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A 3D Revolution

A quick Google News search for the term "3D printing" reveals that the technology is growing by leaps and bounds. What isn't as obvious, at least to those reading the consumer press, is that thousands of copyrights, patents and trademarks are all at stake.

"3D printing or additive manufacturing (AM) has been available on the market for over three decades, but we are only seeing its more widespread adoption now," says Xiaodong Li, general manager at Beijing East IP. "Recent reports and developments suggest that 3D printing is gaining momentum and could be reaching a take-off point within the next decade, as a revolutionary technology that may impact or even up-end the last two centuries of approaches to design and manufacturing with profound geopolitical, economic, social, demographic, environmental and, of course, legislative implications."

Asia IP's Johnny Chan takes an in-depth look at the intellectual property behind 3D printing. What he's learned might surprise you.

For one, 3D printing isn't everywhere – at least not just yet. Nguyen Duc Hieu, a partner at Phuoc & Partners in Hanoi, says that he has Googled '3D printing technology/service' in Vietnamese, for example, without the same kind of response he might get doing so in English.

"No results except for a couple of science articles are shown," Nguyen says.

But IP lawyers around the region point out that many industries will be harmed, including engineering, architecture, automotive, construction and industrial designs, but the fashion, footwear, jewelry and cosmetic industries could be hardest hit due to the high demand of luxury brands if consumers could print them using home printers.

"The manufacturers of high-end goods could suffer a lot when consumers can create their own products with 3D printing, particularly in relation to the sale of objects that have few (if any) moving parts or that are simple in design or operation, as these are most likely to be produced or replicated. Retailers may also lose sales where people can 'produce' their own versions with 3D printers," says Christina Cavallaro, an associate at Eakin McCaffery Cox in Sydney. "Therefore, the potential for impact on conventional markets of 3D printing is huge: if a person can make an item with a 3D printer, various parts of the supply chain will be adversely impacted including designers, manufacturers, distributors, wholesalers, retailers as well as transporters."

What's clear from Chan's piece is that stakeholders around the region must demand that lawmakers in their jurisdictions work to amend and update intellectual property laws as quickly as possible, or before you know it, 3D printers will be churning out a whole new range of counterfeit goods.

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3D Revolution

With the rise of 3D printing, copyright, patents and trademarks are all at stake. Lawyers across jurisdictions share with **Johnny Chan** about the ups and downs of this technology.

Without a doubt, 3D printing will impact intellectual property rights, says Christina Cavallaro, an associate at Eakin McCaffery Cox in Sydney.

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Given that the technology is touted as ‘greener and leaner,’ it has potential to provide fillip to India’s manufacturing sector.

- Manish Singh Nair, partner,
LexOrbis, New Delhi

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Of course 3D printing will become an IP issue, agrees Xiaodong Li, general manager at Beijing East IP in Beijing. “3D printing or additive manufacturing (AM) has been available on the market for over three decades, but we are only seeing its more widespread adoption now. Recent reports and developments suggest that 3D printing is gaining momentum and could be reaching a take-off

point within the next decade, as a revolutionary technology that may impact or even up-end the last two centuries of approaches to design and manufacturing with profound geopolitical, economic, social, demographic, environmental and, of course, legislative implications. 3D printing is capable of describing objects with digital files and reproducing the objects via AM processes, thus is making it much easier to copy and transport physical objects. When the music industry started to digitalize melodies and songs, IP became and is still a big issue. Similarly, 3D printing will bring IP issues and change the world.”

In India, 3D printing is yet to gather momentum. “This is perhaps due to the high operational costs and low awareness of the technology,” says Manisha Singh Nair, a partner at LexOrbis in New Delhi. “However, given that the technology is touted as ‘greener and leaner,’ it has huge potential to provide fillip to India’s manufacturing sector and governmental initiatives – such as Make in India – and will surely permeate India’s manufacturing sector.”

