Our Digital Futures: Technology Without Boundaries

3-D Printing: From Imagination to Reality

An Interview With

Dinusha Mendis

Joseph Savirimuthu: Hi Dinusha, really appreciate you taking the time to discuss 3-D printing so soon after your presentation at the BILETA Conference 2013. I am so pleased that a paper on downloadable designs was offered. It is amazing to think that in such a short space of time, we can purchase a 3D desktop printer to materialise designs relating to clothes, high tech furniture, puzzles and human organs! In fact, just before the BILETA Conference, I visited my friends @DoESLiverpool and they showed me some really fantastic things that you could do with 3D printers. I am getting a little ahead of myself and do not wish to anticipate what you are going to say. Why don't you start off my by telling us what 3D printing is. Also, why has there been so much interest, even though the technology has been around a long time?

Dinusha Mendis: 3D printing is a computer driven manufacturing technology through which 3D shapes and products are created and it is done by printing *successive layers of material.* As such it is technically known as Additive Layer Manufacturing (ALM) although 3D printing is the more common and popular name. The material that these printers use ranges from, amongst others, plastic, resin, alumide, chocolate to metal. So it is very different to the printers we are used to, which uses ink cartridges as its main 'material'.

You are right; the technology is not so new. The concept of 3D printing can be traced back to the 1970's and in fact the first patent for this technology was granted in 1977 – although the patent did not lead to a commercially available 3D printer at the time. But the fact is that since the 1970s the concept of 3D printing has been around.

Right now, it's an exciting time for 3D printers because it is finally making inroads into the domestic market as prices for these printers have started to drop and the technology has been improved to make it more accessible to the average consumer.

Parallels can be drawn to the early days of the computer, when initially it was reserved for those with computing and technical knowledge. Companies such as *Microsoft, Apple* created an entirely new market and made it accessible to the mass market. 3D printers are moving in the same direction.

Joseph Savirimuthu: Tell me a little about the motivations for your recent research paper and your presentation at BILETA.

Dinusha Mendis: I have always followed advancements in technology with a keen interest, particularly advancements in relation to 'emerging technologies'. Whilst I have been aware of 3D printers for a while, I started researching into it, whilst initially researching into another topic for a paper on the *Digital Economy Act 2010* (recently published in the [2013] 27(1) *International Review of Law, Computers and Technology*). In that paper I suggest that in implementing legislation to curb online infringement it is futile to focus on a particular type of technology, thereby being reactionary as technology will continue to march forward.

In developing my argument, it seemed the most natural thing to undertake research into 3D printing, examine legal responses to disruptive technologies and assess intellectual property law concerns raised. Following on from my research, I authored a paper on 3D printing and its implications for UK intellectual property law which was published in February in the *European Intellectual Property*

Review which in turn led to an interview for the BBC http://www.bbc.co.uk/podcasts/series/pods (programme titled '19 Feb 13' relevant section starts at 15.45 minutes of the programme).

My presentation at BILETA was based on this paper and fits in very much with my research into this subject area. I agree, it is such an exciting area to research into and with the Conference theme this year being 'Our Digital Futures: Technology without Boundaries' it seemed timely, to speak about 3D printing and the law at BILETA.

Joseph Savirimuthu: Thank you so much for giving me a preview of your presentation. I did enjoy the podcast. I think you are right - the internet and pace of technological innovation is not only democratizing design but it is also forcing us to rethink received ideas about artefacts. Dinusha, you suggested in that research publication that the law lacks clarity with regard to 3D and proprietary entitlements. IP practitioners advising copyright owners may disagree. What is your response?

Dinusha Mendis: The reality is that law has always been playing a catch-up game with technology and has found it hard to keep up with technological advancements. This has been evident in the manner in which IP laws, and in particular copyright law, has struggled to keep up with the internet and online piracy – the reason why since 1999 and the days of *Napster*, there have been so many court cases and legislative developments against illegal file-sharers. There are a number of grey areas concerning copyright law which needs clarification and the *Hargreaves Review* highlighted some of these areas, calling for reform of copyright laws.

Of course, 3D printing will create a new dimension for copyright practitioners. However, in dealing with physical objects, issues pertaining to 3D printing go beyond copyright law and raises questions in relation to other types of IP laws. In this context, a review of the current UK copyright, trademark, patent and design laws illustrate that the situation is far from clear.

The issue is that the present IP laws we have in the UK, were not designed to deal with such advanced technologies and regulating 3D printing will be no different to other types of technologies. If the law was crystal clear the solution for dealing with the tensions which exist between 'disruptive technologies' and the law will also be equally clear. Yet it is not. 3D printing brings to the forefront these grey areas and the reality is that it will create a lot of challenges for IP rights holders and manufacturers of industrial products who wish to protect their IP, but, will have the challenge of dealing with increased piracy and counterfeiting through the widespread use of 3D printers.

