big issue in Africa, especially given the size of its youth population, which is disproportionately higher than most developed

economies where the population is ageing. Against this backdrop, policymakers need to find ways to increase industrialization, enhance manufacturing capabilities and productivity, and improve business competitiveness. In so doing, the aim is to reduce the dependence of African countries on the export of primary raw materials, which leaves them vulnerable to volatile commodity markets and fluctuations in the global economy. Economic diversification is therefore, a priority for African countries, especially in sectors with the potential to create employment and produce high-value outputs.

CREATING JOBS AND BUSINESS GROWTH WITH IP AND INNOVATION

History shows us that an environment in which innovation and use of the IP system thrive creates opportunities for employment and socio-economic development. The experiences of countries such as Japan, the Republic of Korea and more recently, China, attest to this. If African countries are to compete in the global knowledge economy, the development of vibrant innovation ecosystems supported by balanced and effective IP systems is essential. This is a critical step in fulfilling the aspirations of African countries to become producers of high-value knowledge-based goods and services. Only then will it be possible to succeed in reversing existing trends – where Africa imports most of what it consumes – and for African countries to start adding value to the products they exports. Innovation and IP lie at the heart of this process.

Investment in research and development (R&D) and innovation, supports the production of new and improved technologies to address local needs, while creating opportunities for business growth and employment. The IP system also facilitates effective transfer, adaptation and assimilation of technologies developed elsewhere, to African countries. Countries that have robust innovation ecosystems underpinned by a balanced and effective IP system have benefitted in terms of increased economic growth, employment, tax revenues and foreign direct investment, as well as access to high-end technologies through technology transfer agreements.

An effective IP system is an integral part of a thriving innovation ecosystem. It provides incentives to invest in R&D and other innovation and enables firms to commercialize and monetize their innovations, and to justify and sustain R&D investments.

POTENTIAL BENEFITS OF IP

Companies use IP rights strategically to develop, trade in, and secure income from their innovative products and services. These rights help companies gain and maintain a competitive advantage in markets at home and beyond. Firms with an effective IP strategy generally enjoy a stronger negotiating

6513.0

*North America

4902.0

European Union

2605.2

East Asia & Pacific

1197.2

Latin America & Caribbean

790.9

*Middle East & North Africa

273.7

South Asia

136.5

Africa excluding North Africa

Manufacturing Value Added per capita, 2017

*Data from 2016. Source: World Development Indicators, World Bank, 2019.



position, achieve greater success and have a higher market value than those that do not. This is particularly so in a highly competitive global market where cross licensing is increasingly prevalent, especially within the pharmaceutical, automotive, and information and communications technology sectors.

IP awareness is particularly important among small and medium-sized enterprises (SMEs) as these companies generally drive economic growth and job creation. Those that embrace IP rights tend to fare better in terms of growth, income and employment than those that are unaware of how IP can support their business.

Consumers and society as a whole also stand to gain. IP rights support the process of bringing a product to market, thereby providing consumers with access to an expanding range of innovative products and services. Of course, IP rights also safeguard consumers from counterfeit and pirated goods. Such illegal activity undermines legitimate businesses and their ability to invest in product development. It also puts consumer health and safety at risk.

Broader understanding of the benefits that can flow from innovation and access to an effective IP system will help ensure that Africa's inventors, creators and entrepreneurs can readily and effectively protect and harness the value of their IP assets and thereby create opportunities for employment, wealth creation and economic growth.

BUILDING BRIDGES BETWEEN ACADEMIA AND BUSINESS

Universities and research institutions, as well as knowledge-based SMEs, are the backbone of economic activity in most countries. These actors have a critical role to play in transforming African economies and in making them more competitive globally. Their ability to innovate and to develop frontier technologies and knowledge are central to boosting Africa's ability to fulfill more of its needs and to produce and export high-value products and services and thereby establish itself as a global economic player.

More and more, policymakers in Africa are recognizing the critical role of universities, research organizations and SMEs as producers of new knowledge to address local needs. They also acknowledge the need to strengthen links between academia and business to ensure research programs generate outputs that are relevant and useful to society. Policies that encourage active use of IP rights to protect and leverage the economic value of the new technologies, products and processes that these important actors generate – for example, through licensing and startup schemes – will enable them to secure sustained research funding and promote business growth.

By linking IP and innovation, policymakers have an opportunity to create favorable settings for African businesses to compete in global markets. The emergence of companies like Sasol in South Africa and MPESA in Kenya attest to this. The experiences of certain Asian countries also offer interesting insights about how to achieve sustained economic growth by encouraging the generation, acquisition and use of IP. For example, 60 years ago, the Republic of Korea was poorer than Mozambique. However, its commitment to innovation and the strategic use of IP has enabled it to emerge as a leading economy. The Republic of Korea's experience highlights what can be achieved when governments adopt a long-term and deliberate focus on innovation, and strategic use of IP to build on a country's strengths.

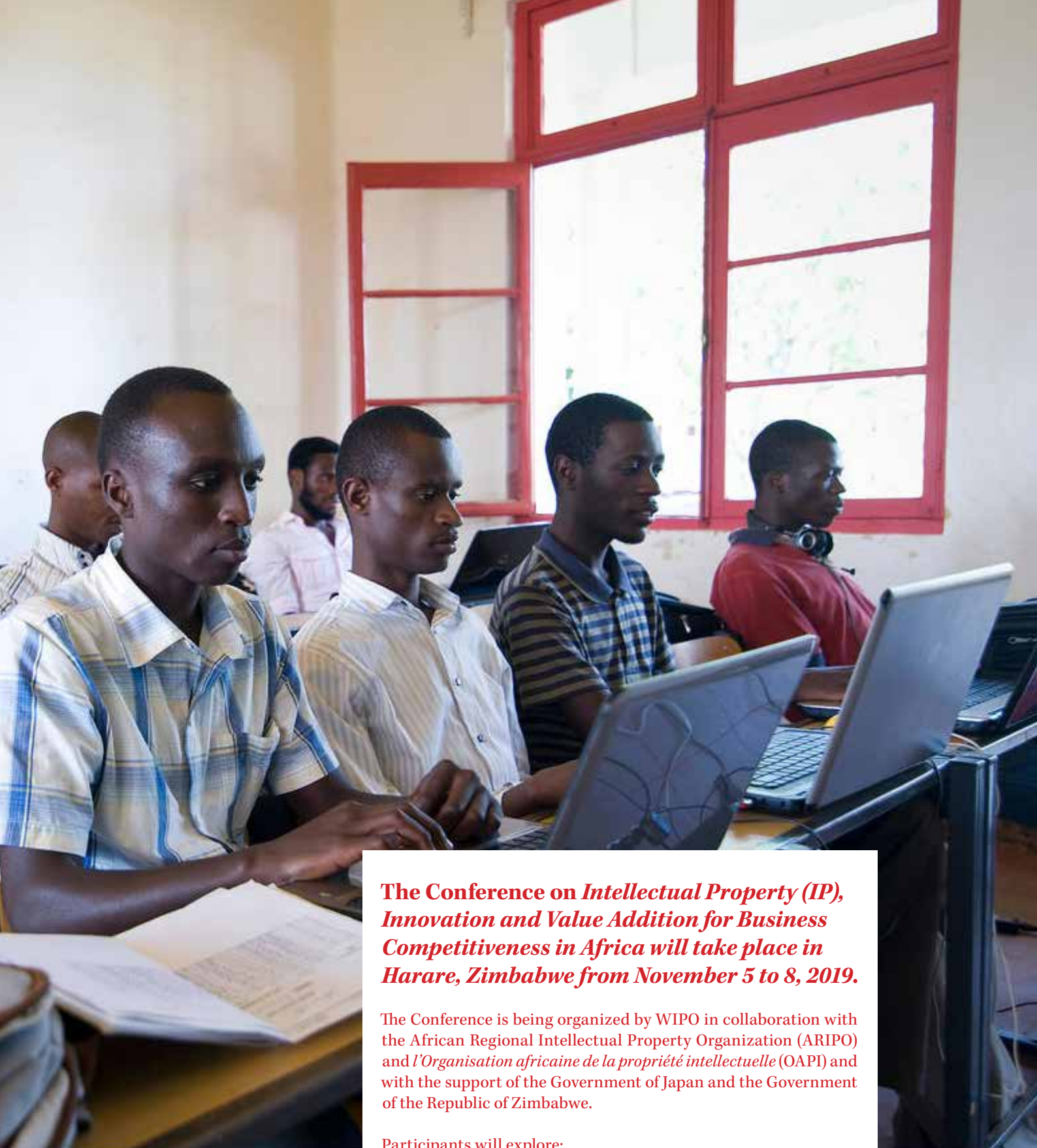


By 2050, Africa's population will double, rising from 1.2 billion today to 2.4 billion, with over 60 percent of the population under the age of 25. Amid low levels of industrialization and associated high unemployment, African policymakers are grappling with ways to promote innovation and greater use of the IP system to foster business growth, jobs and economic sustainability.

MARRYING UPSTREAM RESEARCH WITH DOWNSTREAM COMMERCIALIZATION

As traditional generators and disseminators of knowledge, in general, the research activities of universities and research institutions are concentrated upstream in innovation value chains. In contrast, SMEs tend to focus downstream, adapting and applying new knowledge to produce goods and services that the market can consume.