In Malaysia, the principles of infringement under the Copyright Act 1987 may be applicable to 3D printing in which artistic

works would be relevant to computer-aided design (CAD) files and literary works would be relevant to 3D design software. As far as the Patents Act 1983 and Industrial Designs Act 1996 are concerned, infringement occurs if patented inventions are

model of 'manufacturing on demand' that 3D printing can offer is inapplicable in Vietnam at this moment."

"IP comes into play whenever the monopoly given by law is substantively affected by unauthorized copying," says Bayani Loste, a partner at Fortun Narvasa & Salazar in Manila. "Who will take advantage of copying of IP through the use of 3D printing in the Philippines? Most likely DIY-ers and students/academic researchers involved in prototyping and proofs-of-concept. But these are exceptions to the monopoly given to patent holders. If the copying jumps from private and educational use to commercial, then IP will become an issue."

In Indonesia, the technology has supported various industries including everything from multinational corporations to small- and medium-sized enterprises (SMEs), says Justisari Kusumah, founding partner at K&K

Advocates in Jakarta. "3D printing has also been used in several local schools and universities to support students' learning."

The Dark Side of the Force

Revolutionary technologies might bring lots of benefits, but at the same time, there is often some evil behind the good.

3D printing opens the doors wide for counterfeiting in more ways than one can presently imagine, says Gregory Ross, a partner at Eakin McCaffery Cox in Sydney.

In the trademark prosecution realm, for the purposes of classification of goods/services, there would be a question of whether a 3D print-service provider should be regarded as a "manufacturer" who could manufacture products on demand (or at others' orders), says Nguyen Duc Hieu.

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I have Googled '3D printing technology/service' in Vietnamese, and no results except for a couple of science articles are shown.

- Nguyen Duc Hieu, partner,
Phuoc & Partners, Hanoi

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reproduced by 3D printers which will subsequently be used, sold, offered for sale, or kept for the purpose of using, selling or offering for sale to potential buyers. Besides, says Beng Chai Tay, managing partner at Tay & Partners in Kuala Lumpur, whenever trademarks exist on 3D objects which are then reproduced, there is a risk of infringement under the Trade Marks Act 1976.

In Taiwan, certain patent registrations related to 3D printing can be traced before 2000, says Joyce Ho, director of Tsar & Tsai's IP practice group in Taipei.

The IP implications of 3D printing remain on the horizon in the country. "3D printing is having considerable development in Taiwan. Local companies represent a significant percentage of the global market for 3D printers," says Peter Dernbach, a partner at Winkler Partners in Taipei. "Taiwan's Premier Jiang Yi-huah has also announced a plan to help local companies continue their growth in this developing market in the coming years."

Although there are exemptions from infringement expressly enumerated in Thailand's Patent Act, the law does not include personal use exemption and the printer cannot escape from patent infringement liability by such excuse, says Say Sujintaya, a partner at Baker & McKenzie in Bangkok.

In accordance with the IP law of Vietnam, reproduction of copyrighted and patented works for personal or non-commercial use is not considered infringement, says Nguyen Thi Hong Anh, a partner at Indochine Counsel in Ho Chi Minh City. "However, this could be abused by consumers."

But 3D printing will likely not become a huge issue in some jurisdictions.

The technology is not yet popular in Vietnam, for example. "As an advanced-but-expensive technology, it is unprofitable to the eye of a local manufacturer. But for a customer, it definitely goes beyond what he can afford. I have Googled '3D printing technology/service' in Vietnamese, and no results except for a couple of science articles are shown," says Nguyen Duc Hieu, a partner at Phuoc & Partners in Hanoi. "In short, the business

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K&K Advocates, Jakarta

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Many industries will be harmed, including engineering, architecture, automotive, construction and industrial designs, but the fashion, footwear, jewelry and cosmetic industries could be hardest hit due to the high demand of luxury brands if consumers could print them using home printers, says Tay.

"The manufacturers of high-end goods could suffer a lot when consumers can create their own products with 3D printing, particularly in relation to the sale of objects that have few (if any) moving parts or that are simple in design or operation, as these are most likely to be produced or replicated. Retailers may also

lose sales where people can ‘produce’ their own versions with 3D printers,” Cavallaro says. “Therefore, the potential for impact on conventional markets of 3D printing is huge: if a person can make an item with a 3D printer, various parts of the supply chain will be adversely impacted including designers, manufacturers, distributors, wholesalers, retailers as well as transporters.”

