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# EU Design and Copyright Protection and their adaptability to 3D Printing

JAEM03 Graduate Thesis

Graduate Thesis, Master of Laws program
30 higher education credits

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Semester of graduation: Spring semester 2016

# Contents

# Summary

This thesis deals mainly with three questions. The first question concerns what lessons concerning the development of 3D printing and its influence on EU copyright protection in accordance with the InfoSoc Directive and EU design protection can be learnt from history concerning the technological developments of digitization of music and the introduction of the InfoSoc Directive. The second question concerns EU design law and copyright law in accordance with the InfoSoc Directive and its adaptability to the technology of 3D printing. The third question deals with the technological measures that the rightholders can use to protect their product or service in relation to 3D printing.

From the digitization of music and the development of the Internet and the introduction of the InfoSoc Directive, it is clear that EU copyright protection has been harmonised in certain areas in order to adapt to new technology. The recent history of technology and copyright protection can give guidance on how to deal with new technologies like 3D printing and intellectual property protection like copyright and design protection in the near future. The lesson to be learnt is that EU intellectual property legislation should not have provisions that are too technology specific.

The introduction of the InfoSoc Directive was troublesome since it was difficult to foresee the developments of DRM systems. DRM systems have not been used as extensively as expected. Consequently, the provisions concerning DRM systems should be changed. In my opinion, rightholders should have the possibility to use these measures, but the protection of them should only last as long as the right they are protecting. In general, it is better to provide a 'broad' intellectual property legislation in relation to new technology since it is difficult to foresee how that technology will be developed and used. Accordingly, special provisions concerning 3D printing should not be introduced. Provisions applicable on 3D printing concerning for example reproduction of copyright protected or design protected products are already provided by the InfoSoc Directive and the DD. These directives provide a strong protection for rightholders. Some products may even have the double protection of a design right and a copyright.

In my opinion, the InfoSoc Directive and the DD should be changed, not because of the 3D printing technology, but due to the need for update. The DD should be changed for the purpose of harmonising the protection or non-protection of spare parts. The InfoSoc Directive should be changed in relation to the DRM provisions, but also in relation the harmonisation of exceptions and limitations to promote legal certainty for rightholders and other actors. In my opinion, a problem with the current InfoSoc Directive is that the only focus seem to be the interests of the rightholder. I would prefer a legislation were the interests of the user and other designers are taken into account. The DD seems to provide a rather good balance of rights.

# Sammanfattning

Den här uppsatsen behandlar huvudsakligen tre frågor. Den första frågan rör vilka lärdomar avseende 3D printing och dess påverkan på EU-upphovsrätt i enlighet med InfoSoc-direktivet och EU-mönsterskydd som kan dras från historian avseende den teknologiska utvecklingen i form av digitalisering av musik införandet av InfoSoc-direktivet. Den andra frågan rör EU-mönsterskydd och EU-upphovsrätt i enlighet med InfoSoc-direktivet och dess anpassningsförmåga till 3D printing-teknologin. Den tredje frågan behandlar tekniska åtgärder som rättighetsinnehavare kan vidta för att skydda sin produkt eller tjänst i förhållande till 3D printing.

Från digitaliseringen av musik och utvecklingen av Internet och införlivandet av InfoSoc-direktivet är det tydligt att det EU-rättsliga upphovsskyddet har harmoniserats på vissa områden för att anpassas till ny teknologi. Den senare historian om teknologi och upphovsrättsskydd kan vara vägledande för hur man ska hantera ny teknologi som 3D printing och immaterialrättsligt skydd som upphovsrätt och mönsterskydd. Lärdomen är att EU-rättslig immaterialrättslagstiftning inte bör innehålla bestämmelser som är för specifika i förhållande till teknologi.

Införlivandet av InfoSoc-direktivet var problematiskt eftersom det var svårt att förutse utvecklingen av DRM-system. DRM-system har inte använts i den utsträckning som förväntades. Följaktligen borde reglerna om DRM-system ändras. Enligt min mening borde rättighetsinnehavare ha möjligheten att använda DRM-system, men skyddet för dessa bör endast vara så länge som rättigheten de skyddar. Generellt är det bättre med en ”bred” immaterialrättslagstiftning i förhållande till ny teknologi eftersom det är svårt att förutse hur teknologin utvecklas och hur den kommer användas. Speciella bestämmelser om 3D printing bör alltså inte införas. Bestämmelser applicerbara på 3D printing angående exempelvis reproduktion finns redan i InfoSoc-direktivet och mönsterskyddsdirektivet. De här direktiven tillhandahåller ett stark skydd för rättighetsinnehavare. Vissa produkter har till och med dubbelt skydd med mönsterskydd och upphovsrättsskydd.

Enligt min mening borde InfoSoc-direktivet och mönsterskyddsdirektivet ändras, men inte på grund av 3D printing, utan på grund av behovet av uppdatering. Mönsterskyddsdirektivet borde ändras för att harmonisera skydd av reservdelar. InfoSoc-direktivet borde ändras i förhållande till bestämmelserna om DRM-system, men även i förhållande till harmoniseringen av undantag och inskränkningar i rättighetsinnehavarens rättigheter i enlighet med direktivet. Enligt min mening är problemet med det nuvarande InfoSoc-direktivet att det bara verkar fokusera på rättighetsinnehavarens rättigheter. Jag skulle föredra en lagstiftning där det även tas hänsyn till konsumentintressen och andra formgivares intressen. Mönsterskyddsdirektivet verkar ha en rätt bra avvägning av rättigheter.

# Preface

I would like to thank the teachers and students that I have worked with and obtained knowledge with at the Faculty of Law at Lund University. I would especially like to express my gratitude to Ulf Maunsbach for introducing me to intellectual property law and guiding me through the work of this thesis.

I am very grateful to the lawyers at Ramberg Advokater in Malmö, who have provided me with an internship at their office and helped me improve my legal skills. I especially owe many thanks to Jennie Kastberg for helping me with choosing the topic for this thesis and helping me with valuable information and advice concerning this thesis and intellectual property law in general.

Ida and Sebastian, thank you very much for reading my thesis and making useful comments.

Thank you all my friends and family for believing in me and being supportive.

Emilia Bengtsson
Bjärnum, 12 June 2016

# Abbreviations

| | |
|---|---|
| Amending Regulation | Regulation (EU) 2015/2424 amending Council Regulation No. 207/2009, implementing Council Regulation No. 40/94 and repealing Commission Regulation No. 2869/95 |
| Berne Convention | Berne Convention for the Protection of Literary and Artistic Works |
| Charter | Charter of Fundamental Rights of the European Union |
| CDR | Council Regulation (EC) No 6/2002 on Community designs |
| CJEU | Court of Justice of the European Union (The CJEU consists of the ECJ, the GC and the Civil Service Tribunal) |
| CRM Directive | Directive 2014/26/EU on collective management of copyright and related rights and multi-territorial licensing of rights in musical works for online use in the internal market |
| Database Directive | Directive 96/9/EC on the legal protection of databases |
| DD | Directive 98/71/EC on the legal protection of designs |
| DRM | Digital rights management |
| ECJ | The Court of Justice |
| E-commerce Directive | Directive 2000/31/EC on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market (Directive on electronic commerce) |
| EUTMR | Council Regulation (EC) No 207/2009 on the Community trade mark, read together with the Amending Regulation |
| EUTMD | Directive (EU) 2015/2436 to approximate the laws of the Member States relating to trade marks (Recast) |

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|---|---|
| EUIPO | European Union Intellectual Property Office, (previously called OHIM) |
| GC | General Court |
| InfoSoc Directive | Directive 2001/29/EC on the harmonisation of certain aspects of copyright and related rights in the information society |
| IPRED | Directive 2004/48/EC on the enforcement of intellectual property rights |
| OHIM | Office for Harmonisation in the Internal Market (Trade Marks and Designs) (now called EUIPO) |
| Orphan Works Directive | Directive 2012/28/EU on certain permitted uses of orphan works |
| Rental and Lending Directive | Directive 2006/115/EC on rental right and lending right and on certain rights related to copyright in the field of intellectual property |
| Resale Right Directive | Directive 2001/84/EC on the resale right for the benefit of the author of an original work of art |
| RMI | Rights management information |
| Satellite and Cable Directive | Directive 93/83/EEC on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission |
| Software Directive | Directive 2009/24/EC on the legal protection of computer programs |
| Term Directive | Directive 2006/116/EC on the term of protection of copyright and certain related rights |
| TPMs | Technical protection measures |
| Treaties | Treaty on European Union and Treaty on the Functioning of the European Union |
| WCT | WIPO Copyright Treaty |
| WIPO | World Intellectual Property Organization |
| WPPT | WIPO Performances and Phonograms Treaty |

# 1 Introduction

## 1.1 Background

With a 3D printer you can print for example customized shoes, metal parts for NASA's equipment,[1] medical devices and machine parts.[2] These objects are created through additive manufacturing, a technique that enables shapes that previous techniques have not been able to perform.[3] In the future a 3D printer will even be able to produce active systems, e.g. within a functioning cell phone.[4]

Internet, computing power, new materials and new design software have driven the 3D printing technology forward. The 3D printer needs a computer to function. When using a 3D printer, an electronic blueprint, which tells the 3D printer how to place the raw material, is fed into the 3D printer. The instructions of an electronic blueprint (also called design file) tells the 3D printer how to produce the object. There are 3D printers with different producing techniques. A 3D printer either spurts out material or solidifies liquid, molten or powdered material in a pattern. The 3D printer follows this pattern one layer at a time until all these layers have created a three-dimensional object.[5]

The different techniques require different raw materials. Materials that can be used for 3D printing so far are for example different plastics, sand, concrete, metal powder or liquid metal and even biological cells.[6]

3D printing is different from ordinary manufacturing since it does not change a material by removing pieces from it or shaping it in the way ordinary manufacturing does.[7] A 3D printer can perform much more complex objects than an ordinary manufacturing machine.[8] For example, a 3D printer can 'artfully blend together once-incompatible raw materials into a single printed object.'[9] It can produce objects with a variety of shapes and form interlocked parts, which means no assembly is needed. Hence, a 3D printer could be a very useful tool for a designer because there are not many boundaries, unlike ordinary manufacturing methods, of what the 3D printer can produce.[10] An assembled clock (with gearwheels and movable hands)

[1] Lipson & Kurman, p. 7.
[2] Lipson & Kurman, p. 15.
[3] Lipson & Kurman, p. 11.
[4] Lipson & Kurman, p. 17.
[5] Lipson & Kurman, p. 11-12.
[6] Hausman & Horne, p. 12, 18 and 29.
[7] Lipson & Kurman, p. 12.
[8] Lipson & Kurman, p. 20-21.
[9] Lipson & Kurman, p. 15.
[10] Lipson & Kurman, p. 20-22.

has for example been printed by a 3D printer. After it was printed, the producer only added a metal weight and the clock started ticking.[11]
The 3D printer is easier to use than other machines, e.g. compared to an injection molding machine (a machine used for manufacturing plastic products), because the 3D printer is portable and its technique is guided by the design file.[12]

Because no more material is used than that actually needed for 3D printing the object, 3D printing is more environmentally friendly.[13] Stocks are not needed for 3D printed objects, since the objects are printed on demand and can easily be changed according to the customer's wish.[14] These characteristics of 3D printers make them suitable for e.g. small businesses that design and provide prototypes.[15]

A machine in close relation to the 3D printer is the 3D scanner. A 3D scanner scans an object and creates a CAD file. From this CAD file, the 3D printer can produce a replica of the first object. CAD files are easily copied and distributed online.[16] CAD files consequently have the same advantages and disadvantages as MP3 files, making it possible that handling CAD files could become as problematic as the handling of MP3 files has been.[17]

A 3D printer will in the future copy a physical object with digital precision in the same manner digital music files of today are copied (with no loss of audio quality) – 'We will scan, edit and duplicate physical objects to create exact replicas or to improve on the original.'[18] This creates implications for intellectual property protected products. It is important to discuss the legal consequences of 3D printing, and as Lipson & Kurman put it 'Law changes slowly. But technology doesn't wait.'[19] 3D printing will probably in the near future 'slowly improve and creep into the mainstream'[20] according to Weinberg, which makes this relationship between technology and law important to discuss.

