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The Legal Concerns of Three-Dimensional Printing

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1 Introduction

Three-Dimensional Printing or 3D Printing is an additive method of production which creates a three-dimensional object from gradually adding material until a solid is formed. There are many types of 3D printing, and the printers come in all different shapes and sizes. However, they are all related to each other. Every process requires a digital file that's been 3D modelled on CAD software or 3D scanned. A typical printer will have three-axis consisting of X, Y and Z. They will have a bed, box or vat that the object is created within. Fused Deposition Modelling or FDM is one of the most common printing types. It uses a spool of plastic in a wire-like form; this gets fed into a heated nozzle which extrudes the melted plastic. The nozzle and or bed is moved by following the instructions given by the 3D printing software to create a solid form into the desired shape. These days printers are more capable of creating objects out of more options than just solid plastic. Objects have been printed in metals, flexible polymers, carbon fibre and even ceramics.

Since the expiration of a patent on 3D printing expired in 2009, FDM printing became publicly available and caused a vast interest in affordable 3D printers. It is hard to find an industry that has not been changed by 3D printing, like consumer products, movie props, housing and even medical care. 3D printers are becoming more common in the household too, and the future could bring a printer into every home. It is reported that the 3D printing industry "could be worth \$34.8 billion by 2024" (MarketsandMarkets, 2019).

The current legal system has a significant amount of uncertainty within what is defined as legal and illegal in the subject of 3D printing. This thesis will uncover research into current concerns and implications of how 3D printing is affecting society and industries

within the law. I hope to get a greater insight into something I have not investigated previously; this will benefit my knowledge on the law and as a designer, 3D printing itself.

The second chapter covers Gun Crime, a very controversial subject concerning the social and legal issues regarding with 3D printed guns in comparison to traditional firearms. There are multiple cases of consumers having the ability to 3D print guns at home with access to files on the internet.

Chapter three covers Intellectual Property laws such as copyright, patents and trademark infringements of objects that have been 3D printed in comparison of a standard lawsuit claim. 3D printing has been referred to as a new age of piracy, as it gives the ability to replicate almost any product.

The fourth and final chapter researches Product Liability with purchased printed objects, the purchasing of printable 3D CAD files, and the liability within public sectors such as construction and healthcare. This is an essential subject to me as a designer, as in the future, I will have to ensure the integrity of my own products and ensure I am not violating these laws.

2 Gun Crime

2.1 PRINTED FIREARMS

3D printed guns can be an interesting item for a gun enthusiast or hobbyist, but there are many concerns within law enforcement. The UK police reported that they seized 672 traditional firearms in 2017 (National Crime Agency, 2019). Although there are plenty of illegal and unlicensed guns in the country, it can be challenging to acquire one and often requires a third-party provider. However, 3D printing a gun is much simpler and could be done in complete isolation without arousing suspicion. If a printed gun were to be used in a crime, it could be destroyed far easier than a regular firearm.

Traditional firearms are regulated, they have serial numbers, and purchasers are subject to background checks and sometimes firearm safety training before acquiring these weapons. According to the 1968 Firearms Act, it is prohibited to produce firearms in the UK without a license (Firearms Act 1968 c.27). Technically 3D printing weapon components would be in violation under this act. However, the UK government updated the legislation in 2013 to “make it absolutely clear that it is an offence to own or manufacture a 3D printed gun without a license” (Berry, 2013). The UK also has national laws that adhere to the EU Common Position on arms exportation, meaning anyone who wishes to distribute plans online to produce firearms must apply for an export license permit (EU Council 2008). Although, it is highly unlikely a permit will be granted as there is no way to monitor or regulate who is downloading the plans.

The first recorded instance of a publicly available 3D printed gun design was in 2013, created by the founder of a private defence company in Texas, Cody Wilson. The plans

to make the single-shot handgun were readily available to the public on the internet, causing considerable controversy (Harvard Law Review, 2017).



Figure 1: The Liberator 3D Printed Gun

The Liberator consists of around 16 printed parts that can be printed in approximately 20 hours, and a standard nail is used for the firing pin (Victoria and Albert Museum, 2013). And the gun is capable of firing a .380 bullet.