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SMEs may not think printing a famous cartoon image will need authorization of the owner. Inadvertent IP theft could occur.

- Frank Liu, partner,

Chang Tsi & Partners, Beijing

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3D printing will diminish the necessary costs and skills – as well as labour – in developing, producing or assembling products. “If the technology is not properly controlled, this can result in significant damages to industries that have spent lots of money to develop the genuine products or designs,” Kusumah says. “The problem will be more serious if there are loopholes in the regulation due to the unpreparedness of current IPR laws.”

In Vietnam, the jewelry industry would be the most vulnerable, because jewelry is worth a significant investment on the part of infringers, Nguyen Duc Hieu says. “I doubt that other local industries would suffer from this because Vietnam is not a significant market for high-tech products or services.”

In China, the entertainment industry – film production in particular – and industries that produce precision instruments such as medical instrument may be harmed significantly, says Spring Chang, founding partner at Chang Tsi & Partners in Beijing.

The after-market of the relevant industries could shrink and after-sale services might not be as lucrative as before. “In general, small-item manufacturers will be harmed most as their products are easily copied and created,” Sujintaya says. “With associated material cost and size limitation, large objects or objects that require many different materials may be less affected.”

As printers become faster and more sophisticated, the scope of markets and industries vulnerable to IP theft will expand, says Dernbach. “It is very challenging to develop sufficient evidence to bring a strong case for infringement.”

Another problem is that SMEs may not know 3D printing can cause infringement, says Frank Liu, a partner at Chang Tsi & Partners. “For example, they may not think that printing a famous cartoon image shall need the authorization of the right owner. Therefore, inadvertent IP theft could occur.”

Concomitant liability of different actors once the infringement of IP takes place via 3D printers also needs to be determined properly. “For instance, whether the maker of the 3D printer or the creator of the CAD file should be held liable when the product was printed by an infringer,” Nair says. “An equally challenging issue will be the identification of the original from the counterfeit

given that 3D printing could create identical replicas.”

There is no heated debate about whether CAD files are eligible for copyright protection in Vietnam, but they should be, says Nguyen Duc Hieu.

Soon, when the plummeting cost of 3D printers, scanners, modeling technology and free associated software become readily available, IP theft will be widespread for would-be criminals in Malaysia, Tay says. “3D printers do not require production of a finished product in order to enable IP theft. IP theft occurs even with a 3D-printed mould which can then be used to manufacture the object that replicates the original. Besides, with low public awareness of 3D printing and

insufficient enforcement, IP theft will be a growing problem in the 3D printing space.”

As far as how big of a problem IP theft will be with 3D printing in China, it depends on how quickly the technology develops and becomes popular, and how the legislation is adapting to the application of breakthrough technologies. “In the past, China has been regarded as one of the major global manufacturing and distributing centres of counterfeits,” Li says. “However, the digitalization of physical objects allows for global distribution of designed solutions, which lowers the barriers to manufacturing. 3D printing has made it possible to ‘ship’ digital designs instead of complete products through the internet and allow anyone –

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Markets may also adapt to the impact of emerging technologies, just like digital music killed the Walkman.

- Xiaodong Li, general manager,

Beijing East IP, Beijing

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including the end users – to ‘manufacture’ directly through their 3D printers, so there is a potential to alter current overseas traditional manufacturing and global distribution into local manufacturing and distribution by shifting production towards the end users or consumers.”

This potential, Li says, together with greater efforts by the judicial and administrative systems of China to emphasize the protection of IP owners, may ease the pressure of IP theft issues in China.

The technology gap prevents high-tech products from being

copied by most SMEs in China, says Howard Hao, a patent partner at Chang Tsi & Partners. "The development of the 3D printing technology might decrease this gap and make the unauthorized copying easier than before."

