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Negotiators modernize international system for registering GIs

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The newly adopted Geneva Act of the Lisbon Agreement on Appellations of Origin and Geographical Indications modernizes and updates the current Lisbon System by allowing for the registration of geographical indications (GIs) as well as appellations of origin, such as Olives de Nyons (above). It also accommodates the needs of countries that use the trademark system to protect GIs.



Producers of origin-based quality products (goods produced within a given geographical area) – as well as consumers in search of such produce – stand to benefit from a recently revised international treaty which protects the indication of the geographical origin of, among others, coffee, tea, fruits, wine, cheese, pottery, glass and textiles.

Think Café de Colombia, Darjeeling tea, Florida oranges, Champagne, Gouda Holland, Jaipur blue pottery, Murano glass and Harris Tweed. Different jurisdictions protect such high-value, quality products in a variety of ways: through *sui generis* systems to protect appellations of origin (AOs) or geographical indications (GIs), or through the trademark system using collective marks and certification marks (see box).

The Geneva Act of the Lisbon Agreement on Appellations of Origin and Geographical Indications, adopted by negotiators in Geneva on May 20, 2015, modernizes and updates the current Lisbon System by allowing for the international registration of GIs as well as AOs. The inclusion of GIs on the international register will offer a new avenue for producers to protect the distinctive designations of their goods internationally. The Geneva Act also accommodates the needs of countries that use the trademark system to protect GIs.

“The revision of a treaty is a major event in the life of the Organization that is responsible for the administration of the Agreement,” said WIPO Director General Francis Gurry at the opening of the Diplomatic Conference which ran from May 11 to 21, 2015. The revision of the Lisbon System, he said, was an opportunity to modernize it and to reflect the changes that had taken place in the world since its adoption in 1958. He referred, in particular, to the “wave of globalization which has seen markets open,” to “a heightened role for brands and identifiers,” and to “an enhanced appreciation of the value and importance of specificity and distinctiveness.” The challenge, he said, was to develop an international system that is attractive to all WIPO member states and that will enable the system to evolve and expand.

AN EVOLVING LEGAL LANDSCAPE

The current Lisbon Agreement, adopted in 1958, provides for a relatively high level of protection for AOs and makes it possible to protect them in multiple countries, regardless of the nature of the goods to which they apply. For its part, the WTO-administered Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) offers two tiers of protection; one generally applicable to GIs for all products and another, higher standard for GIs applicable to wines and spirits.

The newly adopted Geneva Act revises and modernizes the 1958 Lisbon Agreement in a number of ways. The changes introduced are designed to extend coverage of the System beyond AOs (qualification for which usually involves compliance with more stringent production requirements at the national level) to all GIs, both those protected under *sui generis* systems and those protected via the trademark system. In so doing, the Geneva Act is



Photo: © Carol Ann Peacock. Permission given by the Harris Tweed Authority.

About AOs, GIs and marks

Broadly speaking, a geographical indication (GI) is a sign used on goods that have a specific geographical origin and possess qualities, reputation or characteristics that are essentially attributable to that place of origin. An appellation of origin (AO) is a similar type of sign, but often with more stringent criteria for usage.

Both require a qualitative link between the product to which they refer and its place of origin. Both inform consumers about a product's geographical origin and a quality, characteristic or reputation (for GIs) of the product linked to its place of origin. The basic difference between the two terms is that the link with the place of origin is stronger in the case of an AO.

The quality or characteristics and reputation of a product protected as an AO must result exclusively or essentially from its geographical origin. This generally means that the raw materials should be sourced in the place of origin and that the processing of the product should also take place there.

In the case of GIs, a given quality, its reputation or other characteristic of the product must be essentially attributable to its geographical origin, for the GI to qualify as such. Moreover, the production of the raw materials and the development or processing of a GI product do not necessarily have to take place entirely in the defined geographical area.

Examples of AOs and GIs are Gouda Holland, Argan oil, Swiss watches and Tequila.

Some jurisdictions protect GIs through their trademark system. In these jurisdictions, GIs are protected as either collective marks (signs used by members of an association to distinguish their goods or services from those of other entities) or certification marks (signs used to identify goods or services that comply with a set of standards and have been certified by a certifying authority).

Different jurisdictions protect origin-based products in different ways. For example, Harris Tweed (made from wool that is dyed (above), spun and handwoven by Islanders of the Outer Hebrides of Scotland) is protected by certification mark number 319214 registered in 1909 making it the oldest British certification mark.





Photos: Stock photo © helovi



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Camargue bulls (taureaux de Camargue) (left) and Chiapas amber (ámbar de Chiapas) (right) are appellations of origin registered under the Lisbon System.

expected to encourage more WIPO member states to join the Lisbon System, because while some countries apply AO protection, many others operate registration systems for GIs. The System currently has a membership of 28 countries with just 896 AOs on its international register.

The basic negotiating text for the Diplomatic Conference was developed between March 2009 and October 2014 by a Lisbon System working group with the goal of modernizing the System to attract a wider membership while preserving its principles and objectives.

NEW FEATURES

The new Geneva Act introduces a number of new features, including:

- definitions of AOs and GIs;
- maximum flexibility with respect to how the protection standard of the Act may be implemented (i.e. through a *sui generis* AO or GI system or through the trademark system);
- a new definition of the scope of protection of AOs and GIs;
- an obligation for contracting parties to provide an opportunity for interested parties to request the refusal of the effect of an international registration. This new feature will make it possible for interested parties to challenge the effect of an international registration in jurisdictions where such arrangements are not currently in place;
- notification of grant of protection;
- the possibility for contracting parties to request payment of an individual fee;
- the explicitly foreseen possibility to invalidate the effect of an AO or a GI. This new provision of the Geneva Act

confirms that it is possible to record the invalidation of an AO or a GI within a given jurisdiction through the Lisbon System;

- safeguards with respect to prior trademark rights, personal names used in business, and rights based on a plant variety or animal breed denomination;
- a provision that opens accession to the Geneva Act by certain international intergovernmental organizations with competence in the area of GI protection including, for example, the European Union (EU) and the African Intellectual Property Organization (OAPI).

The Final Act of the Diplomatic Conference, an official record that the event took place, was signed by 54 delegations. Eleven of those delegations also signed the Geneva Act, namely, Bosnia and Herzegovina, Burkina Faso, Congo, France, Gabon, Hungary, Nicaragua, Peru, and Togo and two non-Lisbon members, Mali and Romania. Italy signed the Geneva Act the following day, bringing the number of signatories to 12.

The Geneva Act will remain open for signature for 12 months. It will enter into force upon ratification or accession by five contracting parties.

Lenovo: driving business success through innovation

By **Fred Gao**, Patent
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As one of the world's largest computer technology companies, the Lenovo Group is no stranger to innovation. A major player in what we call the "PC+" world, where people use personal computers and a broad range of smart devices, the company is constantly striving to create new categories of products that enhance the consumer experience, stand out from the competition and drive growth.

Lenovo has a rich pool of talent, employing around 33,000 people in over 60 countries serving customers in more than 160 markets. Product innovation is at the heart of Lenovo's business success. The company operates 46 world-class laboratories, including research centers in Beijing, Shanghai, Wuhan and Shenzhen, China; Yokohama, Japan, and Morrisville, North Carolina, USA. The ultimate goal of Lenovo's research and development (R&D) teams is to make more affordable products that add value and connect with the evolving needs of customers.