Wilson was ordered to delete the plans from the internet as they breached International Traffic in Arms Regulations. Anyone could download these plans without a background check, even people living outside the US. By the time Wilson removed the design plans, they had already been downloaded over 100,000 times in just two days (Hanrahan, 2019). A lawsuit was filed against the federal government by Wilson, claiming that they violated his First Amendment free speech rights. Wilson managed to win the case, and his 3D printable designs could be published back online, although this time a few states had been banned.

Polymer guns have been around since the 1950s, Remington being the first to release a Nylon .22 Rifle to the market in 1959 (Hawks, 2016). In January 1986, it was reported that a Glock 17 Polymer handgun was undetected through airport security (J. MICHAEL KENNEDY, 1988). This report caused a debate in the media questioning

national security and the current state of laws for plastic guns. News outlets were warning Americans of plastic pistols, and one report referred them as the “hijackers special”. This report also stated that the Glock 17 is “composed almost entirely of plastic.” (Groves, 1986). This statement was simply an exaggeration as the Glock 17 weighs 21.5 ounces and only two ounces are plastic (J. MICHAEL KENNEDY, 1988). The Austrian manufacturer of the Glock 17 claimed that they could produce an entirely plastic gun but has not done so “in the interest of international security” (Mrazek, 1986). After speculation on the reliability of the security screening, and the fact that the Glock 17 is mostly metal, it was found that the security measures at the airport were not being used properly (Prince, 2018). Despite this, the subject was still a concern, and the Undetectable Firearms Act was legislated in 1988.

An undetectable firearm is used to describe a weapon that can easily bypass security measures such as metal detectors and X-rays. The Undetectable Firearms Act 1988 was issued to prohibit the manufacture, importation and possession of any of these weapons in the USA (Undetectable Firearms Act 1988). In 2018, Boston Globe falsely reported that the 3D printed Liberator is undetectable (BostonGlobe.com, 2018). However, if the official instructions are followed correctly, this is not the case. The instructions state:

Once the frame is finished, epoxy a 1.19 x 1.19 x 0.99” block of steel in the 1.2 x 1.2 x 1.0” hole in front of the trigger guard. Add the bottom cover over the metal if you don’t want it to show. Once the epoxy has dried, the steel is no longer removable, and is an integral part of the frame. Now your gun has ~6 ounces of steel and is thus considered a ‘detectable’ firearm. (Biggs, 2013)

It is a common belief that for a firearm to be detectable, it must contain at least 3.7 ounces of stainless steel, this statement is not entirely true. The law declares that the gun must be detectable by the equipment used in 1988 when the Undetectable Firearms Act 1988 was first issued (see section 921). The law also states “the term ‘firearm’ does not include the frame or receiver of any such weapon” (see section 922). The 3.7 ounces of steel is only needed on the barrel and slide sections, as the receiver is not considered. Therefore, as the Liberator’s barrel is plastic, it would not comply with the law.

There are a group of 3D printed firearm supporters, working on designs and the improvement of these weapons. Unlike Wilson’s case, members are kept anonymous and do not use branding or trademarks. By doing this, the members believe governments or the law cannot stop them. The group's spokesman only known by his online alias Ivan The Troll, he states that he knows at least 100 designers who are currently working on 3D printable firearms (Hanrahan, 2019). He also claims the plans are being accessed by thousands of people all over the world. They are here to stay and have no easy way of being removed by the government.

The first person to be convicted for 3D printing a firearm was, in fact, a student in the UK. Tendai Muswere pleaded guilty when appearing in court in June 2019, after police raided his London home and found printed gun components on two separate occasions (Poppy Noor, 2019). Muswere claimed he intended to use the firearm for a university film project but refused to give any information on what the film was about. The 26-year-old student said he was unaware that the gun was capable of firing. However, evidence was found in his search history, showing he watched multiple online tutorials

on how to make the weapon fire live ammunition (Osborne, 2019). He was sentenced to three years in prison (Rodger, 2019).



Figure 2: Printed Gun Made by Muswere

As 3D printed weapons are not monitored, there is not currently a particular way of registering each item to a database or even linking a consumer to a firearm. However, in the University of Mississippi Department of Chemistry and Biochemistry, Professor James Cizdziel and Student Oscar Black discovered that it is possible to forensically trace Physical and Chemical evidence from 3D printed weapons (Stewart, 2019). Using Spectrometry, they were able to link gunshot residue and polymers to specific weapons.