To create optimal conditions for knowledge generation and its subsequent commercialization, policymakers need to address many challenging questions. For example, to what extent should universities and research institutions operate downstream on commercialization issues to ensure the relevance of their work? What support mechanisms (policy incentives and structures) are required to increase both upstream and downstream activities to serve society? How can universities support efforts to upgrade technological and manufacturing capabilities of African countries? What type of support should SMEs receive to encourage them to embrace innovation? How can countries strengthen academia and industry linkages and encourage them to use the IP system?



The Conference on Intellectual Property (IP), Innovation and Value Addition for Business Competitiveness in Africa will take place in Harare, Zimbabwe from November 5 to 8, 2019.

The Conference is being organized by WIPO in collaboration with the African Regional Intellectual Property Organization (ARIPO) and *l'Organisation africaine de la propriété intellectuelle* (OAPI) and with the support of the Government of Japan and the Government of the Republic of Zimbabwe.

Participants will explore:

- the challenges and opportunities for Africa in the context of the Fourth Industrial Revolution;
- ways to harness the potential of universities and research institutions as generators of new knowledge and IP assets; and
- how to encourage the business community, especially SMEs, to embrace innovation and IP in support of national economic growth.

The Conference will produce a draft five-year roadmap and action plan on effective use of IP and innovation to establish an advanced innovation ecosystem in Africa.

COLLABORATION IS CENTRAL TO DEVELOPING THRIVING INNOVATION ECOSYSTEMS

Consideration also needs to be given to ways to encourage academia, industry and governments to work together to improve awareness of the economic benefits that can flow from strategic use of IP. Such collaboration is central to justifying and securing research funding, and is particularly important in the context of the Fourth Industrial Revolution, in ensuring that research programs are relevant to local and future needs. Such collaboration also promises to deepen understanding of the implications for innovation and IP of the on-going digital transformation. This will enable African countries to take advantage of potential opportunities and to anticipate and mitigate the challenges arising from the rapid deployment and uptake of advanced digital technologies. Only by working together will it be possible to encourage broader use of IP to boost business development and competitiveness.

The goal, of course, is to ensure that academic and research institutions in Africa become part of a fully integrated national innovation ecosystem, where all players, including businesses, are embracing innovation to create the technologies required to address societal needs and challenges. The creation of opportunities for decent employment and heightened global competitiveness are critically important by-products of this process. How successful we are in achieving this goal will determine how far Africa will be able to increase its share of global IP production in a rapidly evolving technological and economic landscape.

Today, there is a pressing need for dialogue to support the development of an African roadmap for IP and innovation. Such a roadmap will give added impetus to efforts across the continent to improve employment prospects and living standards by leveraging Africa's wealth of talent in an era of rapid technological transformation.

Recognizing the importance of these issues, in November 2019, WIPO and its partners (see box) are hosting an international conference on IP, innovation and value addition for business competitiveness in Africa in Harare, Zimbabwe. The event is an opportunity for policymakers to exchange views on how to use the IP system to create an enabling environment for socio-economic, scientific and technological development in Africa. The discussions will result in draft five-year roadmap and action plan on effective use of IP and innovation to establish an advanced innovation ecosystem in Africa.

Leveraging Indonesia's creative economy

By **Catherine Jewell**,
Publications Division, WIPO

Indonesia is South East Asia's largest economy and one of the world's most diverse countries – both in terms of its biodiversity and cultural diversity. In 2015, Indonesia's President Joko Widodo, set up the Indonesian Agency for the Creative Economy (BEKRAF), a non-ministerial agency with a mandate to develop and coordinate policies to harness the huge potential of Indonesia's creative economy. Ari Juliano Gema, Deputy Chairman for IPR Facilitation and Regulation at BEKRAF, explains what his organization is doing to help Indonesia's creative businesses thrive.

How big is Indonesia's creative sector? What are its core strengths?

Indonesia's creative economy is very diverse and covers 16 different sub-sectors (see box). Its performance in recent years demonstrates its strong growth potential. In 2017, the sector generated more than 7 percent of GDP – and employed around 15.9 million people. By 2020, we predict it will be worth around IDR 1.924 trillion (aprox. USD 130 million).

Indonesia's creative economy has huge untapped potential but faces a number of challenges. Much of the sector consists of small and medium-sized enterprises that still only market their products locally. Few of them have any knowledge of how intellectual property (IP) rights can add value to their businesses nor do they have access to the financial capital and technologies required to expand their operations.

The diversity of our culture is a core strength, as is the demographic bonus we enjoy. By 2030, we will have 180 million young people ready to join the workforce. Right now, there is a lot of enthusiasm among young people about the creative economy. Many are setting up startups and developing great creative content and creative events. We also have many successful performers, singers and Youtubers.



"Indonesia's creative economy has huge untapped potential," says Ari Juliano Gema, Deputy Chairman for IPR Facilitation and Regulation at the Indonesian Agency for the Creative Economy (BEKRAF).

Indonesia's creative economy comprises 16 sub-sectors, including:

- apps and game development;
- architecture;
- interior design;
- fashion;
- product design;
- visual communication design;
- movies, animation, and video;
- photography;
- crafts;
- culinary arts;
- music;
- publishing;
- advertising;
- performing arts;
- fine art;
- television and radio.

These sub-sectors are expected to make significant contributions to Indonesia's GDP and to boost exports and employment.

Tourism also plays a key role in supporting the sector's development. You could say that tourism is the skin and the creative industries are the muscle and the flesh. When tourists come to Indonesia, they see all the products we make and often want to take them back home. In a move to support tourism, the Government has identified 10 major tourist destinations in Indonesia. BEKRAF is helping these destinations leverage their culture and the potential of the local creative industries to ensure they remain attractive to tourists.

What is BEKRAF's role?

BEKRAF's main role is to establish an ecosystem that enables Indonesia's creative businesses to boost their productivity and thrive. The Agency covers six functions, research, development and education; access to capital; infrastructure, marketing, facilitation; regulation of intellectual property (IP) rights; inter-governmental relations and interregional relations. We coordinate with other government agencies that have established creative economy support programs in place to ensure that our actions are aligned and coherent. Our overriding aim, of course, is to create the conditions for the creative economy to become a mainstay of national economic performance.

Which sectors stand out in Indonesia's creative economy?

The fashion, culinary and craft sub-sectors are the most mature and make the biggest contribution to GDP. In fashion, for example, we have a long and rich tradition of batik making and many talented contemporary designers. Our aim is for this sub-sector to sustain its high levels of performance.

There are also exciting developments in the areas of film, music and computer apps and gaming, which are recording strong growth. The development of Indonesia's film industry is particularly exciting. For example, in 2018, 10 Indonesian movies attracted more than 1 million viewers in theatres in Indonesia. *Warkop (DKI)*, a film produced by Falcon Pictures, attracted around 7 million viewers across Indonesia. This was a first. Indonesian movies are also doing well internationally. *Marlina the Murderer in Four Acts* recently premiered in the United States and *Sekala Niskala (Seen and Unseen)* became the first Indonesian film to win the Grand Prix at the 2018 Berlin International Film Festival. It went on to win the Asia Pacific Screen Award and the International Feature Fiction Award at the Adelaide Film Festival.

In practical terms, how are you supporting these sub-sectors?

We are working to ensure that an effective regulatory framework is in place to support Indonesia's creative businesses. We are also helping them to access the investment they need to develop and grow. We run a range of initiatives within each sub-sector. For example, in the film sector, we have created opportunities for young filmmakers to spend time at the TorinoFilmLab in Italy, to hone their skills. We send some to international film festivals and to events like the Akatara Indonesian Creative Financing Forum, where they can pitch their ideas to investors. So far this year, the Forum has financed five films that were released in cinemas, with a number of others in production. There's a lot of interest among foreign investors in co-producing or co-directing films in Indonesia. With around 250 million people, the Indonesian market is very attractive.



Fashion is one of Indonesia's most mature, vibrant and economically important creative sub-sectors.

“Our cultural diversity is our strength. It gives us the means to develop a robust creative economy built on effective use of IP rights.”

Similarly, in the music sector, we organize Indonesia Creative Incorporated (ICINC), an umbrella program to discover, promote and market Indonesia's creative talent at home and in international markets. We also organize *Muskilogi*, an event that brings together professionals from across the music industry and enables them to share their knowledge and experience with upcoming musicians. The clinics we organize help young musicians learn about the music business and IP rights. BEKRAF is also working to promote Indonesia's collective management society, which is responsible for setting royalty rates and for collecting and re-distributing revenues to artists.

And the BEKRAF Developer Day, which includes a series of master classes and clinics, is an opportunity for software experts to share their knowledge with young enthusiasts keen to learn new skills. Access to such training opportunities is very limited in Indonesia, so these events are very popular. Various government-funded initiatives also allow us to send promising startups to international events like the SXSW Conference and the Startup World Cup in the United States. Such participation shows the world that Indonesia has some very talented software developers.

In fashion, one of the largest and most mature sectors in Indonesia, we play a supporting role, for example, by researching fashion trends and offering government grants to upcoming designers. Similarly, in the craft section, we support events like Inacraft. We also help artisans take part in international gatherings like NY Now, the world's biggest craft event. Our workshops for batik makers help these artisans to improve their professional standing and the quality of their outputs so they become more competitive.

In Indonesia, we can't compete on technology, but we can compete with our creativity and culture.

What role does intellectual property (IP) play in adding value to Indonesia's cultural assets?