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The art industry may be affected the most by 3D printing. Art cannot be replaced by spare parts.

- Bayani Loste, partner,

Fortun Narvasa & Salazar, Manila

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On the other hand, 3D printing is creating new markets and industries. Li says. "Markets and industries may also adapt to the impact of such emerging technologies, just like digital music killed the Walkman and some of the record companies, but which was a godsend to Apple's iPod and iTunes."

Loste is also looking at the positive side of the technology, as he expects that IP theft by 3D printing will be small in the near future. "Assuming that IP theft through 3D printing will only be relevant in commerce (as opposed to private and educational use), the effect will still be negligible, because Filipinos are known to be ingenious and resourceful. If some part of a machine is broken, the Filipino technician will craft the broken part out of existing spares," Loste says. "While the impact on the manufacturing sector is negligible, the art industry – in particular, the market for sculptures and copyrighted figures – may be affected the most by 3D printing. Art cannot be replaced by spare parts."

Once IP infringement is identified, there are challenges for IP owners and authorities during enforcement. While copyright infringement can be proven if the infringer has copied the IP owner's blueprint of a 3D design, it is difficult to establish a case if the copying is from the 3D object itself, which lawyers expect to be more common, Ross says. "Only when a design is industrialized (such as when over 50 articles are made), then copyright protection might be said to have been effectively lost for the 3D product."

Extensive manufacturing of items for personal use will be a great concern, especially given the current private-use exemptions under many IP laws. "Privately' manufactured goods are difficult to detect, control or prevent. They could also bypass shipping costs and customs seizures. As such, 3D printing infringement will be difficult to detect, let alone enforce," Tay says. "Rightsholders will need to make smart choices about which elements of their IP they want to enforce."

From a patent litigation perspective, it is very difficult to recover

damages from a person printing a patented item if there are no sales, and recoverable damages are small since no profit is made, Sujintaya says. "As a result, an attempt to pursue infringement claims will be made on websites that host 3D blueprints or CAD

files as a file-sharing platform or that make available for sale products that are printed using 3D printers," she says.

In 2013, the Intellectual Property Office of the Philippines promulgated rules which give the agency the authority to conduct visits to business establishments on the basis of verified complaints to determine whether piracy or counterfeiting is being committed therein, Loste says. "Since these rules cover only commercial entities, IP holders may have a hard time making a case that private DIY-ers are eating up profits, thereby removing them from Fair Use exception."

Li thinks that the enforcement challenge is particularly great for patents. "It seems that simply sharing a digital file online would not be regarded as a violation of patent under current patent law in China, and Chinese courts seem quite discreet in determination of induced infringement and joint infringement," he says. "Furthermore, the digitalization of the physical objects makes it more difficult to locate and trace the distributors and manufacturers. It is reported that The Pirate Bay, the file-sharing website known for allowing users to share multimedia via P2P clients, has launched a 'physibles' category for 3D printable objects. Therefore, 3D printing is already raising challenges for enforcement."

Taiwan's Copyright Act has a fair use defense, which means that unauthorized reproduction could be exempted from infringement if such reproduction is for private or family use without commercial purposes and within a reasonable scope.

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- Say Sujintaya, partner,

Baker & McKenzie, Bangkok

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"But how 3D printing reproduction for pure personal use could comply with the reasonable scope element under private use defense is unclear," Ho says. "Similar cases may be applicable for reference. The Taipei District Court in 2005 found an individual who downloaded hundreds of songs from music sharing sites guilty and rejected her private use defense. The judgment clearly

indicated that the defendant downloaded the full songs, and the unauthorized downloading satisfied her need for personal entertainment and saved her costs for buying genuine albums, which should rather be deemed commercial entertainment purposes and went beyond private use purposes. Whether the above private use standard for unauthorized music downloading

sharing of digitalized 3D printable objects by both the IP owners from the industries and the authorities, says Li.

Industries should seriously consider establishing specific strategies such as IP-portfolio building, marketing monitoring patterns and enforcement mechanisms to deal with infringement in China, says Martin Meng, a patent partner at Chang Tsi & Partners.