FOSTERING A CULTURE OF INNOVATION

Innovation is part of Lenovo's DNA. All employees are encouraged to share their ideas. A mechanism is in place to foster and screen innovative ideas for further development. The department in charge of innovation regularly pushes the latest science and technology news to R&D teams and organizes brainstorming sessions with employees. After evaluation by the Innovation Committee, successful proposals are fed through to the relevant operational departments. Senior managers also meet regularly to analyze technology trends and decide on the company's innovation strategy, which is systematically communicated to all employees to ensure everyone is familiar with and works to support the company's innovation objectives.

Lenovo's R&D teams have introduced many industry firsts and have a strong track record when it comes to innovation and design. Its commitment to delivering high-quality, reliable and durable devices that meet consumer demand, underpinned by an extensive patent portfolio, continues to drive the company's growth. Lenovo's innovative products have won over 100 major design awards.

Lenovo's award-winning Yoga Tablet, launched in autumn 2014, incorporates new technologies and design features covered by over 100 patent and design rights.



Photos: Lenovo

INNOVATIVE DESIGN UNDERPINS COMMERCIAL SUCCESS

One such product is the award-winning Yoga Tablet which was launched in autumn 2014, ushering in the multimodal concept for electronic devices. Inspired by the “hinge” in the bamboo slips – a sequence of bound long narrow strips of bamboo featuring a single column of brush-written text – used in ancient China, the Yoga Tablet integrates traditional cultural elements with cutting-edge technology. Its hallmark cylindrical hinge and metal kickstand differentiate it from other commercially available tablets, making it easier to grip. Its rotatable stand offers users multiple operating modes – stand, tilt and hold – allowing them to adapt to different operating contexts. The Yoga Tablet’s innovative design has proven a hit with consumers, with nearly 2 million units sold since its launch.

In December 2014, the Yoga Tablet won the WIPO-SIPO Award for Outstanding Chinese Patented Invention and Industrial Design and the China Patent Golden Award for Industrial Design. It has also won a number of other prestigious design awards in China and abroad, including the Red Dot Design Award.

The Yoga Tablet is the brainchild of one of Lenovo’s regular in-house designers whose ideas made it through the company’s innovation screening process. It also underlines the benefits of a practice introduced by the company some years ago whereby researchers are required to put aside one day a month to focus on innovation-related matters. Lenovo’s so-called “patent day” approach has proven an effective means of boosting awareness of intellectual property (IP) among employees.

AN INTEGRATED APPROACH TO INNOVATION, DESIGN AND INTELLECTUAL PROPERTY

At Lenovo, innovative ideas and intellectual property converge seamlessly. Lenovo’s IP strategy is an integral part of the innovation cycle and product design process. R&D teams work closely with the company’s IP lawyers from product conception through to manufacture and commercialization to develop effective IP strategies for new products. These typically involve a combination of invention patents, utility models and industrial design rights. The Yoga Tablet product line is protected with over 100 patents and design rights covering multiple technology areas, from innovative structure and design and multi-mode conversion to software, display



Photos: Lenovo

Lenovo's R&D teams have introduced many industry firsts and have a strong track record in innovation and design.

adjustment and user interface. Similarly, Lenovo's Yoga Laptop, which combines its unique 360-degree rotating screen with standard tablet and laptop functionality, boasts around 100 patent and design rights.

Thanks to its drive to innovate and strong commitment to intellectual property, the Lenovo Group now holds over 22,000 patents worldwide, with annual application numbers exceeding 3,500.

Lenovo's commitment to enhancing the consumer experience means that product design plays an important role in the commercial success of our products both in China and abroad.

In 2013, Lenovo became the first China-based company to apply for international industrial design protection via the Hague System for the International Registration of Industrial Designs. While China has yet to join this WIPO-administered System, as a global conglomerate with offices across the globe, the company has been able to take advantage of the System's benefits. By filing a single application under the System, right owners can secure protection for their designs in all participating countries, avoiding the time and expense of having to file multiple separate applications with different national or regional IP offices (see www.wipo.int/hague/en). Having filed international industrial design applications through the Hague System for two consecutive years, Lenovo has taken full advantage of its cost-effectiveness and efficiency. In fact, in 2014 it became the seventh largest user of the System (see www.wipo.int/export/sites/www/ipstats/en/docs/infographics_hague_2014.pdf).

Within the global ICT sector, the drive to enhance the consumer experience – and gain market share – means that companies will continue to focus not only on technological innovation, but also on product design. As a critical source of value creation, design has an increasingly important role to play in the IP strategies of businesses, especially those seeking to compete in international markets. As Lenovo's experience with the Yoga Tablet shows, an effective IP strategy both builds a protective wall for the company, and creates an effective platform for international competition and commercial success.

As Chinese companies expand into international markets, they will inevitably need to ensure their IP rights are protected internationally. Services such as those offered by WIPO, including the Hague System, provide companies with a streamlined and cost-effective means of doing so.

How licensing a portfolio of standard-essential patents is like buying a car

By J. Gregory Sidak, Chairman, Criterion Economics, LLC, Washington, DC, United States

The calculations made when trading-in an old car for a new one are similar to those undertaken by two patent holders when they cross-license their respective patent portfolios.



Photo: Stock photo © michaeljung

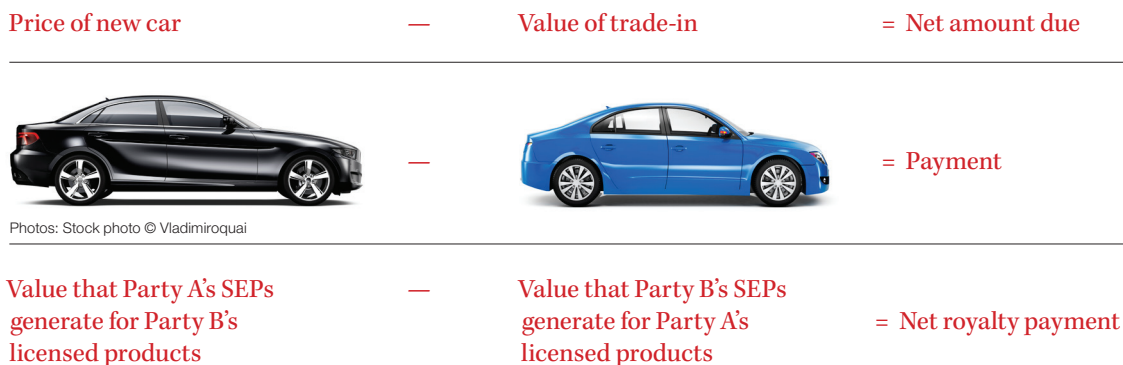
A driver wants to replace her old BMW 328i with a new Toyota Camry. At the dealership, she decides to accept the dealer's offer to trade in her used car and receive a credit (a "trade-in allowance") toward the price of the Camry. The dealer and the driver are each, in effect, simultaneously buying and selling in this transaction. The dealer offers to buy the used BMW at a price equal to the trade-in allowance. The better the condition of the used BMW, the higher the credit the dealer will grant the driver toward the net price—that is, the total amount of cash exchanged for the new Camry. If the BMW's fenders were rusted, the dealer would offer less than he would pay if the car were in pristine condition.