IP is at the heart of the creative economy. Without IP protection, a product becomes a simple commodity; there is no value added. That is why raising awareness across the creative sector about the advantages that can flow from the strategic use of IP assets is a top priority.

What the producers of the famous Indonesian movie, *Ada Apa Dengan Chinta (Mr. Hunter's Sweetheart is the Storyteller)*, were able to accomplish is a recent example of what can be achieved through strategic use of IP rights. Released in 2004, the movie was a box office hit. Recognizing an opportunity to leverage its popularity, the producers signed licensing deals for a TV series and merchandizing (e.g. T-shirts and other fashion items). In so doing, they were able to generate enough money to finance a sequel and other box office hits, including *Filosofi Kopi (Coffee Philosophy)*, from which they created an eponymous coffee shop. BEKRAF's role is to facilitate the flow of capital to Indonesia's creative businesses and to support the monetization and commercialization of the country's many creative assets by encouraging creative businesses to think more strategically about their IP assets.

So how are you building awareness?

Building IP awareness in Indonesia is very challenging. Only around 11 percent of actors in Indonesia's creative economy have acquired IP rights. To address this, we organize IP awareness activities regularly in cities around the country. These events are an opportunity for creative businesses to learn about IP and connect with potential investors. The growing number of media outlets covering IP-related issues is an indication of the solid progress we are making.

BEKRAF also recently launched its mobile app, BIIMA (Bekraf IPR Info on Mobile Apps) which gives users basic information about IP rights. You simply open the application and select a product (there are many options) to find out about the IP rights relevant to it, what you need to do to obtain those rights and how much it costs. Our aim is to hit 1 million by 2022. We launched it in July 2016 – it took us about six months to develop – and so far, we have around 1,500 subscribers. BIIMA is a practical tool to raise understanding of IP among small businesses and artisan communities so they can better protect their IP interests and leverage the value of their IP assets.

Is counterfeiting and piracy a big issue?

Yes, as is the case in many countries, we face challenges in this area. BEKRAF has established an anti-piracy taskforce, and while we don't have the authority to investigate IP infringement cases, we give creative businesses practical guidance and advice when their products are infringed. In sum, we connect creative economy actors with enforcement authorities. This is important because if creators don't report cases of IP infringement, enforcement authorities can't do anything.

Online piracy is also a big issue right now because many people still don't have access to legitimate streaming platforms. But piracy arises not just because it is difficult to access legitimate products or because the price is too high. Addictive behavior is another major factor. Although they know it is wrong, some online users still buy pirated copies of creative works. How do we tackle this? Imposing strong sanctions has not been very effective. Education is the key to changing such behavior. We need to teach people from the earliest age about the

damage that piracy and counterfeiting causes and such education needs to be comprehensive and continuous.

How do you see Indonesia's creative economy evolving?

The creative economy will become the backbone of the Indonesian economy. It already generates around IDR 1.100 trillion annually. Our cultural diversity is our strength. It gives us the means to develop a robust creative economy built on effective use of IP rights. That will enable Indonesia to realize its economic ambitions and to promote social progress and cultural development. All Indonesians stand to benefit from the wealth generated by the continued development and expansion of our creative economy.

What message do you have for Indonesia's creative businesses?

By 2030, Indonesia is projected to become one of the world's largest economies. To take advantage of this economic expansion, creative businesses need to recognize that the only way they can reap the full economic benefit of their innovations and their creative work is to protect it with IP rights. They need to become more IP savvy. They need to develop strategies and systems that will enable them to harness the value of their work in a rapidly evolving business landscape. So my message is, keep innovating, be sure to protect your work with IP and enjoy the ride!

What are BEKRAF's future objectives?

Our ongoing objectives are to ensure the creative economy becomes a new pillar of the Indonesian economy and that Indonesia becomes an established global creative economy player by 2030. To this end, in 2018, BEKRAF organized the first World Conference on Creative Economy in Bali around the theme of "Inclusive Creativity," to promote the creative economy as a vehicle for equal opportunities and inclusion. In line with this vision, BEKRAF will continue to focus its efforts on promoting understanding among the creative business community and beyond, of the advantages of astute protection and management of their IP assets. This is essential in creating the conditions for these businesses to thrive in international markets.



In 2017, Indonesia's creative sector generated more than 7 percent of GDP – and employed around 15.9 million people. "By 2020, we predict it will be worth around IDR 1.924 trillion (USD 130 million)," says Ari Juliano Gema.



KidZania: get ready for a better world

By Catherine Jewell,
Publications Division, WIPO





Built around children's love of role-play, KidZania, has become one of the world's fastest growing learning and entertainment brands. At KidZania, children between the ages of 2 and 14 get a chance to explore over 90 adult careers.

KidZania offers children from age 2 to 14 a unique, interactive experience and many unforgettable and fun memories. Built around children's love of role-play, KidZania has become one of the world's fastest growing learning and entertainment brands. The outgoing Chief Executive Officer of KidZania's Mexican operations, Maricruz Arrubarrena, offers an insider's view of the company and explains what lies at the heart of its success.

What was the inspiration for KidZania?

park, known as Ciudad de los Niños (City of Children), opened in September 1999, in Santa Fe, Mexico City. That was when I started working for the company. KidZania is driven by a desire to make a difference to the lives of children and to ensure they become engaged and responsible citizens.

Tell us about the KidZania concept.

KidZania is an indoor kid-sized city that offers children a unique opportunity to learn and interact with other children through role-play. Our concept combines education and entertainment and is built around children's natural desire to create, explore and play together. We believe that role-play is a really smart way for kids to learn. At KidZania, children get a chance to explore over 90 adult careers, learn how to manage money and get a grasp of the how the real world works. KidZania offers them a safe place to learn by doing, to learn from each other and to gain confidence in their abilities. Our aim is to inspire them to become great global citizens.

KidZania is a scaled-down replica of a fully operating city. It is divided into three main areas: the airport, the city center and the suburbs. Kids access the park via the airport – their entry ticket is their boarding card. The city has brick-paved streets with office blocks offering different services and storefronts with the logos of familiar brands. We make every effort to give our visitors an experience that is as true-to-life as possible.

Inside, kids can play at being adults in a host of activity locations or “establishments,” which include a fire station, a supermarket, a courthouse, a sushi bar, a hospital, a tax office and many others. We make sure each establishment is equipped with highly realistic props so the experience is as realistic as possible.

We think of KidZania as a nation with its own language, identity, culture, government and economy. All transactions take place in our currency, kidZos. On entry, each child receives 50 kidZos, which they can spend, save (they can even open a bank account) or donate. They can earn more kidZos by doing different jobs. The roles of firefighter, pilot and police officer are very popular. In this way, KidZania introduces them to the world of work, and the value of money. Many children have gone on to pursue careers that they first discovered at KidZania.

“Careful management of IP is central to ensuring that we maintain the integrity of our brand and those of our industry partners.”

KidZania is driven by a desire to make a difference to the lives of children and to ensure they become engaged and responsible citizens. KidZania's RightZKeepers (above) support this goal by encouraging children to be, to know, to create, to share, to care and to play.



Kids can even get a paZZport from the PaZZport Office – it's part of our loyalty program, which is built around the theme of citizenship. The paZZport is stamped after each activity and offers certain benefits. And our RighthZKeepers: Bekha, Urbano Beebop, Chika, Vita and Bache represent the nation's ideals, and are responsible for promoting our values among the kids, namely, to be, to know, to create, to share, to care and to play.

On arrival, each child is given a security bracelet so parents can track their whereabouts and activities (children under eight years are accompanied by an adult). The bracelets also enable the company to capture invaluable data about the evolving needs and tastes of children so we can further enhance our offering. KidZania is a place where kids can try out new ways of being and doing things and prepare themselves for the future. We say KidZania is an "opportunity to get ready for a better world."

What has been your experience in working with KidZania?

I started with the company in 1999, developing educational content for KidZania's first facility in Santa Fe, then moved into sales and operations. I studied business administration, but I love kids, so KidZania was a perfect place for me. For the last three years, I have been managing KidZania's four Mexican facilities. KidZania has allowed me to grow professionally and in many ways has become my second home.

How many KidZania facilities are there?

We now have 28 facilities in 25 countries. The last one launched in Abu Dhabi in September 2019. Another 10 facilities are under construction and by the end of the year, we will have opened another two – one in Dallas (our first facility in the United States) and another in Surabaya, South Africa.

KidZanias are generally located in shopping malls, so parents can go shopping while their children are enjoying their KidZania experience. We are open 360 days a year, and since 1999 have welcomed over 80 million visitors – parents and children, of course, but also schools and companies who visit us for team-building purposes. It's amazing how KidZania brings out the kid in everyone!



“KidZania is two businesses in one. It is a family entertainment and learning center, and it is a platform for brands to engage with families,” explains Maricruz Arrubarrena, outgoing CEO of KidZania’s Mexican operations.



Each facility has around 400 employees, including teams for operational support, office administration and sales. Inclusion is very important to us. Retirees and people with disabilities make up 10 percent of our workforce. We also offer disadvantaged children and those with disabilities free access to our facilities.

KidZania has been recognized as one of the fastest growing global entertainment brands in the world. What is the secret of its success?

We try to marry performance with purpose, and to do good and to do well. With KidZania everyone wins. The community wins because we offer jobs. Parents win because their kids get to learn while having fun. Schools win because we offer their pupils an immersive educational experience. And our industry partners win because we offer them a unique marketing platform to build brand loyalty and to grow with us in different countries. I think our success comes from our strong social commitment to make a difference.