Products should state clearly that the trademark, logo and design are protected under trademark, copyright and industrial design laws, so reproduction in any manner (including 3D form) is a violation of the IP and will be subject to criminal sanctions, says Kusumah.

Rightsholders should explore creative ways to discourage unauthorized 3D printing by, for instance, offering customized products, or products (such as replacement parts) with additional functionality or using materials not available for home-printed versions, says Sujintaya.

More awareness should also be raised among markets and industries, Chang says. "Promoting the value and importance of IP across industries are very important, especially thinking about

the great variety of applications 3D printing would be used in the near future, but improving the IP sense of both the enforcement authorities and the public is more important."

The same applies to Malaysia, Tay says. "The IP office should carry out reasonable steps to raise public awareness of 3D printing, particularly with regards to the possible downside of 3D printing including prohibited acts constituting infringement and the effects of infringement."

Despite the above remedies, the ultimate one is to be optimistic and open-minded.

"If IP holders want to protect their profits (if not increase their metrics), they should embrace the fact that 3D printing is here to stay, similar to what IP holders did for Betamax, VHS, and CD

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is applicable to copyright infringement through 3D printing is subject to the court's determination on a case-by-case basis."

With file-sharing platforms, the extent of liability of individuals and internet service providers is also debatable, says Tay.

The Empire Strikes Back

Despite the challenges, the IP community is equipped to conquer them.

In Australia, IP owners can apply for design registrations of their products under the Designs Act 2003, which allows protection for up to 10 years and will protect the shape of the object or the pattern applied to the object, Cavallaro says. "However, registration will need to be applied for before the product is made public, which would usually be before it goes on sale."

The best protection strategies for companies are to apply for all registrations of IP, make infringement complaints and enforce their rights through legal proceedings at the specialized Intellectual Property High Court, says Tay.

Another strategy is having governments make registration inexpensive and fast for patents and designs. "The 3D printer manufacturers can also incorporate the monitoring or print-tracking device into the 3D printers, which could be helpful for evidence-gathering processes," Sujintaya says. "A plaintiff must gather evidence from raid actions prior to filing an infringement claim. The process could be inefficient due to concealment or spoliation of evidence by defendants, so the installation of monitoring or print-tracking devices may reduce or at least discourage the use of such tactics."

More attention should be paid to platforms for uploading and

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CAD files supplied and updated by IP owners could be more reliable and thus attractive to consumers.

- Joyce Ho, partner,
Tsar & Tsai, Taipei

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technologies," Loste says. "Once they have accepted the fact that this new medium of production will become commonplace, IP holders can make legal arrangements to make the production of IP through 3D printing profitable even from use by DIY-ers. For instance, Marvel could enter into licensing agreements with manufacturers of 3D printers so they can both sell the

CAD of Marvel superheroes and a 3D kit for hobbyists. The Louvre Museum could do the same with its Winged Victory of Samothrace by allowing DIY-ers to download, for a price, the CAD of this sculpture. IP holders can make additional revenue from the CAD of their off-patent designs and inventions.”

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It will be important for industry groups to educate customers about potential risks in using 3D printers to produce items that look like the original goods, but may not share all of the same properties.

- Peter Dernbach, partner,
Winkler Partners, Taipei

Rightsowners may release their CAD files for certain spare parts or products in exchange for licensing fees for home use to stimulate consumption, Ho says. “Compared to the CAD files from an unknown third party, those supplied and updated by IP owners could be more reliable and thus attractive to consumers.”

“Technical measures may be implemented to only allow “approved” or “licensed” files to be printed on 3D printers to mitigate the liability of 3D printing manufacturers, although it is likely in this digital age that such measures will be circumvented and that pirated files will still be used and distributed, though there will be the obvious problems of adequacy of enforcement mechanisms,” Ross says. “A very recent Australian case on potential copyright issues in downloading ‘plans’ from the internet may also have to be factored into the mix, given the potential for internet service providers to be caught up in the issue.”