3D printing will facilitate the creation of objects with intellectual property protection but will also make it easier to copy these objects, with or without consent from the rightholder. This thesis will discuss what implications 3D printing may have for EU copyright and design protection. Copyright and designs are interesting since their scopes of protection are rather close. Copyright law is also interesting because several parts of it are harmonised with directives addressing the issues of recent technology.

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[11] Susson, p. 12-13.
[12] Lipson & Kurman, p. 22.
[13] Leaders, *Print me a Stradivarius*, under the headline 'Just press print'.
[14] Lipson & Kurman, p. 22.
[15] Lipson & Kurman, p. 28-30.
[16] Weinberg, p. 6.
[17] See Weinberg, p. 12.
[18] Lipson & Kurman, p. 23.
[19] Lipson & Kurman, p. 218.
[20] Weinberg, p. 12.

EU designs protects 'the appearance of the whole or a part of a product resulting from the features of, in particular, the lines, contours, colours, shape, texture and/or materials of the product itself and/or its ornamentation'[21] if it is new and has individual character,[22] while copyright protects 'the rights of authors in their literary and artistic works.'[23]

Consequently, these different intellectual property rights have different scopes of protection. Design protection can be given to a vase if it is new and has individual character and, if national law allows it, the appearance of a spare part (component part of a complex product) if it is visible during normal use and is new and has individual character.[24] Copyright protection can be given to texts like instructions,[25] for example a CAD file. According to Article 17 DD and Article 96(2) CDR, a registered design can also be copyright protected under national law if it fulfils the national conditions for copyright protection. Accordingly, the copyright protected CAD files can be used to create a design protected vase or spare part, designs that also may be copyright protected.

The production of works of art like music has changed completely during the previous century and this century due to development of technology. Because of this development, EU copyright law has changed. These changes will be discussed in order to draw conclusions of how copyrights and designs could be protected in relation to 3D printing.

## 1.2 Purpose

The purpose of this thesis is to discuss how well current EU design law and EU copyright law in accordance with the InfoSoc Directive can handle the protection of copyrights and design rights in relation to 3D printing technology.

The thesis will deal with the following questions:

1. What lessons concerning the development of 3D printing and its influence on EU copyright protection in accordance with the InfoSoc Directive and EU design protection can be learnt from history concerning the technological developments of digitization of music and the introduction of the InfoSoc Directive?
2. Is EU design law and EU copyright law in accordance with the InfoSoc Directive adaptable to the technology of 3D printing?
3. What technological measures can the rightholders use to protect their product or service in relation to 3D printing?

[21] Article 1(a) DD.
[22] Article 3(2) DD.
[23] Article 1 of the Berne Convention.
[24] See Articles 3(2), 3(3) and 14 DD.
[25] See Article 2(1) of the Berne Convention.

## 1.3 Method and material

The method used when presenting EU legislation is an EU legal dogmatic method. This method means in this thesis using the current EU legislation, i.e. directives, regulations and judgments from the CJEU, to describe the current state of EU law and then discuss how the law can be changed. The EU law is divided into primary legislation – the Treaties, and secondary legislation – the directives, regulations and decisions. The secondary legislation is derived from objectives and principles set out in the primary legislation. The authorities of each Member State are bound by EU legislation and must implement it in national law and enforce it.[26] Since the provisions relevant to the topic of this thesis are found in directives and regulations, this thesis will not deal with the interpretation of primary EU legislation.

The CJEU's role is to 'ensure that "the law is observed" "in the interpretation and application" of the Treaties.'[27] In order to fulfil that mission, the CJEU reviews the legality of EU institutions' acts, ensures that the Member States comply with the Treaties and at the request of courts or tribunals of the Member States interprets EU law. By these means, uniform application and interpretation of EU law is ensured.[28] Actions brought against EUIPO relating to intellectual property are within the jurisdiction of the GC,[29] while the references for preliminary rulings are within the jurisdiction of the ECJ.[30] There is one case presented in this thesis that is judged by the GC concerning an appeal of a decision made by EUIPO. The other cases presented in this thesis are references for preliminary rulings from national courts to the ECJ.

In addition to the EU sources mentioned above, legal doctrine, like books and articles, and other sources discussing relevant EU legislation are used to write this thesis.

When presenting and discussing the technology of 3D printing, articles concerning intellectual property law and 3D printing have been used together with some books and an article in the area of technology.

For chapter 2 I have used a legal history perspective in order to discuss what lessons can be learnt from recent history concerning copyright protection within the scope of the InfoSoc Directive and previous technological

[26] See EU's website on EU law, http://europa.eu/eu-law/index_en.htm Last visited: 12 June 2016.
[27] See the presentation of CJEU at Curia's website, http://curia.europa.eu/jcms/jcms/Jo2_6999/ Last visited: 12 June 2016.
[28] See the presentation of CJEU at Curia's website, http://curia.europa.eu/jcms/jcms/Jo2_6999/ Last visited: 12 June 2016.
[29] See the presentation of GC at Curia's website, http://curia.europa.eu/jcms/jcms/Jo2_7033/#compet Last visited: 12 June 2016.
[30] See the presentation of the ECJ at Curia's website: http://curia.europa.eu/jcms/jcms/Jo2_7024/en/ Last visited: 12 June 2016.

developments in the music industry. The legal history perspective in this thesis has an external approach to law, meaning that the law is seen as 'emerged from, acquired meaning in and acted upon "society."'[31] The reason for having a legal history perspective in this thesis is that a discussion concerning the development of the technology within chapter 2.1 and the legal history of the introduction of the InfoSoc Directive as a consequence of that development within chapter 2.2, relates directly to contemporary legislation and case-law.[32] Further, the presentation of 'the evolution of the law and legal structures can have profound impact on questions of essential importance to the life of the polity.'[33] In other words, a discussion of the history of implementing certain legislation and its consequences makes an evaluation of that legislation possible. That evaluation facilitates legal progress, including suggestions for changes of the law.

The chapter about technological history has been written with the help of legal doctrine and books in the areas of technology and media and communication. Legal doctrine, two of WIPO's treaties, reports, a communication from the EU Commission, the Commission's Green Paper on copyright and related rights in the information society and the Commission's proposal for a directive amending the current directive concerning design protection have been useful for the discussions in the chapter concerning legal history.

In addition to the sources mentioned above, EU's website and the European Commission's websites have been very useful.

When discussing possible changes of EU law, I suggest solutions that are, in my opinion, suitable and practical for current rightholders but also future rightholders and users. The solutions are not only presented in relation to a legal perspective and a legal history perspective, I also use an economic perspective for example when discussing the business models of iTunes and Spotify in chapter 2 and in the chapter 5 conclusion. In my opinion, EU legislation should be easily adapted to new technologies and promote the possibility for many actors to make legal use of new technology. My view is that the copyrights and design rights should not be so strong that they prevent new actors from producing objects based on their own creativity.

## 1.4 Delimitations

This thesis will deal with the EU law's protection of copyright in accordance with the InfoSoc Directive and industrial designs. It will not discuss other intellectual property. When discussing provisions of relevant EU directives, the focus will be on mandatory provisions and provisions

[31] Parker, p. 168.
[32] See Davies, p. 1350.
[33] See Davies, p. 1350.

relevant for the purpose of this thesis. The thesis will not discuss other areas of law, which means that for example contract law, market law, competition law and provisions within the Treaties concerning the functioning of the internal market are excluded.

In chapter 2, I will discuss some American examples, which have grown to be worldwide phenomena, such as Napster and iTunes. They are relevant since these services also had and have users in the EU, a fact that has affected EU legislation. Even if some American situations are discussed briefly, there will be no substantial discussion of American law.

This thesis will in relation to design protection focus on registered design rights and not deal specifically with unregistered design rights. The presentation of relevant provisions concerning design protection contains an overview of the protection of a product or part of a product, protection of spare parts and the overlap of design protection and copyright protection.

In relation to copyright protection, this thesis will focus on some of the provisions the InfoSoc Directive. This thesis is only dealing with the protected rights of reproduction, making available to the public and distribution. In relation to exceptions and limitations to the copyright, only Articles 5(1) and 5(2)(b) of the InfoSoc Directive are discussed. The InfoSoc provisions on technological measures and rights-management information will be discussed in relation to DRM systems in chapter 4.

This thesis will not deal with enforcement of intellectual property rights, which means that inter alia the provisions of IPRED, discussions of liability of Internet service providers in accordance with the E-commerce Directive and provisions concerning customs enforcement are excluded.

The technological history in chapter 2.1 deals briefly with the recent developments of computers, Internet and music from around the 1980s until about 2008. The legal history in chapter 2.2 deals with the introduction of WCT and WPPT in 1996, the development of the InfoSoc Directive as a consequence of those treaties and ends with recent reports from 2015 and 2016 concerning the outcome of that legislation.

## 1.5 Outline

Firstly, I will in chapter 2 discuss the example of the digitization of music and the introduction of personal computers and Internet and how these events influenced EU copyright protection within the scope of the InfoSoc Directive, in order to draw a conclusion of how 3D printing will affect EU copyright in accordance with the InfoSoc Directive and EU design protection. In chapter 2.1 I will discuss technology from the 1980s and onwards and focus on music files and the Internet. The legal history will be discussed in chapter 2.2, where I will discuss the introduction of WCT and WPPT and how these treaties affected EU law and the introduction of the

InfoSoc Directive. At the end of chapter 2.2, there will be a short presentation of what recent reports say about the implementation of the InfoSoc Directive. Concluding comments are presented in chapter 2.3.

Secondly I will in chapter 3 present the protection available through the InfoSoc Directive and DD that is relevant in relation to 3D printing. I will after that presentation discuss whether the EU legislation in these areas needs to be amended because of the 3D printing technology. The protection of design law and copyright law in accordance with the InfoSoc Directive will be discussed in relation to harmonisation and scope of protection. In chapter 3.1 I will focus on copyright protection in accordance with the InfoSoc Directive. In chapter 3.2 I will focus on the protection of registered designs for a product or part of a product, spare parts and the overlap of design protection and copyright protection in accordance with the DD and CDR. In chapter 3.3 the concluding comments concerning copyright protection of CAD files and copyright and design protection of 3D printed objects will be presented.

Thirdly I will in chapter 4 discuss how the rightholders may use digital rights management systems, i.e. technological protection measures and rights-management information, to restrict use and to prevent illicit copying through 3D printing. The restrictions by the technological measures are discussed in relation to design protected objects and copyright protected CAD files or objects. I will present relevant provisions of the InfoSoc Directive. Chapter 4.4 will deal with concluding comments concerning the rightholder's use of DRM systems and its consequences for 3D printing.

Lastly I will in my conclusion discuss the purpose and the questions of this thesis and summarise the concluding comments.

# 2 Recent European history of digitization and EU copyright protection

## 2.1 Technological history of the digitization of music

The digitization of music and the introduction of the InfoSoc Directive will be discussed in this chapter because it is a very illustrative example of how EU copyright protection is affected by new technology.

Contemporary time can be referred to as the era of 'communication revolution' where the industry's infrastructure is upgraded or modernized.[34] The new communications and information technologies developed because of this revolution 'have also profoundly affected our social structure, and there is growing interdependence among technology, information and society.'[35] This situation has raised some ethical questions, for example concerning intellectual property.[36]

Owing to the personal computer (or the 'microcomputer'), the communication revolution was possible.[37] Its popularity can be traced back to 1981, when the IBM microcomputer was introduced. Over the years, more advanced models and powerful software were introduced and the costs became lower,[38] allowing the personal computers to get more and more accessible for consumers.