What is its business model?

KidZania is two businesses in one. It is a family entertainment and learning center and it is a platform for brands to engage with families. Each has a strong corporate social responsibility focus. Our concept centers on children's innate love of role-play. At KidZania, kids can explore what it means to be a doctor, a firefighter, a police officer, and many other roles.

We own and operate four facilities in Mexico, and have expanded our international operations through franchising. Our franchisees are typically service-oriented companies – they understand the importance of good customer relations – that are committed to children's education. Franchisees need to have the “know how” and the “know who” to get the business off the ground quickly. KidZania provides the intellectual property (IP), designs, themes, know how, and operational manuals, and works with the franchisee to develop the master plan and choose the right location.

What challenges are associated with franchising?

Every new franchise has its own challenges. But the overriding challenge is to ensure that the format and operations of our facilities continue to meet international quality standards. While all KidZania facilities resemble each other in terms of their design, each has its own cultural flavor. The team responsible for managing and monitoring franchisee relationships, known as the KidZania Intelligence Agency, plays an important role in monitoring and upholding quality benchmarks. Control is very important in franchising. That is why we have very strict franchising contracts in place. Poor execution and bad service can damage our reputation.

What role does innovation and creativity play in the company?

Innovation and creativity are deeply woven into the company's culture. We wouldn't exist without them. At KidZania we develop innovation and creativity around the world with entertainment. With every activity, we seek to inspire kids and to enable them to explore their flair for creativity, innovation and entrepreneurship. At the corporate level, we are always looking for new ideas and employ many young people. We also work very closely with academia so students can learn from our experience and realize their own ideas and ambitions. We see this as part of our social responsibility.

What role does intellectual property play in the company?

Intellectual property is central to our business model. We own the IP in the architectural designs and all the creative elements associated with establishing a KidZania facility and actively protect our IP assets. This is critically important because we have a lot of competition from copycats around the world. We are growing as rapidly as we can to make the most of the first mover advantage. And we are very detail-oriented and set great store on quality because we believe the best way to beat copycats

is to offer top quality service and the best available product. Our brand and our global reputation as a quality service provider are what make us stand out in this market.

We also work with over 960 brands - I don't think many other companies have so many industry partners - so careful management of IP is central to ensuring that we maintain the integrity of our brand and those of our industry partners.

Why does KidZania work with so many brands? What is in it for them?

Our industry partners represent the city's businesses and activities and are a key part of the KidZania experience. Their participation adds authenticity and credibility to our activities. By working with us, brands have an opportunity to give something back to the community by supporting children's learning. It also offers an opportunity for them to learn about the evolving tastes and needs of children and parents and to cultivate brand recognition and loyalty among them. They also get an opportunity to grow with us as we enter new markets. Some brands have been with us from the outset. KidZania offers brands a unique platform to reach new customers and an opportunity to make a difference.

Have you used the WIPO's Madrid System to register your trademarks internationally?

Yes, as a Mexican company with a global footprint, the Madrid System is a user-friendly and cost-effective way for us to register our trademarks and protect our brand in our target markets. It also makes it easier for us to manage our portfolio of trademark assets.

What are KidZania's plans for the future?

We are rolling out KidZania 4.0 to make our facilities smarter and more technology-oriented, with new professions and activities that reflect new trends. We are also launching a range of new apps to enhance the KidZania experience for children and parents, while making sure we don't sacrifice interactivity. We are assessing the feasibility of opening smaller sites with fewer activities in smaller cities to create opportunities for KidZania to expand its global franchise. And our new health, fitness and entertainment concept for older people, Kinezis, will open in Mexico State in 2020, with franchising opportunities in other countries.

What advice do you have for young people?

Be open, patient and passionate. Work hard for your goals and have fun!



KidZania now operates 28 facilities in 25 countries with another 10 facilities are under construction.



“Innovation and creativity are deeply woven into the company’s culture. We wouldn’t exist without them. At KidZania we develop innovation and creativity around the world with entertainment.”

BrightSign: a smart glove that gives a voice to those who cannot speak

By **Catherine Jewell**,
Publications Division, WIPO



"I would like to see BrightSign give people with hearing or speech difficulties the independence and the freedom we all enjoy when we communicate with others. I want to give a voice to those who can't speak," says Hadeel Ayoub, Saudi inventor and founder of BrightSign.

Millions of people around the world use sign language to communicate and rely on a friend or a relative to interpret those signs on their behalf. Saudi inventor Hadeel Ayoub, founder of the London-based startup, BrightSign, talks about how she came to develop BrightSign, an AI-based smart glove that allows sign language users to communicate directly with others without the assistance of an interpreter.

What prompted you to start developing assistive technology?

I started developing the glove as part of my PhD degree, which focused on the use of gesture recognition for wearable technology. I was chosen by my University to take part in a hackathon organized by IBM for artificial intelligence (AI) for social care, and began looking for an application for gesture recognition with community impact. As I know sign language, it was easy for me to adapt and test the system I had been working on to recognize gestures for sign language and to translate them into speech. At first, the system was very simple, but the response I received after winning the IBM Hackathon, which highlighted that there was a real need for the technology, convinced me to make its development the focus of my research.

What is the scale of the actual need for this type of technology?

Millions of people around the world use sign language as their primary language. The statistics are glaring. Seventy million people are profoundly deaf and 230 million others are hearing impaired or can no longer speak because of conditions such as autism or stroke. On top of that, 90 percent of deaf children are born to hearing parents and only 25 percent of those parents can sign, so communication can be a huge problem.

Our market analysis shows that just 2 per cent of people with hearing impairment have access to the technology they need to communicate because it is either too expensive or cannot be customized to their individual needs. That is why the company, BrightSign, which I set up with my co-founder in 2017, is focusing on delivering an affordable and customizable product. Our glove is designed for anyone whose primary means of communication is sign language or who has hearing or speech difficulties. Our aim is to give a voice to all those who cannot speak.

Tell us more about your technology?

Originally, the glove came with a predefined sign language library. Users simply wore it, signed, and the glove translated their hand gestures into speech. However, after working closely with different users, I realized that people sign in different ways and use different sign language libraries. That's why I decided to include a machine learning algorithm in the glove's design to make it learn from the user's own signs so that each user can train their glove with their movement and create their own customized library of signs. The glove is embedded with multiple sensors to measure, track and record the user's individual hand movements and is paired with an application that allows the gestures to be expressed as text and/or speech. Users can also select the language (e.g. English, French, Arabic) and the voice (e.g. male, female, child) they want the glove to speak. The glove translates the gestures to text, which appears on the screen of the wristband, and then to speech via a mini speaker, which is also on the wristband. When using the app, the text appears on the screen of a paired smart device and is vocalized via the device's speakers. The glove is, in effect, a two-way communication system, that enables people with hearing or speech disabilities to communicate independently and directly with others without an interpreter. Its functionality means that people with limited movement, such as stroke victims, or elderly people with hearing loss, can also use it. Over the last two years, I have created multiple prototypes, adding new features and functionalities to personalize the technology and make it user-friendly. It has been a work in progress.

Why is it so important for the glove to be customizable?

Sign language, like spoken language, has different libraries and each individual signs in their own unique way. With our technology, each user can train their glove to their own motor abilities so that it understands and translates those signs into speech. It gives them complete control over their sign language libraries and verbal communication, making it useful for anyone with hearing or speech difficulties.

What makes your product stand out in the market?

Both the customizability and the affordability of our product is what make it stand out in the market. We will be marketing our glove at around GBP 600 (USD 740). The next available technology used by the schools we have been working with costs around GBP 2,000 (USD 2,465).

How long did it take to develop?

I have been working on the glove's development for the last three years. Over that time, thanks to the feedback from the schools we have been working with, the technology has changed beyond recognition. We are now getting ready to move into production.

What has been the children's reaction to the glove?

At first they saw it as a toy but once they figured it out they were very keen to train it themselves and to communicate with others directly without the assistance of their teacher or their mother to translate for them. This heightened level of independence and freedom is exactly what we wanted to achieve.

What technical challenges did you have to overcome?

As with all wearable technology, the biggest challenge lies in reducing the size of the hardware to make it wearable, safe and user-friendly. In our case, we also had to ensure the glove was waterproof and washable so that children could play freely while wearing it without worrying about getting it wet or dirty. We tried various solutions, and are now using washable sensors. We had to overcome quite a few technical challenges to get to this final stage of development. There is a lot of interest in the glove. We have already opened pre-orders on our website. Once we have finalized the glove's operational design, we will move into production and start filling orders, hopefully, by the end of the year.

Which markets are you targeting?

The UK is our top priority, followed by the United States. For other markets, such as the Middle East, we will license out our technology to local suppliers. This is the most feasible option because each country has its own certification requirements for innovative healthcare devices like BrightSign. It would simply be impossible for us to navigate the specific requirements of each

“IP protection is hugely important to us, especially, given our plans to license out our technology to local partners and the need to protect ourselves against any copycats that may try to free-ride on our work.”

market, so we have decided to work through local partners. The process of identifying official suppliers in both Saudi Arabia and the United Arab Emirates is well under way.

Why is it important for startups like BrightSign to protect their IP, and what role does it have in your business?