An analogous transaction occurs when two patent holders cross-license their respective patent portfolios. Each patent portfolio commands a particular royalty payment from the counterparty. Typically, the royalty specified in a cross license is a net-balancing royalty that one party must pay to the other—that is, the difference between the one-way royalties that each party owes the other for the use of its respective patent portfolio.

The net-balancing royalty, or the cash exchanged, will equal the difference between the royalty for the more valuable portfolio and the royalty for the less valuable one.

The values that the parties' patent portfolios generate for the other determine which party is the net payer and which the net recipient of royalties and the amount of the net-balancing royalty. As Figure 1 illustrates, the net-balancing royalty is analogous to the net price of the new Camry.

Figure 1



Photos: Stock photo © Vladimiroquai

CROSS-LICENSING PORTFOLIOS OF STANDARD-ESSENTIAL PATENTS (SEPS)

The parties' patent portfolios might include standard-essential patents (SEPs) that they have committed to license on fair, reasonable, and nondiscriminatory (FRAND) terms. Standard-setting organizations develop and promote technical standards (for mobile phones, for example) that permit interoperability among standard-compliant products. A SEP is a patent that a manufacturer needs to use to produce a standard-compliant product.

SEP holders sometimes also manufacture the standard-compliant product that incorporates their own SEPs. It is common for SEP holders to cross-license their SEP portfolios to one another, enabling each party to manufacture its standard-compliant products without infringing the other's SEPs, and to receive compensation for its contributions to the standard.

NET-BALANCING ROYALTIES

Holding all other factors constant (including each party's revenue from sales of its licensed products), the party whose SEP portfolio contributes less value to the relevant standards will pay the net-balancing royalty. Like the car dealer, a net recipient will assess the "trade-in value" of the net payer's SEP portfolio when offered in exchange for the use of the net recipient's SEP portfolio. Just as the driver who is trading in a used BMW in poor condition will pay more for the new Camry than a driver trading in a used BMW in good condition, the weaker the net payer's SEP portfolio relative to the net recipient's, the higher the

net-balancing royalty. The net-balancing royalty in a cross license thus reflects the values of *both* parties' patent portfolios. It is necessarily equal to or (far more likely) *less than* the value of the net recipient's patent portfolio.

WHAT IF THE CAR DEALER STOPS ACCEPTING TRADE-INS?

Suppose that the dealership decides to stop accepting a trade-in from a driver wanting to purchase a new car. If the dealer does not grant a credit toward the price of the new Camry, the transaction becomes a one way sale by the dealer. Similarly, if two parties have entered into a cross-license agreement, and Party B decides to stop licensing its patented technology, or Party A decides to stop obtaining a license for Party B's patented technology, then the transaction is no longer a cross-license. The parties simply become a licensor and licensee, and the net-balancing royalty between them simplifies to a one-way royalty. That one-way royalty equals the value of the licensor, Party A's, patent portfolio because the value that Party B's patents generate for Party A's products falls to zero.

ADJUDICATED FRAND ROYALTIES

Judges, juries and arbitrators may be required to interpret a net-balancing royalty in a cross license to determine reasonable-royalty damages for patent infringement and for setting FRAND royalties for SEPs. This can be challenging. Determining a patent portfolio's one-way royalty based on a cross license that specifies only a net-balancing royalty is analogous to calculating the price of the new Camry on the basis

of the net price charged after accounting for the trade-in allowance for the used BMW. Without knowing the value of the BMW, it is hard to calculate reliably the price that the dealer would have charged for the Camry if a customer had not traded in her used car. Suppose that the driver paid a net price of USD7,500 for her new Camry, after trading in her used BMW. That fact indicates only that the one-way price of the Camry must exceed USD7,500 (assuming that the trade-in value of the used BMW exceeded zero), because the net price of USD7,500 is the one-way price of the Camry less the one-way price (the trade-in value) of the used BMW.

The net price does not indicate by how much the one-way price of the Camry exceeds USD7,500. To measure that amount, previous transactions for a new Camry or a used BMW could shed light. A transaction for a new Camry of the same model year would provide the most direct and informative benchmark. However, if the price of such a transaction is not available, then transactions for a used BMW, combined with other information (namely, the net price of USD7,500 that the driver paid), help in determining the one-way price of the Camry. Suppose that the dealer sold for USD15,000 a used BMW in similar condition to the one that the driver traded in for a new Camry. We can then estimate that the driver received a trade-in allowance of USD15,000 for her BMW. The driver paid USD7,500 beyond the comparable trade-in value, which implies that the estimated one way price of the Camry was USD22,500 (that is, $USD15,000 + USD7,500 = USD22,500$).

COMPARABLE LICENSES

Similarly, existing patent licenses comparable to a hypothetically negotiated license can help adjudicators determine the reasonable-royalty damages that an infringer owes the patent holder. When an adjudicator is required to estimate the one-way royalty for a patent portfolio based on the net-balancing royalty in a cross license, previous license agreements for either patent portfolio in that cross license might inform the calculation. Comparable license agreements upon which licensors and licensees have willingly agreed reflect the real-world market valuation of the SEP owner's patented technologies. US courts consider such agreements probative of the royalty upon which the parties in a dispute would willingly have agreed in a hypothetical negotiation. The Federal Circuit said in *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 79 (Fed. Cir. 2012), that comparable licenses are "highly probative as to what constitutes a reasonable royalty" and that "actual licenses most clearly reflect the economic value of the patented technology in the market place." Likewise, royalties specified in comparable licenses represent what SEP holders and their licensees considered to be fair and reasonable in previous negotiations. Calculating a FRAND royalty based on what other similarly situated licensees paid in previous license agreements also satisfies the nondiscrimination requirement of a FRAND royalty.

THE EFFECT OF THE NET PAYER'S SALES ON THE NET-BALANCING ROYALTY

To calculate a reasonable royalty for a patent portfolio using the net-balancing royalty in a cross license, it is necessary to adjust the damages calculation according to the extent to which each party uses the counterparty's patent

portfolio. The net payer in a cross license does not necessarily have the weaker patent portfolio—that is, the portfolio that contributes less value to a relevant standard. Suppose that Party A sells 1,000 units of a product that uses Party B’s patent portfolio, and Party B sells 100 units of a product that practices Party A’s patent portfolio. Also suppose that Party A charges a per-unit royalty of USD2 for its patent portfolio and Party B charges USD1. Table 1 shows that, even though Party A’s patent portfolio is more valuable and Party A licenses its patent portfolio for a higher per-unit royalty, Party A will be the net payer in a cross license between Party A and Party B.

Table 1: The effect of sales on the net-balancing payment

	Unit sales [1]	Per unit royalty of counterparty’s patent portfolio [2]	One-way royalty payment [3] = [1] x [2]
Party A	1,000	USD1	USD1,000
Party B	100	USD2	USD200
Net balancing payment that Party A owes Party B			USD800

In the 1920s, Les Kelley began to circulate a list of automobile prices that became a trusted source for both consumers and dealers, the *Kelley Blue Book*. The availability of pricing information for cars of virtually all makes, models and conditions eased negotiations between consumers and dealers and helped enable exchange that benefitted both parties. Lack of information (for example, about what other licensees of the relevant patent portfolio paid in royalties) might frustrate a SEP holder’s attempts to negotiate a license. Perhaps patent licensing would become more efficient if standard-setting organizations adopted some of the mechanisms that the market for automobiles has devised to increase the transactional efficiency of voluntary exchange.