Digitization is the shift in media technology and communication technology from analogue to digital, a shift that started only about 30 years ago and changed the media and distribution of music and films.[39]

Cassettes and vinyl records were replaced by compact discs (CDs) in the 1980s.[40] At the beginning of the 1990s people copied their favourite songs on tape and it took a couple of years before the 'burning' of individual CDs was widespread. When digital technology became more common however, it was possible to copy e.g. music files[41] 'repeatedly with no loss of quality.'[42]

[34] Mirabito & Morgenstern, p. 3.
[35] Mirabito & Morgenstern, p. 5.
[36] Mirabito & Morgenstern, p. 5 and 7.
[37] Mirabito & Morgenstern, p. 33.
[38] Mirabito & Morgenstern, p. 35-36.
[39] Edwards, Klein & Moss p. 17.
[40] Edwards, Klein & Moss p. 17.
[41] Bates, p. 231.
[42] Antezana, p. 439.

Videocassettes were replaced by DVDs in the 1990's.[43]

Limitations to the use of these new media came along with them. DRM systems, described in chapter 4, were developed for CDs in the 1980s. Copy control marks were used which made possible digital copies only of the 'master' copy but no other copies. Region coding for DVDs has also existed for many years.[44]

The 'global data highway' that we call the Internet can be traced back to a U.S. government project, the Advanced Research Projects Agency Network, during the 1960s. Eventually it evolved into the Internet structure that we are familiar with today.[45]

In the middle of the 1990s, the World Wide Web rapidly grew popular.[46] The relation between the web and the Internet can be described saying that the web is an overlying net that can be used for gaining Internet access for retrieving information.[47] The development of the World Wide Web and the Internet lead to efficient Internet through which it has been possible to provide digital distribution since the 2000s.[48]

The digitization has had such an impact on copyright because it 'changed the way that copyright material could be accessed, controlled and exploited, necessitating a re-evaluation of the principles and processes surrounding copyright law.'[49]

Digitization made copyright protected material like music cheaper and faster to make, copy and distribute, not only for the copyright holder or someone assisting the copyright holder, but also for ordinary consumers. It was easy for consumers to use the new technology, the product of the consumer's copying was of high quality and it was difficult to control.[50]

Along with the Internet grew peer-to-peer technologies,[51] which allowed consumers to share files and copy copyright works on the Internet.[52] One of the earlier most successful peer-to-peer systems was Napster, released in 1999. It was developed by a University student in Boston. Soon other students started using Napster to share their own files, mostly music.[53] More users added their computers to the network and it grew to a national network

[43] Edwards, Klein & Moss p. 17.
[44] Pedley, p. 54.
[45] Mirabito & Morgenstern, p. 231.
[46] Herman, p. 38.
[47] Mirabito & Morgenstern, p. 233.
[48] Edwards, Klein & Moss p. 17.
[49] Edwards, Klein & Moss p. 17.
[50] Edwards, Klein & Moss p. 17.
[51] Schollin, p. 110.
[52] Frankel & Gervais, p. 285.
[53] Schollin, p. 111-112.

and finally a 'popular global phenomenon.'[54] Napster became so popular probably because it was easy to adopt even for people outside the 'computer culture' and was easily available, its content was narrowed down to MPR files and it had a limited scope of use.[55] However, six months after its release, in December 1999, 15 record companies sued Napster in the USA.[56] Before the judgment came, the Napster's amount of users peaked in 2001.[57] Then the copyright owners won the case and obtained damages and injunctive relief, which forced Napster to close down in July 2001.[58]

After Napster, new file-sharing services turned up. These services were also sued in the USA, along with individual consumers.[59] However, 'while winning each of these battles, copyright owners have just as clearly been losing the war.'[60] Files of copyright protected works are still shared on the Internet and 'file-sharing traffic has increased consistently and substantially in absolute terms over the last ten years – a trend that is expected to continue'.[61]

As stated above, the music industry early limited the use of CDs with DRM systems. With the growing music service via Internet however, the music industry seemed to more and more lose its interest in DRM.[62] For example, Apple's iTunes service for music and films, introduced 2001,[63] turned out to be successful despite dropping DRM protection. One of the bigger record labels, EMI, let iTunes sell their songs without DRM and higher audio fidelity in the 'iTunes Plus' format. These songs were charged extra for the convenience of portability instead of being limited with DRM. Consumers also demonstrably accepted higher prices for new hits, allowing iTunes and its partners to be strong competitors to the peer-to-peer services since iTunes' music was of higher quality.[64] The success of iTunes lead to that 'the promise of infringement prevention gave way to the reality of real financial drawbacks, and the industry moved forward with less restrictive media as the norm.'[65]

Since the launch of Spotify in 2008, music streaming services have become more and more popular.[66] Spotify provides one service were the user streams music for free and advertisements are played between the songs. The other service, Spotify Premium, allows the user to play music with high quality audio, on demand without advertisements and with the possibility to

[54] Schollin, p. 112.
[55] Schollin, p. 112.
[56] Frankel & Gervais, p. 287.
[57] Schollin, p. 113.
[58] Frankel & Gervais, p. 287.
[59] Frankel & Gervais, p. 288.
[60] Frankel & Gervais, p. 289.
[61] Frankel & Gervais, p. 289.
[62] Herman, p. 167-168.
[63] McElhearn.
[64] Herman, p. 167-168.
[65] Herman, p. 169.
[66] Karsen & Levine.

listen offline.[67] Spotify's founder Daniel Ek actually wanted to 'create a music service with the breadth and functionality of Napster that would operate legally and pay rights holders.'[68]

The trend of file-sharing as described above has however not lead to a decrease in creation of original works, but a steady increase of new released albums.[69] The record sales in the USA fell with about sixty-five per cent from 1999-2001,[70] however, the decrease in record sales have not been as devastating for the music industry as one might think since the digital technologies also made music less expensive to produce and distribute.[71] Investing in music is also less risky now because of these lower costs and many artists have had a breakthrough because of the Internet, e.g. Justin Bieber who had his breakthrough on YouTube[72] and a lot of artists that have received funding from Kickstarter.[73]

Rightholders in the EU have since the breakthrough of technology taken actions to strengthen copyright protection, which was the purpose of the InfoSoc Directive, discussed below. Rightholders have also lobbied for sui generis protections of e.g. databases and stronger enforcement of intellectual property rights, used DRM systems to control the access of copyright protected materials and used licencing to set terms and conditions concerning the use of the copyright material.[74]

## 2.2 Legal history of the InfoSoc Directive

The WIPO Copyright Treaty, hereafter referred to as WCT, and the WIPO Performance and Phonograms Treaty, hereafter referred to as WPTT, were adopted in 1996 and have the purpose of inter alia to address the issues with copyright and new technology. According to the preambles, these treaties aim to 'provide adequate solutions to the questions raised by new economic, social, cultural and technological developments'.[75]

Article 6 WCT addresses the right of distribution. The access of copyright protected work through the Internet is addressed in Article 8 of the WCT:

> Without prejudice to the provisions of Articles 11(1)(ii), 11*bis*(1)(i) and (ii), 11*ter*(1)(ii), 14(1)(ii) and 14*bis*(1) of the Berne Convention, authors of literary and artistic works shall enjoy the exclusive right of authorizing any

[67] See under 'Learn about Spotify' at https://www.spotify.com/uk/ Last visited: 22 May 2016.
[68] Levine & Karsen.
[69] Frankel & Gervais, p. 291 and 295.
[70] Frankel & Gervais, p. 292.
[71] Frankel & Gervais, p. 296.
[72] Frankel & Gervais, p. 298.
[73] Frankel & Gervais, p. 301. See also Kickstarter's website: https://www.kickstarter.com/about?ref=nav Last visited: 12 June 2016.
[74] Pedley, p. 5-7.
[75] See the preamble of WCT and the preamble of WPPT.

> communication to the public of their works, by wire or wireless means, including the making available to the public of their works in such a way that members of the public may access these works from a place and at a time individually chosen by them.[76]

The integration of TPMs into international treaties happened for the first time with WCT and WPTT.[77] Articles 11-12 of the WCT address obligations concerning technological measures and rights-management information. These provisions were implemented in EU law through Articles 6-7 of the InfoSoc Directive, which will be further discussed in chapter 4.1. According to Article 11, contracting parties shall provide adequate legal protection and effective remedies against circumventions of the authors' effective technological measures. They shall also provide adequate legal protection and effective remedies against the performing of acts 'that will induce, enable, facilitate or conceal an infringement of any right covered by this Treaty and the Berne convention'[78] according to Article 12 WCT.

Article 18 WPTT provides similar protection as Article 11 WCT. Article 19 WPTT is similar to Article 12 WCT.

The InfoSoc Directive was introduced on EU level to incorporate the WIPO provisions[79] and further elaborate on technical measures and rights management information.[80]

In its Green Paper on copyright and related rights in the information society, the Commission discussed the need for change in intellectual property regulations because of the technological progress and new challenges of multimedia and globalization.[81] The term information society relates to the Commission's goal to build an "efficient European information infrastructure."[82] There was a need to adjust to the 'information superhighway'[83] that 'will in the future carry more and more works and other protected material'[84] due to which 'technical and legal protection will become more and more important.'[85] Further, the application of copyright and related rights needed to be discussed in relation to new services and products in the information society.[86]

The Commission was of the opinion that a balance of interests is necessary:

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[76] Article 8 of WCT.
[77] Gasser & Girsberger, p. 6.
[78] Article 12 of WCT.
[79] Bates, p. 229.
[80] Stamatoudi & Torremans, p. 15.
[81] Green Paper: Copyright and Related Rights in the Information Society, presented by the Commission, p. 6. Hereafter referred to as Green Paper InfoSoc.
[82] Green Paper InfoSoc, p. 6.
[83] Green Paper InfoSoc, p. 7.
[84] Green Paper InfoSoc, p. 7.
[85] Green Paper InfoSoc, p. 7.
[86] Green Paper InfoSoc, p. 7.

> In order for the potential of the information society to be realised to the full, it will be necessary to maintain a balance between the interests of the parties concerned (rightholders, manufacturers, distributors and users of services as well as network operators).[87]

There was also a need to overcome legal uncertainty in relation to 'acts of on-demand transmission of copyright works and subject-matter protected by related rights over networks'.[88]

The formal deadline for the Member States to implement the InfoSoc Directive was 22 December 2002, however only Greece and Denmark could comply with the deadline. Spain and France were among the last states to implement the Directive and did that in 2006.[89]

As will be seen from chapter 3.1.3, the ECJ has dealt with cases concerning the interpretation of provisions of the InfoSoc Directive. The ECJ has dealt with a considerable amount of cases since the InfoSoc Directive was established,[90] probably because the Member States are uncertain of what online acts are covered by the definitions of certain provisions.[91] The amount of cases referred and the late transposition show the difficulties with implementing and applying the provisions of the InfoSoc Directive.

Inter alia the Committee on Industry, Research and Energy and the Committee on the Internal Market and Consumer Protection, have acknowledged that there are issues and welcome a legislative proposal that would modernise the rules.[92]

The InfoSoc Directive has been criticized for only achieving one of its goal, namely aligning EU legislation with international law (particularly the WIPO treaties of 1996). The InfoSoc Directive failed however to strengthen intellectual property protection in light of technological developments, reduce existing disparities between national legal systems and ensure adequate remuneration and compensation for authors and performers. The common definitions that were introduced are an important step, but the InfoSoc Directive relied too much on TPMs, that in fact were not used as much as expected. The enforcement measure that could be used instead, injunction, however proved to be inconsistent with Articles 12-15 of the E-commerce Directive.[93]

The exceptions and limitations in accordance with Article 5 of the InfoSoc Directive vary significantly between the Member States, both in

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[87] Green Paper InfoSoc, p. 7.
[88] Recital 25 of the InfoSoc Directive.
[89] Mazziotti, p. 74.
[90] See the EURLEX webpage on the InfoSoc Directive under Linked Documents, 'Affected by case', http://eur-lex.europa.eu/legal-content/EN/LKD/?uri=CELEX:32001L0029 Last visited: 12 June 2016.
[91] Communication from the Commission, COM(2015) 626 final, p. 9.
[92] Committee on legal affairs report, p. 17 and 23.
[93] Renda et al., p. ii-iii.

implementation and scope.[94] This is probably related to the fact that only Article 5(1) of the InfoSoc Directive provides mandatory exceptions and limitations for the Member State to implement, while there are long lists of optional exceptions and limitations in Article 5(2)-(3) of the InfoSoc Directive.