2.2 HOMEMADE WEAPONS

3D printed firearm enthusiasts are arguing that there are already plans and components for dangerous weapons available on the internet. That the 3D CAD files are causing no additional harm. There are a countless number of cases involving homemade shotguns, pipe pistols and even explosives that have caused significant injury and or death.

John Zawahri was the cause of a mass shooting in Santa Monica back in 2013, killing six people (Juan I Blanco, 2013). Zawahri gathered numerous parts and assembly instructions to construct his semi-automatic rifle at home. Like the 3D printable plans,

these are easy to access via the internet. When buying components online, the majority of each sale is not regulated or checked, except for one crucial part, the lower receiver. It was believed that Zawahri purchased a partially completed lower receiver and modified it himself. Initially, Zawahri was denied access to legally obtain a firearm in 2011 (Evans, 2013).

In 2013, Paul Alton in the UK was arrested for possession of a dangerous homemade pistol after being reported by his frightened wife (Cruz, 2013). He also had a shotgun of which he had a revoked license. The gun was capable of firing .22 expanding ammunition, which would “explode” on hitting flesh.



Figure 3: Alton's Homemade Pistol

Alton claimed he used this weapon for the humane dispatch of animals; however, there was no proof of this. The gun was constructed of parts of an Air Rifle, then modified to fire the .22 ammunition (Barlow, 2013).

It is alarming how many plans for homemade weapons there are on the internet, and how easy they are to access. There are even detailed instructions on how to make a “pipe gun” on popular websites such as wikiHow (wikiHow, 2010). These particular instructions were simple to access just from a Google search and have over a million views.

3 Intellectual Property

3.1 INTRODUCTION TO IP LAW

Intellectual property law is all about ownership of the idea, concept or design of a product and what can be done to protect it legally. Preventing unwanted uses, copies and sales of products or branding. Although it is not a physical asset, IP can be bought, sold and licensed just like other forms of property. There are a few types of intellectual property rights that can be applied. Patents must be an original invention covered by how the product works, what it does, how it does it, what it is made from and how it is made (Intellectual Property Office, 2017). Design rights can be protected by the overall look of a product or part. Brands can protect themselves by acquiring a trademark, and this is something that can be used to identify a product or service to a brand such as logos or words. Copyright protects creators of literary, artistic or musical items.

The unfortunate truth of today's creative world is that it is filled with competitors who are willing to steal or imitate the products of businesses and individuals. When using IP laws to protect assets, it reduces the chances of these competitors even thinking about copying the idea. It's common to see companies change a rival's product slightly in aim to avoid a lawsuit against them, but a good IP law will protect all aspects of infringement, however subtle.

An example of a products intellectual property being infringed was a legal battle between Lego and Zuru toys regarding the similarities between their products, mainly the Minifigure range (Nadkarni, 2019). Lego introduced Minifigures in 1978, and they've been a sensational collector's item ever since selling over 120 million in the US

alone (Farshtey and Lipkowitz, 2013, p.13). Lego filed a lawsuit against Zuru toys due to their figurines, packaging, and various bricks being strikingly like their own.



Figure 4: Comparison of Lego & Zuru Minifigures

The lawsuit is still ongoing at the time of writing this thesis. However, Zuru will likely have to pay Lego a hefty sum for this infringement.

3.2 CONCERNS WITH 3D PRINTING

3D printing gives the ability to make an almost infinite range of products. Sites like Thingiverse offer thousands of files available to download and print (Thingiverse.com, 2019). Creators are also using 3D scanning to reverse engineer and reproduce existing products or sculptures and share them around the world. This raises a concern of ownership and property rights, and the idea of customizable, quick and cheap prints entices consumers to bend the law, sometimes unintentionally.

In 2013, a creator called Fernando Sosa received a takedown notice for offering the sale of a printed iPhone dock inspired by the Iron Throne from Game of Thrones (WIRED, 2013). He modelled the file on 3D CAD software using reference images and videos from the hit TV series and put a pre-order up for the printed model on his website for \$49.99 (nuPROTO, 2013). HBO, who own the rights to Game of Thrones, sent Sosa a cease-and-desist letter, meaning he must stop sales immediately as they believed

that his product infringed their copyright. If this item were released without a pre-order, HBO probably would have sued him for a fee. HBO felt that Sosa was making money from something he didn't initially design nor own the rights to.