For further reading about licensing standard-essential patents on fair, reasonable, and nondiscriminatory terms, see

- J. Gregory Sidak, *The Meaning of FRAND, Part I: Royalties*, 9 JOURNAL OF COMPETITION LAW & ECONOMICS 931 (2013) (www.criterioneconomics.com/meaning-of-frand-royalties-for-standard-essential-patents.html)
- J. Gregory Sidak, *The Meaning of FRAND, Part II: Injunctions*, 11 JOURNAL OF COMPETITION LAW & ECONOMICS 201 (2015) (www.criterioneconomics.com/meaning-of-frand-injunctions-for-standard-essential-patents.html)

Protecting intellectual property in the cloud

By **Asaf Cidon**, Founder and CEO of Sookasa, California, United States

As intellectual property (IP) becomes the heart of the global economy, collaboration is becoming increasingly important.

For most corporations, research organizations and other institutions, that means turning to the cloud. In many cases, the cloud makes mobile work and collaboration easier, offering unprecedented advantages in terms of storing and syncing information across multiple devices. The cloud makes sharing information seamless, boosts productivity and unchains people from their physical offices, enabling cross-border coordination and easy access to files and the insights they contain. According to the *RightsScale 2014 State of the Cloud Report* (www.rightscale.com), nearly 90 percent of businesses already use the cloud, and that number is only expected to grow. Clearly, the cloud is here to stay.

But for those who work with intellectual property (IP) and need to secure it, these cloud computing trends may raise concerns. After all, part of the cloud's magic is the necessary proliferation of data across devices and collaborators – which means relinquishing considerable control. And when your life's work entails handling confidential product designs, source codes, patents, or trade secrets, the last thing you want are vulnerabilities caused by inadvertent leaks or malicious actors in the cloud. The value of IP means the stakes are already high. The cost of patent disputes – especially in the technology sector – can be stratospheric.

IDENTIFYING AND MEDIATING RISKS

The key to using the cloud confidently and to harnessing its power to advance new IP is to take charge of what you can control. This really comes down to implementing safeguards and security. In fact, the cloud provides a way not only to share knowledge, but also to protect IP.

When it comes to IP, embracing the cloud is a double-edged sword. It allows the collaboration that business needs, but at a potential risk to sensitive IP information. Every industry is subject to data breaches, and many companies that fall victim are attacked at random by cybercriminals stripping large amounts of usernames, passwords, credit card numbers, or other private information from

their databases for quick financial gain. But intellectual property is explicitly desirable. More than a quarter of cybercriminals are intellectual property spies according to Verizon's 2014 Data Breach Investigations Report (www.verizonenterprise.com). Malicious actors targeting IP are looking for something more specific than numbers or logins – and they know how to get it.

Malware and phishing are by far the two biggest threats when it comes to data breaches at large, but these techniques only get cybercriminals so far, perhaps because they generally come from outside the organization. Another Verizon study, *DBIR Snapshot: Intellectual Property Theft* from 2012 found that IP spies are more sophisticated, and perhaps even more malicious. In fact, the study found that nearly half of all IP data breaches involve current or former employees, especially in industries such as manufacturing, finance, technology, and government. Moreover, the single biggest reason for IP breaches is the abuse of system access and privileges. In other words, confidential IP tends to leak because of people who have access to information they should not be authorized to see; have retained access after they have left the company or project; or are colluding with an outside criminal or hacker.

User error, however, is not always malicious. Employee negligence is a top concern across many industries, especially as the cloud becomes more and more prominent. For example, take the issue of file synchronization: The cloud allows for syncing across devices, which in turn allows you to access your clients' patents or blueprints on your smartphone or tablet while traveling or working from home. In many respects, this is a boon: you are able to be more productive, as well as more responsive, even when you are not in the office.

But say you leave your tablet in a taxi, and on it a company's trade secrets accessible through your email or in your downloads folder. If the tablet falls into the wrong hands and is disseminated to a competitor, your client's work is essentially rendered useless. A 2012 survey by Microsoft found that nearly 70 percent of professionals nationwide use their personal mobile devices for work and with them the cloud, whether or not their companies allow it (<http://blogs.microsoft.com/cybertrust/>). That being so, there is no doubt that some devices will be lost, email accounts will be left open, and attachments will be sent accidentally. But if all files are encrypted – whether

they are in a cloud folder, in a secure link in an email, or downloaded – it does not matter who finds the tablet in the taxi. If they are not authorized to read the files, they simply cannot.

HOW CAN THE CLOUD HELP PREVENT INTELLECTUAL PROPERTY THEFT?

The cloud brings risks, but also a big potential silver lining in terms of security: not only are there feasible ways to protect your information, but the cloud may actually prove safer than traditional network servers, which are disproportionately targeted in attacks.

According to Verizon, at least half of all IP theft involves companies' database servers and file servers. These are more frequently compromised than documents, staff members, emails and web applications, among other company assets. In light of this, a first instinct might be to simply build bigger and better firewalls to provide those servers with additional protection. But another approach would be to remove protected data from the servers altogether and move it to the cloud.

Using cloud-based storage for all your IP information may actually enhance its protection. As a result, your company can remain assured of its security while being able to embrace all the benefits the cloud provides. With appropriate safeguards, IP data stored in the cloud will be safer than on any single physical network. The key to secure cloud-based storage is encryption.

Encrypting data at the file level means it is *always* encrypted from before it reaches the cloud to after it leaves it. This means that only you and the users you authorize will be able to decrypt the files.

In contrast, it is often not practical to encrypt traditional databases. They are in constant use, and sensitive content is effectively decrypted each time it is accessed, because the key is ever-present. This is not the case with the cloud, where the right solution will keep your IP data separate from encryption keys. In consequence, neither the cloud provider nor the encryption provider can access your data – only you can – ensuring strong security hygiene.

Not only does file encryption ensure security in the event of a breach, it also means that you, your colleagues and clients can share and sync files without putting them at

Photo: Stock photo © daflyn





The cloud provides a way to share knowledge and to protect IP. The key to harnessing its power is to take charge of what you *can* control by implementing safeguards.

risk, making collaboration and communication seamless. Imagine sharing folders full of sensitive files, keeping all the information your team needs close and safe.

A major advantage of encryption and the ability to control who can decrypt the data is that administrators can provide access on a need-to-know basis. We have already seen how detrimental misuse can be; but if an employee or team member cannot snoop around on a server because he or she cannot open encrypted files, the likelihood of theft decreases dramatically.

Finally, security solutions layered onto the cloud also allow you to maintain a thorough audit trail. The ability to monitor your encrypted files, knowing which users accessed them and when, is key to preventing breaches and theft. If an unauthorized user – whether from inside or outside your organization – gains access to IP data that he or she should not have access to, you will know it and can stop the attack early. Being able to revoke access to people no longer involved in a project, or to lost devices, is also vital. An ex-employee could still access files emailed to a personal account or saved on a home computer unless you take steps to prevent them.

Deploying file-level protection not only protects the data itself, it also reduces overhead on the cloud servers, so you can work with encrypted documents quickly and easily.

In short, the cloud can provide myriad advantages in storing, sharing and collaborating on IP projects. However, with the cloud come vulnerabilities that must be properly preempted. But with the right type of encryption, it is easy to protect your files and to authorize only those users who are meant to see them.