There is also issues with remuneration since it seems that only a few successful authors and performers get what could be called fair remuneration.[95]

However, introducing intellectual property legislation adapted to new technology is difficult since 'policymakers and judges will be asked to weigh concrete losses today against future benefits that will be hard to quantify and imagine.'[96]

As a recent example of modernising intellectual property law, the directive (EUTMD) and the regulation (EUTMR) concerning trademarks were changed since the trade mark system needed to be modernised and technologically up to date.[97]

As for the design protection system, the Commission has launched a comprehensive economic and legal evaluation of the functioning of that system, which hopefully will be finished this year, 2016. The results were foreseen to be presented at the beginning of 2016, but so far only an economic review has been presented.[98]

## 2.3 Concluding comments

As stated in chapter 1.3, a legal history perspective is used in this thesis because a discussion concerning the previous implementation of a piece of legislation makes it possible to evaluate that legislation and suggest changes.

The digitization of music and the introduction of the InfoSoc Directive is discussed because it is a very illustrative example of how EU copyright protection is affected by new technology. The change from 2D printing to 3D printing can be compared to the change from analogue music to digital music. The change of the manufacturing process with 3D printing can be compared to the change with distributing music online.

[94] Renda et al., p. iii.
[95] Renda et al., p. iii.
[96] Weinberg, p. 15.
[97] Recital 6 of the preamble of EUTMD and recitals 7 and 9 of the preamble of the Amending Regulation.
[98] http://ec.europa.eu/growth/industry/intellectual-property/industrial-design/protection/index_en.htm Last visited: 12 June 2016.

From the technological history, it is clear that new technology develops very fast and that the Internet helps spreading the use of new technology. This creates many opportunities for rightholders but also raises problems with protection of rights. Previous technological developments and their effect on legal developments, like the introduction of the InfoSoc Directive, can give an insight into what problems may arise with intellectual property legislation in relation to new technology, like 3D printing, and how to handle these problems. Using this experience can help the legislators to see possible consequences when adapting current legislation to 3D printing technology. This legal history perspective is also useful for rightholders, since they with some information on previous developments are better prepared for how to adapt their business to new technology.

It is clear that it is difficult to supervise or regulate the Internet and find the users responsible for illegal actions, however the rightholders may try, efforts that probably will take much of the rightholder's time and money. In my opinion, it is relevant to focus on the 'big' infringers, i.e. those whose activity is most harmful for the rightholder. However, spending too much time chasing copyright infringing individual consumers is in my opinion a waste of time and money. The rightholder could instead use this time and money to provide a better service with higher quality in order to gain more customers, customers that might otherwise infringe the rights of the rightholders if it was easier and cheaper (even free) to find unlawful digital material online. Rightholders could learn from iTunes' and Spotify's business models where services of higher quality are provided at a higher price, in addition to 'basic' services that are cheaper, or even provided for free. Spotify's free service makes it possible for new users to try Spotify without any obligations. If users want to continue using the service with more advantages, they can choose to pay for the Spotify Premium service. In my opinion this business model is very attractive to new users, and consequently for music producers who want their music to be played by many users.

Taking a legal point of view, the issues with new technology have resulted in a change of copyright protection, first internationally and then at EU level. The EU legislator adapted rather technology specific provisions concerning technological protection measures and rights-management information in Articles 6-7 of the InfoSoc Directive. These provisions have proved to be inefficient since the technology that the provisions are aimed at have not been used as much by the rightholders as expected. The lesson to learn from this situation is that copyright laws should not be too specific in relation to technology; instead, a 'broader' legislation that is open to different technologies is more suitable. As stated before, the technology changes so much faster than law, so copyright law should be adaptable to new technology. In relation to 3D printing, this means that provisions concerning 3D printing per se should not be introduced, instead there should be general provisions, stating for example in what cases copying is illegal, independent of what method is used for copying. This is also relevant for intellectual property in general and new technologies in general.

While the technological part of some provisions of the InfoSoc Directive are too specific, the provisions concerning exceptions and limitations seem to give too much uncertainty of what actions taken by the users of copyright protected work actually are allowed according to the InfoSoc Directive. Article 5(1) of the InfoSoc Directive is the only mandatory provision concerning exceptions and limitations. Article 5(2)-(3) provides optional exceptions and limitations for the Member States, referring to cases when the Member States may provide for exceptions and limitations. Since the purpose of the InfoSoc Directive is to harmonise a certain area of copyright, I think it would be better if the provisions on exceptions and limitations were also fully harmonised, or at least with more mandatory provisions and less optional provisions. The current differences between Member States in relation to exceptions and limitations make it difficult for the rightholder to predict what consequences the protection will have in different Member States. This situation also makes it difficult for other actors to know whether their actions are legal or not.

The issue with fair remuneration for the rightholder is important, but I am not sure what role the EU legislator should have in this area. Contracts have a very important role when dealing with use of copyrights. In my opinion, the contracts that the rightholder concludes with other actors on the market, e.g. the contract between a singer and a record company, are most often the foundation for remuneration. Consequently, each contract affects the rightholder's remuneration, which makes it very difficult to regulate at an EU level.

# 3 Copyright protection and design protection in the EU

## 3.1 Copyright law

### 3.1.1 Harmonisation

Copyright law is relevant for 3D printing since CAD files and 3D printed objects may be copyright protected. Copyright legislation is only partly harmonised within the EU.[99] The Copyright Directives 'have mostly dealt with specific, limited issues, typically where technical or economic developments have created an obvious and urgent need for uniform regulation in the Member States.'[100]

Currently there are nine directives on EU Copyright (not counting IPRED, which deals with enforcement of intellectual property rights):

- The Satellite and Cable Directive, Directive 93/83/EEC
- The Database Directive, Directive 96/9/EC
- The InfoSoc Directive, Directive 2001/29/EC
- The Resale Right Directive, Directive 2001/84/EC
- The Rental and Lending Directive, Directive 2006/115/EC
- The Term Directive, Directive 2006/116/EC
- The Software Directive, Directive 2009/24/EC
- Orphan Works Directive, Directive 2012/28/EU
- CRM Directive, Directive 2014/26/EU[101]

I will focus on some provisions of the InfoSoc relevant for 3D printing in chapter 3.1.3. To give an overview of the harmonisation of copyright, the other copyright directives will be dealt with very briefly in the coming paragraphs and in chapter 3.1.2. The scope of copyright protection in the narrow sense is dealt with in chapter 3.1.2.

The first version of the Software Directive, Directive 91/250/EEC, was the first EU directive to initiate the harmonisation of copyright protection. This directive dealt with the protection of computer programs. After that came the directives on rental and lending rights, satellite broadcasting and cable transmission, term of protection and database protection.[102] The InfoSoc Directive of 2001 was introduced to regulate 'the rights granted to authors and owners of related rights as well as a conclusive, although non-binding, catalogue of limitations.'[103]

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[99] Dreier & Kur, p. 63.
[100] Dreier & Kur, p. 63.
[101] https://ec.europa.eu/digital-single-market/en/eu-copyright-legislation Last visited: 12 June 2016.
[102] Dreier & Kur, p. 63.
[103] Dreier & Kur, p. 64.

The Resale Right Directive was enacted in 2001 'for the benefit of the author of an original work of art'.[104] The purpose of the directive is to 'provide creators with an adequate and standard level of protection and eliminate the distortions in the conditions for competition currently existing within the single market for contemporary art.'[105]

The Orphan Works Directive introduced 2012 applies to protection of works of which the author cannot be traced or is unknown. Such works get an orphan status in the entire EU and may on the grounds of national law of a Member State be used for certain privileged purposes.[106]

The CRM Directive enacted in 2014 has the purpose of 'ensuring that rightholders have a say in the management of their rights and envisages a better functioning of the of collective management organisations as a result of EU-wide standards.'[107] The rules also aim to 'ease the multi-territorial licensing by collective management organisations of authors' rights in musical works for online use.'[108]

### 3.1.2 Protection of copyright in the narrow sense

The Software Directive as well as the Database Directive give copyright protection for computer programs and databases. Article 1(1) of the Software Directive states that computer programs shall be protected by copyright, 'as literary works within the meaning of the Berne Convention for the Protection of Literary and Artistic Works.'[109] According to Article 1(2) of the Software Directive, protection 'shall apply to the expression in any form of a computer program.'[110] A computer program is protected when 'it is original in the sense that it is the author's own intellectual creation. No other criteria shall be applied to determine its eligibility for protection.'[111]

The Database Directive has similar provisions, stating that 'databases, which, by reason of the selection or arrangement of their contents, constitute the author's own intellectual creation shall be protected as such by

[104] http://ec.europa.eu/internal_market/copyright/resale-right/index_en.htm Last visited: 12 June 2016.
[105] http://ec.europa.eu/internal_market/copyright/resale-right/index_en.htm Last visited: 12 June 2016.
[106] Dreier & Kur, p. 64.
[107] http://ec.europa.eu/internal_market/copyright/management/index_en.htm Last visited: 12 June 2016.
[108] http://ec.europa.eu/internal_market/copyright/management/index_en.htm Last visited: 12 June 2016.
[109] Article 1(1) of the Software Directive.
[110] Article 1(2) of the Software Directive.
[111] Article 1(3) of the Software Directive.

copyright. No other criteria shall be applied to determine its eligibility for protection.'[112]

It is clear from both the Software Directive and the Database Directive that the Berne Convention has influenced the EU legislation.[113] The Berne Convention gives guidance on when works are regarded to be copyright protected. All EU Member States are parties of the Berne Convention.[114] According to Article 1 of the Berne Convention, 'the rights of authors in their literary and artistic works'[115] are protected.[116] Article 2(1) of the Berne Convention protects inter alia the following works:

> The expression "literary and artistic works" shall include every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; … musical compositions with or without words; … works of drawing, painting, architecture, sculpture, engraving and lithography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science.[117]

As already discussed in the previous chapter, music is copyright protected. In relation to 3D printing, a 3D printed object can take the form of a sculpture or other three-dimensional work and consequently be copyright protected in accordance with Article 2(1) of the Berne Convention. The CAD files are copyright protected since they can be said to provide illustrations or sketches of the 3D printed object. Computer programs needed for a 3D printer may be copyright protected under the Software Directive. The copyright protection of computer programs will however not be further dealt with in this thesis.

According to Article 6 bis(1) of the Berne Convention, the moral rights of the author must be protected – even after the author has transferred his economic rights, she or he has the right to claim authorship and object to any distortion, mutilation or other modification.[118]

Article 5(2) of the Berne Convention states that the enjoyment and exercise of copyright 'shall not be subject to any formality',[119] which means that no registration is required for the work to be protected. Accordingly, a CAD file with content is copyright protected as soon as it is created and a 3D printed object is copyright protected as soon it has been produced, on the condition that they fulfil national conditions for copyright protection.

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[112] Article 3(1) of the Database Directive.
[113] See for example Article 1(1) of the Software Directive and recital 35 and Article 6(3) of the Database Directive.
[114] See http://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=15 and http://europa.eu/about-eu/countries/member-countries/ Last visited 12 June 2016.
[115] Article 1 of the Berne Convention.
[116] Article 1 of the Berne Convention.
[117] Article 2(1) of the Berne Convention.
[118] Article 6 bis(1) of the Berne Convention.
[119] Article 5(2) of the Berne Convention.

The Resale Right Directive deals specifically with the resale right that the author of an original work of art has. Hence, there is a definition of 'original work of art' in Article 2(1) of the directive:

> For the purposes of this Directive, 'original work of art' means works of graphic or plastic art such as pictures, collages, paintings, drawings, engravings, prints, lithographs, sculptures, tapestries, ceramics, glassware and photographs, provided they are made by the artist himself or copies considered to be original works of art.[120]

Consequently, works that are considered original works of art in accordance with the Resale Right Directive make a small group among all the works that can be copyright protected.