Enforcement authorities should urge ISPs to provide access to allow CAD files passed through their portals to establish “notice and takedown” mechanism to avoid contributory infringement, says Ho. “In fact, the Taiwan Intellectual Property Office has issued an interpretation letter in February 2015 indicating that those replicating famous virtual characters via 3D printing should obtain copyright owner’s authorization.”

Dernbach believes companies will eventually adapt. One product category that is already seeing a big push in 3D printing is spare parts.

“Spare parts for machinery or vehicles obviously involve serious safety and IP concerns. It may well be that companies that currently provide spare parts that are protected by various forms of IP will develop a new business model in which they authorize certain 3D printers to produce spare parts on demand,

or license the files so that consumers can manufacture the parts themselves anywhere there is an appropriate 3D printer and materials,” he says. “It will also be important for industry groups to educate their customers about any potential risks in using 3D printers to produce items that look like the original goods, but

may not share all of the same properties. The example of a spare part used in a car or airplane immediately springs to mind.”

Recent amendments to the Thai Copyright Act incorporates preliminary injunctive relief for copyright holders to file motions with a court to request injunctions against ISPs to stop infringement, Sujintaya says. “Pursuing copyright infringement claims against an ISP for illegal 3D printing violations can prove difficult if the provider is complying with the court’s order and could prove that it is not the person who controlled, initiated or ordered the infringement in its system.”

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A patent-related issue also arises as CAD files are arguably not the equivalent of the underlying patented product. Direct infringement claim can be difficult

to be established if CAD file sharing does not constitute direct infringement. Nevertheless, indirect infringement is not expressly stipulated in the Thai Patent Act and has never been tested in courts, Sujintaya says. “The patentee has to pursue criminal claims against any supporter who assists or facilitates the infringement, and for such supporter to be subject to criminal liability, the patentee carries the burden of proving the supporter’s intention to commit a criminal offence.”

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A 3D printer may have the log of all products printed and the log usually cannot be deleted.

- Martin Meng, partner,
Chang Tsi & Partners, Beijing

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In terms of helping IP owners and authorities on enforcement, the Chinese State Council’s Legislative Affairs Office (SCLAO) issued a draft copyright law in June 2014 stating that practical art works are firstly included in the definition of works protected under the copyright law. “Therefore, it is promising that 3D printable objects that are both practicable and artistic might be protected under the copyright law,” Li says. “The draft patent law is also under examination with an effort to join the Hague Agreement concerning the International Deposit of Industrial Designs. These are all favourable to the orderly development of 3D printing.”

On the other hand, the 2013 rules on enforcement in the Philippines are more than sufficient, as the authorized IPOPHL

personnel may visit business establishments without notice, Loste says. "If an IP violation is in plain view, the IPOPHL personnel can take note of it in his report. The business owner (or his employee or representative) may object or comment on the note, and this objection or comment shall become part of the post-operation report of the personnel. Within 10 days from the visit, a post-operation report together with a recommendation thereof must be submitted to the Deputy Director General who may subsequently issue a compliance order. The order must be

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As 3D printers hit the mass market, it will likely cause a legal minefield in various IPRs and laws.

- Beng Chai Tay, managing partner,
Tay & Partners, Kuala Lumpur

complied with for a period not more than 60 days to avoid being subjected to an administrative action. If there is a reasonable ground to believe that a violation of the relevant trade and consumer laws has been committed, IPOPHL may initiate the appropriate charges before the local government units concerned or other government agencies."

Despite the best efforts of governments, legislation and regulations might not protect rights owners well enough during the emergence of a new technology.

"The most effective enforcement still needs the cooperation of the government authorities," Liu says. "Since administrative enforcement is still time- and cost-effective, rights owners should make good use of it with the combination of several court actions."

Taiwan's IP police, for example, have been standing on the front line for years against infringement, in particular those that are subject to criminal liability. "It is advisable that IP owners work closely with public authorities for enforcement," Ho says. "Against serious and bad faith infringement, it is also necessary to send messages into the market to minimize potential infringement from time to time."