Figure 5: Sosa's Printed Iron Throne

As previously mentioned, there are thousands of 3D printable files available online and most of them are free to download. Fans are innocently sharing objects that have a relation to their dearest interests for no cost. However, some companies are not happy with the distribution of copycat products. Lego, as mentioned previously, has recently been sending cease-and-desist notices to fans and creators who have designed printables inspired by Lego. The CEO of the large 3D print content site MyMiniFactory reported that a legal representative for Lego requested that they should “remove a long list of LEGO-related free content” (Vialva, 2019).

One of the hundreds of content creators, Stian Ervik Wahlvåg, used his creative abilities to 3D design multiple Lego related printables, including a human-scaled Lego space blaster and a human-scaled Lego parrot. He was given a notice, stating the

removal of his files from MyMiniFactory. Wahlvåg has never made any financial gain from the download of his files nor the completed models. He wrote on Twitter:

LEGO has just done a takedown of my LEGO fanart related STL files. I don't blame them, and I respect their decision of protecting their IP, but as an AFOL I can't help feeling disappointed. This means I won't be doing projects like these anymore. (Wahlvåg, 2019)

It's not clear what Lego is basing their infringement claims on as they haven't released an official statement. Some of these designs that have been taken down are original but compatible with official Lego products, therefore should they have the right to take these down? If anything, these printables are only embellishing the Lego brand, and they should be grateful they have a creative community supporting them.

3D printer owners are already modifying their products by printing objects to either enhance or decorate. Consider a scenario where a product has customizable printable parts such as a car with a 3d printed bumper grill. If this part caused a problem during operation, would the car's existing warranty be voided just because the part was printed at home and not the manufacturer? There are more than just safety concerns within customizing products. How much does a product have to be modified to change the ownership of rights within Intellectual Property Laws?

4 Product Liability

4.1 CONSUMER RIGHTS

There are various laws and regulations in place detailing what consumers and businesses are responsible for when trading goods and services. On the 1st October 2015, the Sale of Goods Act, Unfair Terms in Consumer Contracts Regulations, and the Supply of Goods and Services Act were replaced by the Consumer Rights Act. This change was implemented to clarify rights and simplify the law (Citizens Advice, 2015).

Under the new Consumer Rights Act, it is stated that all products must be of satisfactory quality, fit for purpose, and as described (Which?, 2015). Goods should not be broken or faulty, they should be functional for its intended use, and they should match any description given at the time of purchase. If any of these rights are infringed upon, the consumer has 30 days to claim a full refund for any product or service. If they are outside of the 30 days, the retailer has the opportunity to repair or replace the product. Past six months, the consumer has the responsibility to prove that the product was faulty from the start.

Fisher-Price recalled approximately 4.7 million baby sleepers due to the death of 32 infants (Baynes, 2019). Babies unrestrained in the cradle could roll onto their front or side, causing suffocation. Fisher-Price warned parents to stop using this product after their child was over three months old, the typical age a baby will learn to roll over. In 2009, the major car manufacturer Toyota recalled 3.8 million cars due to numerous incidents of the accelerator pedal getting stuck under the floormat (Cars.com, 2009). One particular incident caused one vehicle to unintentionally accelerate and collide

with another car, killing four people (BBC News, 2010). These two examples highlight just how important quality control is when creating consumer products. Although these cases have been lethal, there are hundreds of minor Consumer Rights claims every day. Including issues with faulty goods, fake goods, poor service, rogue traders and even cowboy builders (Government Digital Service, 2012).

4.2 PURCHASING 3D PRINTED PRODUCTS

There is a growing number of 3D printer owners all over the world. However, companies and individuals are still outsourcing to online or local printing services to have models made for them. Whether it be a prototype part or commissioned prop, services are available to anyone who does not have access to a 3D printer.

Shapeways are one of many providers of on-demand online 3D printing, capable of delivering custom parts and products to customers in around 10 - 15 business days (Smith, 2012). Users can upload their 3D models or browse thousands of files on the marketplace, with a choice of materials and colour. Although Shapeways offers detailed design guidelines when ordering custom parts, sometimes these criteria cannot be met. However, a "Print it Anyway" option is available which ensures the customer receives a printed model, regardless if it meets the guidelines or not. By using this option, Shapeways cannot guarantee a product without imperfections. Therefore the customer will no longer qualify for a refund (Shapeways, 2019).