Except for the Software Directive and the Database Directive, which specifically refer to the Berne Convention, the definition of copyright is not harmonised when it comes to the application of the other directives on copyright. This means that for the other directives national law decides what works are copyright protected and may be covered by those directives.[121] As stated above however, all EU Member States are parties of the Berne Convention, but even members of the Berne Convention 'with similar legal structures do not hold the same conceptions on moral rights.'[122]

### 3.1.3 The InfoSoc Directive

Most of the Directives mentioned in chapter 3.1.1 deal with rights related to copyright, i.e. not the copyright protection in a narrow sense in itself. The directives on related rights do not state the requirements for copyright protection but deal with the handling of works that already are established to have copyright protection.[123]

The most interesting directive in relation to the topic of this thesis is the InfoSoc Directive. The history of the adoption of the InfoSoc Directive has been discussed in chapter 2. This chapter will deal briefly with some of the provisions of the Directive relating to the topic of this thesis.

The InfoSoc Directive addresses 'the legal protection of copyright and related rights in the framework of the internal market, with particular emphasis on the information society.'[124] The rightholders protected by the directive are creators of copyright protected works – for example authors, performers, phonogram producers, producers of first fixation of films or broadcasting organisations. Their protected rights are the reproduction right,

[120] Article 2(1) of the Resale Right Directive.
[121] Mazziotti, p. 53.
[122] Antezana, p. 431.
[123] See for example Article 2 of the InfoSoc Directive, Article 1 of the Rental and Lending Directive, Article 2 of the Satellite and Cable Directive, Article 1(2) of the Orphan Works Directive and Article 1 of the CRM Directive.
[124] Article 1(1) of the InfoSoc Directive.

the right of communication of works to the public, the right of making available to the public and the distribution right.[125]

The InfoSoc Directive clearly addresses the issue of making available copyright works on the Internet:

> It should be made clear that all rightholders recognised by this Directive should have an exclusive right to make available to the public copyright works or any other subjectmatter by way of interactive on-demand transmissions. Such interactive on-demand transmissions are characterised by the fact that members of the public may access them from a place and at a time individually chosen by them.[126]

Below I will present relevant provisions of the InfoSoc Directive together with examples from case-law.

#### 3.1.3.1 The reproduction right

The reproduction right is protected in Article 2 of the InfoSoc Directive. According to Article 2(1), the rightholder has 'the exclusive right to authorise or prohibit direct or indirect, temporary or permanent reproduction, by any means and in any form, in whole or in part'. In relation to 3D printing, this means that copying a CAD file is only allowed when the rightholder has authorised it, that is also the case for 3D printing a copy of a copyright protected three-dimensional object. In addition, reproduction of a *part* of the CAD file or a *part* of the copyright protected three-dimensional object is prohibited, which means that is not lawful to create a 3D printed object or a CAD file when a part of it has already been created by someone else.

In the Infopaq case,[127] the ECJ interpreted the meaning of 'reproduction' and concluded that the actions performed by Infopaq constituted reproduction.[128] Infopaq operated a media monitoring and analysis business, which consisted in drawing up summaries from selected articles from Danish daily newspapers and DDF was a professional association of Danish daily newspaper publishers that assisted its members with copyright issues. Infopaq had drawn summaries of articles from DDF's newspaper, which DDF complained about since it was of the view that consent was necessary.[129] The selection was made by a 'data capture process',[130] during which firstly publications were registered manually and scanned in order to digitally search for a word defined beforehand. When searching for the word, the five words before the word and the five words after the word were captured, making it possible to read extracts of eleven words. A cover sheet

[125] Articles 2-4 of the InfoSoc Directive.
[126] Recital 25 of the InfoSoc Directive.
[127] Case C-5/08, Infopaq International A/S v. Danske Dagblades Forening.
[128] Infopaq case, para. 51.
[129] Infopaq case, para. 13-15.
[130] Infopaq case, para. 13.

then was printed out of all the pages where the search word was found.[131] The ECJ stated that 'a data capture process which consists of storing an extract of a protected work comprising eleven words and printing out that extract, is such as to come within the concept of reproduction'.[132] However, it was for the national court to decide whether the elements reproduced expressed the intellectual creation of the author.[133]

### 3.1.3.2 The right of making available to the public

According to Article 3(2) of the InfoSoc Directive, the right of making available to the public is 'the exclusive right to authorise or prohibit the making available to the public, by wire or wireless means, in such a way that members of the public may access them from a place and at a time individually chosen by them'.

In the UPC case,[134] it was common ground that the behaviour by UPC was included in the scope of Article 3(2) InfoSoc Directive, since UPC had made protected subject-matter available on their website without the rightholders' consent.[135] UPC had on their website offered downloading or streaming of films without the producers' agreement.[136]

Consequently, Article 3(2) of the InfoSoc Directive applies for example when someone is making the rightholder's CAD file available for downloading on the Internet.

### 3.1.3.3 The distribution right

The distribution right is, according to Article 4(1) of the InfoSoc Directive, the exclusive right to 'authorise or prohibit any form of distribution by sale or otherwise' of original or copies of work. According to this provision, any form of distribution of CAD files and copyright protected three-dimensional objects or copies of them without the rightholder's consent is unlawful. This provision is of course relevant for 3D printed copies.

The right of distribution in Article 4(1) had been violated in the Donner case,[137] where the Italian company Dimensione sold replicas of furnishings that were copyright protected in Germany but not in Italy. Dimensione sold furnishings inter alia to customers in Germany and advertised its products in Germany. Dimensione recommended purchasers to use Inspem, Mr Donner's company, to deliver orders to Germany. Inspem was also established in Italy, but Mr Donner conducted his business from his place of

[131] Infopaq case, paras. 16-21.
[132] Infopaq case, para. 51.
[133] Infopaq case, para. 51.
[134] Case C-314/12, UPC Telekabel Wien GmbH v. Constantin Film Verleih GmbH and Wega Filmproduktionsgesellschaft mbH.
[135] UPC case, para. 24.
[136] UPC case, para. 11.
[137] Case C-5/11, Criminal proceedings against Titus Alexander Jochen Donner.

residence in Germany.[138] Mr Donner was sentenced by a German court to two years' imprisonment 'for aiding and abetting the prohibited commercial exploitation of copyright-protected works.'[139] Mr Donner appealed the judgment to the Bundesgerichtshof, which referred questions to the ECJ concerning inter alia the interpretation of 'distribution to the public'.[140] The ECJ stated that since the InfoSoc Directive serves to implement inter alia the WCT, EU legislation must as far as possible be interpreted with a manner consistent with international law and referred to Article 6(1) of the WCT. However, the notion of 'distribution' must be given an independent interpretation under EU law.[141] The ECJ said in this regard:

> distribution to the public is characterised by a series of acts going, at the very least, from the conclusion of a contract of sale to the performance thereof by delivery to a member of the public. Thus, in the context of a cross-border sale, acts giving rise to a 'distribution to the public' under Article 4(1) of Directive 2001/29 may take place in a number of Member States. In such a context, such a transaction may infringe on the exclusive right to authorise or prohibit any forms of distribution to the public in a number of Member States.
>
> A trader in such circumstances bears responsibility for any act carried out by him or on his behalf giving rise to a 'distribution to the public' in a Member State where the goods distributed are protected by copyright. Any such act carried out by a third party may also be attributed to him, where he specifically targeted the public of the State of destination and must have been aware of the actions of that third party.[142]

However, it is for the national courts to assess whether the trader did actually target members of the public in the Member State where the distribution was carried out and whether the trader must have been aware of the third party's actions.[143] The facts of the case with a German-language website and close cooperation between Dimensione and Inspem, 'may be taken as constituting evidence of such targeted activity'[144] according to the ECJ. The ECJ concluded:

> a trader who directs his advertising at members of the public residing in a given Member State and creates or makes available to them a specific delivery system and payment method, or allows a third party to do so, thereby enabling those members of the public to receive delivery of copies of works protected by copyright in that same Member State, makes, in the Member State where the delivery takes place, a 'distribution to the public' under Article 4(1) of Directive 2001/29.[145]

[138] Donner case, paras. 11-14.
[139] Donner case, para. 2.
[140] Donner case, paras. 17 and 20-21.
[141] Donner case, paras. 23-25.
[142] Donner case, paras. 26-27.
[143] Donner case, para. 28.
[144] Donner case, para. 29.
[145] Donner case, para. 30.

### 3.1.3.4 Exceptions and limitations

#### 3.1.3.4.1 Transient or incidental temporary production

Exceptions and limitations of the previous mentioned rights are stated in Article 5 of the InfoSoc Directive. Article 5(1) is a mandatory exception,[146] stating:

> Temporary acts of reproduction referred to in Article 2, which are transient or incidental, which are an integral and essential part of a technological process and the sole purpose is to enable:
> a) a transmission in a network between third parties by an intermediary, or
> b) a lawful use
> of a work or other subject-matter to be made, and which have no independent economic significance, shall be exempted from the reproduction right provided for in Article 2.[147]

Article 5(1) was interpreted in the previous mentioned Infopaq case.[148] The ECJ stated that the previous described data capture process, where an extract is printed out, 'does not fulfil the condition of being transient in nature as required by Article 5(1) of Directive 2001/29 and, therefore, that process cannot be carried out without the consent of the relevant rightholders.'[149]

Consequently, a 3D printed object that is a copy of a copyright protected three-dimensional object would probably never be exempted from the reproduction right, since it is very difficult to argue that a three-dimensional object could be transient or incidental. However, a reproduced CAD file may be covered by Article 5(1) if it fulfils the conditions of the provision.

#### 3.1.3.4.2 Private copying

The other paragraphs of Article 5 are optional exceptions or limitations that the Member States may provide.[150] The list is however exhaustive, which means that Member States may not provide other exceptions than those mentioned in Article 5.[151]

One of the optional exceptions and limitations concerns private use. According to Article 5(2)(b), Member States may provide exceptions or limitations to the reproduction right in Article 2 in the following cases:

> in respect of reproductions made by a natural person for private use and for ends that are neither directly nor indirectly commercial, on condition that the rightholders receive fair compensation, which takes account of the application or non-application of technological measures referred to in Article 6 to the work or subject-matter concerned

[146] Dreier & Kur, p. 271.
[147] Article 5(1) of the InfoSoc Directive.
[148] Case C-5/08, Infopaq International A/S v. Danske Dagblades Forening.
[149] Case C-5/08, para. 74.
[150] Dreier & Kur, p. 271.
[151] Pedley, p. 11.

The EU legislator means by the last part of the provision that the use of technological protection measures may affect the level of fair compensation – 'where the prejudice to the rightholder would be minimal, no obligation for payment may arise.'[152] When applying this provision, a specific payment should not be made when the rightholder already has received payment in other forms, for example through a licence fee.[153] The purpose of this provision was to phase out copyright levies in favour of technological measures.[154] However, due to this provision, 'digital reproduction for private use purposes is totally subject to the control of copyright holders.'[155]

In relation to 3D printing, a national provision implementing Article 5(2)(b) of the InfoSoc Directive, allows reproduction of CAD files or copyright protected three-dimensional objects through 3D printing for private use in that Member State, as long as the rightholder receives 'fair compensation'. If extensive technological protection measures are preventing reproduction, it can be assumed that the rightholder has received 'fair compensation'. Otherwise, the Member State may provide a system where copyright levies are charged[156] or other remuneration schemes,[157] in order for the rightholder to receive 'fair compensation'. For example a Member State could choose a system where levies are charged on 3D printers, since they are able to reproduce copyright protected objects, and 3D scanners, since they can be used to make a CAD file of a copyright protected object.

