



The copyright issues of the augmented reality: freedom of panorama

Master Thesis

LLM Law and Technology 2017

Student: Nguyen Quynh Trang
Student number: u 1276336
Administration number: 320993
Supervisor: Martin Husovec
Second reader: Emre Bayamlioglu
April 2017

ACKNOWLEDGEMENT

I would like to express my gratitude and appreciation to my supervisors Martin Husovec and Emre Bayamlioglu for their patience, commitment and constrictive comments during the process of writing this Thesis.

My sincere thanks goes to my beloved family and friends for supporting and lifting me up through the duration of my studies. Without them, it would have been more challenging.

Finally yet importantly, I wish to thank my colleagues at Tilburg University for being with me in this chapter of my life.

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INTRODUCTION

Augmented reality (AR) is a developing technology, which provides an overlaying of computer-graphic layers on the objects of the real world and in real-time. By using depth sensing, image and geolocation tracking, AR technologies provide possibilities to enhance the real environment, which produces new opportunities for improving human lives. The potential of AR technologies can be applied in various sphere of our life and it have already been applied in medicine, military, commerce, art etc. However, the most advanced appliance of the AR can be found in gaming and entertainment industries as possibilities of AR technology left them up on the new level by mixing virtual and reality together.

Since launching of the first mobile AR video game (ARQuake) in 2000, the average of such application had been gradually raised.¹ However, the AR technology recently has got an additional impulse and investments for the further development only with the popularity of Pokémon Go in 2016. By combining AR technology, which allows user to find hidden virtual objects in the real world and characters from the famous TV serial, the AR video game Pokémon Go became one of the most highlighted event of the technological world in 2016. Only for two month after launching, Pokémon Go had been downloaded 30 million times by smartphone users even the application was only available in the USA, Australia, New Zealand and some European countries ². Thus, we can say that, the Pokémon Go will promote AR technology to the masses and in the near future, AR applications will be more widespread in our routine. In the meantime, the tendency of AR popularity arose many issues and challenges concerning copyright, patent, trademark and privacy. ³

For example, most of AR applications display digital layers based on the landmarks' geolocation, which includes copyrighted of buildings or sculptures in public places. It means that the developers of AR applications exploit the images of copyrighted works, which are permanently located in public places to maintain the functionality of their software. Hence, the question concerning interconnection between AR technologies and author's rights of such kind of works is raised as the permission of copyright holders for taking and reusing images of buildings or sculptures are necessary in most cases. It is important to note, that the Thesis will be focused on cases, where AR applications intendedly take and reuse photos or video of copyrighted works, which are permanently located in public places. That means situations relating to

¹ 'Augmented Reality History' (*Augmented-reality-games.com*, 2017) <<http://www.augmented-reality-games.com/history.php>> accessed 5 April 2017.

² Jeff Grubb, 'Sensor Tower: Pokémon Go Has Already Passed 30M Downloads and \$35M in Revenue' (*VentureBeat*, 2017) <<http://venturebeat.com/2016/07/19/sensor-tower-pokemon-go-has-already-passed-30m-downloads-and-35m-in-revenue/>> accessed 18 January 2017.

³ Brian D. Wassom, 'IP in an Augmented Reality | Section of Intellectual Property Law' (*Americanbar.org*, 2017) <http://www.americanbar.org/publications/landslide/2013-14/january-february/ip_an_augmented_reality.html> accessed 18 January 2017.

incidental inclusion of buildings or sculptures by AR technologies are excluded from the scope of the following research in this Thesis.

At the same time, the AR and others digital technologies encourage the Digital Single Market reform, which has been becoming one of the European Commission's policy priorities in recent years. Therefore, it is necessary to evaluate of copyright law in the near future because of specific features of digital technologies. For that purpose, Julia Reda presented a draft report⁴ of the current Copyright Directive. Some part of proposals were adopted, others were rejected. One of the most discussed issue of this report was the question of so-called freedom of panorama, a copyright exception, which allows taking and reusing pictures or videos of artworks in public place without right holder's permission. Currently, freedom of panorama is regulated by the article 5.3(h) of the InfoSoc Directive⁵, which delegates to European Member States (MS) to decide whether to permit or restrict the panorama freedom under national legislation. Therefore, there are various interpenetrations and regimes of copyright exception among European countries. Some of them as Germany, Portugal and Czech Republic allow freedom of panorama without limits⁶. Most Scandinavian countries, namely Norway, Finland and Denmark, permit taking and reusing photos and videos of buildings only⁷. Whereas, Italian and Greece legislations restrain the panorama freedom at all.⁸

Consequently, due to different understating of freedom of panorama in EU, there was a long run of debates, up-side down decisions and petition⁹ concerning initial Reda's purpose of providing and harmonizing freedom of panorama between MS from 2015. Finally, in 2016, the paragraph concerning freedom of panorama was not included in the final version of report,¹⁰ therefore the new approach for unified regulation among MS has not been found during debates. Currently, freedom of panorama is still non-harmonized and regulated by the domestic legislation of the EU countries.

In addition, the right of taking and reusing photos and videos without right holders' permission in public place raises a question of blurred line between commercial and non-commercial uses on that point that non-commercial is not always interpreted as "not for profit". Especially, this question is up to date in the

⁴ Julia Reda, 'Report on the Implementation of Directive 2001/29/EC of The European Parliament and of The Council Of 22 May 2001 On The Harmonisation Of Certain Aspects Of Copyright And Related Rights In The Information Society (2014/2256(INI))' (2017) <<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A8-2015-0209+0+DOC+PDF+V0//EN>> accessed 18 January 2017.

⁵ Council Directive 2001/29/EC on the harmonization of certain aspects of copyright and related rights in the information society [2001] OJ L167/10

⁶ 'Commons: Freedom of Panorama - Wikimedia Commons' (*Commons.wikimedia.org*, 2017) <https://commons.wikimedia.org/wiki/Commons:Freedom_of_panorama#Greece> accessed 18 January 2017.

⁷ Ibid

⁸ Ibid

⁹ Nico Trinkhaus, 'European Parliament: Save the Freedom of Photography! #Savefop @Europarl_EN' (*Change.org*, 2017) <<https://www.change.org/p/european-parliament-save-the-freedom-of-photography-savefop-europarl-en>> accessed 18 January 2017.

¹⁰ Julia Reda, 'EU Copyright Evaluation Report – Full Current Text' (*Julia Reda*, 2017) <<https://juliarreda.eu/copyright-evaluation-report/full/>> accessed 18 January 2017.

age of social networks services on a reason that term and conditions of such networks platforms, users have a copyright infringement risk by posting their content on such services like Facebook, Instagram, YouTube even they have not commercial interest. At the present time, freedom of panorama is a controversial question and it has to be reformed.¹¹

Discussing previous paragraphs, we can state, that AR technology is a grey area of IP law and freedom of panorama is one of the most doubtful question in the EU. Here raises a question, what will be a legal framework if we will put two issues together? In this Master Thesis, we will focus on the copyright issues of the AR in general and its connections with freedom of panorama, in particular, on a point that there are some AR applications based on interaction with reality in public place. For instance, the aforementioned Pokémon Go application concedes to catch Pokémons in the reality by using smartphones. The game uses GPS for determining player's location and camera layers a Pokémon or Pokestops in the real world¹². Usually, Pokémons and Pokestops can be founded at the landmarks and public places hence it means that game has a high risk of IP infringements by using images of building or sculpture in a commercial way.

Another example of copyright infringement can be raised because of game's outputs in case if a user wants to share a screenshot of caught Pikachu on the front of 'Venus of Transcendence' by Yannis Koutsouradis on Facebook though there is no freedom of panorama in Greece¹³ and Facebook's terms and conditions,¹⁴ which allow to take a commercial advantage of user's content. In this example, a user will provoke a copyright infringement of permanently placed artistic work without intention on a reason that he posted an image on a commercial website.

Two previously mentioned examples shed a light on how AR applications can infringe copyright of buildings and sculptures, which are located in public place. In the near future, the possibilities of AR will be extended and they will be more interacted with freedom of panorama. In this following tendency, a determination of freedom of panorama should not be only from position of harmonization between MS but it needs to take into account upswing technologies like AR as well. Therefore, by researching AR applications and freedom of panorama separately and integrally with each other, this Master Thesis can contribute improvements of its enforcement in particular and enforcement of intellectual property law and technologies in general.

¹¹ Helmut Masson and Sarah Watson, 'Freedom of Panorama' (2017) <<https://epthinktank.eu/2016/07/21/freedom-of-panorama/>> accessed 18 January 2017.

¹² Brandon Widder, 'Best Augmented-Reality Apps' (*Digitaltrends.com*, 2017) <<http://www.digitaltrends.com/mobile/best-augmented-reality-apps/>> accessed 18 January 2017.

¹³ 'Greece Law 2121/1993 On Copyright, Related Rights and Cultural Matters' (Wipo.int, 2017) <http://www.wipo.int/wipolex/en/text.jsp?file_id=127563> accessed 18 January 2017.

¹⁴ 'Data Policy' (*Facebook.com*, 2017) <<http://www.facebook.com/about/privacy>> accessed 18 January 2017.

There be following question for the research: Is the current legal framework of freedom of panorama enough for regulation copyright issues, which will raise by AR technology? In other words, does a specific nature of AR require a reconsideration of freedom of panorama? Consequently, in a case of a positive answer on the previous question, what will be a regime of freedom of panorama for AR?

It will be hard to harmonize freedom of panorama on the territory of EU as there were long debates concerning integrated regulation of taking and reusing photos and videos of art works in public places on EU territory. On the one hand, it probably sounds absurd that the restriction of using copyrighted works in public places and sharing screenshot of Pikachu on a landmark can be an infringement. On the other hand, one of the aim of copyright is to protect authors' right inter alia authors of sculptures, buildings and others art objects in public place. Therefore, it needs a balance to be found in this issue. This question is not only related to video games and applications developers, profession photographers or video makers, but also to ordinary people which uses AR applications on the daily basis for different assignments. Thus, for educational purposes some AR applications can immediately give information concerning particularly building or sculpture.

Several methods will be used for investigating questions, which will be raised in this Thesis. Firstly, the method of analyzing current international, EU and MS legislations, literature, articles and case law concerning AR and freedom of panorama. It will provide a background for researching touchpoints between AR applications and freedom of panorama. Secondly, the method of comparing different legal frameworks and reports will shed light on Thesis's issues from two perspectives such as allowing to take and reuse photos and video copyrighted works, which are permanently located in public place, without rightholders' authorization across EU MS and a total restriction of freedom of panorama on the whole territory of EU. We will also provide the research concerning possibilities of freedom of panorama harmonization in relation on growing popularity of AR applications in our daily lives.

For researching the above-mentioned questions, the Thesis will be divided into several chapters. In the second chapter, we will provide a general information about AR applications such as Pokémon Go, Blippar, Wikitude, Layar, Arart and AugSatNav. There will be also provided a definition of AR based on a legal and doctrine background. Afterwards, we will research some copyright issues, which are raised by AR applications. The investigation will be started with the analyzing a copyrightability of the AR content in case if such content can significantly modify an appearance of copyrighted work. In the second part of this chapter, we will describe potential risks of copyright infringements with the understanding that some AR digital layers cannot be considered as original and therefore it will be related to the authors' right of the initial copyrighted work.

At the beginning of the third chapter, we will analysis the current international and EU legislations concerning freedom of panorama in general. Afterwards, we will compare legislations of two EU counties

with different positions regarding to freedom of panorama. The choice of these countries is based on the recent case in Swedish Supreme Court (Sverige ek. för. (BUS) vs Wikimedia Sverige)¹⁵ and on Portuguese copyright law which allows the reuse of works permanently installed at public locations.

In the fourth chapter, we will focus whether it is necessary to transform a current legal framework of freedom of panorama rather the existent legislation is enough. The investigation of the previous statement will be based on analyzing of current trends concerning development of AR technologies and their application in our daily basis life. Moreover, for researching the abovementioned issue, we will take into consideration reports of EU experts such as Julia Reda and Jean-Marie Cavada and positions of different organizations, publishers, photographers and users concerning an implementation of freedom of panorama as a mandatory copyright exception among EU MS.

In the conclusion, we will summarize researches from the previous chapters for the purpose for finding solutions to regulate copyright issues, which are caused by augmented reality technology within in scope of the freedom of panorama.

2 CHAPTER: < AUGMENTED REALITY >

For the understanding the core of AR technologies, the following chapter will provide general information and definitions of AR. Moreover, it will help to research potential copyrighted issues which can arise in order to establish further legal regulation and enforcement in the near future. Furthermore, there will be provided overview of the several AR applications, which have potential of copyright infringement in general and in the field of freedom of panorama in particular.