In many ways, IP moves the world forward, and the world is moving fast. But it can only drive the growth of the international economy if it becomes simple, even seamless, to collaborate on the most challenging questions facing our world. A secure cloud can make it easier for people to work together and help the world move forward one good idea at a time.

Valuing Africa's creativity: an interview with Kenyan TV entrepreneur Dorothy Ghettuba

By Catherine Jewell,
Communications Division, WIPO

Spielworks Media, a Nairobi-based television and digital media company, is one of a growing number of content production companies that are springing up and thriving in Kenya's vibrant media sector. In 2008, with little more than her passion for creativity, her drive and determination, the company's founder and CEO, Dorothy Ghettuba, returned to her native Kenya from Canada to follow her dream of becoming a TV entrepreneur who celebrates Africa's story-telling tradition. To date, Spielworks Media has produced some 20 TV shows and employs 17 staff, though the number can swell to 700 depending on the creative project at hand. In this interview Ms. Ghettuba shares her experiences and aspirations and explains why copyright is critical to the long-term viability of her business.

How did you get involved in television?

I have always been a creative person and loved theatre, drama and dancing at school. I soon realized that regular office work was not for me. I was restless. Creative people are always restless. During a holiday in Kenya, I saw a creative opportunity that made business sense. So I returned to Canada, packed my bags and came back home to become a TV entrepreneur producing content with an African aesthetic.

What challenges did you face?

I arrived in Kenya with stars in my eyes and high hopes of starting a production company, producing and selling shows and making lots of money. I quickly sobered up. Raising the working capital to produce content continues to be a huge challenge. I can draw on my background in finance and my creativity, but it is tough. If a TV network gives me money in advance to create a show they will claim the rights in it and we will barely cover our production costs. So at Spielworks Media we borrow money from the bank. The good news is



Photo: Spielworks Media

Dorothy Ghettuba's long-term vision is for Spielworks Media to become the biggest, the best, the boldest of creators, producers, developers and broadcasters of content with an African aesthetic.

that we are now starting to make money and are beginning to finance our own shows.

Why is copyright important for your business?

There is no money in production. The only way to be profitable is through syndication, selling and re-selling our shows to multiple broadcasters. I dream of the day I will be able to sell one of our shows to 100 channels on a non-exclusive basis at the same time. This means retaining the intellectual property (IP) rights in our shows. I found that in Kenya broadcasters would buy all the rights to a show in perpetuity. This just didn't make sense nor was it an option for Spielworks Media. We would not and could not give away our IP for a few shillings. In show business everybody thinks you are making money, but in reality we could not cover production costs. We could only stay afloat if we carefully and strategically managed our IP rights. So we sold broadcasters only those rights they were going to exploit. We sold TV rights to TV networks, free-to-air rights to free-to-air stations, pay TV rights to pay TV platforms and so on. If they wanted additional rights, they could have them but they would have to pay for them. Our ability to control our IP rights means we can maximize the value of our shows and start making money.

Can you give us an example?

For example, our show *Sumu La Penzi*, Swahili for "Poisonous Love", which recounts the exciting journey of four young women living in Nairobi. It was initially licensed to M-Net exclusively for one year and on a non-exclusive basis for a second year. This meant that in the second year we could sell it to another broadcaster. The money from the M-Net deal covered two-thirds of the production costs. The remaining third was absorbed by the company. The second screening of the show is now on a free-to-air TV network and the money from that deal will allow us to break even.

The beauty of this approach is that we can sell the show to any network in Swahili-speaking East Africa. We are very careful about how we manage the different bundles of rights associated with the distribution of our shows (e.g. video-on-demand, DVD, in-flight entertainment, and so on) because syndication is the only way to be profitable. Creativity is financially viable, but only if we retain the copyright in our shows. We recently launched our first, local language television channel, Mwanyagetinge TV. With digital migration, such a venture is more affordable. It is critical that we hold on to the rights in our content but also, to the extent possible, that we own the linear and digital platforms on which it is broadcast.

I started out in the business because I had a strong urge to produce African content, but I now realize the critical importance of intellectual property rights to the business. Strategic use of these rights makes it possible to ensure that everyone gets

Our ability to control our IP rights means we can maximize the value of our shows and start making money.



Photo: Spielworks Media

“Creativity is financially viable, but only if we retain the copyright in our shows,” explains Dorothy Ghattuba.

a share of the revenue derived from exploiting them. This makes it possible to motivate and retain staff. It creates a sense of ownership in the company. People work hard to create the best product because that is what will sell and that means more money will come into the company.

How do you go about getting a broadcaster to air your shows?

The company’s creative team is responsible for developing and shooting pilots – the first episode of a series – for a catalogue that we pitch to broadcasters. We do this at our expense but it is an investment that we have to make. We present the pilots to different networks so they get an idea of what a show is about and, hopefully, select one for their channel. Once selected, we move into production, but this requires substantial investment so it has to make financial and business sense. That is why it is so important for us to leverage our IP rights.

What new opportunities do you see for licensing the rights in your shows?

With digital migration, Kenya’s media sector is really going places. More channels are appearing, and more people want content. The boom in mobile telephony has huge potential. In Kenya most everyone has a mobile phone – there are around 40 million handsets.

The future of entertainment is mobile, so we are starting to create shows specifically for the mobile platforms. We are also slicing existing shows into 3–5 minute “mobisodes” for viewers to watch on their mobile phones. We are working with Safaricom, which has some 26 million subscribers, to produce these. Today, telephone companies need people to consume data and for that they need content. Safaricom needs local content to create buy-in among Kenyans. Astute management of our mobile rights will enable us to create additional income for the company.

The democratization of the Internet in Africa is slow but growing. Broadband usage is expanding and will be everywhere within a few years. So we are also careful about how we manage our video-on-demand rights, which we believe have huge income-generating potential. If TV stations are smart, they will work in partnership with telephone companies and with content producers to expand viewership and generate more advertising revenues.

What is your long-term goal?

For Spielworks Media to become the biggest, the best, the boldest of creators, producers, developers and broadcasters of content with an African aesthetic. If someone wants African content I want them to knock at our door. We want to keep on creating and to support the viability of the industry in Kenya.

We really want to tell African stories, give the African perspective and share the African experience. Hyper-local content is the new rage. This is very exciting because it creates more space to produce local content. Beyond having a good-looking show, you need a fantastic story, a story that people can relate to. Without a good story nobody will watch your show. This is a great opportunity for us to tell our stories and to preserve our cultural heritage. The success of Hollywood, Bollywood and Nollywood was built on local content and copyright protection. If the Kenyan industry is to thrive, it too needs local content and effective copyright laws.

Is there a role for government?

I think government has a key role in encouraging the creative sector. For example, subsidies or tax rebates would support the development of Kenya's creative sector. But policies need to be tailored to the needs of young people and the realities they face. Policy-makers need to understand that we work very hard to create and produce our content, and that it is only fair that we are able to extract maximum value from it. Some people argue that IP rights inhibit access to content. But what greater access is there than when we sell mobile rights to a company like Safaricom and reach over 20 million Kenyans? There will be more access, not less, if content creators can manage and strategically exploit their IP rights. If content owners cannot do business in a profitable way, we all lose out.

We have to respect people's creativity. We must respect the effort they put in and we must ultimately reward it. This is about understanding what people have brought to the table and rewarding them for it. We can only do that if we are able to maximize the value of our IP.