The ECJ has dealt with several cases concerning the interpretation of Article 5(2)(b) of the InfoSoc Directive. In the Padawan case,[158] the concept of 'fair compensation' was discussed. The case concerned a dispute between Padawan, which marketed CD-Rs, CD-RWs, DVD-Rs and MP3 players, and SGAE, one of the bodies in Spain responsible for the collective management of intellectual property rights. SGAE claimed a private copying levy from Padawan, a levy established by the Spanish law implementing the InfoSoc Directive. The Juzgado de lo Mercantil judged in favour of SGAE's claims, but Padawan appealed to the Provincial court of Barcelona.[159] The Provincial court referred five questions to the ECJ concerning inter alia the concepts of 'fair compensation',[160] 'fair balance'[161] and concerning the link between levied reproduction equipment, devices and media and the deemed and intended use of these products.[162]

[152] Recital 35 of the InfoSoc Directive.
[153] Recital 35 of the InfoSoc Directive.
[154] Mazziotti, p. 200.
[155] Mazziotti, p. 90.
[156] See Mazziotti, p. 200-201.
[157] Recital 38 of the InfoSoc Directive.
[158] C-467/08, Padawan SL v. Sociedad General de Autores y Editores de España (SGAE).
[159] Padawan case, paras. 16-19.
[160] Padawan case, para. 29.
[161] Padawan case, para. 38. 'A fair balance of rights and interests between the different categories of rightholders' is mentioned in recital 31 of the InfoSoc Directive.
[162] Padawan case, para. 51.

The ECJ stated that 'fair compensation' is:

> an autonomous concept of European Union law which must be interpreted uniformly in all the Member States that have introduced a private copying exception, irrespective of the power conferred on them to determine, within the limits imposed by European Union law and in particular by that directive, the form, detailed arrangements for financing and collection, and the level of that fair compensation.[163]

The ECJ then explained the relation between 'fair compensation' and fair balance:

> Article 5(2)(b) of Directive 2001/29 must be interpreted as meaning that the 'fair balance' between the persons concerned means that fair compensation must be calculated on the basis of the criterion of the harm caused to authors of protected works by the introduction of the private copying exception. It is consistent with the requirements of that 'fair balance' to provide that persons who have digital reproduction equipment, devices and media, and who, on that basis, in law or in fact, make that equipment available to private users or provide them with copying services are the persons liable for to finance the fair compensation, inasmuch as they are able to pass on to private users the actual burden of financing it.[164]

In relation to the link between charged levies and the intended use, the ECJ said that when a system is used where levies are charged on reproduction equipment, devices and media, the products that are charged with a levy must be liable to be used for private copying and therefore likely to cause harm to the author in order for the compensation system to be compatible with 'fair balance'.[165]

With regard to indiscriminate application of levies, the ECJ stated:

> Consequently, the indiscriminate application of the private copying levy to all types of digital reproduction equipment, devices and media, including in the case expressly mentioned by the national court in which they are acquired by persons other than natural persons for purposes clearly unrelated to private copying, does not comply with Article 5(2) of Directive 2001/29.[166]

After reading this case, the conclusion can be drawn that if 3D printers and 3D scanners were sold to natural persons for private use, they could in the future be charged with levies in a Member State using such a system for 'fair compensation', provided that the 3D printers and 3D scanners were considered to be intended for private copying. 3D printers and 3D scanners sold to companies could however not be charged with this kind of levy.

Provisions of the InfoSoc Directive regarding technological measures and rights-management information are dealt with in chapter 4.

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[163] Padawan case, para. 37.
[164] Padawan case, para. 50.
[165] Padawan case, para. 52.
[166] Padawan case, para. 53.

### 3.1.4 What may not be protected

According to Article 2 bis of the Berne Convention, Member States may choose not to protect e.g. political speeches or speeches delivered in legal proceedings.[167] They may also choose not to protect lectures and public speeches, which means they may be reproduced by some kind of communication to the public.[168] However, the author still has the 'exclusive right of making a collection of his works mentioned in the preceding paragraphs.'[169] It is important to note that since copyright protection is granted according to national law, the different Member States may have different exceptions from what can be copyright protected.

## 3.2 Design law

### 3.2.1 Harmonisation

Design law is relevant for 3D printing since 3D printed objects may be design protected. Design protection is harmonised rather extensively through Directive 98/71/EC on the legal protection of designs, hereafter called DD. DD was adopted in order to make an approximation of the Member States' national laws.[170] One of the objectives of the directive is to 'give a unitary definition of the notion of design and of the requirements as to novelty and individual character with which registered design rights must comply.'[171] However, the Member States have their own national procedural provisions on registration, renewal and invalidation.[172]

The Council Regulation 6/2002 on Community designs, hereafter called CDR,[173] regulates Community designs, i.e. designs that are uniformly protected in the entire EU when they are registered.[174] A Community design is directly applicable in each Member State through one application made to EUIPO[175] after going through one single procedure.[176] According to recital 15, the Community designs 'should, as far as possible, serve the needs of all sectors of industry' in the EU.

[167] Article 2 bis(1) of the Berne Convention.
[168] Article 2 bis(2) of the Berne Convention.
[169] Article 2 bis(3) of the Berne Convention.
[170] Directive 98/71/EC of the European Parliament and of the Council on the legal protection of designs, [1998] OJ L 289/28, hereafter referred to as the DD, recitals 5-6 in the preamble.
[171] DD, recital 9 of the preamble.
[172] DD, recital 6 of the preamble.
[173] Council Regulation (EC) No 6/2002 of 12 December 2001 on Community designs, hereafter referred to as the CDR.
[174] Recital 1 of the preamble of CDR.
[175] The recital refers to the previous name of the office, 'the Office for Harmonisation in the Internal Market (Trade Marks and Design)'.
[176] Recital 5 of the preamble of CDR.

In some provisions of the directive and the regulations, the wording is identical. These identical provisions are intended to have the same meaning and therefore case-law discussing the interpretation of the directive will be relevant when interpreting the regulation and vice versa.[177]

The rights conferred by the design right and their limitations are presented in Articles 12-13 DD. According to Article 12(1) DD, the registration of a design gives the rightholder an exclusive right to use it and prevent any third party to use it without consent. In particular the using, making, offering, putting on the market, exporting and stocking a design protected product is covered by Article 12(1).

Article 13(1) DD states however, that rights conferred shall not be exercised in respect of:

> (a) acts done privately and for non-commercial purposes;
> (b) acts done for experimental purposes;
> (c) acts of reproduction for the purposes of making citations or of teaching, provided that such acts are compatible with fair trade practise and do not unduly prejudice the normal exploitation of the design, and that mention is made of the source.

## 3.2.2 Protection of rights

### 3.2.2.1 Protection of a product or a part of a product

Article 1(a) of the DD and Article 3(a) of the CDR give the following definition of design:

> 'design' means the appearance of the whole or a part of a product resulting from the features of, in particular, the lines, contours, colours, shape, texture and/or materials of the product itself and/or its ornamentation

According to Article 3(2) DD and Article 4(1) CDR, a design can be protected if it is new and has individual character. Novelty is according to Article 4 DD when 'no identical design has been made available to the public before the date of filing of the application for registration or, if priority is claimed, the date of priority.' There is a similar provision in Article 5 CDR. According to Article 5(1) DD, the design is considered to be of individual character when 'the overall impression it produces on the informed user differs from the overall impression produced on such a user by any design which has been made available to public before the date of filing of the application for registration or, if priority is claimed, the date of priority.' There is a similar provision in Article 6(1) CDR. According to Article 9(1) DD and Article 10(1) CDR, design protection includes 'any design which does not produce on the informed user a different overall impression.'

[177] Stone, p. 13.

Consequently, a 3D printed vase, lamp or any other product can be design protected if it fulfils the above mentioned conditions.

In the Karen Miller case,[178] the ECJ dealt with the interpretation of the term individual character. The Court came to the conclusion that when comparing two different designs, the overall impression which a design produces on the informed user must be different than the overall impression by one or more earlier designs taken individually (not by a combination of features taken in isolation and drawn from a number of earlier designs).[179]

With a design protection the appearance of the design is protected, not its function.[180]

Articles 5(2) and 9(2) DD and Articles 6(2) and 10(2) CDR state that the degree of freedom of the designer should be taken into consideration when assessing individual character and assessing the scope of protection.

According to Article 6(1) DD and Article 7(1) CDR, the design is deemed to have been made available when it has been published following registration or exhibited, used in trade or otherwise disclosed except when these events could not reasonably have become known in the normal course of business to the circles specialised in the sector concerned, operating within the Community, before the date of filing of the application for registration or, if priority is claimed, the date of priority. If the design has been disclosed to a third person under explicit or implicit conditions of confidentiality, it shall not however be deemed to be made available.

Article 6(2) and (3) DD and Article 7(2) and (3) CDR state situations where disclosure shall not be taken into consideration.

#### 3.2.2.2 Protection of component parts of complex products

A part of a product can be protected, see the definition of 'design' in Article 1(a) DD and Article 3(a) CDR, referring to 'the whole or *a part* of a product'. Protection of these parts are not the same thing as the protection of component parts of a complex product. Component parts of a complex product is the legislation's reference for spare parts. Component parts need to be visible during normal use for protection, while a part of a product can be protected even if it is not visible. The difference between the protection of parts of products and component parts of complex products has its explanation in that the EU wanted to grant a more limited design protection of automobile spare parts.[181]

[178] Case C-345/13, Karen Millen Fashions Ltd v. Dunnes Stores and Dunnes Stores (Limerick) Ltd.
[179] C-345/13, para. 35.
[180] Stone, p. 39.
[181] Stone, p. 45.

According to Article 3(3) DD and Article 4(2) CDR, a component part of a complex product can be protected if it is new and has individual character, remains visible during normal use, and these visible parts themselves fulfil the criteria of novelty and individual character.

Article 1(c) DD and Article 3(c) CDR give a definition of 'complex product':

> 'complex product' means a product which is composed of multiple components which can be replaced permitting disassembly and reassembly of the product.

Article 3(4) DD and Article 4(3) CDR define 'normal use' as use by the end user. Normal use does not contain maintenance, servicing or repair work.

Stone explains the design protection of different parts of a product in the following manner:

> Community design rights protect the appearance of the product itself, the appearance of parts of the product, the appearance of visible component parts of a complex product, and the appearance of any ornamentation. Thus, different design rights may subsist in the product (a car), in parts of the product (the rear of the car), visible component parts (a hub cap), and/or the ornamentation on the product (a logo on the car) or on its parts (a logo on a hub cap).[182]

The protection of spare parts is not completely harmonised within the EU, which is the reason for the transitional provision of Article 14 DD:

> Until such time as amendments to this Directive are adopted … Member States shall maintain in force their existing legal provisions relating to the use of the design of a component part used for the purpose of the repair of a complex product so as to restore its original appearance and shall introduce changes to those provisions only if the purpose is to liberalise the market for such parts.[183]

The reason for this provision is that the EU legislator wishes to liberalise the spare parts market, while some Member States do not agree because they have strong car industries that they want to protect.[184]

Consequently, 3D printed spare parts can be design protected in Member States that provide national design protection for spare parts. Since a 3D printer due to its technique can produce complex designs, it is very useful for the production of complex spare parts, for example interlocked spare parts. A 3D printer may be able to produce spare parts that already are assembled when they are printed.

[182] Stone, p. 46.
[183] Article 14 DD.
[184] Dreier & Kur, p. 366.

However, spare parts are not available for EU design protection at all according to Article 110 CTMR, at least until any amendment is made. The Commission has presented a proposal that suggests a complete liberalisation of the spare parts market, i.e. a provision in the Directive similar to Article 110 of CTMR, according to which there is no protection for spare parts.[185] However, this proposal has not been accepted yet.

### 3.2.3 Overlap of design protection and copyright protection

According to Article 17 DD, a design protected by a design right is also available for copyright protection according to national copyright law in that Member State where it is registered for design protection. The design is copyright protected from the date when it is created or fixed in any form. The conditions for copyright protection, including which level of originality that is required, is determined by each Member State. There is a similar provision in Article 96(2) of the CDR. Consequently, a 3D printed design protected vase may also be copyright protected in a Member State if it fulfils the conditions for copyright protection according to national law.