2.1 SUBCHAPTER: < DEFINITON OF AUGMENTED REALITY >

There is no general accepted definition of AR at the present moment. This situation has occurred because scientists have different interpretations of AR's classification in the field of technology, which allows to combine virtual graphics and physical reality. Beside AR, Virtual Reality (VR) and Mixed Reality (MR) technologies also diminish boundaries between vitality and reality, but with some differences. Unlike VR, which replaces reality by a synthetic environment, AR overlays virtual objects onto real world. The difference between AR and MR is not so obvious and more controversial. Some researchers as Joshua A.T. Fairfield concern that MR is a broad definition of the AR while other consider as MR is a mix of the VR and

¹⁵ Ö 849-15Bildupphovsrätt i Sverige ek.för. (BUS) v Wikimedia Sverige [2016]

AR.^{16 17} Nevertheless, there are fundamental key points of AR differentiation from the other technologies, which has been first mentioned in a paper “A survey of the Augmented reality” by R. Azuma.¹⁸ Firstly, as it was previously mentioned, AR technologies is a combination of the reality and virtuality. Thus, AR technology contribute a possibility to enhance or diminish objects based on the real environment. For that perspective, it is not so clear why the term “augmented” has been chosen and it can be confusing for the legal viewpoint. The second highlight of AR is a real time interaction. That is to say, the user should be able to manipulate with the augmented objects in current time. And the third feature is that a layered object by AR should be at the three dimensional level.

Further researches of AR were based on characteristics, which are powered by R. Azuma with a different variation. Alan B. Craig made one essential addition in the book “Understanding Augmented Reality”. He defines AR in context of a medium in which a digital information is overlaid on the physical world that is in both spatial and temporal registration with the physical world and that is interactive in real time.¹⁹ Hence, Craig emphasizes on the importance of attachment between location and physical perspective of the person in the real world for the AR technology. Along this line, a geolocation error will be significant in case of using AR technology for surgeon, as the consequence would be fatal.²⁰

Notably, AR technologies do not only concern supplementing the vision sense but to other four senses as well. The Meta 2 Development Kit is the example of the AR device, which includes improving touch, vision and sound all together.²¹ It has commonly been assumed that improving the abovementioned senses are easier whereas smell and taste requires chemical compounds for enhancing reality, but there positive towards has been already taken. Thus, researchers from the University of Tokyo invented MetaCookie+, which can change person’s perception.²²

Abovementioned definitions of AR are provided by engineers and mathematical scientists from the technical perspective. There are no official legal definitions and cases related with the AR, considering the recent popularity of the AR in last years. The first attempt was made by Brian D. Wasson, who characterized AR technology as an overlaying of digital data in the physical world.²³ The Wasson’s definition does not make distinction between AR and MR and is considerably more narrow than others definitions. Other groups of lawyers such as F. Roesner, T. Denning, B.C. Newell, T. Kohno and R.Calo

¹⁶ Eric Johnson, 'What Are the Differences Among Virtual, Augmented and Mixed Reality?' (Recode, 2017) <<http://www.recode.net/2015/7/27/11615046/whats-the-difference-between-virtual-augmented-and-mixed-reality>> accessed 19 January 2017.

¹⁷ Alan B Craig, *Understanding Augmented Reality* (Morgan Kaufmann 2013).

¹⁸ Ronald T. Azuma, 'A Survey of Augmented Reality' (1997) 6 *Presence: Teleoperators and Virtual Environments*.

¹⁹ Alan B Craig, *Understanding Augmented Reality* (Morgan Kaufmann 2013).

²⁰ *Ibid*

²¹ 'Augmented Reality - Home | Meta Company' (Metavision.com, 2017) <<https://www.metavision.com/>> accessed 19 January 2017.

²² 'Purpose and Procedure' (2011) 14 *Evidence-Based Nursing* <<http://dl.acm.org/citation.cfm?id=1978957>>.

²³ Brian Wassom, 'Defining Terms: What Is Augmented Reality?' (Wassom.com, 2017) <<http://www.wassom.com/defining-terms-what-is-augmented-reality.html>> accessed 19 January 2017.

suggested a definition of AR considering from the perspective of its capacity. From that point of view, a comprehension of AR should be divided into two groups: an ability to collect and hold information (“input”) and an ability to layer information over the reality (“output”)²⁴. Such separation is an aim for solving different legal issues concerning AR technology. Other legal researchers regularly classify AR based on the Azuma’s definition and key points.

Therefore, the definition of AR is controversial as researches have different approaches concerning the nature of AR. However, such characterization of AR has already been determined and generally accepted as well it can be fundamental for legislation and enforcement in prospect.

2.2 SUBCHAPTER: < AUGMENTED REALITY APPLICATIONS >

In the following subchapter, we will give a consideration of some current popular AR applications. The applications’ researching facilities will approach us to understand potential possibilities of copyright infringements.

Pokémon Go

Particularly, a phenomenal popularity of Pokémon Go raised a question of setting up a legislation of AR in many countries. By using avatars in Pokémon Go players are able to catch hidden Pokémon at the current location in the real world. The purpose of game is to catch all available Pokémon. For better results, players should visit gyms and Pokestops on a regular basis. Usually, gyms and Pokestops are based on the landmarks in reality as monuments, city’s sights and public art. The types of Pokemons will change in accordance with the geolocation of the user. For instance, Pikachu can be found near with the electric station, while Squartle inhabits close to a lake. Moreover, this application provides a screenshot of Pokemon at the real location. A monetization of game is based on the purchasing additional staffs for catching and raising Pokemons like Pokeballs, lure module etc.²⁵

Blippar

Blippar is a search engine application which is powered by AR technology and machining learning. The distinguished feature of Blippar’s searching is based on image recognition. By scanning (“blipping”) objects users can obtain different kinds of information in a real time. Initially, application was an innovative media platform for different brands promotion. For example, by scanning cinema poster application provides links to movie trailer, information about nearby cinema theaters and online tickets services. In 2004, Blippar acquired another AR application Layar, which has the same function as Blippar. Such acquisition

²⁴ Franziska Roesner, Tadayoshi Kohno, Tamara Denning, Ryan Calo, Bryce Clayton Newell 'Augmented Reality: Hard Problems of Law and Policy' (2014) <<http://www.franziroesner.com/pdf/ar-law-upside2014.pdf>> accessed 19 January 2017.

²⁵ Toby Pinder, 'Monetization in Pokemon GO' (Medium, 2017) <<https://medium.com/@tobypinder/monetization-in-pokemon-go-1372a9fd2826#.sqawnu34e>> accessed 19 January 2017.

allows obtaining the world largest AR user base.²⁶ In the near future, developers of Blippar intend to update application by video browser, which will make possible to scan and obtain information of every physical object like animal or monument.²⁷ Thus, Blippar's developers concern that searching by scanning item from real world could replace a current classical text searching.

Wikitude

Wikitude is the AR geolocation-based application, which provides information about user's surrounding area. The application overlays icons with the different categories of information on the real objects. The data is provided from the different sources as Wikipedia, Yellowmap, Twitter, Booking and Gowalla. In addition, user has an option to filter suggesting information or make it more specified.²⁸ In essence, Wikitude is a real time virtual guide on a particular territory. For example, a tourist can get information of the Eiffel tower by Wikitude. In 2012, the company launched Wikitude SDK, utility software with the possibilities for producing digital layers for AR technologies. In other words, developers can produce their own AR layer for the Wikitude. Thus, Wikitude is one of the most open-source AR application for supplementing and editing information by others developers and users. Consequently, such approach produces a dynamic and vast data for application.

AugSatNav

AugSatNav is a satellite navigator based on the AR technology. Instead of classical navigation by map, this application scans and displays a real location by using smartphone's camera and then layers a white line to the necessary final destination. Moreover, the application is able to calculate and correct direction on real time based on the user's movement in case if he turns in a wrong direction. This application is differing from others navigating applications as it is not abstract map but user's personal guide during his path from one point to another.

Arart

Arart is another AR application, which enhanced paintings and drawings by the real time animations. Thus, by scanning the painting "Girl with a pearl earring" by Johannes Vermeer user sees how girl is turning her eyes away through his smartphone. Then developers extended capabilities of application by adding interactive layers of simulating spinning records of Radiohead's CD cover. Probably, in the near future, creators of Arart application will make possible to add creative and interactive digital layers for real art object in a public space.

Aforementioned subchapter provides a brief overview of current AR applications. It has to be mentioned that the scope of the AR applications is broad and developers intend to impose other functions of AR

²⁶ 'Blippar Acquires Layar, Creating World's Largest AR Userbase' (*Marketwire*, 2017) <<http://www.marketwired.com/press-release/blippar-acquires-layar-creating-worlds-largest-ar-userbase-1921802.htm>> accessed 19 January 2017.

²⁷ 'A New Way to Search the Web?' (*Mail Online*, 2017) <<http://www.dailymail.co.uk/sciencetech/article-2993742/Forget-words-Blippar-app-lets-search-web-using-smartphone-CAMERA.html#ixzz4JmjjBanX>> accessed 19 January 2017.

²⁸ '10 Of The Best Android Apps' (*TrustedReviews*, 2017) <http://www.trustedreviews.com/opinions/10-of-the-best-android-apps_Page-5> accessed 19 January 2017.

applications for everyday using. According to the popularity of the Pokémon Go, people are ready for such new and progressive technology whence the amount of various AR application will be raised. Therefore, there are many legal questions conserving commerce, copyright, patent, trademark, database and privacy will be accruing in the time coming.

2.3 SUBCHAPTER: < COPYRIGHTABILITY OF AUGMENTED REALITY APPLICATIONS' CONTENT >

This subchapter will focus on one of the copyright issue, which can be raised with AR applications. Particularly, we will investigate the copyrightability of the AR content in case if this content remarkably alters the real-world object though the such criteria as an existence of tangible form and creativity.

According to the Berne Convention,²⁹ literary work can obtain a copyright protection if it is original and fixed in a tangible form. From that perspective, AR has risks of struggling with several issues.

It is clear that AR content is fixed in the tangible mediums such as smartphones, tablets and other dedicated devices. Therefore, AR content can obtain a copyright protection in case if the digital data on a hard disk of tangible medium and it can be displayed on the screen. Consequently, keeping an AR layer or image in software and projecting it on the real object, though device is sufficient to obtain a copyright protection.

With another criterion relating to obtaining a copyright protection as originality is not so evident and clean in the matter of the AR technologies' specification. The content can be protected under the copyright in case if the author of the content invests enough contributions, which are expressing his artistic or aesthetic idea of the work. Taking into account that in most cases AR content is connected with an object in the real world, the level of creativity will depend on the significant alteration of the real object. In other words, the originality of the digital content is defined by the author's intent, whether to alter or enhance the initial copyrighted work. Hence, there is a risk of arising a blurred line between original and derivative content.

AugSatNav and Arart applications are good illustrations of the above-mentioned duality of AR content's copyrightability. Hence, the content of many applications with utilitarian function like AugSatNav cannot be copyrightable because they are used as useful tools for the fulfillment of human needs rather than artistic work. Thus, a white guideline in AugSatNav is classified as a symbol, which provides direction to users; therefore, it does not meet the copyright requirement of creativity. Notwithstanding, there can be a little chance for copyright protection in case if such layout will be expressed in a more creative way, but it will be hard to obtain a copyright protection as the main purpose of this guideline is supposed to provide the utilitarian function of the application.

²⁹ Article 2 Bern Convention for the Protection of Literary and Artistic Works' (1986).

On the other hand, the AR content of such software like Arart can be copyrightable as the idea is original and there is enough contribution of creativity. The before mentioned statement is confirmed by the fact that there was an animation artist who was involved in creating layered digital data and it had significantly changed the appearance of the original work.³⁰ At the same time, the Arart's content can be classified as a derivative content because the artistic conception is based on the alteration of the original object by layering digital data on it. However, concept of derivative works is mentioned in the Berne Convention and in legislations of the countries with the common law system. In Europe, such concept is legislated as exceptions in the Software³¹ and Database Directives³² and it is non-harmonized among EU MS. The discussion of AR content as a derivative work will be investigated further in the next subchapter.

2.4 SUBCHAPTER: < POTENTIAL RISKS OF COPYRIGHT INFRINGEMENTS BY AUGMENTED REALITY APPLICATIONS >

This subchapter will be dedicated to the AR content, which cannot be protected as a subject of the copyright legislation because it is very similar to the original object. In this scenario, we will analyze how AR applications will correlate with the exclusive rights of the rightholders of the original work. Then we will try to provide several exceptions, which can be possible in this case.