When we make money, we pump it back into the company to create and produce more content. If this content is given away for free, the creative industry will shrivel and die. If we can't make money, we can't employ creative people to produce engaging new shows. It is in valuing our content that we are able to create value, make money and sustain a cycle of creativity.

What needs to be done to boost IP awareness in Kenya?

While the government has taken steps to improve IP awareness, there is still a lot to do. If we want to change mindsets, we need to target young people. In Africa more than 70 percent of the population is

under 18 years of age. We need to find a palatable way to teach these young people about intellectual property. They need to understand that when they create something they have rights in their work. It is never too early to start teaching them.

What drives you?

I am just very fortunate to be doing something I love. It's tough, but my passion drives me – that and the excitement of creating opportunities for the young people working in my company. Beyond my role as executive producer, I see myself as someone who helps people develop their talent. This involves trusting that the young people I work with are good at what they do, and giving them the space, the money, and the encouragement to do it.

Where do you get your ideas?

At Spielworks Media we realize that we don't have a monopoly on ideas, so we have created a sort of talent incubator. Anyone with an idea for a TV, web or mobile series can come to us with it and we will take a look at it and see if it is viable. Many people don't produce because they don't have the technical know-how or access to the necessary equipment or studios. So they share their talent and we share our technical ability – it's a partnership. Once a show is sold, production costs are deducted and any profit is split fifty-fifty. That seems only fair to me, because they created the work. If we work together we will go further.

What message do you have for young creators?

Create! Create! Create! Don't stop creating. Understand and embrace the value of your creativity. Protect yourself, protect your work. Develop a business mind as well as your creative mind and make them meet. It's a balancing act.

Remix culture and amateur creativity: a copyright dilemma

By **Gilda Rostama**,
Consultant, WIPO

Many commentators today are talking about the “age of the remix”, a practice enabled by widespread access to sophisticated computer technology whereby existing works are rearranged, combined or remixed to create a new work. They make it sound as if remixing were a novel phenomenon, but a brief glance at human history reveals that it is in fact nothing new.

Most cultures around the world have evolved through the mixing and merging of different cultural expressions. The US media scholar Professor Henry Jenkins argues that “the story of American arts in the 19th century might be told in terms of the mixing, matching and merging of folk traditions taken from various indigenous and immigrant populations.” Another historical example of remixing is Cento, a literary genre popular in Medieval Europe consisting mainly of verses or extracts directly borrowed from the works of other authors and arranged in a new form or order. Similarly, the arts and architecture of Renaissance Europe in the 15th and 16th centuries derive directly from Ancient Rome and Ancient Greece. Another example is found in Persian traditional music. Drawing on the work of different artists stored in a repertoire known as *radif*, performers create new musical variations and improvisations around common themes. Their similarity with the original work is such that listeners often feel they have heard the musical theme before. Throughout history, the public has been actively involved in creating and re-creating culture, a phenomenon referred to by the US academic Lawrence Lessig as the “read/write” culture.

A SHIFT IN THE CREATIVE LANDSCAPE

However, technological changes that emerged throughout the 20th century enabled the widespread distribution of music, prompting a shift in the creative landscape in favor of an increasingly passive “read-only” culture. “The 20th century was the first time in the history of human culture when popular culture had become professionalized,

and when the people were taught to defer to the professional,” Professor Lessig notes.

In a further twist, widespread access to ever more sophisticated computers and other digital media over the past two decades has fostered the re-emergence of a “read-write” culture. Today, anyone with access to a computer and an internet connection can create remixes, mash-ups, and spin-offs combining musical and audio-visual elements to create new works.

Where does copyright stand in all of this?

IMPORTANT CHALLENGES FOR COPYRIGHT

The remix culture raises important challenges, not only for cultural industry stakeholders, legal practitioners and scholars, and policy makers, but also for members of the public.

The national copyright laws of most countries around the world do not effectively address these challenges, and leave many important questions unanswered. For example: Are remixes legal under copyright law? If so, should the “remixed work” benefit from standard copyright protection? Should it qualify as a derivative work, (in the same way as an adaptation or a translation as defined under Article 2(3) of the Berne Convention on the Protection of Literary and Artistic Works)? Should there be a right to remuneration for the original author? Should a distinction be made if the remixed work is used for non-commercial purposes?

A VIOLATION OF COPYRIGHT?

Many within the cultural industries believe that any unauthorized extract taken from a pre-existing work constitutes copyright infringement. Strictly speaking, they are right. Remixes do violate the copyright in a pre-existing work, insofar as the act of creating a second work that

YouTube's *Content ID* software

YouTube's *Content ID* software analyzes samples of musical works provided by the recording industry and collective management organizations and compares them with the videos uploaded to the website. The software establishes a link between an existing work and an uploaded work such as a remix. If the content matches, the video may be automatically blocked or the sound muted and the user is automatically informed by e-mail that the material has been disabled "as a result of a third-party notification claiming that this material is infringing". The user is also informed that "repeat incidents of copyright infringement will result in the deletion of your account and all videos uploaded to that account", and is requested to delete any videos for which they do not own the rights, and to "refrain from uploading additional videos that infringe on the copyrights of others".

The uncertain legal status of remixes and mash-ups is the source of great frustration among the public.

contains elements of an original work violates both the right of reproduction (Article 9 of the Berne Convention) and the right of communication to the public (Article 8 of the WIPO Copyright Treaty) of the original author. The moral rights of the original author also come into play. Under Article 6*bis* of the Berne Convention, “the author shall have the right to claim authorship of the work and to object to any distortion, mutilation or other modification [...] which would be prejudicial to his honor or reputation”. When a given song is remixed in a way that strongly decontextualizes its meaning, the author of the original work can claim a violation of moral rights.

COMPLIANT WITH COPYRIGHT?

However, it could also be argued that remixes and mash-ups are compliant with copyright law. For example, Article 13 of the Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) states that in “certain special cases which do not conflict with a normal exploitation of the work and do not unreasonably prejudice the legitimate interests of the right holder”, an exception to copyright can be made. This school of thought argues that as long as the remixed work remains in the realm of amateur creativity (i.e. no commercial gain is derived from it), the exclusive right of the original author can be limited, as the new work does not threaten the “normal exploitation” of the work. In other words, just because images from a cinematographic work are mixed with a specific song that does not mean that the public will stop purchasing either the original movie or the original soundtrack. On the contrary, such remixes or mash-ups may constitute free publicity for the pre-existing work.

One might also argue that remix works are akin to quotations protected under Article 10 of the Berne Convention. Under this Article, it “shall be permissible to make quotations from a work which has already been lawfully made available to the public, provided that their making is compatible with fair practice, and their extent does not exceed that justified by the purpose”. While quotations are often associated with literary works, the Berne Convention refers to “quotations from a work”, which may include audiovisual, musical or even photographic works. In 2011 the Court of Justice of the European Union decided in *Eva-Maria Painer v. Standard Verlags GmbH and others* (CJEU-C/145/10) that photography could be quoted, as long as it had been made lawfully available to the public and the name of the author was indicated. It could therefore be argued that remixing audiovisual or musical works is similar to quoting from a literary work.

The uncertain legal status of remixes and mash-ups is the source of a great deal of frustration among members of the public. Few understand why the creative remixes they upload to YouTube are automatically taken down or blocked. Many, unfamiliar with the minutiae of copyright law, feel their creativity is being censored. As Professor Lessig observes, the copyright laws that exist today were to a large extent drafted with the principle aim of regulating relations in the professional world, not the activities of ordinary citizens. In the digital environment, however, this has all changed. “For the first time, [copyright] law regulates ordinary citizens. For the first time, it reaches beyond the professional to control the amateur, to subject the amateur to a control by the law that the law historically reserved to professionals.”