Industries should develop a relationship with their governments to increase their willingness to take care of the 3D printing issues. "A simple start can be to have a dialogue with government agencies asking for a new regulation or an amendment of the current law," Kusumah says. "High-level officials at the Indonesian IP office are aware of the 3D problem, but have not yet included the issue in their main agenda. But within the trademark bill, there are some suggested provisions (i.e. acknowledgment of a 3D mark) which we believe are relevant to address the 3D printing issues."

Regardless of whether 3D printing is deemed a hero or a villain,

right owners and authorities should directly approach the printers when infringement arises, because "a 3D printer may have the log of all products printed and the log usually cannot be deleted, so being familiar with the technology will surely help right owners and authorities on enforcement," says Meng.

Alternative Dispute Resolution v. Litigation

When IP infringement takes place, rightsholders usually take cases to court for damages as well as a deterrent effect. However, as the use of ADR increases globally, the question arises as to when should each be used.

Infringement actions should be used for deterrent effect, Sujintaya says. "Suing an individual counterfeiter may be worthwhile only if the rights owner believes that by doing so, it will deter an adequate number of future counterfeiters. However, the value of deterrence could be outweighed by costly litigation over nominal damages," she says. "ADR saves money and time, especially in the area of IP where the complexity of technology disputes increases the litigation cost exponentially. The parties

may select 3D-knowledgeable arbitrators who will understand the issues involved and technology at hand. ADR has a competitive edge over litigation especially in time-sensitive cases, such as trademark disputes where the market can be saturated with infringing materials and the harm to the trademark owner can become irreparable. Since an ADR procedure is carried out on a confidential and voluntary basis, the chance of enforcement and resolution is likely increased."

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3D printing has the potential to undermine firearm laws and restrictions. This is socially undesirable and dangerous to the public.

- Gregory Ross, partner,
Eakin McCaffery Cox, Sydney

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In countries such as Taiwan where ADR is insufficiently available, "whether to pursue mediation is subject to the presiding judge's discretion and both parties' willingness," says Ho.

The Way of the Future

So what should the future hold for 3D printing legislation-wise? Should IP acts be amended to adapt to the 3D environment? The answer is yes, as most jurisdictions yearn for changes.

"The Malaysian IP office has not come out with any action

or proposal to change the IP laws yet given that the local development of IP is relatively slow compared to other jurisdictions. The IP office should impress upon the legislature the need to address issues of uncertainties on IP protection in the 3D printing space through amendment of existing IP laws or enactment of new laws," Tay says. "New provisions should be included in the existing IP law framework to regulate the role of the manufacturers and distributors of the 3D printers. As 3D printers hit the mass market, it will likely cause a legal minefield in various IPRs and laws. Apart from this, relevant changes to IP laws may be made to include design registrations in the 3D printing space and specific provisions governing the use of 3D printing technology, as well as licensing of 3D printed works in order to prevent IP theft in 3D printing space."

India's legal framework needs to demarcate the nature and extent of the IP protection CAD files would be eligible for and whether this protection also extends to the final printed product. There is also the issue of those rights that are likely to be violated using 3D printing, Nair says. "Considering that most of the infringement could be personal rather than commercial, private use exceptions in current IP laws need to be evaluated. Patent and design holders may be hit hard and, in this context, certain provisions that were incorporated in the copyright legislation dealing with digital reproduction could also be extended to these laws."

Protection for industrial designs in Indonesia is seemingly applicable to cover 3D printing activities, but from a strict reading, Kusumah says, it appears that infringement will only arise if the alleged infringed product uses an identical design, so even a minimum change could escape the infringer from allegation. "There should be a clarification on to what extent slight differences between two designs are, or are not, sufficient to release the infringer from the allegation."

The reasonable scope limit for private use defense under Taiwan's Copyright Act and the dilution of well-known marks due to replication for personal use under Trademark Act appears unclear and pending upon more attention from legislative and juridical aspects, says Ho.