The investigation in the previous subchapter has demonstrated that the copyrightability of AR content is an ambiguous issue, therefore there are more probability of AR contents' qualification as duplication or supplementation to the existing copyrighted work. Thus, it can arise risks of copyright infringements.

The first risk of copyright infringement concerns about the ability of many AR applications to take pictures or record videos of copyrighted works. However, the Infosoc Directive does not provide a distinctive conception of 'reproduction' as itself and does not specify conditions of limitations.

Thus, according to the Article 2 of Infosoc Directive, an author has an exclusive right to directly and indirectly authorize or prohibit any temporary, permanent reproduction, entirely or partly, by any means and in any form. However, the broad scope of the abovementioned article provokes uncertainties in relation with the Article 5, which provides exceptions to reproduce copyright works without authorization of a copyright holder in case of transient or incidental integral and essential part of a technological process, which is proposed for a transmission in a network between third parties by an intermediary or in case if a lawful use of work, which has no independent economic significance. Thus, there are no provisions concerning the content of a work, which can be involved into transmission actions such as browsing caching or routing. The clearness in this issue can be founded in the Infopag case, which

³⁰ 'ARART' (*Arart.info*, 2017) <<http://arart.info/>> accessed 19 January 2017.

³¹ Directive on the legal protection of computer programs [2009] OJ 2 111/17/2

³² Directive on the legal protection of databases [1996] OJ 2 77/21/25

constitutes that the copyright infringement will be in case if the reproductive part of the copyrighted work contains the authors' own intellectual creation³³.

In connection with the AR application, it means that exclusion will take place only in condition if the reproduction of the copyrighted work will be only for technical purposes without including the authors' creativity elements of the work. Otherwise, the consent for reproduction by AR technologies is necessary from the author of copyrighted work.

Another issue concerning right of reproduction is related to the specific feature of AR technologies, which provides to artists a possibility for transforming certain existing copyrighted works from two dimensions to three dimensions. Such situations fall into the scope of the right of reproduction and therefore the alteration of the copyrighted work's medium without any originality constitutes the copyright infringement.³⁴

The second risk of IP infringement is relating of adding or altering elements to other copyrighted works because AR technology provides an extension of self-expression's boundaries to other artists. As it was mentioned before, such layers can be classified as derivative works.

The Berne Convention does not explicitly mention about the derivative works, however the Article 2 of the Berne Convention listed some forms of derivative works such as translations, adaptations, arrangements of music and other alterations of a literary or artistic work, which shall be protected as original works without prejudice to the copyright.

On the EU level, adaptation, translation and transformation are only specified in the context of the software and databases. There was an attempt to harmonize this issue by the Foundation of Information Policy Research (FIPR), which included the definition of the derivative work in the guidance to the implementing the EU Copyright Directive.³⁵ The FIPR set two requirements for the classification a work as a derivative work. Firstly, the derivative work should be based on the prior work. Secondly, the derivative work should transform, recast or adapt the pre-existing work. It is important to notice, that concept of the derivative work will be related to the original copyrighted works, not to the works that have already been in the public domain.³⁶

However, the regulation of before mentioned original work's deviations is still left to the national legislations of the MS. Thus, the French Intellectual Property Code has the similar conception. Although the French legislators defined it as a "composite work" (*oeuvre composite*), it constitutes the similar meaning of the "derivative works" as in the Berne Convention and in common law. In the article L 113-2 of the French Intellectual Property Code, a "composite work" specified as "the new work in a pre-existing

³³ C-5/08 Infopaq International A/S v Danske Dagblades Forening, [2009]

³⁴ C-419/13 Art & Allposters International BV v Stichting Pictoright, [2015]

³⁵ Ian Brown, *Introduction to: Implementing the EU Copyright Directive* (2013) <<http://www.fipr.org/copyright/guide/eucd-guide.pdf>> accessed 28 February 2017.

³⁶ Ave-Liis Saluveer, 'The concept of derivative works under the European Copyright Law in relation to the digital era: free and open source software licensing' (Master of Law, Lund University 2014).

work without the collaboration of its author".³⁷ Nevertheless, France is one of the few countries, which includes such conception.

Generally, establishing the concept and definition on the EU level will have a positive influence of the legislation such phenomenal as AR technologies. In practice, such creative AR content as Arart 's digital layers will be classified as a derivative work. Such classification and legislation of original AR content can stimulate a creativity among other artists for producing new works by using the AR technologies.

The capacity of some AR devices for images dissemination of copyrighted buildings or sculptures though the Internet arises another copyright issue concerning AR technologies and the author's right of communication to the public. According to the Article 3 of Infosoc Directive and series of preliminary cases³⁸, the interpretation of definition of the 'communication to the public' consists of the two elements, which are the 'act of communication' and 'new public'. Under 'act of communication', legislators and CJEU interpreted as a new source for accessing to the copyrighted work to a new public. Whereas, a 'new public' is a public that has not been taken into consideration by the rightholders at the time of authorizing the initial communication to the public.

Consider to the AR content, most of them are displayed on the device for private use and there will not be a copyright infringement. However, the capacity of AR applications is able to display and perform to a group of people. For instance, there are some questionable points concerning 3DS AR tattoos, which are powered by Nintendo.³⁹ An above-mentioned tattoo in the real world looks like a simple square with code. However, the special 3DS device the tattoo transforms into three-dimension moving model. Such AR tattoo can be for private use as well, it is possible to infringe the right of communication to public. Therefore, there has been raised an issue about copyright license of such tattoo, which should be granted by the author.

In addition, there are some doubts emerging in context of the possibility of such AR applications as Blippar and Wikitude for providing hyperlinks to the copyrighted works. In accordance to the Svensson case⁴⁰, a hyperlinking establishes an act of communication as it makes possible to get access to the copyrighted work from other sources, which is not expected by the authorization of copyright holder.

³⁷ French Intellectual Property Code (*Code de la Propriété Intellectuelle*, 2016)

<https://www.legifrance.gouv.fr/content/download/1959/13723/version/3/file/Code_35.pdf > accessed 19 January 2017.

³⁸ C-306/05 Sociedad General de Autores y Editores de España (SGAE) tegen Rafael Hoteles SA., [2006]

C-403/08 Football Association Premier League Ltd and Others v QC Leisure and Others [2011]

C-351/12 OSA - Ochranný svaz autorský pro práva k dílům hudebním o.s. v Léčebné lázně Mariánské Lázně a.s. [2014]

C-348/13 BestWater International GmbH v Michael Mebes en Stefan Potsch. [2014]

C-151/15 Sociedade Portuguesa de Autores CRL v Ministério Público and Others [2015]

C-117/15 Reha Training Gesellschaft für Sport- und Unfallrehabilitation mbH v Gesellschaft für musikalische Aufführungs- und mechanische Vervielfältigungsrechte (GEMA) [2016]

³⁹ Matt Rosoff, 'This Guy Got a Nintendo 3DS Augmented Reality Tattoo -- And It Works' (*Business Insider*, 2017)

<<http://www.businessinsider.com/this-guy-got-a-nintendo-3ds-augmented-reality-tattoo-and-it-works-2011-5?international=true&r=US&IR=T>> accessed 28 February 2017.

⁴⁰ C-466/12 Nils Svensson and Others v Retriever Sverige AB., [2014]

Therefore, there will be a risk of infringement of the right of communication to public by the AR applications and it will be problematic to prevent infringements in the near future, as there are no guarantees and proper techniques to control displaying and performing AR content in a proper way.

On the other hand, as it was previously mentioned, the Article 5 (3) of InfoSoc Directive enumerates a list of exceptions and limitations to the rights of reproduction, distribution and communication to the public, which allows using copyrighted works by AR applications without authorization and compensation to the rightholders. However, the following list is not mandatory. Therefore, MS are freely able to choose what particular exceptions and limitations can be implemented to national legislations according to their national legal traditions for such proposes as science, education, uses in administrative and judicial proceeding, public security uses, for the benefit of public institutions and archives, news reporting and for the using by people with disabilities.⁴¹ The unrestricted nature of exceptions and limitations provoke a non-harmonization among MS and raise a chilling effect of legislation of the new technologies such as AR technologies.

In the following chapters, we will focus on the exception concerning on using of copyrighted works such as architectures and sculptures that made to be located permanently in public places. In reason that this exception is one of the most non-harmonized and has many variations of implementation among EU countries. Moreover, the AR technologies' specific feature, such as the ability to interact virtual and real objects, raised the question concerning the infringement of copyrighted works in the public places, which will be actual in the near future.

2.5 SUBCHAPTER: <CONCLUSION>

By analyzing the core of the AR technology and applications, it can be assumed that this is a brand new way of perceiving and presentation of information. The further development of AR will bring new possibilities and improvements in many spheres in our lives. However, AR's specific features require an attention for creating the legal framework in the nearest time because it has already caused several controversial questions concerning the definition and copyrightability of the AR technologies, which can form a grey area of law.

3 CHAPTER: < FREEDOM OF PANORAMA >

The previous chapter discusses the findings, which emerged from the current and potential copyright issues by AR technologies. The following part of the Master Thesis will focus on the one particular copyright issue concerning freedom of panorama. The choice is based on subject matter of AR technology,

⁴¹ Eleonora Rosati, 'Copyright in the EU: In Search of (In) Flexibilities' (*Papers.ssrn.com*, 2017) <https://papers.ssrn.com/sol3/papers2.cfm?abstract_id=2388307> accessed 28 February 2017.

which layers data on different real objects. Therefore, the possibility that AR applications will overlay digital contents on architectural and sculptural copyrighted works, which are permanently located in public place, is highly predictable. Consequently, a unified legal framework should be established on the different levels of legislations in purpose to avoid the appearance of grey area concerning the exploitation of architectural and sculptural works in public place by AR applications. Before we will make an attempt of regulation AR technology within a legal framework of freedom of panorama, we will analyze a current regulation of freedom of panorama.

Firstly, the international legal framework of freedom of panorama will be investigated by the international documents such as Berne Convention for the protection of literary and artistic works in 1886 (Berne Convention). Afterwards, there will be analyzed the current legislation concerning freedom of panorama on the EU level in general for understanding the different implementations of the above-mentioned copyright exception by MS. In the third subchapter, the two particular legislations of Portugal and Sweden will be considered. The choice of these countries is based on the controversial approach from the perspective of the recent case in Swedish Supreme Court (Sverige ek.för. (BUS) vs Wikimedia Sverige (Case nr Ö 849-15))⁴² and on Portuguese copyright law which allows the use of works permanently installed at public locations.

3.1 SUBCHAPTER: < FREEDOM OF PANORAMA ON THE INTERNALITONAL LEVEL >

The Berne Convention does not have provisions, which is literally mentioned the definition of freedom of panorama as itself. However, the scope of Convention provides an implied framework for a right of taking and reusing photos and video of sculptures and buildings, which are permanently located in public places without authorization of copyright holder by several articles such as Articles 2, 9 and 10 bis.

Article 10 bis (2) allows to take and use photos or video of copyrighted works for the reporting purposes by means of photos or videos without consent of the authors or copyright holder, which is substantially similar to the definition of freedom of panorama.

Article 2(1) provides a separate copyright protection to artistic works such as building, sculptures, cinematographic and photographic works, which are tangible and original.⁴³ However, concerning two last kinds of artistic works, the Berne Convention has not specify the content of artistic works. In this connection, it can be assumed the absence of distinction between taking and reusing photos and videos of copyrighted or non-copyrighted objects and whether for commercial and non-commercial purpose.⁴⁴ Therefore, the Berne Convention does not prohibit taking and reusing photos or video of copyrighted

⁴² For more information, see subchapter 3.3 "Legislation of Portugal and Sweden"

⁴³ Article 2 Bern Convention for the Protection of Literary and Artistic Works' (1986).

⁴⁴ Alifia Qonita Sudharto, 'Copyright Law and The Freedom of Panorama: The Right to Commercialize Photographs of Protected Works' (Master of Laws, Victoria University of Wellington 2014).

artistic works, which are permanently located in public places without authorization of the copyright owners of such works.