From the outset, we have recognized the importance of IP protection. Investors advised us that they would view our product more favorably with it. Very early on, I filed a patent application in the United States, but after setting up the company, our patent attorneys advised us to withdraw it. We are now going the global route by filing an international patent application under the Patent Cooperation Treaty, which covers more than 150 countries. That makes far more sense, especially as the technology has evolved so much; we now have new claims to submit and the backing of an investor. In the early days, however, we simply couldn't afford to invest in IP protection in a big way. We decided the best way forward was to focus on developing a technology that outperformed existing technologies in terms of performance and cost. Now that we have done that and have financial backing, we are actively protecting our hardware and electronics ahead of our formal product launch at the end of the year. IP protection is hugely important to us, especially in light of our plans to license out our technology to local partners and the need to protect ourselves against any copycats that may try to freeride on our work.

The BrightSign glove has won multiple awards. How have these helped your business?

Many of the awards were organized by large corporations with big media partners. That meant we received great media exposure. For example, we won The AI for Social Care Award from IBM in 2018; The Technology Playmaker Awards '18 (Community Impact Award category) by Booking.com; and the 2018 AXA Health Tech and You Awards (Women Entrepreneurs in Health Tech category) by AXA PPP Healthcare. This success led to feature stories about our work in outlets like The Guardian and Forbes. We were also guests on the BBC's One Show, watched by around 6 million viewers. These awards came with little pots of money but more importantly, they came with free marketing and advertising, which enabled us to reach millions of people. One of



BrightSign, an AI-based smart glove, allows sign language users to communicate directly with others without the assistance of an interpreter.

the awards also included an office for free in a co-working space, which meant we could share our experiences and network with other startups. That was really enriching and useful.

What is your biggest achievement to date?

BrightSign aligns perfectly with my degree. While it has been great to make an original contribution to the field of knowledge, I am even more proud of the fact that I have produced something that can help children and others all around the world.

How would you like to see your technology used?

I would like to see BrightSign give people with hearing or speech difficulties the independence and the freedom we all enjoy when we communicate with others. I want to free them from their reliance on someone to translate for them. I want to give a voice to those who can't speak. That's our slogan

How do you think wearable tech will evolve?

I think wearable technology will continue to become smaller, easier, lighter, more durable and more customizable and it's going to play an increasingly important role in our lives. In healthcare, for example, wearable tech is being used to monitor and track patients' well-being and is already saving lives.

Do you have links with inventors in Saudi Arabia?

Yes. While I am in touch with a number of entrepreneurs and startups in the tech field in Saudi Arabia, at present, I am based in London and that is where my core network is right now. But at some point in the future I would like to go back to Saudi Arabia to share my experience and support on-going efforts to create a thriving startup scene there.

What are the next steps for BrightSign?

My first order of business is to submit my thesis! Then we are going to New Zealand to close a deal with a manufacturer so we can start filling orders by the end of the year.

What advice do you have for young girls with aspirations to get into technology or business?

Just do it. Keep your eyes on your goal and don't listen to those who tell you it can't be done. There will be low points, that's fine; just get up, recover and keep going.



The development of the BrightSign glove has involved multiple prototypes with new features and functionalities added to each new version to personalize the technology and make it user friendly.

Protecting trade secrets: how organizations can meet the challenge of taking “reasonable steps”

By **John Hull**, Queen Mary Intellectual
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Trade secrets are widely used by businesses across the economy to protect their know-how and other commercially valuable information and thereby promote competitiveness and innovation. Amid their growing use and commercial value, what practical steps can businesses take to protect their trade secrets?

A report by Forrester Consulting published in 2010 entitled *The value of Corporate Secrets: How Compliance and Collaboration Affect Enterprise Perceptions of Risk*, suggested that:

“...enterprises in highly knowledge-intensive industries like manufacturing, information services, professional, scientific and technical services and transportation accrue between 70% and 80% of their information portfolio from trade secrets.”

The significance of trade secrets is also borne out in other studies, including the European Commission’s *Study on trade secrets and confidential business information in the internal market* (see parts 4.1 and 4.2). These studies suggest that businesses, irrespective of size, consider secrecy to be as, if not more, important than patents and other forms of intellectual property (IP).

Small and medium-sized enterprises (SMEs), in particular, are more likely to rely on trade secrets to protect their innovations for a variety of reasons. In a nutshell, trade secrets have no subject matter limitations; they require no time consuming or expensive procedures; they ensure a seamless relationship between practical and legal protections and they are an immediate complement to contracts and security measures.

Moreover, many of the most commercially valuable trade secrets do not relate to patentable subject matter. The most highly valued trade secrets tend to reside in information about commercial bids and contracts, customer or supplier lists and financial information and planning.

POLICYMAKERS SEEK TO ENHANCE TRADE SECRET PROTECTION

Given the commercial value of trade secrets – and their vulnerability to threat, particularly by insiders – their misappropriation is of growing concern in many countries. For example, trade secret litigation in courts in the United States has increased significantly in recent years, where



The most highly valued trade secrets tend to reside in information about commercial bids and contracts, customer or supplier lists and financial information and planning.

perceived threats to confidential information have led to the adoption of the Economic Espionage Act in 1996, and more recently to the Defend Trade Secrets Act (2016), which introduces a federal dimension to related state laws.

The picture is similar in other countries. A European Union study on trade secrets and confidential business information in the internal market, published ahead of the EU Trade Secrets Directive (EU 2016/943), highlighted the concerns of businesses faced with misappropriation from external and internal sources. The study revealed that in the preceding 10 years, 20 percent of businesses surveyed had experienced at least one attempted misappropriation of confidential information, and nearly 40 percent of them perceived that the threat of such misappropriation had increased.

In light of their importance to firms across the economy, how can policymakers increase trade secret protection? The EU has responded by making it easier to obtain remedies against infringers, the assumption being that, secure in the knowledge that processes exist to preserve and protect commercially valuable information, businesses will be more disposed to engage in cross border deals within the EU.

One important and practical issue that emerges from the definition of a trade secret in the EU Directive relates to the “reasonable steps” that a business must take to protect its information.

Under the EU Directive (Article 2 (1)), and in line with the definition of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), a trade secret:

- “(i) must not...be generally known among or readily accessible to persons...that normally deal with the kind of information in question;
- (ii) must have commercial value because it is secret; and
- (iii) must be subject to reasonable steps under the circumstances to keep it secret.”

Accordingly, information may be secret because it is inaccessible, but may not fulfill the definition’s requirements because the holder has not taken “reasonable steps” to protect it. In practical terms, then, what steps can companies take to meet the “reasonable steps” requirement?

The test set out in the EU Directive is a proportionate one, insofar as it refers to steps “...under the circumstances...”. This suggests that a large pharmaceutical company is expected to take more robust protective steps than, say, a medium-sized business. Moreover, what may be considered reasonable in one country may not be viewed in the same way in another country – particularly if the issue is tested in court.

The “reasonable steps” referred to in the EU Directive are plainly aimed at countering the threat to trade secrets,

“The value of trade secrets to businesses, large and small and operating in all sectors, is clear. However, unlike other IP rights, trade secrets lose their value if revealed to competitors or made public.”

whether from internal or external sources. While the following practical steps will likely satisfy the Directive’s requirements, businesses operating outside the European context can also benefit from adopting such protective measures to better safeguard their most valuable assets.

PRACTICAL STEPS TO COUNTER INTERNAL AND EXTERNAL THREATS

Identification

Trade secrets differ from other IP rights. In contrast to a portfolio of registered or unregistered rights – for example, a catalogue of published works – a trade secret portfolio is, as described by Mark Halligan and Richard Weyand in *Trade Secret Asset Management* (2006), “an intangible and inchoate cloud of information stored on paper, computer drives and in the minds of employees.”

Defining what constitutes a secret may be difficult but is critical if a court is asked to grant an injunction to stop an infringer from misusing the information it safeguards. A defendant is entitled to know precisely what he or she cannot use, and the court will expect the claimant to define what it claims to own and to have protected.

Blockchain technology may offer one possible solution to the problem of categorizing and defining secrets. Uploading evidence to a secure storage site can provide a time seal and proof of storage.

Protected information technology systems

The cyber threat to computer systems (malware, ransomware, etc.) is well documented. Organizations must have security measures – encryption, password controls, virus protection – in place and the steps taken need to align with the level of perceived risk to and value of the information concerned.

Physical controls

Most organizations have access controls in place. Again, the level of security applicable to visitors and to employees will depend on the risk to the organization. A recent news report in the UK’s *Sunday Telegraph* suggested that some UK businesses are planning to “microchip their employees” (by inserting a biometric chip under the skin) to create automatic access controls and thereby protect sensitive areas of the business. Whether such an extreme measure is proportionate to the business risk is a matter for debate.

Documentary security

Much confidential information is recorded and transferred within an organization and beyond in documentary form. Marking hard or soft copy documents as “confidential” is an elementary but important step which companies should not ignore. It demonstrates that the company has drawn attention to the need to conceal the information concerned.

An enforcement policy

To resort to enforcing rights against someone who has misappropriated or disclosed trade secrets suggests that reasonable efforts have failed. This is not entirely justified. There is always the risk of misuse or disclosure by a determined or malicious infringer despite the best efforts of the rights owner.

Having an enforcement policy in place and using it successfully are two different things, since litigation has cost and risk implications. By pursuing infringers, the organization sends a message that it will take action to preserve and protect its valuable rights.