There are numerous contributors to the sale of a 3D printed product or part. Such as the designer, the CAD designer, the print operator, the assembler, the seller, the packager, and even the courier. Although these could all be one person in many cases, it is important to discuss who is held responsible for what.

Consider this scenario, a company in Germany designs a 3D model part for printing and uploads the CAD file to the internet for sale. A motor garage in the UK buys the CAD file and offers the file to get printed for customers in their shop. A customer buys and installs the 3D printed part into their car, and they are then injured in a traffic collision caused by the recently installed part.

Who is liable for the damage and compensation towards the customer? The CAD file designer, motor garage, 3D printer manufacturer and even the customer could get blamed. It is far more challenging to determine which collaborator should be held responsible for a defective product in comparison to traditional manufacturing methods.

Accountability, traceability, the distribution of liability and jurisdiction are all significant problems with selling 3D printed parts.

4.3 PURCHASING 3D MODELS TO PRINT

There are plenty of untraditional methods of the distribution of products that makes the current legal system questionable. Not only are there sales of 3D printed products, but also the sale of CAD files for 3D printed products. Consumers that own a 3D printer can purchase files online and print products themselves.

The German camera accessories manufacturer Edelkrone, sells a fully assembled adjustable camera tripod mount for £129 (Edelkrone, 2019a). A 3D printable version of the same product is also available for only £26 (Edelkrone, 2019b). This purchase includes detailed instructions and a set of CNC machined parts shipped to the customer that are not 3D printable. Edelkrone are calling this the “ORTAK method” where the product is manufactured by both parties of the company and the customer. A much cheaper solution than the “real thing” providing you have access to a 3D printer.



Figure 6: Edelkrone's 3D Printable Camera Mount

It is stated in the instruction manual “Edelkrone cannot be held responsible for damage caused by improper use or modification of the product.” (Edelkrone, 2019c)

James Beck, a specialist in product liability and personal injury at Reed Smith law firm says,

As a theoretical matter, there could be “product liability” of a sort. It may not be strict liability as is common in the USA, because it is questionable whether the CAD files are “products.” Under USA law “products” must be tangible things. There could still be negligence or warranty liability. As a practical matter, the plaintiff would have to be able to identify the file designer and be able to obtain jurisdiction over that person. If the file is open source, and the designer is located in another country, that could present significant problems. (Beck, 2019).

Still, this does not provide a conclusive answer to the question of warranty or guarantee within purchased CAD models for printing. It all seems to depend on the company and the product.

4.4 PUBLIC SECTOR CONCERNS

Large scale printers are capable of building houses for cheap and on a much faster scale. One construction technology company, Icon have developed a way to print a 350 ft² home in less than 24 hours and for around \$4,000. They plan to print 100 affordable homes in El Salvador in 2020 (Aria Bendix, 2019). This is a fantastic breakthrough and will reduce homelessness, benefit refugees during migration and limiting waste and costs on labour, plant hire and materials.

The concern here is the liability change in comparison to standard construction methods. Traditionally when building a house, there are many aspects to be wary of to protect yourself from risk. Building site insurance, structural warranties and even the architect's certificates from the designer all need to be thoroughly checked. A building needs to be designed in a way that it is structurally safe, how can a 3D designer be guaranteed to consider the difference within the way a building is printed and not built from beams, bricks, cement etc.? and are insurance companies prepared to pay out if in the event a 3D printed structure is deemed defective and falls apart? A standard structural warranty is active for ten years and costs between £1,500 and £5,000 (Grand Designs Magazine, 2019). If a building is 3D printed, will they still be eligible for a structural warranty and will the premium or duration be different? An Architect's certificate is given on building works after completion and validates that the building complies with regulations, does this cover printed structures? How can an architect be qualified to oversee such a new method of construction and ensure no faults are being made? These are all questions that will need to be answered as the 3D printing technology develops further.

The medical industry is said to have been enhanced since the further development of 3D printing technologies, and it is said to be worth \$3.5 billion by 2025 (Nawrat, 2018). Dentistry, prosthetics, surgery tooling, biometrics, and even pharmacology have been affected by 3D printing. For example, traditional prosthetics have been known to be expensive and uncomfortable for the user. Depending on the limb and the desired application, prosthetics can be up to \$15,000 (Gregurić, 2019). Often measurements are taken for inaccurate methods and can cause the artificial limb not to fit correctly. With the help of 3D scanning, it is possible to take a highly detailed scan of the residual limb and import the data into modelling software where a perfect fitting prosthetic can be designed and then printed in the appropriate material.