Joseph Savirimuthu: I was anticipating this response. The Napster Moment! I do not think you will find any disagreement that good innovation tends to be disruptive. The law is no stranger - Gutenberg, VCR, Photocopiers, Internet, and now 3D printing. Can I just place a footnote to the "Napster Moment" observation – I am not entirely sure whether we are going to witness the scale of file sharing activity that followed Shawn Fanning's unleashing of P2P. I have two questions however: is a legal solution likely to be efficient given the problems of enforcement and the pace of innovation? Second, business models. Consider this example - I badly need a body part. A highly reputed surgeon from India's Silicon Valley wishes to make this available via 3D printing. I hope the Law will make my life easier and I do not want to wait until a court ruling a decade later! Where do you stand both in terms of the law and business models?

Dinusha Mendis: A very interesting question. First, I don't think a legal solution alone will be effective in dealing with 3D printing. In considering the intellectual property implications of 3D printing and in drawing lessons from the past, it is clear that focusing on stringent IP laws alone, has not worked, particularly in relation to 'technologies without boundaries' – i.e. internet and beyond. People will always find a way to get round the law. As I suggest in my paper and the interview I gave for the BBC, attempting to completely suppress access to new technologies by enforcing *draconian IP laws* is not the solution – in fact it creates more problems and sends people down the infringement path of looking for ways to circumvent the digital locks. Of course as 3D printing leads to the creation of physical objects and goes beyond mp3 and digital files, some regulation will definitely be necessary. However, part of the solution should be to adopt new business models in adapting to this new technology – which brings me to your second question.

Adapting to this new technology by adopting new business models, as a complement to regulation, is certainly the way forward. Body parts have already been 3D printed – including blood vessels, kidneys and a 3D printed jaw. The thing with body parts is that whilst the technology might be perfect for meeting the needs of each individual, there are also a number of ethical issues which needs to be considered. In my paper I focus purely on IP laws, although the technology has implications on a wide variety of other laws, depending on the type of product which will be printed. Recently there were issues raised in relation to 3D printed guns. However from a purely IP, proprietary point of view, from the point of view of access and use, I believe creative business models in relation to 3D printing is the way forward – whether it be in relation to body parts, spare parts, toys, hobbies etc.

I suggest a number of solutions and recommendations in my paper on how such business models can be taken forward. To know more about these recommendations, you will need to read my paper!

Joseph Savirimuthu: Sure. Actually, I have read the paper and want to press you further, if I may. How do the recommendations you propose actually move the governance debate forward in practice, given the responses to the smartphone unlocking saga and even the possible security/ethical implications that require some form of regulatory oversight. I would not be surprised that industry has already started lobbying Parliament and emphasize that downloadable designs are "derivative works". In fact, there appears to be a meme war already in progress.

Dinusha Mendis: I agree; it is not possible to ignore security, ethical and other legal implications brought forward by 3D printing. Whilst my paper discusses the IP implications, 3D printing throws up a variety of other legal implications which require equal attention and a review of other existing laws. As you correctly point out, industry has already started to lobby Parliament and there has been a call for a policy framework in relation to 3D printing in the UK. The report states that the critical issues which need consideration include IP law; regulation; legal responsibility; standards; materials; and infrastructure. As such, IP is one of the many areas which need consideration and my paper is written purely from an IP point of view.

In my paper, I mention an IP issue within the 3D printing context from 2011. In this case, Thomas Valenty (a hobbyist) and *Thingiverse* (online platform) was issued with a "notice and takedown order" under the DMCA 1988 for tweaking and uploading a couple of *Warhammer*-style figurines, owned by Games Workshop. As you mention, the same Act now makes it illegal to circumvent digital protection technology. In October 2012, a patent was granted to prevent people from using 3D printers to 'pirate' goods. In effect, the patent embeds copy controls in 3D design similar to digital rights management (DRM). We know from past experience that whenever our personal liberty is

invaded by suppressing access to technology through stringent *IP laws*, people always tend to find new ways of getting around the system. This leads me to think about the capabilities offered by Go!Scan and Defcad in the 3D printing world, which defeats the above issues.

My argument is that in the context of IP, we need to be creative in adopting new business models, to avoid replicating the issues experienced from the *Napster* revolution, whilst also considering a review of the existing IP laws. The reality is that technology will continue to move forward and it is better for us to embrace and adopt the technology and find ways to work with it, rather than supress it altogether or criminalise individuals. Of course, it goes without saying that apart from IP laws, there are a number of other legal implications will also need to be reviewed. These considerations could be the topic of another paper!

Joseph Savirimuthu: Thank you!

Dinusha Mendis: Thank you for the interesting and thought-provoking questions.

The interview was given by Dr. Dinusha Mendis for the 28th BILETA Conference at the University of Liverpool, 10-12 April 2013. The interview is based on her paper titled, '"The Clone Wars": Episode 1 – The Rise of 3D Printing and its Implications for Intellectual Property Law: Learning Lessons from the Past?' [2013] 35(3) *European Intellectual Property Review pp. 155-169.*

Dr. Dinusha Mendis is a Senior Lecturer in Law and Co-Director of the Centre for Intellectual Property Policy and Management (CIPPM) at Bournemouth University. Dinusha specialises in digital aspects of Intellectual Property (IP) Law, in particular copyright law, and has published widely in this area. Dinusha's recent projects have included considering the challenges to Intellectual Property Rights (IPRs) as a result of Emerging Technologies, such as the Intellectual Property implications of 3D Printing.