The overlap of design protection and copyright protection is an important safeguard for rightholders because of the absence of proper harmonisation of copyright law.[186] However, in this area, Member States are 'free to establish the extent of copyright protection and the conditions under which such protection is conferred'.[187]

In the Flos judgment,[188] the ECJ examined Article 17 DD in relation to Italian legislation concerning copyright protection of designs.[189] Flos brought proceedings against Semeraro since Semeraro had imported a lamp called Fluida. The Fluida lamp 'imitated all the stylistic and aesthetic features of the Arco lamp'.[190] Flos claimed to hold the property rights of Arco lamp, which was an industrial design.[191] The Arco lamp was created in 1962 and was copyright protected as an industrial design under previous Italian law. However, the lamp entered the public domain before the entry into force of national legislation implementing Article 17 DD. According to that legislation, designs that had entered public domain were not copyright protected.[192]

[185] Commission Proposal COM(2004) 582 final, p. 2, 9 and 12.
[186] See recital 8 of the preamble of DD and recital 32 of the preamble of CDR.
[187] Recital 8 of the preamble of DD and recital 32 of the preamble of CDR.
[188] Case C-168/09, Flos SpA v. Semero Casa e Famiglia SpA.
[189] Flos judgment, para. 28.
[190] Flos judgment, para. 20.
[191] Flos judgment, para. 20.
[192] Flos judgment, paras. 14-21.

The ECJ was asked whether this exclusion from copyright protection was consistent with the DD.[193] The Court stated that designs that were in the public domain before the entry into force of national legislation implementing DD because they had not been registered are not covered by Article 17 DD.[194] However, when a design has entered public domain because the registration for protection has ceased to have effect, national legislation cannot exclude those designs from protection of copyright.[195] The ECJ emphasized that *all* designs protected by design right must be conferred copyright protection when they meet the conditions for copyright protection.[196]

### 3.2.4 What cannot be design protected

According to Article 7(1) DD and 8(1) CDR, features of appearance of a product solely dictated by its technical function cannot be design protected. According to Article 7(2) DD and Article 8(8) CDR, interconnections cannot be design protected. Article 7(3) DD and Article 8(3) CDR however state an exception from the second paragraphs in modular systems, where a design allowing multiple assembly or connection of mutually interchangeable products can be protected. Accordingly, 3D printed interconnections and 3D printed engines (not the engines' possibly visible appearance, but their function) are not design protected. A 3D printed modular system may however be design protected.

Article 8 DD and Article 9 CDR state that a design that is contrary to public policy or accepted principles of morality cannot be protected.

According to Article 11(1) DD a design shall be refused registration or declared invalid if it is already registered (a) when the design does not meet the requirements of Article 1(a) DD or (b) Articles 3-8 DD, (c) when the applicant for or holder of the design right is not entitled to it according to the concerned Member State's laws or (d) when the design is in conflict with a previous design which has been available to the public. Article 11(2) DD states further grounds for refusal of registration and invalidity that the Member States may choose to use. One of these grounds is for example that the design constitutes an unauthorised use of a copyright protected work. CDR has relevant provisions on invalidity in Articles 24-26 and the grounds for refusal in Articles 46(3) and 47. Article 25(1)(f) CDR states that a Community design may be declared invalid if it constitutes unauthorised use of a copyright protected work.

The Viejo Valle case[197] dealt with a dispute concerning declaration of invalidity of disputed designs in accordance with Article 25(1)(f) CDR.

[193] Flos judgment, para. 28.
[194] Flos judgment, para. 33.
[195] Flos judgment, para. 44.
[196] Flos judgment, paras. 36-37.
[197] Cases T-566/11 and T-567/11, Viejo Valle SA v. OHIM.

Viejo Valle had registered crockery for Community design protection at EUIPO.[198] However, an intervener had applied for declaration of invalidity in accordance with Article 25(1)(f) CDR since the intervener claimed French copyright protection for crockery that Viejo Valle's designs were similar to.[199] The Board of appeal found that the intervener's crockery was protected by copyright and used without permission by Viejo Valle.[200] Viejo Valle appealed this decision and claimed that it should be annulled.[201]

The GC however came to the conclusion that Veijo Valle had not established that the Board of Appeal made an incorrect decision when finding that the intervener's crockery was copyright protected under French law and that the similar decoration of Veijo Valle's crockery constituted unauthorised use.[202]

## 3.3 Concluding comments

Within EU law there is already a functioning system of intellectual property protection according to which CAD files and three-dimensional objects that may be 3D printed can be protected. The CAD files are copyright protected while the three-dimensional objects (that may be 3D printed) can be both design protected according to EU law and copyright protected according to national law, provided they fulfil the conditions for each protection.

In relation to copyright protection, the harmonisation of different areas of copyright law shows the EU law's adaption to technology. The rightholder has achieved a very strong protection in accordance with the InfoSoc Directive. The reproduction right according to Article 2(1) of the InfoSoc Directive has a very wide scope, since reproduction by any means and in any form – even indirect and temporary reproduction – is unlawful if it is not authorised by the rightholder. The provision also forbids reproducing a *part* of a copyright protected work, which means that if someone produces a 3D printed object, which contains a part influenced by a previous produced three-dimensional object, the first produced three-dimensional object's rights may be infringed by the second produced 3D printed object. The main rule seems to be that this is the case independent of how different the second produced 3D printed object is from the first produced three-dimensional object.

There are exceptions to the reproduction right, however even the exceptions seem focused on a strong right of the rightholder. The exception in Article 5(1) of the InfoSoc Directive only applies on temporary reproduction that is transient or incidental, which excludes 3D printed reproductions from being covered by this exception. Reproduction of CAD files may however be

[198] In the judgment EUIPO's previous name OHIM is used.
[199] Viejo Valle case, paras. 3-4.
[200] Viejo Valle case, paras. 14-19.
[201] Viejo Valle case, para. 20.
[202] Veijo Valle case, para. 102.

allowed according this provision, provided that the conditions of the provision are met.

The optional exception for private use according to Article 5(2)(b) of the InfoSoc Directive is only applicable 'on condition that the rightholders receive fair compensation'. As mentioned above, the purpose of Article 5(2)(b) was to phase out copyright levies in favour of technological measures. However, it is obvious that this purpose has not been fulfilled. For 3D printing technology, this means that 3D printers and 3D scanners sold to natural persons for private use may be levied in some Member States where a system with levies are used to achieve the rightholders' right to 'fair compensation'. In my opinion, the concept of 'fair compensation' is very problematic since it is difficult to say in what situations the rightholder has already received fair compensation and cannot demand further payment. Since fair compensation is calculated on the basis of the criterion of the harm caused to authors of protected works by the introduction of the private copying exception, the opinion of the EU legislator and the ECJ must be that the rightholder is harmed as soon as a natural person has equipment making available copying of the the copyright protected object for private use. To me it is not clear where the harm lies since it is obvious from Article 5(2)(b) that the exception applies to private use that is 'neither directly nor indirectly commercial'. A person making a copy that fulfils the conditions of Article 5(2)(b) does not get any payment for making that copy; consequently, there is no economic gain for the private user that would correspond with a loss to the rightholder. Even taking into account the moral rights of the rightholder, I do not see why it would be harmful to the rightholder that a natural person, who has for example paid a price for a copyright protected vase from which the rightholder receives remuneration, decides to 3D print some copies of that vase and put the copies along with the original in his or her home. Since the burden for financing the 'fair compensation' in this context is placed on consumers, it is likely that the consumer price for 3D printers and 3D scanners will be expensive. The possible problems with levies presupposes however that the Member State has chosen such a system for the fair compensation for rightholders and that the reproduction equipment, devices and media affected are regarded to be produced for purposes clearly related to private copying. Since the purpose of a 3D scanner is clearly to make copies of three-dimensional objects, it is likely that at least the 3D scanner would be affected by levies in such a system.

The right of making available to the public and the distribution right are also strong rights of the rightholder. Making available CAD files on the Internet is only allowed with the consent of the rightholder. Consent from the rightholder is also needed inter alia to sell and deliver to the public CAD files (original or copies) or three-dimensional copyright protected objects or 3D printed copies of them.

The scope of design protection seems narrower than the scope of copyright protection in accordance with the InfoSoc Directive. According to Article 7

DD, features of appearance of a product solely dictated by its technical function cannot be design protected, neither can interconnections as a main rule. Design protection is also narrower in that the assessment of individual character in accordance with Article 5 DD is made – a 3D printed object may have separate protection in relation to a previous produced three-dimensional object if the 3D printed object produces a different overall impression on the informed user than the previous produced three-dimensional object does. Consequently, and contrary to copyright protection, if a part of a previous design, like a lampstand, is copied through 3D printing and reused in a newer design, both designs could be protected if they produce different overall impressions on the informed user. However, if the first design fulfils the conditions for copyright protection in a Member State, it has in that Member State the same strong copyright protection for its parts as discussed above.

Design protection of spare parts may prevent legal 3D printing of spare parts in some Member States in accordance with Article 14 DD. However, as the EU legislator wishes to liberalise the market for spare parts, it is possible that spare parts will not have design protection in the future, which will allow copying of spare parts through 3D printing.

Unlike the exception for private use in accordance with the InfoSoc Directive, Article 13(1)(a) DD provides a limitation to the designer's right for 'acts done privately and for non-commercial purposes' independent of any consideration to the rightholder's fair compensation. I prefer the limitation in the DD since it is easier to apply and does not place any unnecessary burdens on the consumers. However, if the design also obtains national copyright protection in a Member State, the 'fair compensation' for the rightholder needs to be taken into consideration. As discussed in chapter 2.3 however, I believe the rightholders can achieve proper remuneration by other means than charging the individual consumer extensively.

# 4 DRM systems

## 4.1 Technological protection measures

As can be seen from Articles 6-7 of the InfoSoc Directive, technological protection measures and rights-management information in copyright protected works are encouraged by the EU legislator in that circumventions of these measures are forbidden. These measures are often referred to as digital rights management,[203] DRM.

DRM systems include TPMs – technical protection measures, subject of Article 6 of the InfoSoc Directive and RMI – rights management information, subject of Article 7 of the InfoSoc Directive. DRM systems are used to restrict the use of a copyright protected product.[204] They could also be used to prevent unlawful copying of design protected products, but the DD has no provisions concerning TPMs or RMI.

According to Article 6(1) of the InfoSoc Directive, 'Member States shall provide adequate legal protection against the circumvention of any effective technological measures'. Products or components for circumvention of any technological measures shall be prohibited to manufacture, sell, distribute etc. according to Article 6(2) of the InfoSoc Directive. Actual infringement of copyright is not needed for Article 6(1)-(2) to be breached.[205] Article 6(3) contains a definition of 'technological measures'. Technological measures could be used in a 3D scanner or 3D printer to prevent certain objects from being scanned by the 3D scanner and prevent the 3D printer from produce certain objects. The TPMs could for example prevent reproduction from CAD files with 'do not copy' watermarks.[206] As Lipson & Kurman explains it: 'A 3D printer reading a DRM design file would refuse to print it, similar to the way a software application refuses to work after its product key has expired.'[207]

Article 6(4) of the InfoSoc Directive states exceptions from Article 6(1). Article 6(4) is relevant when a Member State is using one or several exceptions mentioned in Article 5(2)-(3), i.e. when there are, according to national law, specific cases where the work's reproduction, communication to the public, making available to the public or distribution is allowed. If that is the case, the Member State shall take appropriate measures to ensure that rightholders make the means benefiting from that exception available to

[203] Pedley, p. 49.
[204] Pedley, p. 49.
[205] Gasser & Girsberger, p. 9.
[206] See Weinberg, p. 14.
[207] Lipson & Kurman, p. 229.

the beneficiary of the exception.[208] However, the exceptions do not apply to on-demand services according to the fourth paragraph of Article 6(4).[209]

TPMs enforce terms of licences and have the possibility to restrict access and use to prevent unauthorized copying. These measures make unauthorized duplication and avoiding mandatory payments difficult. In order for TPMs to be protected by law they must be designed to protect the work and be effective. There are different kinds of TPMs, e.g. security and integrity features of computer operating systems, encryption, fingerprinting algorithms and digital watermarks.[210]

In the Nintendo judgment,[211] the ECJ stated that Article 6 of the InfoSoc Directive covers inter alia consoles for video games:

> the answer to the questions referred is that Directive 2001/29 must be interpreted as meaning that the concept of an 'effective technological measure', for the purposes of Article 6(3) of that directive, is capable of covering technological measures comprising, principally, equipping not only the housing system containing the protected work, such as the videogame, with a recognition device in order to protect it against acts which are not authorised by the holder of any copyright, but also portable equipment or consoles intended to ensure access to those games and their use.[212]

In relation to under which criteria the scope of the protection in accordance with Article 6 should be assessed, the ECJ said that the principle of proportionality must be taken into account. In practice this means that activities or devices that do not have the purpose of circumventing technical protection but have another commercially significant purpose or use, should not be prohibited.[213] Further, the ECJ stated that it was necessary to examine whether measures that caused less interference could have been installed instead, while still providing comparable protection. It is consequently relevant to take relative costs of different technological measures, technological and practical aspects and a comparison of effectiveness into account.[214]

Consequently, not only the 3D printer or 3D scanner may contain TPMs, it is also allowed for the rightholder to implement TPMs in devices that somehow can be interconnected with the 3D printer or 3D scanner. However, when implementing TPMs, the rightholder should not cause more interference for the user than necessary.