Photo: UNESCO Photolibrary

Traditional Persian musicians draw on the work of different artists to create new musical variations around common themes.

AN NEW EXCEPTION

Existing copyright laws do not adequately address the challenges arising from the wealth of amateur creativity facilitated by the tools available within the digital environment. Canada is one of a few countries, if not the only one, to have introduced into its copyright law a new exception for non-commercial user-generated content. Article 29 of Canada's Copyright Modernization Act (2012) states that there is no infringement if: (i) the use is done solely for non-commercial purpose; (ii) the original source is mentioned; (iii) the individual has reasonable ground to believe that he or she is not infringing copyright; and (iv) the remix does not have a "substantial adverse effect" on the exploitation of the existing work.

THE JURY IS STILL OUT

The situation, however, remains less than clear elsewhere. In the United States, the courts are still grappling with the issue, as indicated in *Stephanie Lenz v. Universal Music Corporation* which has been ongoing since 2007. The claimant, Stephanie Lenz, posted a video to YouTube of her children dancing and running around in her kitchen with Prince's *Let's Go Crazy* playing in the background. A few months later, Universal Music Corporation had the video removed from YouTube claiming copyright infringement; an allegation strongly contested by Ms. Lenz. After six years of proceedings, in 2013 a district court ruled that copyright owners do not have the right

to simply take down content before undertaking a legal analysis to determine whether the remixed work could fall under *fair use*, a concept in US copyright law which permits limited use of copyrighted material without the need to obtain the right holder's permission (US District Court, *Stephanie Lenz v. Universal Music Corp., Universal Music Publishing Inc., and Universal Music Publishing Group*, Case No. 5:07-cv-03783-JF, January 24, 2013).

A Green Paper issued by the US Department of Commerce Internet Policy Task Force in 2013 recognized this gap in the law: "[A] considerable area of legal uncertainty remains. The question is whether the creation of remixes is being unacceptably impeded. There is today a healthy level of production, but clearer legal options might result in even more valuable creativity" (<http://2010-2014.commerce.gov/blog/2013/07/31/commerces-internet-policy-task-force-releases-report-digital-copyright-policy>).

Given the emergence of today's "remix" culture, and the legal uncertainty surrounding remixes and mash-ups, the time would appear to be ripe for policy makers to take a new look at copyright law.

Sonic Pi: getting creative with computer programming

By **Jenny Judge**, Music and Science Researcher, Cambridge University, United Kingdom

On a damp Thursday afternoon in Cambridge, UK, Sam Aaron is telling a barista that he has a gig coming up. She looks up from the espresso machine, interested. “What do you play?” she asks. “Well, it’s a bit weird,” says Sam, laughing. “I play the computer.”

Software programmer Sam Aaron has made it his mission to “play the computer”, and to help others do the same. From his base in the University of Cambridge Computer Laboratory, Sam has developed Sonic Pi, a free software synthesizer that produces musical sounds from text commands. It is designed for the low-cost programmable computing platform Raspberry Pi. Sam’s work was initially funded by the Broadcom Foundation, which supported the project for the first three months. After that, the Raspberry Pi Foundation stepped in, providing support by way of donation to the Computer Laboratory.

Sonic Pi is a social project, rather than a commercial one. It encourages everyone to learn to code, while having fun with music. Sam has collaborated with educators to produce teaching materials for computing in primary schools. He has also worked with artists to experiment with the potential of the software. The latest phase in the project, “Sonic Pi Live and Coding”, is aimed at making Sonic Pi into a fully-fledged musical instrument, for live performance.

SONIC PI: A SOCIAL MISSION

“Through Sonic Pi, I want to try to give as many people as possible a creative experience through coding,” says Sam. “That is the drive. And the way to do that is to lower the entry barrier to that experience.” First of all, Sonic Pi’s simple, clean interface, with big buttons and friendly colors, makes programming seem unthreatening. “It makes the programming experience itself easier, and not so scary,” he explains. “Typical programming environments are pretty horrendous for beginners.” The barrier to entry is lowered further by the fact that Sonic Pi is free – and not only that, it is designed to run on a £25 computer.

ENCOURAGING CHILDREN TO TINKER

The Raspberry Pi was the brainchild of a group of researchers at the University of Cambridge who wanted to change the way children

interacted with computers. In 2006, Eben Upton, Rob Mullins, Jack Lang and Alan Mycroft, based in the Computer Laboratory, were becoming concerned that almost none of the applicants to read Computer Science at Cambridge were hobbyist programmers. Why was it that children did not seem to be experimenting with programming anymore? Part of the problem, thought the group, was the fact that computers had become so expensive and complicated. Maybe children were forbidden from experimenting with them by money-conscious parents. The group decided to start by developing a cheap computer that children could tinker with, without risk. And so, the Raspberry Pi was born. Three years later, the Raspberry Pi Model B entered mass production, and to date, it has sold close to four million units.

The Raspberry Pi developers recognized that some children might not be interested in a purely programming-oriented device. To appeal to everyone, the Raspberry Pi would have to be powerful enough to support excellent multimedia. And this is where Sonic Pi comes in. Through Sonic Pi, children learn to write code, but they do so through making sounds. They make music, both on their own and with their classmates and friends, and they just happen to learn how to code along the way.

SONIC PI AND IP

Sonic Pi is licensed under the “MIT license” of the Open Source Initiative – a permissive free license for software, with the main condition being that the terms of the license (including a copyright attribution to the original programmer) are always carried with the code. “It means you can essentially do what you want with the software,” says Sam. “For example, you could recreate it and call it Cheese Pi, and sell it.” Why would he choose to let people do that? It seems at odds with the usual way that a lot of proprietary software is licensed. He agrees. “The default approach is to release your software under much more restrictive licenses, which can get in the way of sharing,” he explains. “I want people to be able to build products on top of it. I want it to have a lifespan beyond me. I do not want the license to hold it back.”

But software licensing is not the only issue to think about when it comes to intellectual property. For example, users of Sonic Pi can manipulate music samples that are pre-loaded into the program. “The samples in Sonic Pi are all Creative Commons Zero licensed,” Sam says. The CC0 1.0 public domain license requires no permission or attribution. “I want to make sure that people using Sonic Pi with samples do not have to attribute them to anyone, or pay them, or worry about it in any way.” But there is a catch. “The problem is, I have to trust the people who upload those samples to freesound.org, which is where

I source them, that they are actually the originators of those samples, or are not themselves infringing copyright. I trust that freesound.org has taken care in establishing their real provenance, but you cannot be sure.” In fact, freesound.org disclaims responsibility.

“I really think the world would benefit from a clearer demarcation of the licensing of media,” says Sam. On the other hand, an express disclaimer of warranty is a condition of both the CC0 and MIT licenses. This may be an appropriate rule for open software such as Sonic Pi, but it might create difficulties in proprietary cases, or cases where software is at the heart of devices with real-world effects, like in health or home settings.

SONIC PI AND ARTISTS

Sam also wants Sonic Pi to be an artistic tool in its own right. This raises some further IP issues. If somebody releases a track that was made in Sonic Pi, this is not just an audio file – it is actually a piece of code. The question is, how should computer music that is produced by code be treated by intellectual property law? Could an artist be challenged for using somebody else’s algorithm in a piece of music, in the same way as they may be challenged for using somebody else’s riff?