STEPS TO MITIGATE INTERNAL THREATS TO TRADE SECRETS

Much empirical evidence confirms that the main threat to business secrets is internal. For example, a 2010 survey of European employees by Iron Mountain disclosed that 66 percent of respondents had taken, or would take, information they had helped to create. Customer data is the most popular type of information targeted for removal. Seventy-two percent of them believed the information would help in a new job. However, employers must bear some responsibility for this picture. Only 57 percent of employers surveyed said that information was clearly identified as confidential and 34 percent of them admitted they were not aware of company data protection policies.

STEPS THAT ORGANIZATIONS CAN TAKE TO MITIGATE INTERNAL THREATS:**Contract of employment**

Having a written contract of employment with provisions to protect trade secrets is an essential protective measure. A standard contract will suffice for many employees, but those responsible for creating confidential subject matter, or with access to sensitive information, will need more specific contractual clauses that reflect the potential threat they pose to the business.

Some legal systems (including the UK) permit the introduction of provisions, or restrictive covenants, which restrict an ex-employee's ability to work in the same field of business, geographical area or for specific competitors for a period of time. Such restrictions insulate the ex-employer from the inevitable risk of any misuse of their secrets by an employee that leaves an organization to set up their own business or to work for a competitor. Use of restrictive covenants will reflect local restrictions on their use, the level of risk to the organization and the risk and cost of enforcement.

Confidentiality policies

Businesses often have separate policies for the creation and ownership of IP (including the observance and use of IP rights belonging to others) and confidentiality. A general policy on confidentiality is a sound business practice that demonstrates that the company has made its employees aware of the importance of compliance.

Employment procedures

Effective communication with anyone engaged in an organization's work is as important as contractual clauses and policies. For example, an employer can

use an induction interview to familiarize new employees with business procedures. Training on the importance of confidentiality is crucial. A record of employee participation in such programs also ensures they cannot later claim to be unaware of the company's approach to confidentiality. In a similar vein, an exit interview is an opportunity for the employer to remind the outgoing employee of their obligation to respect the confidentiality of any information to which they may have had access during the period of their employment. The overall intention of such procedures is to create a culture of confidentiality in the workplace to remind employees of the value the business attaches to its assets.

Surveillance of employee activities

Evidence shows that employees intent on removing their employer's confidential information (unwisely) do so by downloading soft copies to a portable device or by emailing it to a personal email address. Employers are entitled, within the scope of national data protection laws, to monitor their employees' use of workplace electronic systems. Data Loss Prevention software is an increasingly popular monitoring tool. It detects unusual data flows or access to information and can identify a potential data breach at an early stage, thereby making it possible to confront the offending employee with evidence of their infringing action before they leave.

STEPS TO MITIGATE EXTERNAL THREATS TO TRADE SECRETS

Contracts

Most contracts with third parties contain confidentiality provisions, which all too often contain "standard boilerplate" language. These clauses deserve closer consideration and need to be aligned with the risk posed by the third party's access to business secrets.

Non-disclosure agreements – the most ubiquitous of commercial agreements – also need to be carefully drafted in line with the perceived risk of disclosing the information they cover.

Due diligence

Trade secrets are a uniquely fragile asset. Once disclosed (or made "accessible") their value disappears or falls dramatically. That is why a thorough background check on the trustworthiness and reliability of a prospective commercial partner and the level of risk it poses to the organization is so important. Moreover, such steps will likely be considered "reasonable" within the framework of the EU Trade Secrets Directive.

The value of trade secrets to businesses, large and small and operating in all sectors, is clear. However, unlike other IP rights, trade secrets lose their value if revealed to competitors or made public. The "reasonable steps" required under the TRIPS Agreement and now of the EU Trade Secrets Directive should not be viewed simply as legal hurdles to jump. By implementing the steps outlined above, businesses can satisfy the test and, perhaps more importantly, they can better protect some of their most valuable assets.

WIPO Symposium on Trade Secrets and Innovation

WIPO is convening a Symposium on Trade Secrets and Innovation at its headquarters in Geneva, Switzerland, on November 25 and 26, 2019 to explore the role of trade secrets in a rapidly evolving innovation landscape.

Further information is available at: www.wipo.int/meetings/en/2019/symposium_trade_secrets.html

3D printing: the Maker Movement, IP litigation and legal reform

By **Matthew Rimmer**, Professor in Intellectual Property and Innovation Law at the Faculty of Law in the Queensland University of Technology (QUT), Brisbane, Australia

3D printing is a field of technology that relies upon additive manufacturing (as opposed to traditional subtractive manufacturing). 3D printing has also been associated with the Maker Movement – a social movement focused upon developing and sharing design files.

The field of 3D printing is currently undergoing a transitional phase. The consumer 3D printing revolution – which was aimed at one day seeing a 3D printer in every home – has been a disappointment. The pioneering home 3D printing company MakerBot was embroiled in a number of controversies over its changing approach to intellectual property (IP), resulting in disenchantment with the open source maker community and alienation from its user-base. Bre Pettis, the former head of MakerBot, reflected in an interview, “the open-source community cast us out of heaven.” In the end, MakerBot was taken over by the leading 3D printing company Stratsys and was restructured and repurposed.

A number of other key companies became insolvent. TechShop, a chain of membership-based, open-access, do-it-yourself workshop and fabrication studios, went into bankruptcy. Maker Media – which runs *Make Magazine* and a couple of maker festivals in the United States – went into administration. Dale Dougherty, founder of *Make Magazine* has sought to revive the venture with Make Community LLC.

INDUSTRIAL 3D PRINTING CONTINUES TO ADVANCE

While personal 3D printing has not developed as anticipated, there has been a rise in a number of other forms and modes of 3D printing. Industrial 3D printing – along with robotics and Big Data – has become integrated into advanced manufacturing. Information technology and design companies have sought to improve the applications of 3D printing. Metal 3D printing has attracted significant investment – particularly from transportation companies. There also has been much experimentation with health applications of 3D printing – such as dental 3D printing, medical 3D printing, and bioprinting.

As the technology has matured and advanced, there have been a number of early pieces of litigation and some policy developments in respect of 3D printing regulation. Our recent book *3D Printing and Beyond* explores some of the key developments in

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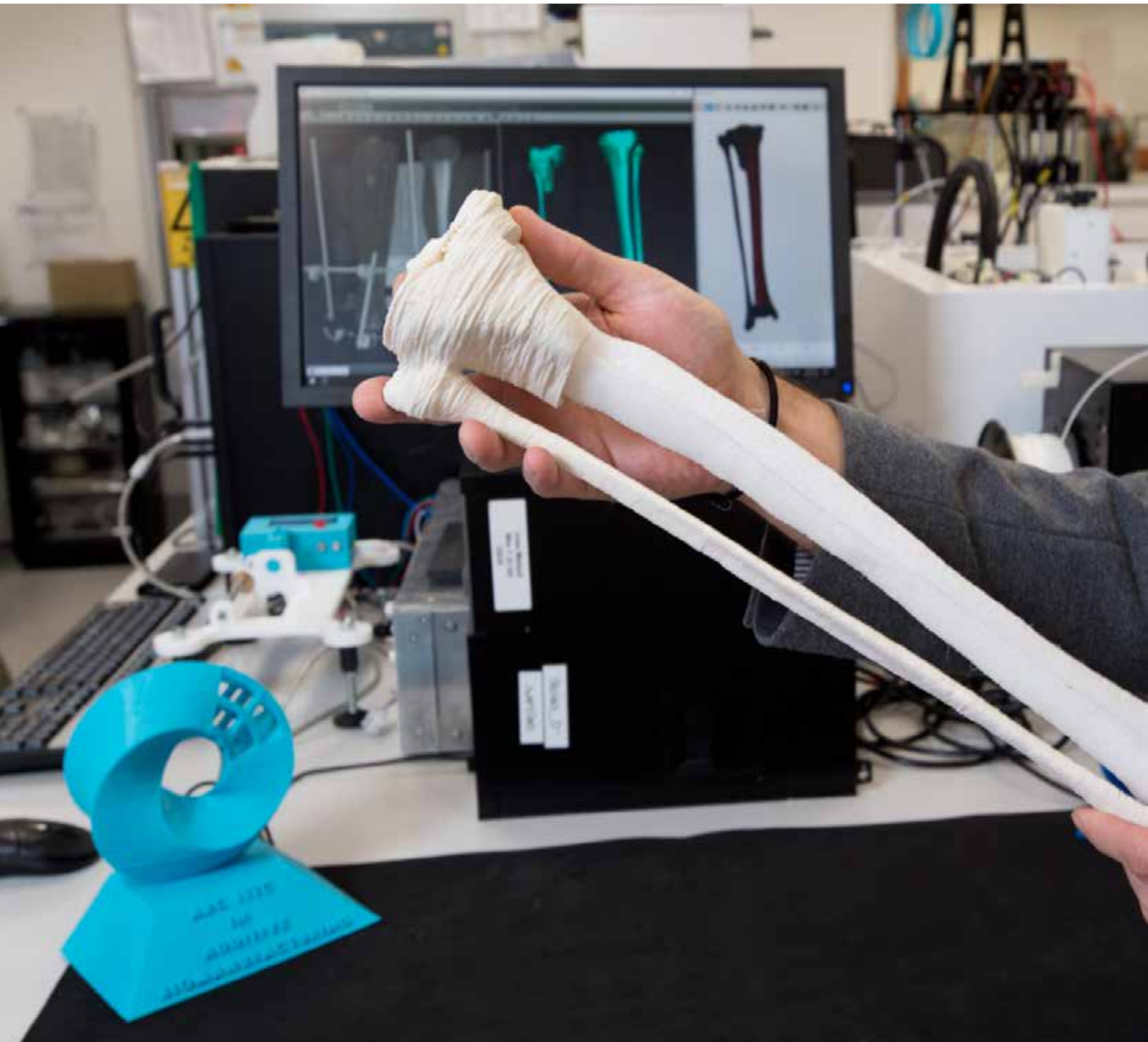


The field of 3D printing is currently undergoing a transitional phase. While the consumer 3D printing revolution has been a disappointment, there has been a rise in other forms and modes of 3D printing.