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[208] Article 6(4) first paragraph read together with Article 5(2)-(3) of the InfoSoc Directive.
[209] Gasser & Girsberger, p. 11.
[210] Pedley, p. 53-54.
[211] Case C-355/12, Nintendo Co. Ltd and others v. PC Box Srl and 9Net Srl.
[212] Nintendo judgment, para. 37.
[213] Nintendo judgment, para. 30.
[214] Nintendo judgment, para. 38.

## 4.2 Rights-management information

Article 7 gives protection against a) removal or alteration of electronic rights-management information and b) distribution, importation for distribution, broadcasting, communication or making available to the public works from which electronic rights-management information has been removed.[215]

RMI has the purpose of identifying digital works and the rightholder, consequently a mechanism for stating moral rights, but indirectly also the economic rights. In addition, the RMI has the purpose of managing supply of material to customers and can transmit information about the use to the rightholder. RMI can be used by labelling the digital content, like a CAD file, with a warning label like a watermark or copyright notice saying for example that it may be copied only for non-commercial purposes. Removing such a label is a violation of Article 7 of the InfoSoc Directive.[216]

## 4.3 Circumvention of DRM systems

Article 6-7 of the InfoSoc Directive do not give any exceptions where it would be allowed to circumvent DRM systems. Hence, circumvention of DRM systems is always a violation, even when the term of copyright has expired. A strong DRM system could consequently make copyright protection perpetual.[217] Further, DRM systems have the possibility to limit the use since they do not always allow interoperability with different kinds of hardware,[218] another problem for the law-abiding user.

Digital rights management technology may be a solution for rightholders who would want to protect their intellectual property protected product from being illegally copied. However, it can be questioned whether it provides efficient means of protection. According to Herman, DRM has failed to prevent widespread infringement.[219] He says that DRM has never provided a long-term solution to infringements since DRM systems are usually circumvented very easily. After a user has circumvented a DRM system, he can post the results online which helps other users to access copies of a product without paying for them. Actually, Herman says, the DRM seems to be more of a problem for the paying user than the users that are not willing to pay for the product containing a DRM system.[220] However, the DRM systems for DVDs and Blu-Ray discs seem to function rather well.[221]

[215] Article 7(1)(a)-(b) of the InfoSoc Directive.
[216] Pedley, p. 49-51.
[217] Pedley, p. 55-56.
[218] Pedley, p. 59.
[219] Herman, p. 161.
[220] Herman, p. 161-163.
[221] Herman, p. 169-170.

## 4.4 Concluding comments

The rightholders of copyright protected works do not only have very strong rights for reproduction, making available to the public and distribution, as discussed in chapter 3, but are also encouraged to use TPMs and RMI to technically enforce their rights. TPMs and RMI are not protected according to DD, but the provisions of the InfoSoc Directive can probably cover most situations concerning DRM systems, especially since a design protected product may also enjoy copyright protection. As stated above, these systems are never allowed to be circumvented except for in limited situations, which in practise could make the copyright protection of technical works eternal. In relation to 3D printing, a CAD file with a watermark would consequently never be allowed to be copied. It would also never be allowed for a user to circumvent TPMs in a 3D scanner or 3D printer in order to copy or produce certain objects that the rightholders do not want others to copy (except from when the limitations of Article 6(4) are applicable). Devices that could be interconnected with a 3D printer or 3D scanner may also contain TPMs, which the user is not allowed to circumvent.

As discussed above, the DRM systems are more a problem for lawful users than a tool for restricting illegal use, which is probably why they have not been used as extensively as the EU legislator has predicted. Consequently, the provisions concerning DRM systems should in my opinion be revised. A suggestion is that TPMs and RMI should be allowed for the rightholder to use to prevent unlawful copying of his or her products, but that the protection of these systems should not go as far as it does with the current legislation. Something that is not used should not deserve such high protection. In my opinion, the time for protection of the TPMs or RMIs should last as long as the intellectual property protection of the work that they are protecting.

# 5 Conclusion

The purpose of this thesis is to discuss how well current EU design law and EU copyright law in accordance with the InfoSoc Directive can handle the protection of copyrights and design rights in relation to 3D printing technology. The purpose and the questions of the thesis are however also relevant to other technology than 3D printing and other intellectual property rights than copyright and design protection.

To fulfil its purpose, this thesis has dealt with three questions. The first question concerns what lessons concerning the development of 3D printing and its influence on EU copyright protection in accordance with the InfoSoc Directive and EU design protection can be learnt from history concerning the technological developments of digitization of music and the introduction of the InfoSoc Directive.

The answer to the first question is that EU copyright law has clearly been influenced by the development of technology. However, it is difficult to adapt law to technology, since technology develops so fast while law develops so slowly. A legal history perspective is useful since both the legislator and the rightholders can learn from previous difficulties with new technology and legal adaptions. The legislator can get insights into how the law could be changed, while the rightholder can get inspiration concerning what business model to use and how to adapt it to new technology. The lesson to be learnt from the example of digitization and the introduction of the InfoSoc Directive is that it is easy to make mistakes when assessing the technology used today and its future importance. This kind of flawed assessment was shown with the too technical provisions of the InfoSoc Directive concerning technical protection measures and rights-management information. The legislator should instead have provided 'broader' provisions in relation to technology, meaning that the provisions should not be so technology specific, but instead be flexible towards new technology. These provisions seem outdated and should in my opinion be changed. I think rightholders should have the possibility to use technical protection measures and rights-management information, but the protection of these measures should only last as long as the right they are protecting. In general, it is better to provide intellectual property legislation that is not technology specific in relation to new technology since it is difficult to foresee how that technology will be developed and how it will be used. Consequently, special provisions concerning 3D printing should not be introduced. The provisions concerning for example the right of reproduction should instead be applicable on different methods for reproduction.

The provisions concerning exceptions and limitations under Article 5 of the InfoSoc Directive are however not harmonised enough in my opinion, since most exceptions and limitations are optional. In order for the rightholder to know what rights he or she has in different Member States and in order for

the users to know what actions are allowed, the exceptions and limitations along with their conditions should be harmonised to a greater extent in order to provide legal certainty.

From the behaviour of the actors on the digital music market, it can be learnt that providing a business model that is attractive to consumers can be just as effective as or maybe even more effective for protection of rights and gaining remuneration than initiating proceedings due to infringements.

The second question deals with how adaptable EU design law and EU copyright law in accordance with the InfoSoc Directive are to the technology of 3D printing.

The conclusion is that EU law already provides a functioning system of intellectual property protection where a CAD file can be copyright protected and a three-dimensional object that may be 3D printed can be both protected by a design right and copyright. In my opinion, the protection of the rightholders' rights in accordance with the InfoSoc Directive are even too strong, since even the private copying exception is very limited. In my opinion, such a strong protection for the rightholder prevents creativity in that new designers may not use even a small part of a design that is copyright protected to create a new object. The concept of 'fair compensation' and the burden placed on the consumer when dealing with the private use exception are other problems with the provisions of the InfoSoc Directive. Due to the provisions of the InfoSoc Directive, the 3D printers and 3D scanners risk being levied in some Member States, which means that consumers will need to pay higher prices for them. The difficulties with introducing the InfoSoc Directive is also shown through the fact that the purpose of the private copying exception was to phase out levies, while they actually seem to be encouraged by that provision.

The mandatory exception concerning temporary protection is only relevant in relation to CAD files if the conditions of that provision are fulfilled. Temporary production of 3D printed objects is not possible within the meaning of the InfoSoc Directive, since 3D printed objects cannot be regarded as transient or incidental. Further, a rightholder also has strong rights of distribution and making available to the public in accordance with the InfoSoc Directive.

The system for design protection seem more balanced between the rightholder's rights and considerations of consumers and other rightholders. There are several limitations to the design protection and the assessment of individual character makes it possible for a 3D printed object to have separate protection in relation to a previous produced three-dimensional objects if the 3D printed object produces a different overall impression on the informed user. However, if the design fulfils national conditions for copyright, it gets the strong protection of the InfoSoc Directive.

The third question concerns the rightholder's possibility to use technological protection measures and rights-management information to regulate the use in relation to 3D printing. The regulated use of copyright protected CAD files and the use of 3D printers and 3D scanners are discussed in relation to the technological protection measures.

These measures seem encouraged by the EU legislator to further strengthen the position of the rightholder. The provisions on TPMs and RMI can probably cover most situations concerning DRM systems, even though they are not protected according to DD. TPMs could prevent a 3D scanner or 3D printer from producing an infringing object. RMI could prevent a CAD file from being used together with a 3D printer. Since these measures are almost never allowed to be circumvented, they also provide a very strong protection for the rightholder. My suggestion is that the provisions concerning DRM systems should be changed so that the time for protection of the TPMs or RMIs should last as long as the protection of the relevant work.

Taking these considerations into account, the InfoSoc Directive will need to be changed in a near future, not specifically because of 3D printing technology, but to keep up with the technology we have today. However, the creation of intellectual property law in relation to technology will never be completely satisfactory since technology develops so much faster than law does. The better solution is probably not to have a very detailed legislation on technological components, but to have provisions with 'broader' scope so that the provisions rather easily can be used also on issues with newer technologies. However, the disadvantage with this technology-broad legislation is then the risk of being too vague. However, the role of the CJEU is to interpret EU legislation that is not clear, so difficult cases concerning interpretation of a scope of a provision concerning intellectual protection should be referred to it.

The new EUTMD and changed EUTMR show very recent changes in EU law due to adaptation to technology. A revision of the DD will hopefully soon follow, depending on when there will be a fairly satisfactory solution to the issue with the spare parts market. My opinion is that EU intellectual property law will need to be changed soon, independently of the breakthrough of 3D printing.

Since the designer's designs can be materialised through 3D printing because of the CAD file, the protection of that CAD file will be very important for the right holder. As stated earlier, one can draw a comparison to the MP3 file. To prevent future infringement, the rightholder may use DRM systems that prevent copying of the CAD file, e.g. a watermark preventing the CAD file from being copied. However, when we look at the iTunes example we see that DRM systems are not always the most eligible solution. iTunes' service became more popular when they dropped the DRM system and received remuneration by charging extra for new hits and songs with better quality.

The same principles should apply for CAD files. The rightholder can sell a CAD file for a certain amount of money, depending on exclusivity of the design. In that way the person or company that has paid for the CAD file can print out the object with a 3D printer. I believe that the rightholder's success with his or her design is not solely dependent on how strong the protection is according to registration or how forcefully the rightholder enforces his or her rights in legal proceedings, but also the rightholder's business model, the quality of the product or service and likability among the users of the rights. It is of course the rightholder's decision whether he or she decides to use DRM systems or not, but I think that if the prices are too high and if technical measures are causing more problems for the users than they help, the users look for other alternatives to obtain the same product or service or similar products or services.

In my opinion, the rightholders' rights should be well protected and enforced, but the rights should not be so strong that they prevent creativity or new competitors from arising.

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