Sam prefers to look at the bigger picture. “What is really exciting to me are the open questions about where this is all going,” he says. “My hope is that, in making music by manipulating text, it opens it all up for more people to be able to share, and for more people to be able to learn from other people’s work. Say I listen to a cool track, and I say, wow, how did you make that? Normally, I do not have any idea where to start. But if it is in code, it is all there, laid out. Sharing musical expertise becomes as easy as emailing a text file. I can look at exactly what the artist did, and learn from it.”

But he does not think that his approach is going to replace current music practices. “I get asked all the time, does this mean that kids won’t play traditional instruments any more? I think it is a ridiculous question.” He shakes his head. “Something like Sonic Pi is not trying to replace anything. It is just adding more possibilities. Those possibilities are broader in some senses, narrower in others. Maybe it is broader in terms of the timbres you can produce and narrow in terms of the physical interaction you can have with the instrument. But it is also about broadening the potential for engagement. If you have got kids who won’t pick up a traditional instrument, then maybe they will pick up Sonic Pi.”

He is eager to stress that computer programming is a creative endeavor in itself. “I really think that

programming is a new kind of human expression. And maybe, by teaching kids how to code, we can help some children who might not otherwise have an opportunity to have a creative and expressive experience.”

EDUCATE TO CREATE

Sam thinks that the arts are critical to education. “Education is not just about STEM – that’s science, technology, engineering and mathematics,” he says. “It cannot be because the future of the economy is in jobs where people have to think creatively.” Jobs whose descriptions can be formalized are being automated now, he argues, but there are some things that cannot be automated. What types of jobs are left over for humans to do? “They are the creative ones, of course.”

The arts are at the heart of encouraging creativity, he believes. Of course, music lessons, or art lessons, are not the only way to develop creative thought in children – but he thinks that they highlight creativity in a unique way. “The arts put students in a position where they have to explicitly think about creativity and making new things, and come up with new ideas. Creativity is put in the foreground.” He rejects the distinction between science and the arts that is apparent in some school curricula. Creativity is at the heart of science. “The scientific method is not just a matter of validating hypotheses, and being really disciplined and rigorous,” he says. “You have to create the hypothesis in the first place. And you have to recover from an unexpected thing happening, and so on. It is investigation. And that is creative.”

PLAYING, FAILING AND LEARNING

The real value of Sonic Pi lies in its emphasis on play. Coding is made appealing, because it is presented as something fun, rather than something serious. And when children are encouraged to have fun with a tool, they will take risks. “Failure is an integral part of learning,” says Sam. “Kids learn to walk by falling over a lot. If they were afraid of falling over, they would not learn to walk.” Sonic Pi removes the fear of failure from learning to code. It is a powerful model, because the children of the present are the leaders of the future. Those leaders need to learn to be unafraid of risk, and failure. Failure is a vital step on the road to learning, and it is a concept that a creative approach to education – one which combines technology, science and the arts, rather than separating them – promises to nourish. The future of *homo sapiens* might lie with *homo ludens*: in being encouraged to play, our children might learn to grow wise.



Photos: Claire Haigh

“Sonic Pi’s simple, clean interface, with big buttons and friendly colors, makes programming seem unthreatening,” explains Sam Aaron who developed the software synthesizer.

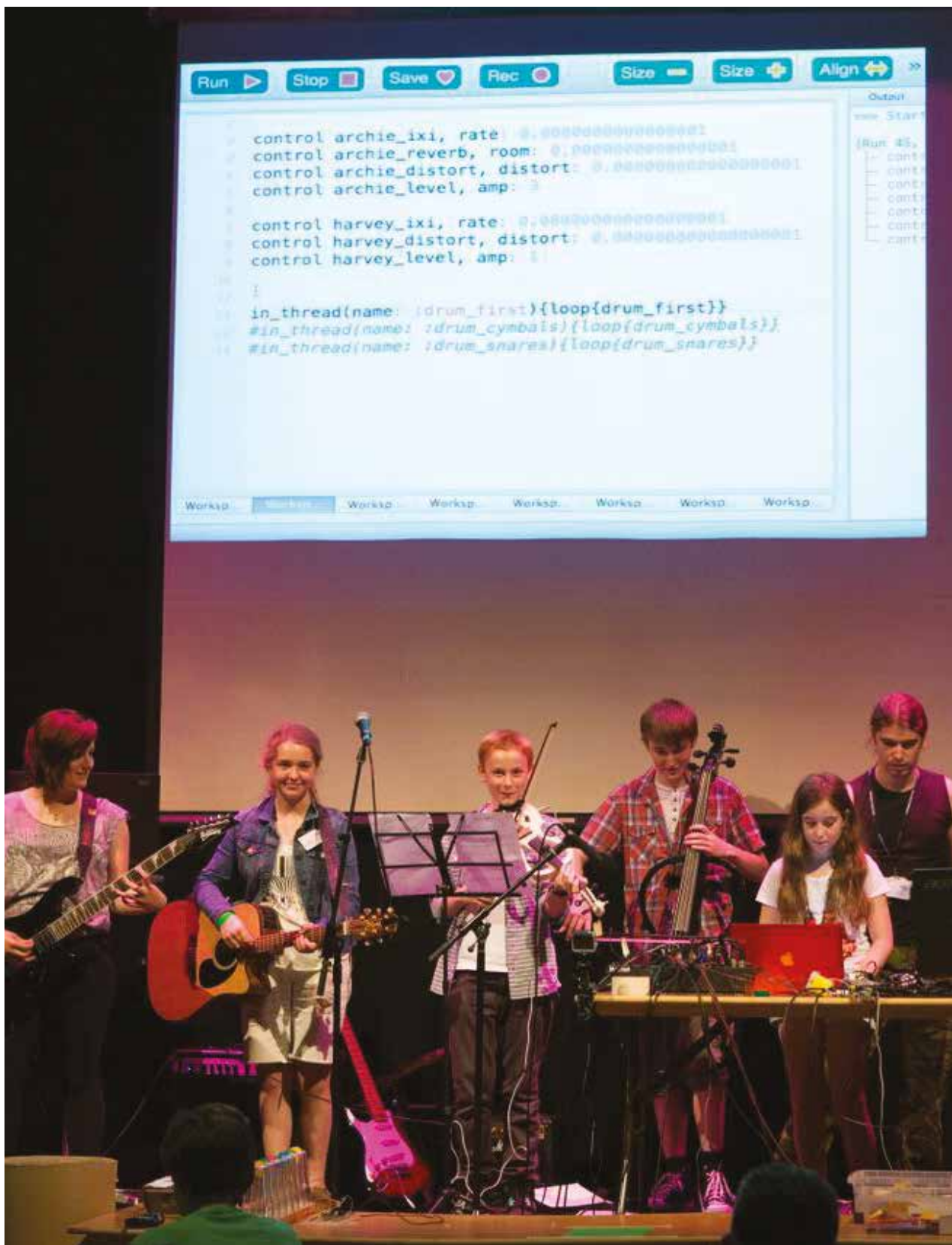


Photo: Claire Haigh

Through Sonic Pi, children have fun making music but learn to code along the way. Children participating in the five-day Sonic Pi: Live & Coding summer school in 2014.



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