IP and 3D printing. In particular, it investigates 3D printing issues in the domains of copyright law, designs law, trademark law, patent law, and trade secrets (as well as some larger questions about 3D printing regulation). It also looks at the use of open licensing models in respect of 3D printing.

3D PRINTING AND COPYRIGHT LAW

Some years ago, there was moral panic that the advent of 3D printing would lead to a Napster-like scenario of large-scale copyright infringement. While this situation has not arisen, there have been various skirmishes involving copyright law and 3D printing. For example, Augustana College in the United States objected to the 3D scanning of Michelangelo statues although these were not covered by copyright and clearly in the public domain. United States cable and TV network HBO objected to Fernando Sosa's 3D printed *Iron Throne Game of Thrones* iPhone deck. American singer-songwriter Katy Perry complained about Fernando Sosa's 3D printed Left Shark (although the work was later reinstated to the Shapeways 3D printing systems). The estate of French-American artist Marcel Duchamp had issues with a 3D printed set of chess pieces based upon the artist's work.



“There has been much experimentation with health applications of 3D printing, such as dental 3D printing, medical 3D printing and bioprinting,” notes Mr. Rimmer.



The notice and takedown system of the Digital Millennium Copyright Act has been employed with respect to 3D printing. Shapeways and a number of other 3D printing firms have been concerned about the impact this regime will have on 3D printing platforms and intermediaries. There has also been debate over the use of technological protection measures in the context of copyright law and 3D printing. For example, the United States Copyright Office has recognized a narrow exception for technological protection measures in relation to 3D printing feedstock.

3D PRINTING AND DESIGNS LAW

Developments in 3D printing have also given rise to the right to repair an object.

In the European Union, there has been a push for the right to repair to help support consumer rights and the development of a circular economy. In this respect, the European Ecodesign Directive (Directive 2009/125/EC) has been an important driver of change in the behavior of companies and consumers.

In the United States, the Federal Trade Commission held a hearing in July 2019 on “Nixing the Fix: A Workshop on Repair Restrictions”. There remain significant divisions between IP holders and champions of the right to repair in the United States. Presidential candidate Elizabeth Warren has called for a right to repair bill to benefit farmers in agricultural communities in the United States.

In Australia, there was an important test case regarding the right to repair under designs law (*GM Global Technology Operations LLC v S.S.S. Auto Parts Pty Ltd* [2019] FCA 97). The Australian Treasury has been considering policy options for sharing repair information in the motor vehicle industry.

The ACT Consumer Affairs Minister, Shane Rattenbury, has called for a right to repair at the Consumer Affairs Forum, which includes Ministers from both Australia and New Zealand. The Federal Minister Michael Sukkar has requested that the Australian Productivity Commission investigate the issue.

There has also been a push for right-to-repair legislation at both state and Federal levels in Canada. In this regard, Laura Tribe, Executive Director of Open Media, has argued, “we’re really making sure people have the power to own their own devices”.

3D PRINTING AND TRADEMARK LAW

3D printing also disrupts trademark law and related legal regimes – such as passing off, personality rights, character merchandising, and trade dress. The legal conflict over Katy Perry's Left Shark trademark application highlights some of the issues in this field.

In the field of bioprinting, Advanced Solutions Life Sciences has sued Biobots Inc. for trademark infringement (*Advanced Solutions Life Sciences, LLC v BioBiots Inc.* 15 May 2017, 2017 WL2114969). Advanced Solutions Life Sciences owns and uses the registered trademark "Bio-assemblybot" for three-dimensional bioprinting and tissue fabrication.

3D PRINTING AND PATENT LAW

As the work of the World Intellectual Property Organization (WIPO) has shown (see World Intellectual Property Report, Breakthrough Innovation and Economic Growth), there has been a steady rise in patent applications in the field of 3D printing. A number of specialist industrial 3D printing companies – such as 3D Systems and Stratasys – have accumulated significant patent portfolios in respect of 3D printing. Major manufacturing companies – such as GE and Siemens – have also built up significant patent assets in the field of 3D printing and additive manufacturing. Information technology companies – like Hewlett Packard and Autodesk – are also notable players in the area of 3D printing.

With the rise in commercial value of 3D printing in the realm of manufacturing, there has been significant patent litigation over metal 3D printing. In July 2018, in *Desktop Metal Inc. v Markforged, Inc. and Matiu Parangi* (2018) (Case Number 1:18-CV-10524), a federal jury found that Markforged Inc. did not infringe two patents held by its rival Desktop Metal Inc (see *Desktop Metal Inc. v Markforged, Inc. and Matiu Parangi* (2018) 2018 WL 4007724 (D. Mass.) (jury verdict). In response, Greg Mark, CEO of Markforged Inc., commented, "we feel gratified that the jury found we do not infringe, and confirmed that the Metal X, our latest extension of the Markforged printing platform, is based on our own proprietary Markforged technology." For its part, Desktop Metal noted that it was "pleased that the jury agreed with the validity of all claims in both of Desktop Metal's patents asserted against Markforged."

In 2018, Desktop Metal Inc. and Markforged Inc. subsequently reached a confidential financial settlement, thereby resolving all outstanding litigation between the two parties. However, in 2019, Markforged Inc. sued Desktop Metal Inc., claiming that its rival had breached the non-disparagement clause in the settlement.

3D PRINTING AND TRADE SECRETS

There has also been some early litigation in the area of trade secrets law and 3D printing. In 2016, a Florida-based startup 3D printing company, Magic Leap, sued two of its former employees for trade secret misappropriation under the Defend Trade Secrets Act in Federal Court in the Northern District of California (*Magic Leap Inc. v Bradski et al* (2017) Case Number 5:16-cv-b-02852). In early 2017, the judge granted the defendants' motion to strike, ruling that Magic Leap failed to disclose the asserted trade secrets with "reasonable particularity". The judge allowed Magic Leap to amend its disclosures. This matter was the subject of a "confidential agreement" in August 2017. In 2019, Magic Leap brought legal action against the founder of Nreal, claiming breach of contract, fraud, and unfair competition (*Magic Leap Inc. v Xu*, 19-cv-03445, U.S. District Court, Northern District of California (San Francisco)).

3D PRINTING AND OPEN LICENSING

In addition to proprietary modes of IP protection, there has been extensive use of open licensing for 3D printing. A number of companies – like the Czech company Prusa Research; the Dutch-American company Shapeways; and Dutch company Ultimaker – have espoused an open source philosophy. The Maker Movement has relied upon open licensing to help share and disseminate 3D printing files. The State of the Commons 2017 report highlighted that Thingiverse was one of the top platforms for using Creative Commons licenses.

OTHER ISSUES RAISED BY 3D PRINTING

In addition to matters of IP, 3D printing has also been posing a range of other legal, ethical, and regulatory issues. In the field of healthcare, regulatory authorities have grappled with personalized medicine. The United States Food and Drug Administration, and the Australian Therapeutic Goods Administration have held consultations about developing well-adapted regulations for medical 3D printing and bioprinting. The European Parliament has issued a resolution calling for an holistic approach to the regulation of 3D printing.

There is also ongoing litigation in the United States over the 3D printing of guns. A number of State Attorneys-General have sued the Trump Administration to halt a settlement between the Federal Government and Defense Distributed. There have been a number of criminal cases in Australia, Japan, the United Kingdom and the United States over the 3D printing of guns. Law makers are also discussing whether there should be new offenses in respect of the possession of digital blueprints for making 3D printed guns.



There has been a steady rise in patent applications in the field of 3D printing. With the rise in commercial value of 3D printing in the realm of manufacturing, there has been significant patent litigation over metal 3D printing, in particular.

Belarus strengthens its IP system to promote innovation and economic growth

By **Uladzimir Rabavolau**, Director General of the National Center of Intellectual Property of the Republic of Belarus



During an official visit to Belarus in June 2019, WIPO Director General Francis Gurry met with President of the Republic of Belarus, Mr. Aleksandr Lukashenko. During the meeting, Mr. Lukashenko reaffirmed his country's commitment to the development of intellectual property at both national and international levels.

Like other countries in Central and Eastern Europe, over the last two decades, Belarus has focused its efforts on transitioning to a knowledge-based economy. To this end, the Government has been supporting the development of an innovation ecosystem that supports business growth and the country's long-term economic sustainability. Enhancing the national intellectual property (IP) system is central to this endeavor.