In addition, under the Article 2(3) of the Berne Convention, photos and video of copyrighted artistic works, which are permanently located in public places can be classified as adaptation, reproduction or derivative work⁴⁵. As it was mentioned in the previous chapter, such kinds of works have the equal protection with original works on condition of obtaining a consent from the author of the original work. One of the example of interpretation of photo with the building in public place as a derivative works can be found in the Pagano case. In this case, the court grant a copyright protection to the photo of the New York Public Library as derivative work because the author put a certain effort and creativity for taking the architectural work with people in various posture and in particular lighting.⁴⁶ Consequently, such classification of photos and video of copyrighted artistic works, which are permanently located in public places, provides opportunities for making profit from his photos or video with the author's agreement of original copyrighted work.⁴⁷

The Article 9 can provide the framework for regulation of taking and reusing photos and video of copyrighted artistic works, which are permanently located in public places without authorization in case if it can be assumed as a reproduction. Thus, Article 9(2) establish three conditions, which permit to produce reproduction of copyrighted works without author's authorization. Freedom of panorama has a reasonable foundation to satisfy all three requirements of so-called three-step test. The act of taking and reusing photos and video of buildings and sculptures, which are permanently located in public places, can be related to "certain special case", which is the first condition of three-step test. Furthermore, freedom of panorama does not violate the normal exploitation of the work, which is a second condition of the three-step test. In the reason that taking and reusing photos and video of copyrighted works does not restricted any authors' rights of such works. Moreover, freedom of panorama also satisfy the third condition "not reasonably prejudice the legitimate interests of the author" because it does not deprive commercial profits from the authors of building or sculptures, which are permanently located in public places. Therefore, the Article 9 is applicable as the framework for the further implementation to the national legislations in aim to the regulate cases concerning taking and reusing photos and video of buildings and sculptures, which are permanently located in public places. In the further subchapter, the application of three-step test will be analyzed in cases by the scope Swedish and Portuguese legislations.

Thus, by analyzing several articles of the Berne Convention, we can say that the framework for regulation freedom of panorama slightly existed on the international level. However, as it does not explicitly mention

⁴⁵ Ibid

⁴⁶ Co 234 F 963 Pagano, et al v Chas Beseler [1916].

⁴⁷ Alifia Qonita Sudharto, 'Copyright Law and The Freedom of Panorama: The Right to Commercialize Photographs of Protected Works' (Master of Laws, Victoria University of Wellington 2014).

in provision, the Convention provokes several uncertainties for regulation on the political unions and national legislations levels. As the consequence, the different way of implementation by parties has a risk to evoke non-harmonization concerning taking and reusing photos and video of buildings and sculptures, which are permanently located in public places and negatively effect to the fast-development technology and ways of communications.

One of the reason why Berne Convention had not regulated freedom of panorama was that the latest amendments were made 38 years ago⁴⁸. At that time, portable technologies for taking pictures were available only for newspapers and magazines. Therefore, the risk of infringement by taking and reusing pictures of buildings or sculptures by a large amount of people were at the minimum level. In addition, the risk of circulation was inconspicuous as the Internet were not generally accessible as well. Therefore, there was no need to take into account and include provisions concerning freedom of panorama at that time.

Thereupon, the Berne Convention should be reconsidered in a light of fast growing and incidence of technical devices, which arise new copyright issues. Obviously, it is challenging to create a progressive and updated legal framework for regulation a development of new technologies on international level. In the reason that it takes a lot of time for implementation and enforcement among members whether technologies develop rapidly at the current time. However, such copyright issue as freedom of panorama should be directly included in the Berne Convention on the point that the practice of taking and reusing photographs and video of buildings and sculptures in public places became more and more wide-spreading and a unified status of this question is necessary to establish on the international level. Even more, the regulation of freedom of panorama has already legislated differently on the national level among some members of the Berne Convention and international setting certainty concerning freedom of panorama will contribute a harmonization between all countries.

3.2 SUBCHAPTER: < EU LEGISLATION >

As it was mentioned in the previous chapter, the exhaustive list of various copyright exceptions and limitations is enumerated in the InfoSoc Directive.⁴⁹ Like the Berne Convention, the “freedom of panorama” was not literally noticed in InfoSoc Directive. However, the Article 5(3) h provides a copyright exception, which allows temporary acts of reproduction with architecture or sculpture works, which are permanently in the public places. As it previously discussed, the list of exceptions and limitations by Article 5 (3) are not binding to MS and the Directive authorizes to national legislators to choose any limitations and exceptions from the list for the further implementation in accordance with their own region copyright

⁴⁸ The last amended was in September 28, 1979

⁴⁹ Directive on the harmonization of certain aspects of copyright and related rights in the information society [2001] OJ 2 167 /16

legislation. Alongside of the optional feature of this list, the Directive has not imposed strict obligations concerning of implementation into nation regime.

As it follows though, such optional nature of exceptions and limitations is negatively affected on the harmonization of freedom of panorama among EU countries. The different interpretations of the copyright exception concerning of taking and reusing photos and video of the copyrighted sculptures and building in public places by the national legislations provides uncertainty for multinational companies, developers and users of the cross-border AR technologies and applications.

Thereupon, the free choice regarding on implementation of exceptions and limitations by MS produces several regimes of freedom of panorama in EU countries. Some national legislations have not provisions concerning the abovementioned copyright exception at all, while others have interpreted the Article 5(3) h in their own ways. For example, the UK Copyright, Design and Patents Act 1988 included one of the broadest definition of freedom of panorama for the reason that the scope of copyright exception extended to the buildings, sculptures and works of artistic craftsmanship which were permanently placed in a public place or in premises open to the public.⁵⁰ That is to say, English copyright law equates museums, galleries and exhibitions to public space. Other countries like Germany, Lithuania and Slovenia include the copyright exception on taking and reusing photographs or video of buildings and sculptures in public spaces without incorporating public interiors. Danish and Swedish provisions of national legislations contain freedom of panorama as a copyright exception only to the buildings. Other EU members like Bulgaria, Romania, Latvia have implemented freedom of panorama only for non-commercial proposes. Conversely, such countries like Italy, Greece and Luxembourg have no freedom of panorama in their legislation at all. This means the author's consent is required for taking and reusing copyrighted work in public place.

As explained in the previous pages, it is clear that the present legal framework concerning freedom of panorama invokes different interpretations and implementations of Article 5 (3) h in several ways. Whereas, the following situation produces ambiguity among EU countries regarding freedom of panorama legislation, which is negatively reflected on the harmonization and cross-border relationships in the era of the digitalization and the Internet. Such situation is mostly affected on education, technical development, public policy and economic spheres in EU.

One of the drawback of such mosaic freedom of panorama's legislation can be found in the Oldenburg case⁵¹. The famous sculptor Claes Oldenburg sent a DMCA notice for removing pictures of his sculptures, which were permanently on the public space in many countries from the Wikipedia website. This case raised disputes concerning grounds of a claim because some sculptures were placed in countries where

⁵¹ 'DMCA Oldenburg - Wikimedia Foundation' (*Wikimediafoundation.org*, 2017)
<https://wikimediafoundation.org/wiki/DMCA_Oldenburg> accessed 19 January 2017.

freedom of panorama was accepted such as Spain, the United Kingdom, Germany, and the Netherlands. However, Oldenburg declared that despite of the EU legislation of some countries, the copyright infringement was occurred under US copyright law, which he usually used for his works' protection. Finally, Wikipedia complied with the claim and deleted 59 images with the Oldenburg's works. Apparently, the lack of finance and staff resources forced Wikipedia to comply with the claim, although they could legally refuse to remove some images due to the territory principle of copyright. That is to say, US copyright law applies only for infringements, which occurs on a territory of the USA.

Regardless that the abovementioned case is based on the USA copyright law, it illustrates what legal issues can raise if the similar case occurs in the EU, where the regimes of freedom of panorama are remarkably different between MS. Obviously, such situation negatively reflects on EU harmonization and creates obstacles for the free movement of goods across the internal market.⁵² At the present moment, the jurisdiction in exercising of freedom of panorama is intending to be solved in accordance with the Brussels I Directive⁵³ and Rome II Directive⁵⁴.

Thus under articles 4 and 7(2) of Brussels I Directive, the jurisdiction of the copyrighted cases defines to rightholders to bring a claim in place whether the defendant is domiciled or in where the event of infringement occurs. Hence, there are some issues that will arise in the question of applying the territoriality principle on the online copyright infringement as it is difficult to define the place where the damage occurs and under what jurisdiction it should be proceeding.

By analyzing several ruling cases by the CJEU concerning cross-border copyright infringements, we can insist that such interpretation of Brussels I Directive provokes more uncertainties concerning interaction of the different regimes of freedom of panorama among MS. Consequently, the current application of the abovementioned Directive brings obstacles to users and companies in exercising freedom of panorama in courtiers, where this corresponding copyright exception has been implemented into national legislations.

The first hallmark case concerning jurisdiction of the online copyrighted infringement was Peter Pinckney v KDG Mediatech AG⁵⁵. In this case, the French composer and performer sued the Austrian company for producing compact disks and largely distributing it to the UK market through the web site. The claimant insisted on the proceeding under French jurisdiction. His statement was based on the fact that he can freely get the access from France to the web-site, where his songs have been on sale without his authorization.

⁵² Joshua Lobert and Bianca Isaias, Karel Bernardi, Giuseppe Mazziotti, Alberto Alemanno, Lamin Khadar, 'The EU Public Interest Clinic and Wikimedia Present: Extending Freedom of Panorama in Europe' SSRN Electronic Journal <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2602683>.

⁵³ Council Regulation (EC) on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters [2001] OJ 2 012/5

⁵⁴ Regulation (EC) on the law applicable to non-contractual obligations (Rome II) [2007] OJ 2 199/45/6

⁵⁵ C-170/12 Peter Pinckney v KDG Mediatech AG [2013]

Whereas, KDG Mediatech AG states that the jurisdiction of case proceeding should be only in courts where the place of the defendant's domicile (Austria) or the place where the infringement was committed (UK). In a long run, the CJEU held that, based on the Article 5(3) of Brussel I Directive, the claimant can bring an action to the court of every Member State where the damage may occur. Therefore, regardless of whether the activity of the website was directed or not, the copyright infringement appears in any EU country where the website provides an online access to the unauthorized content.

The other case, *Pez Hejduk v EnergieAgentur NRW GmH*⁵⁶, concerns unauthorized publishing images of French photographer, Ms Hejduk, by the Austrian company, EnergieAgentur, on the German domain. In this case, the CJEU adhere to the same position that the ability of website for providing an access to the unauthorized copyrighted work constitutes applicability of the territorial principle in accordance with the Article 5 of Brussel Directive. Consequently, this means that the French plaintiff may claim a compensation for infringement in every country where access to the copyrighted work is possible.

Another source for determination a jurisdiction of cross-border IP infringements disputes is the Regulation on the law applicable to non-contractual obligations (Rome II).⁵⁷ The scope of the Article 8(1) of the Rome II states that the proceeding concerning IP infringements in the MS where protection is claimed. Therefore, in the relation of freedom of panorama, such provision also provides a risk for users or companies of MS where they are domiciled or conduct business even the national legislation has already implemented freedom of panorama.

In general, such settled position of the CJEU concerning the jurisdiction of the online copyright infringement provides a chilling effect of services and information's free flow, which is a pillar of the Digital Single Market reform. In connection with the AR technology, such mosaic freedom of panorama's legislation of EU provokes obstacles for developers of AR applications. This means that they should adopt their product in accordance with the legislations of each MS in order to avoid copyright infringements.

Moreover, there are other several possibilities, which arise difficulties with attempting of harmonization freedom of panorama on the EU level. Thus, such legal instruments as legislation concerning trademarks, national heritage and other national provisions provided a risk of derogating freedom of panorama on the EU level.

There was a successful example of preventing the commercial use of building's image though the trademark law. Thus, the rightholders of the world wide famous Opera House in Australia registered the exact image of the building as the shaped trademark in order to restrict the unauthorized use. Henceforth,

⁵⁶ C-441/13 *Pez Hejduk v EnergieAgentur NRW GmH* [2015]

⁵⁷ Regulation (EC) on the law applicable to non-contractual obligations (Rome II) [2007] OJ 2 199/45/6

the uploading a shot of the Opera House by photographer Simon Phipps on website of the microstock photography agency had been rejected in the reason of trademark infringement.⁵⁸

The example of the restriction of freedom of panorama through the cultural heritage law can be found in the Article 1 of the Italian Code of Cultural and Landscape Heritage⁵⁹. Under the scope of code, the national Ministry for Cultural Heritage and Activities is authorized to license reproductions of public architectures and sculptures depending on its purpose and manner. Moreover, the Ministry is competent to deter a fee for taking and reusing images and video of the landmarks for commercial purposes. There were several examples concerning the restriction of the using Italian sculptures and monuments in commercial purpose. Thus, under the Wikipedia's Wiki Loves Monuments project photographers were not able to upload images of the Italian landmarks before obtaining authorization from the Italian government.⁶⁰

Another approach that can be used for the circumventing freedom of panorama is the ruling of the French Supreme Court (Cour de Cassation), which states that the owner of the property is competent to restrict to a third party for exploitation of his real state's images if it cause an abnormal disturbance to him. However, the ruling has not granted the exclusive rights on these images to the owner. Such definition of 'abnormal disturbance' can be applied for the restriction of freedom of panorama in certain situations. Consequently, based on the decision of the French Supreme Court, the French Administrative Supreme Court ruled that right to ban taking pictures is extended to the museums' objects, which indirectly states a restriction of using images of public property.⁶¹

Therefore, the current EU legislation does not promote the harmonization of freedom of panorama among MS. There should be provided more fundamental approach for preventing any loopholes and grey areas in case of the establishing freedom of panorama as a mandatory copyright exception to the EU countries.