The future of medical printing has even more applications, scientists at ETH Zürich and Strait Access Technologies are currently developing custom 3D printed heart valves. The human heart has four valves, each one responsible for blood flow around the body. If these valves are too small, leaky or even damaged, they can cause heart failure or other diseases. Depending on the individual and the heart defect, it has been known to use artificial hearts to fix the problem. In 2003, there were 290,000 cases of heart valve replacement, and it is estimated by 2050 that number will rise to 850,000 (Musumeci et al., 2018). 3D printed valves can be completely customized to fit precisely to the patient, and it is possible to take accurate images of the faulty heart by using magnetic resonance imaging or MRI, these images are then used to model a valve that can be 3D printed. The conventional replacement valves are said to last around 10 – 15 years until they need to be replaced, researches are trying to extend this to an entire lifetime. Meaning we could potentially see these printed valves in young people also (Peter Rüegg, 2019). It will be at least 10 years until we see clinical

use of these printed valves due to the Food and Drug Administration (FDA) and their extensive trials and tests. Some scientists and doctors are concerned that future medical advances like this may cause complications and unnatural physical abilities.

This raises the question of liability in relation to the medical supplies that have been 3D printed, whether it be a prosthetic or printed organ, how can they be guaranteed to provide its function? Who would be responsible if something were to go wrong with a printed implant years after surgery? Medical Malpractice Insurance exists to protect doctors and surgeons against claims for compensation from neglect, misdiagnosis or lack of care, so would surgeries involving printed parts be covered too?

5 Conclusion

The purpose of writing this thesis was to educate myself and others on the potential legal implications of 3D printing in different industries. This included covering some social issues too. Although a lot of research has been done into this subject, there are still many unanswered questions for what the future of 3D printing holds. I cannot predict the future but there is still much more to be done, the legal system needs to be reconsidered continuously whilst this technology is being further developed. There is always going to be grey areas within the law but ignoring them could cause extremely adverse effects.

National laws that deal with the production of weapons still apply to 3D printed weapons. However, it is more complicated to control the printing of firearms compared to manufacturing a traditional metal gun. Whilst it is easier to regulate traditional firearms, there is very little or no control over printed guns and they can easily fall into the wrong hands. Not enough is being done to prevent this, but what can actually be done? Even if there was complete control over 3D printed guns, there are still thousands of plans of other methods of building firearms which can cause lethal harm.

3D printing technology has given people an easy route to infringe intellectual property laws. There is not enough awareness of the issues, and too many people are claiming false innocence. There should be more information available on the subject, not only when purchasing a 3D printer but when 3D CAD files are being downloaded. A brief explanation of what the intellectual property laws consist of should be given at the point of purchase or at the download of the CAD file. These notices already exist when downloading illustrative graphics from the internet, so why not 3D CAD files?

The laws of the Consumer Rights Act still apply within 3D printing. However, there should be considerations to create specific rules for printed products. The chain of production of a 3D printed product is very different to a traditionally manufactured product, and therefore it creates a difficulty in deciding who or what is reliable for faulty products. If a product is printed and assembled by the consumer, it should be treated differently to a quality-checked factory-manufactured product. There are far too many independent variables with 3D printing to consider giving the same warranty or guarantee as a product made in a factory. Although, I do believe there should be some rights available on this subject, as a service and eventually, a product is still being provided to a customer who has spent money. This is also relevant to the 3D printed construction industry, and there should be alternative rules and regulations given to printed structures in comparison to contemporary built structures.

It is difficult to grasp a strong opinion on 3D prints in the medical industry as it is still in early development, and it will be decades until we have substantial evidence to back up the safety and longevity concerns that have arisen. The FDA is stringent, and it is doubtful that we will see printable applications in human subjects anytime soon.

The benefits of 3D printing still out-weigh the negatives, and it is only going to get more popular. Therefore, the legal system will have to update and change for the better. Regardless of who the end-user is, there is going to be malicious crime in almost every industry, lawsuits will be carried out, and someone will always disagree.

List of Illustrations

Figure 1: Janner, J. (2013). *The Liberator 3D Printed Gun* [online] Time. Available at: <https://time.com/5354963/3d-printed-guns-hard-to-stop> [Accessed 14 Oct. 2019].

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