NATIONAL IP POLICY IMPLEMENTATION: KEY ACTORS

The task of developing national IP policy is the responsibility of the State Committee on Science and Technology (SCST). Whereas the practical implementation of that strategy and the delivery of IP services for both industrial property and copyright falls to the National Center of Intellectual Property (NCIP). The NCIP, which reports to the SCST, ensures that IP supports the development of science, technology and innovation within the public sector and industry, including the creative industries. Its work bolsters efforts to modernize the economy and to make it more competitive internationally. Other entities that ensure the national IP system functions effectively are the Judicial Board for Intellectual Property Cases of the Supreme Court of the Republic of Belarus, the Republican Library on Science and Technology (RLST), the Belarusian Society of Inventors and Innovators, as well as patent attorneys, appraisers of IP objects and other IP professionals. The task of enforcing IP laws lies with the Ministry of Internal Affairs and the State Customs Committee, which are responsible for putting into place effective measures, such as anti-counterfeiting measures and criminal sanctions to discourage and prevent IP infringement. The State Customs Committee also manages the National Customs Register for IP objects, which facilitates verification of the authenticity of goods as well as the process of seizing infringing products.

The modernization of Belarus' IP system is guided by the national IP strategy, developed in cooperation with WIPO. The strategy supports key national objectives to boost economic performance, promote the development of high-tech industries, strengthen the country's export potential and competitiveness, attract foreign investment and generally boost national socio-economic development. It covers a range of areas, including development of the national IP legislative and regulatory framework, a national IP infrastructure and a national IP management system. For example, NCIP is in the process of integrating WIPO's customizable Intellectual Property Automation System (IPAS), to improve the efficiency of its trademark operations and reduce processing times for trademark applications. NCIP is also implementing the ePCT system, WIPO's online portal for managing international applications under the Patent Cooperation Treaty (PCT), which covers over 150 markets. These initiatives will enable NCIP to generate efficiency gains and improve the quality of its services. Other objectives outlined in the IP strategy relate to the improvement of IP protection standards, patent information and IP education, as well as measures to tackle IP infringement; these are all important factors in establishing an effective innovation ecosystem.

BOOSTING BELARUS' INTERNATIONAL IP PROFILE

The Government of Belarus is actively working to ensure that the national IP legal and regulatory frameworks meet international standards to help improve the country's international competitiveness.

Belarus is currently party to 17 WIPO-administered treaties, including the Patent Law Treaty, which it joined in 2016. The Government plans to join two additional WIPO treaties in the near future. The first is the Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired or Otherwise Print Disabled. This will help those who live with visual impairment or who are blind to access the published works they need in the formats they require. The second is the Hague



To strengthen the links between academia and business, the Government has established ten technology parks in cities across Belarus. The Hi-Tech Park (HTP) in Minsk, is acknowledged worldwide for its technical expertise in the area of digital technology.



Agreement Concerning the International Registration of Industrial Designs, which will make it easier for Belarusian designers to protect their work in international markets.

Belarus has also signed up to the Agreement on Collective Management of Copyright and Related Rights of the Eurasian Economic Union (EAEU). That agreement entered into force in May 2019 and will help ensure that the necessary institutional structures and mechanisms are in place for creators to receive the royalties due to them. This development is part of the Government's drive to strengthen the creative economy and to protect and enforce authors' IP rights.

In a move to upgrade its collective management service, NCIP recently began implementing WIPO Connect, which will enable it to streamline its local operations and facilitate connections with regional and international networks to ensure that royalty payments are re-distributed to creators. NCIP's copyright collective management service represents the interests of more than one million authors from 40 countries. In 2018, it collected around USD 2.9 million in royalties on their behalf.

RECENT DEVELOPMENTS IN NATIONAL IP LAW

Belarus has six laws that regulate IP rights. These laws are reviewed and improved periodically to ensure they keep pace with technological developments and are in line with international IP standards. Recently, legislators revised and updated national laws on patents, utility models, industrial designs, trademarks and service marks and the protection of topographies of integrated circuits. Parliament is currently considering a revised draft law on geographical indications and a new law on copyright and related rights will enter into force soon. Numerous IP-related by-laws are also subject to periodic review and improvement. Fifty such by-laws were updated in 2018 alone.

To encourage greater use of the IP system by businesses, NCIP continues to look for new ways to make its services more user-friendly and affordable. Patent fees are revised periodically. Since January 2019, accredited scientific institutions have benefitted from a 75 percent reduction in patent fees. The aim here is to encourage these research-based entities to actively protect and commercialize their results and to foster business growth through university spin-offs and startups.

IP FILING AND REGISTRATION RATES ON THE RISE

Increases in IP filing and registration rates in Belarus over the past two years suggest that the Government's ambitious and intensive legislative reform program in the field of IP is bearing fruit. Trademark applications, by far the most dynamic area of IP activity in Belarus, rose from 8,248 in 2017 to 8,338 in 2018, with trademark registrations rising by around 3 percent, from 6,813 to 7,051 in the same period. Filing activity for patents and industrial designs also increased.

IP transactions are also on the rise. In 2018, NCIP registered 688 IP agreements, of which more than half (354 in total) were time-limited licensing agreements. NCIP also recorded an annual increase in the number of agreements relating to the permanent transfer of rights in relation to IP protected products. Franchising agreements are also on the rise. Such agreements, of which 93 were registered in 2018, demonstrate the presence of global brands in the country and are an indicator of the Government's success in attracting inward flows of foreign investment.

National statistics also show an increase in the level of IP service-related exports and revenues. Between 2015 and 2018, such exports tripled, generating around USD 66 million for the national economy.

TECHNOLOGY PARKS

With a view to strengthening the links between academia and business, promoting the commercialization of research results, and stimulating business growth, the Government has established ten technology parks in cities across Belarus. The Hi-Tech Park (HTP) in Minsk, for example, which is now recognized worldwide for its technical expertise, was established to develop the country's digital economy. Over 560 companies operate out of the park, including companies like Viber Media, producer of the leading Viber app, which counts over 460 million registered users. Other award-winning startups at HTP include Teslasuit, which has developed a full-body haptic suit that creates a realistic interface between the user and the digital world and a more immersive virtual and augmented reality experience. Teslasuit won the prestigious Red Dot Award for the Best Revolutionary Design earlier this year.

Other HTP residents are focused on developing applications around cutting-edge artificial intelligence-based solutions. Banuba Development, for example, is a computer vision-centric startup that uses artificial intelligence (AI), computer vision and other machine learning technologies to create camera-based apps around its core computer vision technology. Another highly successful resident, Synesis, is a world leader in developing intelligence video surveillance systems for public safety and other AI-based technology solutions, including for game applications. More than 100 million people around the world use its technology solutions every day.

Around one billion people around the world use the software applications created at HTP. This generates sizeable export revenues for the country.

BOOSTING IP EDUCATION AND PUBLIC AWARENESS OF IP

IP education has been another important focus of NCIP's work. Recognizing the central importance of IP education to a thriving innovation ecosystem, in 2004, NCIP set up its Training Center for Intellectual Property. The Center provides professional development opportunities for legal professionals, businesses and researchers, including residents of the technology parks mentioned above, and more. Every year, more than 100 professionals benefit from the Center's training programs, which cover topics ranging from IP rights management to the drafting and filing of IP applications. The Center also provides tailored training programs for trainee patent attorneys and examiners.

Cultivating broad awareness of the benefits that can flow from the strategic use of IP rights, in terms of employment, business growth and economic performance, is yet another important factor in establishing an effective national IP system. Thanks to the efforts of the country's IP authorities, including the organization of activities to mark the annual World Intellectual Property Day campaign, public awareness of the potential of IP to support social and economic development is increasing. In a move

“Leveraging the capacity of Belarussian inventors to develop cutting-edge innovations by supporting the development of a thriving national innovation ecosystem underpinned by a robust, efficient and cost-effective IP system is a top priority for Belarus.”



The award-winning startup *Teslasuit*, is one of over 560 companies that operate out of HTP. Its full-body haptic suit creates a realistic interface between the user and the digital world offering a more immersive virtual and augmented reality experience.

to bolster understanding of the relevance of IP to businesses, the NCIP recently rolled out its online Intellectual Property Exchange. A platform for inventors to showcase their inventions and for businesses to learn about associated IP licensing opportunities, the Exchange is helping to boost the market for IP assets in Belarus. By the end of 2018, the Exchange had over 670 inventions on its register.

COOPERATION WITH WIPO

Belarus has been a member of WIPO since the Organization began operations in 1970 and remains actively engaged in its work. Over the past five decades, WIPO and Belarus have established a solid basis for cooperation in developing the national IP system and in promoting the strategic use of IP for the country's economic development. This longstanding and fruitful relationship received new impetus in June this year, when the government signed a wide-ranging cooperation agreement with WIPO. The agreement covers a variety of activities including:

- Developing a national IP strategy up to 2030;
- Encouraging the implementation of IP strategies by universities;
- Expanding the network of Technology and Innovation Support Centers (TISCs) in Belarus to help local inventors create, protect and manage their IP rights and realize the economic potential of their innovations;
- Improving patent quality;
- Promoting the commercialization of IP assets; and
- Developing arbitration and mediation services to support the cost-effective and rapid resolution of IP-related disputes.

Leveraging the capacity of Belarussian inventors to develop cutting-edge innovations by supporting the development of a thriving national innovation ecosystem bolstered by a robust, efficient and cost-effective IP system is a top priority for Belarus. With support from the highest levels of government, the commitment of the national IP authorities to promote IP and innovation, and the country's deep pool of innovative and creative talent, the future of innovation looks very bright in Belarus.



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