3.3 SUBCHAPTER: < LEGISLATIONS OF PORTUGAL AND SWEDEN >

In the following subchapter, we will investigate legislations of two EU countries with the different points of view concerning freedom of panorama exception. Firstly, the Portuguese copyright law will be analyzed as it has the most flexible implementation of the list of limitation and exceptions from the InfoSoc

⁵⁸ 'Michael Atkins - Seattle Trademark Lawyer - Rock and Roll Hall of Fame Redux: Can I Sell My Photo of the Sydney Opera House?' (*Seattletrademarklawyer.com*, 2017) <<http://seattletrademarklawyer.com/blog/2007/6/10/rock-and-roll-hall-of-fame-redux-can-i-sell-my-photo-of-the-.html>> accessed 28 February 2017.

⁵⁹ Article 1, Code of the Cultural and Landscape Heritage, Legis. Decree No. 42 of 22 Jan. 2004(It.), <http://www.unesco.org/culture/natlaws/media/pdf/italy/it_cult_landscapeheritge2004_engtof.pdf> accessed 28 February 2017

⁶⁰ Joshua Lobert and Bianca Isaias, Karel Bernardi, Giuseppe Mazziotti, Alberto Alemanno, Lamin Khadar, 'The EU Public Interest Clinic and Wikimedia Present: Extending Freedom of Panorama in Europe' SSRN Electronic Journal <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2602683>.

⁶¹ Ibid

Directive. Portuguese legislations provide all exclusive rights to the exceptions and limitations. Thus, Portuguese copyright legal framework allows transforming copyrighted works without author's consent, which is important in context with the AR technologies. Such flexible provisions go further than other provisions of EU legislations and it is similar to the American fair use doctrine. We consider, that such progressive approach is one of the best solution for copyright implementation in context of the fast-growing pace of the technological progress at the present time. On point that the Portuguese legislation achieved a balance between author's rights and users' rights for the culture and education purposes. On the one hand, such approach as taking fair use principle and adopting it in accordance with the national copyright law traditions allows to evade the risk and drawback of the USA law system such as lack of predictability, threat to the legal security, on the other hand, it provides flexibility and technological neutrality. There were several examples of applying freedom of panorama as a copyright exception for the cultural and educational purpose in the Portugal. For instance, within of the project "Hotel Globo" there were images depicting and distributing during the exhibition of the contemporary architectures works⁶². Moreover, Wikipedia pages contain several images of the artistic works that are permanently placed in public places. Thus, the Portuguese Wikipedia page about Joana de Vasconcelos is supported by the image of her art installation "Nectar" in the front of the Berardo Collection Museum⁶³.

On contrast, national courts of several MS, which have not such flexible implementation of the list of exceptions and limitations as in Portugal, had faced the problem concerning the negative impact of the inflexible list of limitation and exception on the social, economic and cultural needs of the society. In such cases as *Dior v Evora*, *Germania3*, *Scientology v XS4ALL*, *Google Bildersuche*, *Saif v Google France*, judges applied a variety of other legal doctrines in order to create a space for the interpretation of "free uses", which is not recognized in the copyright law.⁶⁴

After investigating Portuguese copyright legislation, we will give a consideration to Swedish legislation and to the recent case «Sverige ek.för». (BUS) vs Wikimedia Sverige (Case nr Ö 849-15). Remarkably, Swedish copyright law has a provision concerning freedom of panorama. However, the Swedish Supreme Court held that the activity of such non-commercial online database as Wikipedia could not be related to freedom of panorama exception. The decision was find in favor of artists and can negatively affected on the providing and making a digital content to the public for the educational, science and cultural reasons⁶⁵.

⁶²Teresa Nobre, 'Freedom of Panorama in Portugal' (2017) <http://www.communia-association.org/wp-content/uploads/2016/06/BCS_Communia_FoP_study.pdf> accessed 19 January 2017.

⁶³ Ibid

⁶⁴ P. Bernt Hugenholtz and Martin R.F. Senftleben, Fair use in Europe. In search of flexibilities (University of Amsterdam 2011) <<https://www.google.nl/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKewiS9srI47XSAhWEnRoKHRRReDwkQFggrMAA&url=https%3A%2F%2Fwww.ivir.nl%2Fpublicaties%2Fdownload%2FFair%2520Use%2520Report%2520PUB.pdf&usg=AFQjCNF79wp1qK6lx7iAcxs3yE-188R7Hw>> accessed 1 March 2017.

⁶⁵Johan Norderyd, Elna Jonsson, 'Swedish Supreme Court Issues Decision Regarding the Freedom of Panorama - Kluwer Copyright Blog' (*Kluwer Copyright Blog*, 2017) <<http://kluwercopyrightblog.com/2016/05/09/swedish-supreme-court-issues-decision-regarding-freedom-panorama/>> accessed 19 January 2017.

However, in context of digitalization, the Swedish Supreme Court's decision seems outdated and can be negatively affected on the other similar cases in EU. In addition, we will compare Portuguese and Swedish interpretations of the three - step test, which is used for establishing the fair use of copyrighted work without author's authorization⁶⁶. Like with a list of exemptions and limitations, MS are authorized to decide whether or not to implement this test in accordance with their domestic legislations. However, the three-step test can be applied by national courts regardless of it incorporating into national law. Thus, Portuguese legislators partially adopted the three-step test and applied it in a flexible way. Whereas Sweden does not have provision concerning three-step test, however the judge strictly applied these test in case «Sverige ek.för». (BUS) vs Wikimedia Sverige. Therefore, a different approach regarding three - step test in these countries is a stumbling block of a controversial position concerning freedom of panorama under two national's legislations.

Legislation of Portugal

Portuguese copyright legal framework is provided by the Code of Author's Rights and Neighboring Rights of 14 March 1985 with last amendments of 5 June 2015. Provision concerning freedom of panorama can be found in article 75 (2) (q) of Chapter II of Title II.⁶⁷ Notably, like the Infosoc Directive, the Portuguese Code has not particular the definition "freedom of panorama". There is a term "free use" instead of it in the Chapter II, which regulates author's rights of copyrighted works. Currently, there are no cases and legal literatures about the abovementioned copyright exception. Therefore, the analysis of legal framework provisions provides on an overall regulating of freedom of panorama's conception in Portugal. First, the article 75 provides a list of works, which are applicable for using copyrighted works without author's authorization. The represented list can be interpreted very broadly as there are no limitations for categories of works. The only criteria, which is mentioned that these works should be placed permanently in public places. Therefore, the definition "works", the provision equally includes two and three-dimensional works. Especially, the article 75 (2) (q) emphasizes on two kinds of artistic works such as architecture or sculpture. However, they had been noticed as examples. Alternatively, there will be an explicit provision concerning limitation of objects.

Moreover, Portuguese's legislators do not put any limitations in definitions of "public place" and this definition can be understood extensively. In this case, public place can be interpreted as a publicly accessible place with or without charging people for admission fee. Therefore, public interiors such as exhibitions and museums are also covered under Portuguese definition of "public place".

⁶⁶ Martin Senftleben, 'The International Three-Step Test' (2010) <<https://www.jipitec.eu/issues/jipitec-1-2-2010/2605/JIPITEC%202%20-%20Senftleben-Three%20Step%20Test.pdf>> accessed 19 January 2017.

⁶⁷ Teresa Nobre, 'Freedom of Panorama in Portugal' (2017) <http://www.communia-association.org/wp-content/uploads/2016/06/BCS_Communia_FoP_study.pdf> accessed 19 January 2017.

Like many others EU legislations, Portuguese legislation has not limitations concerning duration of copyrighted work, which is permanently placed in a public area. Generally accepted that the author of work determines the duration of the exhibition in a public place whether it will be a limited or unlimited period of time. Therefore, the definition of “permanently” is qualified by author’s decision. However, we consider that these provisions do not regulate duration of ephemeral artistic objects like sand or snow sculptures as they, obviously, have inevitable duration and do not depend on author.

The implementation of the three - step test is another reason why Portuguese copyright legislation can be conceded as one of the most progressive for freedom of panorama in the EU. Thus, Portuguese Code has incorporated only two of three step⁶⁸, which are suggested by the Berne Convention⁶⁹ and InfoSoc Directive⁷⁰. The first step of the abovementioned test was skipped by the reason that “certain special cases” were unnecessary as the national legislation already had the same provision. Other two steps that are “no conflict with normal exploitation” and “no unreasonable prejudice” have been incorporated into Portuguese copyright legislation as original. By skipping the first step of the three-step test, the Portuguese legislators preclude possibilities of interpretation such abstract criteria by judges, which used to apply the three-step test on a strict way. Therefore, the flexibility of the Portuguese copyright law is more appropriate for regulating the copyright system in aim to keep a balance between different parts and to remain it up-to-date with the evolving technology.

Legislation of Sweden

The Sweden Act on Copyright on literary and artistic works of 5 March 2013 has also provisions concerning freedom of panorama under article 24 of Chapter 2.⁷¹ However, the definition “freedom of panorama” is not explicitly mentioned in the Act. The abovementioned article is only applicable for the fine arts and architectural works, which may be reproduced in pictorial form. Therefore, the Swedish copyright law excludes literary works.⁷² However, there are three main restrictions of freedom of panorama in Sweden. Firstly, according to the article 24 (1), the object of copyrighted work should be permanently placed outdoors or in public place. This means, that Swedish legislators have not included public interiors such as museums of exhibitions, which are not covered by the article. Secondly, under the article 24(2) freedom of panorama exception applied in case of fine art’s promotion of the exhibition or its sale, but only within the purpose of the advertisement. Thirdly, the copyrighted work of fine art can be reproduced in pictorial

⁶⁸ Ibid

⁶⁹ Article 9(2) Bern Convention for the Protection of Literary and Artistic Works' (1986).

⁷⁰Article 5(5) Directive on the harmonization of certain aspects of copyright and related rights in the information society [2001] OJ 2 167 /16

⁷¹ Plamena Popova, 'Report on the freedom of panorama in Europe' (University of Library Studies and IT 2017) <https://upload.wikimedia.org/wikipedia/commons/9/95/FOP_report_EU_09_04.pdf> accessed 19 January 2017.

⁷² Ibid

form for catalogues as a part of a collection, however, catalogues do not have to be in digital form.⁷³ Moreover, the Sweden Act on Copyright does not mention restrictions for commercial purposes. As like Portuguese copyright code, Swedish copyright act does not regulate an exhibition time for ephemeral works in public places. Swedish legislations also do not expand the definition of “permanently”, and imply that the duration of the artistic work’s exhibition is depended on the author’s decision.

Contradictory, many EU legislations, Swedish copyright act has not implemented a three - step test of InfoSoc Directive. Generally, the core function of three - step test is to help to extend the list of limitations and exceptions. However, presumably, Swedish legislators have rejected incorporation the Article 5(5) of InfoSoc Directive based on the risk of too broadly interpretation of copyright exceptions and limitations, which are provided by Swedish copyright law⁷⁴. However, the Swedish Supreme Court in the recent case *Bildkonst Upphovsrätt i Sverige (BUS) vs Wikimedia Sverige*⁷⁵ applied a three - step test in a strict way.

In this case, BUS claimed that the Wikimedia Sverige posted images of copyrighted fine arts, which are permanently located in public spaces without rightholders’ permission on their online database, constitutes a copyright infringement. Moreover, BUS stated that the Wikimedia Sverige’s actions do not comply with freedom of panorama exception, in the reason that they apply only on the material reproduction of copyright works’ images, which are permanently located in public places.

On the other side, Wikimedia Sverige argued that the Article 24(1) of Sweden Act on Copyright on literary and artistic works should be interpreted broadly as it established in the Infosoc Directive. Thus, the exception concerning of freedom of panorama should not applied only on making reproduction of fine arts and buildings but on their transmission at the same time.⁷⁶ Furthermore, clients of BUS placed their artistic works in public place with the government’s sponsorships, therefore it is fair to enjoy and share pictures though the Internet without rightholders’ consent by public.