Vietnamese IP laws do not yet have any provisions relating to 3D printing, so there should be supplemental provisions on creations, use and delivery of 3D design files of protected objects, and provisions on liabilities of 3D printing service providers so that individual manufacture of 3D printings is limited, says Nguyen Thi Kim Tai.

On the other hand, the Filipino IP Code and its implementing rules are deemed sufficient to protect right holders against commercial 3D printing. "Also, from a developing economy perspective, fiscal incentives should be given to encourage the public to use 3D printing for private and academic use," Loste says. "Importers of 3D printers should be entitled to lower duties. Domestic sales of printers, CAD of IPs, and the materials for 3D printing should be VAT-exempt."

Sujintaya says she believes that the existing IP laws in Thailand are also sufficient to handle 3D printing issues, though other significant issues such as national security and public safety arising out of 3D-printed firearms, which are beyond the current reach of regulators, need to be addressed in other areas of law. "Nevertheless, whether removing the exemption from infringement liability for infringers who use 3D printers for personal purpose would benefit society as a whole requires careful consideration and further empirical study and a discussion among stakeholders. The law should attempt to prevent or at least deter a substantial amount of 3D printing

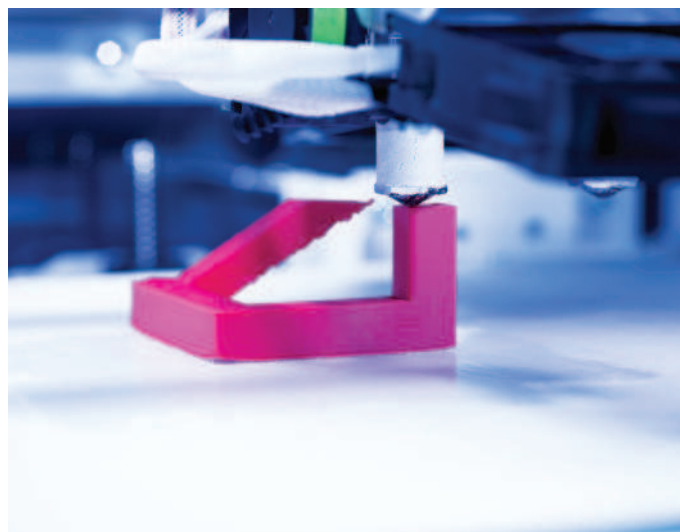
infringement. The government may therefore establish an effective compensation scheme for IP owners. For instance, in certain European countries, copyright levies are imposed on technology, which enables reproduction of content. The right holders will hence receive some remuneration for the inevitable copies that are made. Such scheme is established to encourage individuals to make copies of works at home for private use, and at the same time compensate the IP owners for the private copying exception."

Based On True Stories

Media around the world might not cover 3D printing as much as the litigation between Apple and Samsung, but there are certain cases that are drawing attention.

The Australian media have recently drawn attention to the world's first plastic gun produced from 3D-printed components. "If this concept was released freely to the public, then aside from any implications on IP laws, 3D printing has the potential to undermine firearm laws and restrictions. The creation of detrimental objects using 3D printers is socially undesirable and, in this situation, can be dangerous to the public," Ross says. "The New South Wales Police Service recently demonstrated the manufacture and fired a gun made through 3D printing. The potential harm to society is massive, and the worst case scenario would provoke far more significant regulations of the market place as well as the 3D printing technology."

The Penrose Triangle case is reported as the first ever Digital Millennium Copyright Act (DMCA) takedown complaint over 3D printable objects, Li says. "Ulrich Schwanitz first uploaded his 3D printable Penrose Triangle digital item to an online forum. He then received the printed object and released a video showing the shape. 3D modeler Artur Tchoukanov promptly designed a 3D shape that accomplished the same thing, and uploaded his shape's specifications to another forum. Schwanitz then filed a DMCA take-down notice to the latter forum. In the end, Schwanitz decided to back down, rescinding the takedown notice and promising to release his 3D printable object into the public domain." **AIP**



Media around the world may not cover 3D printing as much as the litigation between Apple and Samsung, but some cases are drawing attention.