Hence, the Supreme Court had to decide whether it is legal to post images of copyrighted works, which is permanently located in public place without rightholders’ authorization via the Internet. By analyzing case though three - step test, the Court stated that the public accessibility to the copyrighted works by new technologies such as an online database provides a great use of works without any compensation to their copyright holders in contrast with the postcards’ distribution where the commercial exploitation is not so

⁷³ Johan Norderyd and others, 'Swedish Supreme Court Issues Decision Regarding the Freedom of Panorama - Kluwer Copyright Blog' (*Kluwer Copyright Blog*, 2017) <<http://kluwercopyrightblog.com/2016/05/09/swedish-supreme-court-issues-decision-regarding-freedom-panorama/>> accessed 1 March 2017.

⁷⁴ Kristin Friberg, 'The Swedish Implementation of the Infosoc Directive: Emphasis On the Exception for Private Use'.

⁷⁵ Ö 849-15Bildupphovsrätt i Sverige ek.för. (BUS) v Wikimedia Sverige [2016]

⁷⁶ Norderyd J and others, 'Swedish Supreme Court Issues Decision Regarding the Freedom of Panorama - Kluwer Copyright Blog' (*Kluwer Copyright Blog*, 2017) <<http://kluwercopyrightblog.com/2016/05/09/swedish-supreme-court-issues-decision-regarding-freedom-panorama/>> accessed 1 March 2017

significant.⁷⁷ On the ground of abovementioned findings, the Court came to conclusion that Wikimedia's online database had failed two of three conditions of the three - step test.

Therefore, court decided a case in favor BUS. Thus, Swedish Supreme Court interpreted a three - step test in a controversial way and thus provided an old-dated decision which could cause a chilling effect not only on similar cases in Sweden but also in others EU countries. It is interesting to note, that originally this test is the aim for providing extensions of copyright exceptions and limitations in national legislations.

Reviewing main points mentioned in paragraphs, we can state that the different approaches of applying the three-step are one of the barriers of harmonization of the list of the exceptions and limitations in general and freedom of panorama in particular. Initially, the incorporating of the three-step test into InfoSoc Directive was an international obligation from the International treaties⁷⁸.

Probably, in the reason that the three-step test is more peculiar to the Anglo-Saxon legal system, scholars and researchers state that it currently flawed and cannot be applied by judges.⁷⁹ One of the drawback of applying the three-step test is that the restrictive application of the test produces additional constraints on national exceptions and limitations as it was in abovementioned Swedish case. Therefore, for striking a fair balance between author's rights and user's rights in context of the current technological development, European MS should take approach of Portuguese legislators of combing legal norms with sufficient flexibility.

3.4 SUBCHAPTER: <CONCLUSION>.

This chapter was attempting to provide an overview of the international and EU legislations, literature and case law relating to freedom of panorama. Such non-binding provisions in Berne Convention and InfoSoc Directive contribute uncertainties and non-harmonization among countries. As the consequence, the different interpretations of freedom of panorama on the EU level established mosaic legislations. The fast-developing technologies and Internet will aggravate current cross-border uncertainties and collisions concerning between MS. Moreover, the analysis of Portuguese and Swedish legislations concerning taking and reusing images and video of copyrighted works, which permanently located in public space, shows that the existence of the same provision does not guarantee the same interpretations. Therefore, the

⁷⁷ Ibid

⁷⁸ Article 9(2) Bern Convention for the Protection of Literary and Artistic Works' (1986); Article 13 Agreement on Trade-Related Aspects of Intellectual Propety Rights (1995); Article 10 WIPO Copyright Treaty (1996)

⁷⁹ Kamiel J. Koelman, 'Fixing The Three-Step Test' [2006] European Intellectual Property Review (EIPR) <<https://poseidon01.ssrn.com/delivery.php?ID=472093064123007097095021116015031009041017062031079020023098116006116012118123117024030049123054053040034012120071092095092103015028041092085065113079019122079025054024089126072116064001096085003014091081094067119025019064079075099093126093001097&EXT=pdf>> accessed 11 February 2017.

establishment of the mandatory provision concerning of freedom of panorama can ascertain a harmonization among MS.

4 CHAPTER: < FREEDOM OF PANORAMA: NEED TO REFORM? >

Having discussed the essence of AR technology and the legislation of freedom of panorama on the different levels of regulation, the final section of this paper will focus on the ways of interrelationship between the AR and freedom of panorama. Evidently, the scope of the AR technology's application will increase rapidly and the current copyright legislation does not provide an efficient regulation neither for developers nor for users. The recent debates from 2015 until 2016 concerning copyright reform were not fruitful for the regulation and harmonization of freedom of panorama as it was excluded from the draft Directive on copyright in the Digital Single Market.⁸⁰ Therefore, at the present time, EU legislators do not take into account freedom of panorama as an issue which needs regulation at the current time. It is worth to note that during of debates, AR and other technologies were not taken into account as one of the arguments from the reforming copyright. Therefore, we think that the popularization of AR technology will arise new debates concerning freedom of panorama in the near future. As there are a lot of potential issues that can arise between users, developers, right holders of the copyrighted work in public places, internet provides etc. In this chapter, we will give consideration to pro and con arguments of the recent debates concerning harmonization freedom of panorama in EU with taking into account of the necessity of the creating a legal framework for AR technology.

In the first part of this chapter, we will analyze the current situation concerning the tendency of AR technology development based on reports and index. Such analysis will help to evaluate the necessity of reforming freedom of panorama under particular condition. In other words, we will try to answer to the following question: "Will AR technology be meaningful for establishing a mandatory exception of taking and reusing copyrighted works, which are permanently located in public space in chance of reintroducing debates of this issue among MEPs?"

Therefore, in the second subchapter we will look more closely to the both sides of the debate concerning freedom of panorama harmonization. Both reports from Julia Reda and Jean-Marie Cavada had reasonable arguments, which support their points of view, but it did not change anything in freedom of panorama regulation at the end. Therefore, we will try to take these arguments from debate by taking a consideration that AR technology is one of the reason of the urgent reforming freedom of panorama in the EU.

⁸⁰ European Commission, 'Proposal for a Directive of the European Parliament and of the Council on the Copyright in the Digital Single Market' COM (2016) 593 final

4.1 SUBCHAPTER: < WHY AUGMENTED REALITY REQUIRES THE REFORMING OF FREEDOM OF PANORAMA >

First of all, AR can put an additional weight into reforming freedom of panorama because AR has already been one of the most invested technology in this year. That meant that AR as field of technology could be more profitable and innovative in the near future. Undoubtedly, the success of the Pokémon Go in the last summer provides additional boost investments in the AR's technological development. Thus, a Goldman Sachs research report concludes with a prediction that the VR and AR industries will reach an 80\$ billion market by 2025.⁸¹ For such a short period of time this prediction looks very promising. It is worth to note, that the experts predict brighter future for AR technology than to VR because AR does not require specific devices for the performing.

That is why many big technology companies have already invested resources in many projects, which are based on the AR technologies. For example, Microsoft invests millions of dollars in their AR project "HoloLens" for producing a revolution in AR technology. Thus, in the near future by HoloLens technologies, which is based on the interactive and projected holograms in the reality, will be possible to apply into many spheres of life such as architecture, building construction and automotive design.

Apple Incorporation is also interested into AR technologies. In 2005, Apple has already emerged Metaio Company, which was specialized on the AR software development. The CEO of Apple, Tim Cook, stated that the enterprise was looking forward for applying AR capabilities into devices. This means that more and more people will use AR technology in daily life, which can evoke new risks of copyright infringements concerning taking and reusing photos and video of copyrighted work in public places.

Besides of companies, the development and interest to the AR technologies are also contributed by the society. Thus, the Structure Sensor is one of the highest funded crowdfunding projects in history of the Kickstarter.⁸² Obviously, it goes to the tendency that people are ready for monetary supporting such devices, which aim to develop AR industry. Moreover, the new AR products can impulse a creativity among people because they are great instruments for expressing themselves as they were with the introducing 3D printers in some years ago. For example, recently, independent developer Kenny Wang has already adapted a computer game Portal on HoloLens device, which provides gamers to move virtual

⁸¹ Virtual and Augmented Reality. Understanding The Race for the Next Computing Platform (1st edn, 2016) <<http://www.goldmansachs.com/our-thinking/pages/technology-driving-innovation-folder/virtual-and-augmented-reality/report.pdf>> accessed 28 February 2017.

⁸² 'List of Highest Funded Crowdfunding Projects' (En.wikipedia.org, 2017) <https://en.wikipedia.org/wiki/List_of_highest_funded_crowdfunding_projects> accessed 28 February 2017.

objects in the real world.⁸³ We consider that such creativity and innovations on part of the society will increase rapidly as soon as AR technology will be available to the most of population.

All abovementioned examples indicated that the tendency of the investing into AR technology has been expeditiously raising and society is highly interested into the AR technologies. Therefore, for the maintaining and contributing innovations of AR technologies, legislators should provide a sufficient level of regulations in aim to reduce risks of copyright infringements.

As regard to EU, it should be mentioned that Europe has already become one of the leaders in developing AR technologies. European companies developed three of the abovementioned applications in the Chapter 2. Moreover, it seems that augmented reality will continue to be one of the newest instrument of human creativity on the EU territory. Moreover, EU also supports the projects, which are based on the AR technologies in different fields. That means that EU takes into account the potential perspective of the future projects and wants to stimulate further researches in this field.⁸⁴

Nevertheless, on the other side, the current legislation cannot provide a sufficient legal framework for AR technologies regulation. Taking into consideration specific features of AR technologies, which is layering digital data on the real object, it is predictable that legal uncertainties concerning freedom of panorama and AR will be raised in the near future. Such situation can take to freezing effect for the AR development in EU. Currently, a non-harmonized situation concerning freedom of panorama put some troubles to developers of AR applications. Thus, on the stage of the AR product's introduction to the market, engineers should take into account the regime of freedom of panorama in each EU MS. Nominally, from the perspective developers of AR applications, European countries are divided into several categories:

- countries which allow to freely innovate and implement AR applications and content on their territory;
- countries which allow to develop and apply AR application and content on buildings, but not for sculptures;
- countries which allow to develop and apply only for non-commercial propose
- countries which do not allow to apply AR technology on copyrighted buildings and sculptures at all in case if a developer will not seek an author's permission of the copyrighted work.⁸⁵

At the present moment, such non-harmonization situation of freedom of panorama can be solved by geo blocking access of application in those countries where freedom of panorama has some certain

⁸³ 'Portal in Microsoft's Hologens Looks like the Best Demo Ever' (CNET, 2017) <<https://www.cnet.com/news/portal-hologens-microsoft-augmented-reality-valve-kenny-wang/>> accessed 28 February 2017.

⁸⁴ 'Augmented Reality Explained: Applications and Research - Innovation Union - European Commission' (Ec. europa.eu, 2015) <http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=ar-explained> accessed 19 January 2017.

⁸⁵ 'Pokémon Go Is Just the Beginning of an Absurd Copyright Struggle in AR' (*GamesIndustry.biz*, 2017) <<http://www.gamesindustry.biz/articles/2016-10-20-pok-mon-go-is-just-the-beginning-of-an-absurd-copyright-struggle-in-ar>> accessed 28 February 2017.

restrictions. However, European Commission published the proposal for a regulation geo-blocking on May 25, 2016⁸⁶. Basically, the aims of such proposal are to prevent unjustified practice of providing discrimination in pricing and payment conditions for sale and services via Internet by geo-blocking between MS. However, the scope of the proposal is wide and such restriction will be applied to the cloud services provides, which usually maintains functionality of AR applications.⁸⁷ Therefore, application developers will lose their possibility to make a selective restriction to access their applications based on legislations concerning freedom of panorama of every EU country. Such restriction can negatively effect on the developers and provoke a collision and uncertainties concerning AR applications across the whole EU territory. This means that, the developers should adopt their AR product in accordance with the legal regime of freedom of panorama in each Member State if they want to avoid undesirable copyright infringements and litigations. Therefore, such perspective will bring up new obstacles to the development of AR technologies because there will be emersion of additional costs and resources for solving above-mention situation. In this situation, a harmonized legislation of freedom panorama will be one of the best solution for solving legal uncertainties for providing AR applications to the market.

In addition, there will be more uncertainties with the ongoing second generation of the AR technology, which will emerge in the case of wide spreading 3D scanning technologies. The first generation of AR technologies layered digital data on objects of the real world based on the geolocation while 3D scans allow lying on virtual objects based on the user's real surroundings. Therefore, the capabilities of 3D scans will provide possibilities for the detailed scanning of the public space. In this case, developers will not be able to prevent a copyright infringement of taking and reusing images of copyrighted works that are located in public places by geo-blocking or by blocking a particular copyright object of the real world for to be scanned. The solution of this situation can be a changing configurations setting of 3D scanner for the general scanning of real environment instead of detailed scanning. However, such measures will slow down all innovations in the 3D scanning on the condition of the lack of a proper legal framework among EU countries in the near future.⁸⁸

The second argument concerning the importance of reforming freedom of panorama in context of the ongoing rapid development of AR technologies is the capability of AR applications to become new tools of communication and platforms where people can express themselves. At the present moment, people progressively produce and share contents through podcasts, blogs, forums and other social platforms, which arise a risk of the copyrights infringement. The current EU copyright reform within the Digital Single

⁸⁶ European Commission 'Proposal for a Regulation of the European Parliament and the Council on addressing geo-blocking and other forms of discrimination based on customers' nationality, place of residence or place of establishment within the internal market and amending Regulation (EC) No 2006/2004 and Directive 2009/22/EC 'COM (2016) 289 final

⁸⁷ 'Mobile Augmented Reality Based On Cloud Computing - IEEE Xplore Document' (*ieeexplore.ieee.org*, 2017) <<http://ieeexplore.ieee.org/document/6325354/>> accessed 28 February 2017.

⁸⁸ 'Pokémon Go Is Just the Beginning of an Absurd Copyright Struggle in AR' (*GamesIndustry.biz*, 2017) <<http://www.gamesindustry.biz/articles/2016-10-20-pok-mon-go-is-just-the-beginning-of-an-absurd-copyright-struggle-in-ar>> accessed 28 February 2017

Market strategy is trying to regulate digital network and services for the more effectiveness to the citizens. However, as it was mentioned in the previous chapters, the question concerning freedom of panorama was not included in the EU Commission proposal for a Directive on copyright in the Digital Single Market.⁸⁹ Thus, the absence of freedom of the panorama as copyright exception in the several EU countries such as Italy, Greece and Luxembourg can limit freedom of expression that is established with the Article 11 of the CFREU⁹⁰ and Article 10 of the ECHR⁹¹. Therefore, we consider that the mainstream of the AR applications can arise new pitfalls concerning the realization of freedom of expression in the digital environment thought out the entire territory of EU.

The educational development in EU is the third reason for the harmonization of the copyright exception concerning taking and reusing photos and video of copyrighted works, which are located in public places among MS in connection with the AR technologies. Thus, the capability of the AR is enhancing real objects by digital layers deliver new possibilities in education. There will be pitfalls for the implementing AR technologies into education process for the massive open online courses (MOOC), which can make such courses more popular and effective. The distant learning by MOOC provides educational opportunities to all citizens of EU countries. The lack of freedom of panorama in several countries contributes a disproportion of the ability to run online courses, which are supplemented with photos and video of copyrighted works that are located in public space. This issue does not relate to the non-commercial MOOCs in the reason that such activities fall under the copyright exception “non-commercial educational and scientific research purposes” by InfoSoc Directive.⁹² Notwithstanding, many popular MOOCs such as Coursera, edX and Iversity, which are commercial or hosted by the third-party commercial platform are struggling with this issue now and collaboration with AR applications will bring up new uncertainties to this problem.⁹³ Moreover, the different interpretations of types and amounts for using copyright works for educational purposes among MS will arise an additional obstacle for MOOCs regarding to using AR technologies in their online lectures.

4.2 SUBCHAPTER: < THE DEBATE OF FREEDOM OF PANORAMA IN EU >

On January 20, 2015, Julia Reda presented the report concerning copyright reform for the improving regulation in context of cross-border cultural exchange though the Internet. The main purpose of the

⁸⁹ European Commission, 'Proposal for a Directive of the European Parliament and of the Council on the Copyright in the Digital Single Market' COM (2016) 593 final

⁹⁰ Article 11, Charter of Fundamental Rights of the European Union (2000)

⁹¹ Article 10, European Charter of Human Rights of the ECHR (1998)

⁹² Joshua Lobert and Bianca Isaias, Karel Bernardi, Giuseppe Mazziotti, Alberto Alemanno, Lamin Khadar, 'The EU Public Interest Clinic and Wikimedia Present: Extending Freedom of Panorama in Europe' SSRN Electronic Journal <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2602683>.

⁹³ Laura Pappano, 'Massive Open Online Courses are multiplying at a rapid pace' (*Nytimes.com*, 2017) <<http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html>> accessed 5 April 2017.

report was enhancing the rights of artists and updating the EU copyright legislation in accordance with the current necessity of society. One of the most debated issue was about freedom of panorama. Under her report, she purposed to implement freedom of panorama on the whole territory of EU and defined such copyright exception broadly as “users” right to display and communicate works that are located permanently in public places⁹⁴. The main argument of such proposal is the restriction of taking and reusing photos and video of copyrighted buildings and sculptures in public places is outdated and ineffective due to digitalization and the Internet era. Moreover, such non-harmonized legislation of freedom of panorama restrains people’s desire to express their creativity and share their thoughts, as every person should seek a permission for taking and reusing photos or video of copyrighted building or sculpture in some EU countries.

On June 16, 2015, surprisingly, the Committee on Legal Affairs adopted an opposite amendment concerning restriction of freedom of panorama. According to the Amendment 421, Committee states that the prior permission of copyright holder is necessary for commercial use of copyrighted works’ images, which are located in the public place.⁹⁵ In particular, the French Member of Parliament, Jean Marie Cavada, declared that the current legal framework concerning freedom of panorama is still updated and suitable for the striking balance between public interest and protection a “sector of European culture and creativity”⁹⁶. His point of view was also supported by the fact, that there are no litigations between artists and users concerning uploading photos or videos of buildings or sculptures that are temporally located in public on social platforms at the present moment. Therefore, the Reda’s suggestion regarding mandatory freedom of panorama will be in favor of international social platforms such as Facebook, Wikipedia and Instagram because such provision allows to exploit European copyrighted works for their private commercial use without paying royalty fees to EU authors. Consequently, he proposed to oblige internet intermediaries to pay for the commercial usage of images contributed on their platforms.

At the first glance, the Amendment 421 can impede to professional journalists, filmmakers and photographers as they act with commercial purposes. Perhaps, it can be realistic in case of a clear diction between commercial and non-commercial purposes of using copyrighted work. However, the definition of the non-commercial license is vague. Moreover, it is problematic to control a work under non-commercial license from undesirable exploit by others on social platforms.⁹⁷ Particularly, terms and

⁹⁴ Julia Reda, 'EU Copyright Evaluation Report – Full Current Text' (Julia Reda, 2017) <<https://juliareda.eu/copyright-evaluation-report/full/>> accessed 19 January 2017.

⁹⁵ 'Amendments Dossier of Implementation of Directive 2001/29/EC on the harmonization of Certain Aspects of Copyright and Related Rights in The Information Society' (2017) <<http://parltrack.euwiki.org/dossier/2014/2256%28INI%29#am-421-PE-549.469>> accessed 19 January 2017.

⁹⁶ Ibid

⁹⁷ Paul Klimpel, Free Knowledge Based on Creative Commons Licenses: Consequences, Risks and Side Effects of the License Module "Non-Commercial Use Only - NC (1st edn, Berlin: Wikimedia Germany 2012) <https://openglam.org/files/2013/01/iRights_CC-NC_Guide_English.pdf> accessed 28 February 2017.

conditions of Instagram⁹⁸ grants to this social platform a right to take advantages of users' content for their own purposes. Moreover, users are liable for uploading a copyrighted content on Instagram⁹⁹. This means, that they should find the right owner of the copyrighted work and get permission before uploading a picture. Otherwise, users will have a risk to become lawbreakers if he or she uploads photos of the copyrighted work, which is instantly located in public even without intention of collecting ruminations. Therefore, a restriction to freedom of panorama can limit such routine activity of many Europeans, for instance, sharing photographs through social networks.

In that reason, such upside-down amendment by the Committee on Legal Affairs provoked a huge public reaction and discussion among society and organizations. Thus, Author's societies (GESAC) and European Visual Artists (EVA) in their brochure "The Panorama Exception-Why you should confirm the JURI Report" supported Cavada's position¹⁰⁰. The abovementioned organizations tried to convince that the Amendment 421 would not extend to the users of many social platforms and there was no need to harmonize freedom of panorama on EU level.¹⁰¹ On the other hand, Wikimedia analyzed statements of GESAC and EVA and disapproved many of them. For example, Wikimedia proved that different regimes of freedom of panorama had provoked cross-border issues and uncertainties between EU countries by citing *Pez Hejduk v EnergieAgentur NRW GmH*¹⁰² and *Peter Pinckney v KDG Mediatech AG*¹⁰³ cases as examples. Moreover, many professional communities of European creators such as Royal Institute of British Architects, German journalist's trade union, German national association of professional image providers expressed opinions against the Amendment 421. Many EU citizens also supported the position against of freedom of panorama's restriction. Thus, more than 500 000 people signed a petition on Change.org that called European Parliament to refuse the adoption of Amendment 421 and provide the mandatory freedom of panorama through the EU¹⁰⁴.

On July 9, 2015, the European Parliament voted for including most of suggestions from Reda's proposals of modernization EU copyright. The question concerning freedom of panorama split EU Parliament into for and against groups. After long run debates, the European Parliament decided to leave the current regulation of freedom of panorama without any changes. Consequently, MEPs decided to remove any

⁹⁸ 'Terms of Use' (Instagram.com, 2017) < <https://help.instagram.com> > accessed 18 January 2017.

⁹⁹ *Ibid*

¹⁰⁰ *The Panorama Exception Why You Should Confirm The JURI Report* (1st edn, European Visual Artists (EVA) and Authors' Societies (GESAC) 2015) <http://www.authorsocieties.eu/uploads/GESAC%20Panorama%20exception_Flyer_June15.pdf> accessed 28 February 2017.

¹⁰¹ *Ibid*

¹⁰² C-441/13 *Pez Hejduk v EnergieAgentur NRW GmH* [2015]

¹⁰³ C-170/12 *Peter Pinckney v KDG Mediatech AG* [2013]

¹⁰⁴ 'European Parliament: Save The Freedom of Photography! #Savefop @Europarl_EN' (*Change.org*, 2017) <<https://www.change.org/p/european-parliament-save-the-freedom-of-photography-savefop-europarl-en>> accessed 28 February 2017.

mentions concerning freedom of panorama in final report¹⁰⁵, which was sent to the European Commission.

On March 2016, the European Commission raised the issue of freedom of panorama by launching a public consultation on the role of publishers in the copyright value and on freedom of panorama¹⁰⁶. During several months, member's states, publishers of press, consumers and others were interviewed by seven questions regarding freedom of panorama for seeking opinions in monitoring specific problems of current legislation of freedom of panorama in context of the Digital Single Market. The results of consultation were published in the synopsis report, which did not provide a clear-cut answer for the European Commission. ¹⁰⁷ According to the synopsis report, only consumers, institutional users and services providers had complained to the current legislation in the reason that such non-harmonized regulation concerning freedom of panorama could led to unintended infringements by such categories of respondents. Therefore, they supported the idea of introduction a mandatory freedom of panorama for the commercial and non-commercial use across EU. The other categories of respondents provided negative or unambiguous opinions. Thus, other categories such as professional photographers, architects, broadcasters and publishers did not provide single-entendre to the questions, which were put on the public consultation. Merely some parts of these categories believed in a positive effect of the mandatory exception while others considered that it will abuse their rights and a following interpretation of the exception on the national level would lead to discrimination to their activities. MS and public authorities indicated that they had not faced with any challenges with the abovementioned copyright exception yet. Some of them are ready for the mandatory "panorama exception" at EU level but only for the non-commercial use and with regarding to the "three-step-test", while others MS reject to change the current national legislation. Visual artist and CMOs are opposite to propose for the mandatory exception, as it will deprive opportunity for obtaining remunerations of their works in public places.

In parallel with debates on EU level, there were discussions concerning freedom of panorama on the national levels. On July 15, 2016 the Belgian Federal Parliament voted for the introducing the full freedom of panorama. It is interesting to note, that legislators intended to include only non-commercial usage into definition of "freedom of panorama". However, the definition was extended to commercial purpose after personalized letter to every member by the president of Wikimedia Belgium. In this letter, he explained the risk of establishing a grey area in case if Belgian copyright exception concerning taking and reusing

¹⁰⁵ Harmonisation of Certain Aspects of Copyright and Related Rights (, European Parliament 2015) <<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P8-TA-2015-0273+0+DOC+PDF+V0//EN>> accessed 19 January 2017.

¹⁰⁶ 'Public Consultation on the Role of Publishers in the Copyright Value Chain and on the 'Panorama Exception' (Digital Single Market, 2016) <<https://ec.europa.eu/digital-single-market/en/news/public-consultation-role-publishers-copyright-value-chain-and-panorama-exception>> accessed 19 January 2017.

¹⁰⁷ Synopsis Report on the result of the public consultation on the 'Panorama exception' (2016) <http://ec.europa.eu/information_society/newsroom/image/document/2016-37/synopsis_report_-_panorama_exception_-_final_17049.pdf> accessed 19 January 2017.

photos and video of copyrighted works, which permanently located in public place would not include a commercial use as well.¹⁰⁸

On October 7, 2016, freedom of panorama was introduced by law for a Digital Republic in France with the less success because French provision provide copyright exception for “architectural works and sculptures, located permanently in public roads, made by natural persons to the exclusion of commercial uses.”¹⁰⁹ Such vague provision does not specify activities, which can be classified as a commercial. Therefore, it is still unclear how the law for a Digital Republic is applicable in context of technological development and era of Internet, where a line between commercial and non-commercial exploitation is blurred.

On September 14, 2016, the European Commission issued a proposal of a Directive of the European Parliament and of the Council on copyright in the Digital Single Market. In this proposal, despite of all results and opinions of the public consultation, the issue concerning of freedom of panorama was not mentioned at all.¹¹⁰ Evidently, controversial opinions among different categories pointed up that European legislators should provide a huge work for striking balance between public interests and rights of the authors of the copyrighted work, which is permanently located in the public places. Obviously, at the present moment European legislators are not ready for crucial changes of EU copyright legislation. The current legislation was designed 15 years ago with the aim of protection author’s rights. However, in the era of Internet and technological development, the relationships in the intellectual property has become more complex and the necessity of regulation and protection rights of others privies are rapidly increasing. Presumably, on reason that the reforming of freedom of panorama requires more resources and researches, European Commission decided not to bring up the issue regarding to freedom of panorama in their ongoing proposal for the Directive on copyright in the Digital Single Market.¹¹¹

Moreover, there is always a chance to reintroduce the issue regarding freedom of panorama by the MEPs in the near future, as there are some members like Marietje Schaakem and Julia Reda, which have already supported the mandatory freedom of panorama across of EU. Moreover, according to the commissioner Günther Oettinger, most of EU nations are ready to introduce freedom of panorama, but, obviously, some of EU countries will continue to stand for the regulation the copyright exception concerning taking and reusing photos and video of copyrighted works in public places on the level of national legislations.¹¹²

¹⁰⁸ Dimitar Dimitrov, 'There Is Now Freedom of Panorama in Belgium – Wikimedia Blog' (*Blog.wikimedia.org*, 2017) <<https://blog.wikimedia.org/2016/07/15/freedom-of-panorama-belgium/>> accessed 28 February 2017.

¹⁰⁹ Marie-Andree Weiss, 'The New, But Narrow, French Freedom of Panorama Exception' (*The1709blog.blogspot.nl*, 2017) <<http://the1709blog.blogspot.nl/2016/10/the-new-but-narrow-french-freedom-of.html>> accessed 28 February 2017.

¹¹⁰ European Commission, 'Proposal for a Directive of the European Parliament and of the Council on the Copyright in the Digital Single Market' (2016).

¹¹¹ Ibid

¹¹² Mélanie Dulong de Rosnay and Pierre-Carl Langlais, Public Artworks and the Freedom of Panorama Controversy: A Case of Wikimedia Influence (1st edn, 2017) <<https://policyreview.info/articles/analysis/public-artworks-and-freedom-panorama-controversy-case-wikimedia-influence>> accessed 4 April 2017.

Therefore, there is a sufficient amount of supporters for the mandatory implementation of freedom of panorama across EU, which can bring other arguments such as upcoming mainstream of the AR technology for introducing freedom of panorama on the EU level. Consequently, the changes of the current EU legislation concerning of freedom of panorama are inevitable. However, due to many of unadjusted nuances the process of harmonization can be indefinitely postponed. Particularly, such nuances as disputes about commercial and non-commercial, use of photos and video of permanently placed copyrighted works in public places or on what objects the abovementioned copyright exception should extend.

4.3 SUBCHAPTER: < CONCLUSION >

In summary, the possibilities of AR technologies supposed to enhance life of society in many spheres. As it has been shown, the development of the AR technology and introducing various AR applications to our lives will seek a solution concerning its regulation from the EU legislators. Specifically, the issue relating to harmonization of freedom of panorama because most of the current AR applications has already interacted with buildings and sculptures that permanently located in public places. However, the current debates of freedom of panorama illustrate a bunch of uncertainties regarding regimes of the abovementioned copyright exception and different opinions among experts and members of the European Parliament. As the result, European Commission decided to lay aside such a controversial issue from the ongoing copyright reform. In our opinion, the issue of freedom of panorama will arise in the near future, as EU legislators will have to face with legal obstacles of regulation AR technology because as itself it does not fit to the current regulation of the copyright. Such situation can provide a grey area and copyright infringements. Therefore, there is no time to postpone an imminent reforming copyright in the age of fast-developing technologies.

CONCLUSION

AR technologies are new and perspective technologies, which can enhance and change our life rapidly. The unique potential nature of AR technologies provides vast possibilities for their applications. Moreover, based on the recent popularity of Pokémon Go, we can say that society is ready for such technology. Therefore, the sufficient legislative framework is needed for the proper regulations and further stimulation of AR technologies' development. This thesis aims to investigate a necessity of reforming and harmonization European copyright legislation in the current fast-developing technological progress and digitalization at the present time. By analyzing first parts of thesis, we can insist that there are many legal uncertainties concerning AR technologies and freedom of panorama separately, which claimed a fundamental work for regulation.

The main legal issues are raised with AR technologies' capacity to blend a fringe between virtual and real world. Such simple AR application as Pokémon Go, where digital data is only layered on device based on the user's geolocation, provoked a mass of discussions among lawyers in a short period of time. It is possible to predict, that there will be other complex legal issues with rolling out more advance AR applications and devices into mass market.

As for freedom of panorama, there are many difficulties for establishing a unified regime concerning taking and reusing copyrighted works, which are permanently located in public place. Thus, there are many nuances for coordination between MS before a full harmonization of freedom of panorama in order to be ongoing with the current age technological and Internet development. According to recent debates, EU legislators are not ready for cardinal changes of freedom of panorama on the EU level in a reason of ambiguousness positions between member's states, publishers of press, consumers, social platforms, organizations and others.

The investigation of this Thesis shows many connections between AR technologies and freedom of panorama. Therefore, there are sufficient reasons for reforming freedom of panorama in order to support innovation and development of AR technologies for benefits to society. However, as it has been previously discovered, the current copyright legislation can hardly provide a sufficient regulation of AR technology. The existent non-harmonized EU legislation does not enhance the development of AR technologies. Therefore, there is a potential infringement, which can lead to the cost losses. Moreover, such uncertainties are not beneficial to common users. In that reason, many EU citizens have a risk to commit an unintended copyrighted infringement by using AR applications.

Therefore, the copyright EU legislation in general and freedom of panorama in particular should be evaluated in accordance with the shift of relationship between artists and consumers. As technological development transforms this relationship by adding other elements such as amateurs, internet providers,

social media, user generated content commercial platforms and peer-to-peer communities.¹¹³ Moreover, the Internet space blurred customary lines between commercial and non-commercial use of copyrighted works, which provokes more uncertainties for regulation of intellectual property at the present time.

The positive steps were towards to the evaluating copyright for regulating contemporary relationships within the Digital Single Market reform but the key question concerning freedom of panorama was decided to put out of the proposal on copyright by European Commission. However, AR technology will inevitably solicit in the near future and consequently a sufficient regulation is required. The uncertainties and different regimes of freedom of panorama across EU can become obstacles for the development and promotion AR to the mass. Furthermore, EU legislations should put more attention to these issues. Undoubtedly, that the process of arriving at a consensus concerning taking and reusing photos and videos of the copyrighted works require a fundamental approach and a lot of time and efforts.

In the light of current legislations of AR technologies and freedom of panorama in EU, there two ways of modernization of effective regulation AR technology in the scope of freedom of panorama. The first option is to establish a mandatory freedom of panorama across EU. Such measure will reduce cross-border uncertainties concerning of different regimes between EU countries and will clear away obstacles to AR developers for producing and launching application to mass-market. In own opinion, the proposal for drafting a mandatory freedom of panorama among EU by the group of researches such as J. Lobert, B.Isaias, K.Baenardi, G.Mazziotti, A.Alemanno and L. Khadar can be used as a guidance for the implementing the abovementioned copyright exception on the EU level. Thus, they proposed to be included into the definition “freedom of panorama” should contain the right to use, alter, reproduce, distribute, communicate, and make available photographs, video footage or other images of copyrighted works, which are permanently located in public space.¹¹⁴ Moreover, freedom of panorama should not be abused by the legislations of trademark or cultural heritage.

Evidently, the implementation of mandatory freedom of panorama across the EU is a time-consuming process. In addition, as it was previously mentioned, this process is complicated by the controversial positions of various participants, which can be related with taking and reusing images and video of copyrighted works, which are permanently installed in public places. Therefore, before achieving a full harmonization of freedom of panorama, MS should take the example from Portuguese legislators’ experience. As by taking the Article 5.3 (h) of the InfoSoc Directive and implementing it with the principle of fair use in accordance with the national copyright legislation, Portuguese copyright law has the most

¹¹³ 'Public Artworks and The Freedom of Panorama Controversy: A Case of Wikimedia Influence' (*Internet Policy Review*, 2017) <<https://policyreview.info/articles/analysis/public-artworks-and-freedom-panorama-controversy-case-wikimedia-influence>> accessed 28 February 2017.

¹¹⁴ Joshua Lobert and Bianca Isaias, Karel Bernardi, Giuseppe Mazziotti, Alberto Alemanno, Lamin Khadar, 'The EU Public Interest Clinic and Wikimedia Present: Extending Freedom of Panorama in Europe' SSRN Electronic Journal <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2602683>.

flexible provision concerning freedom of panorama, which is suitable for current era of digitalization and technological development.

As the alternative, it is suggested the second way to preclude a formation of grey area by licensing an AR content in manner of current digital marketplaces like iTunes and Spotify. By establishing a market of an AR content, AR developers and authors of the copyrighted work, which permanently located in public places, will be remunerated for their efforts. Therefore, payments by users can maintain and stimulate a further development of AR technologies without of having a risk to commit a copyright infringement. Such remunerations can be provided in forms of license fees, micropayments or purchasing a subscription¹¹⁵. The choice of payments can be depending on type of AR application. Thus, hypothetically, developers of Pokémon Go can create a special Pokémon, which will be exclusively displayed on the front of 'Venus of Transcendence' by Yannis Koutsouradis. If a player wants to catch and see such Pokémon, then he or she should pay a fee. The same idea can be applied to other applications. Hence, Blippar's digital content of Danish Little Mermaid can be floating in mid-air only after micropayment, which is provided by user. Moreover, the AR content marketplace can be based on existed "pay per gaze" and "pay per emotion" eye-tracking systems, which purposed to charge advertisers based on quantity of user's gazes on the particular advertisement and their emotional reactions on it. The "pay per gaze" and "pay per emotion" systems can be prototypes for creating a pay method in AR marketplace, even these systems were created for advertising purpose. It seems that the idea of creating a possibility to make purchases through AR applications is taking into consideration by many big companies. Thus, PayPal has already patent the similar to the aforementioned idea of creating a digital market space of AR content.¹¹⁶. Nevertheless, the second way concerning of creating AR marketplace will require considerable amount of time for developing and implementing. Such idea remains more hypothetical rather realistic therefore it can raise other pitfalls for the EU legislation.

Regardless of direction relative to the effective regulation of AR technology in aspect of layering digital data on copyrighted works, which are permanently located in public place, some active actions must be taken as soon as possible. As researches and analysis provided by this Thesis shows, that AR technology will rapidly grow in the near future and it requires updated legal framework for further development.

¹¹⁵ Brian Wassom, 'Defining Terms: What Is Augmented Reality?' (Wassom.com, 2017) <<http://www.wassom.com/defining-terms-what-is-augmented-reality.html>> accessed 28 February 2017.

¹¹⁶ Will Mason, 'Paypal Granted Patent for Augmented Reality Payments - Uploadvr' (*UploadVR*, 2017) <<https://uploadvr.com/paypal-granted-patent-augmented-reality-payments/>> accessed 28 February 2017. Will Mason, 'Paypal Granted Patent for Augmented Reality Payments - Uploadvr' (*UploadVR*, 2017) <<https://uploadvr.com/paypal-granted-patent-augmented-reality-payments/>> accessed 28 February 2017.

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