MYKOLAS ROMERIS UNIVERSITY
MYKOLAS ROMERIS LAW SCHOOL
PRIVATE LAW INSTITUTE

BOGDAN NAUGOLNYY
EUROPEAN AND INTERNATIONAL BUSINESS LAW

Blockchain in Copyright Law: Legal Analysis of Implementation Perspectives

Master thesis

Supervisor — Prof. dr. Paulius Pakutinskas

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LIST OF ABBREVIATIONS

CISAC – International Confederation of Societies of Authors and Composers

CMO – Collective management organisation

DLT – Distributed ledgers technology

DRM – Digital rights management

ECJ – European Court of Justice

TPM – Technical protection measures

TRIPS – Trade-Related Aspects of Intellectual Property Rights

WIPO – World Intellectual Property Organisation

WTO – World Trade Organisation

INTRODUCTION

Statement of the topic. The modern stage of technological development, which has been experienced in the world during the past decade, has brought and still brings changes into existence, functioning and understanding of things in all key areas of life. The law is not an exception in this case: the Internet of things, big data, artificial intelligence, cryptocurrencies, blockchain technology — are of great interest to be introduced in order to make the legal reality corresponding the development. Alongside with the benefits, technological development also brings threats to the intellectual property and copyright in particular.

The Berne Convention on the Protection of Literary and Artistic Works[1] has created and maintains the legal basis by providing minimal and, at the same time, significant legal rules for the protection of copyright law. Later on, other international instruments appeared such as WIPO Copyright Treaty[2], TRIPS agreement[3] etc. All of them served as a ground for the further development and enhancement of national legislations, judicial practice and scientific legal doctrines on various matters. The subsequent creation of the Secondary Legislation within the framework of European Union has introduced a significantly harmonised and, at the same time, precise legal rules aimed to establish a unified approach in the context of intellectual property's usage across the EU.

However, in view of current reality, this domain becomes less efficient in the performance of appropriate legal protection of intellectual property rights' holders as well as maintains high degree of costs, time consumption. The increasing importance of IP assets faces challenging environment on a way of its application in business, economic and social interests.[4] As a consequence, the blockchain's acquired popularity in FinTech sector made a push to the creation of a range of concepts, papers, studies and legal doctrines defining the perspective of implementation and applicability of Distributed Ledger Technology (DLT)[5] or blockchains, in particular, in the framework of copyright law.

There is a common statement for various jurisdictions emphasising about the impossibility of total eradication of infringements, therefore the law and legal science are in charge of prevention

[1] "Berne Convention for the Protection of Literary and Artistic Works", WIPOlex, Accessed 01 March 2019, https://wipolex.wipo.int/en/treaties/textdetails/12214.
[2] WIPO Copyright Treaty, WIPOlex, Accessed 01 March 2019, https://wipolex.wipo.int/en/treaties/textdetails/12740.
[3] The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), World Trade Organisation, Accessed 03 March 2019, https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm.
[4] Baroness Neville-Rolfe, "The Challenge of Protecting Intellectual Property", *WIPO Magazine,* November 2016, https://www.wipo.int/wipo_magazine/en/2016/si/article_0004.html.
[5] Dr. Dominik Thor, "Blockchain technology in the context of intellectual property", *The Patent Lawyer Journal*, June (2018).

of subsequent offences' appearances. Thus, by taking into account the mentioned above, the adoption of blockchain in the sphere of copyright law may potentially lead to the achievement of such goal. The idea of DLT-based databases which is able to store the information securely due to its technical nature, namely by the non-centralised validation of data flow. In this regard, for instance, the registration and storage of copyright works, their authors or rightholders (if different), legal status of works, licensing, assignments or transfer of economic rights and other intellectual property management would become significantly more transparent, simplified and secured. As a result, this could bring to reduction of such infringements as piracy, parallel and grey import, increase the legal certainty with regards to particular works or their copies as well as ensure economic incentives.

Scientific research problem. Upon turning the Internet to public domain and software development, the reproduction, distribution and access of illegal content reached a massive scale. The proprietors of economic rights alongside authors with their moral rights are subjected to huge damages. Even the creation and adoption of Technological Protection Measures (TPM)[6] and Digital Right Management (DRM)[7] data, as it is required by international treaties and InfoSoc Directive[8], did not lead to the positive results. The problem lies in the practical impossibility of differentiation between lawful user of copyrights and infringers, as for the authors – the losses of appropriate economic remuneration and damages on their moral rights, as for the potential licensees – the uncertainty in legal status of certain works.

Subsequently, this leads to discreditations towards efficiency of existing copyright legal system. At the same time, this causes appearance of issues on whether it should be reviewed in order to be able to face novel challenges, in particular, by blockchain's implementation into copyright, achieving more effective prevention, control and regulation of such legal relationships involved.

Relevance and **scientific novelty** lies in the necessity to conduct a conceptual analysis of blockchain's applicability and integration in the realm of copyright law by assessment of its impact to the performance of copyright-related rights. The exploration of this topic is related to the introduction of novel approach to legal reality that is powered by the combination of law and technological means, and constitute a modern response to existing challenges. In view of topic's

[6] Ian Kerr, Alana Maurushat, and Christian Tacit, "Technological Protection Measures: Tilting at the Copyright Windmill", *Ottawa Law Review*, VOL. 34, No. 1 (2002-2003):13-15, https://www.researchgate.net/publication/228171465_Technological_Protection_Measures_Tilting_at_the_Copyright_Windmill/link/54f634870cf2ca5efefdd5f5/download.pp.

[7] Ibid.

[8] "Directive 2001/29/EC on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society, OJ L 167 22.6.2001, p. 10", EUR-LEX, Accessed 05 March 2019, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02001L0029-20190606.

complexity and absence of fundamental works in legal doctrine regarding the evaluation of blockchain's application and efficiency, the topic of this thesis should be considered as novel and relevant. This is due to the fact that majority of existing papers are poor researched and do not provide a comprehensive answer to above-mentioned issues.

Review of the literature. The amount of available and specific literature is quite limited in relation to the topic of copyright law and blockchain, therefore, various sources have been applied for this thesis, ranging from purely legal to purely technical ones. While legal literature includes WIPO Lex[9] and WIPO Academy courses[10], EU copyright law[11], provision of French, German and the Netherlands legislation as well as works of, for instance, I. Stamatoudi, P. L. Torremans, T. Meyer, A. Poltorak and others, the technical sources consist of works of such authors as A. Savelyev, D. Thor, S. Houben, S. Lee, Natarjan and Gradstein, S. Nakamoto etc. Upon the performance of analysis of each work, it became possible to consolidate a vast amount of information under the single topic and reach relatively precise conclusions. The absence of deeply and specifically researched papers is the key point why the literature distinguishing by its context has been applied while conducting research on current topic.

The aim of the research is to outline the existing approach established by current copyright legislation as well as challenges it has faced within the modern digital technologies and propose a technology-based solution.

This should be achieved by performance of following as objectives. The provisions of main copyright-related legal instruments, namely International treaties (including their establishment prerequisites), EU legislation alongside to national legislations of France, Germany and the Netherlands have to be analysed in order to discover the peculiarities of copyright legal system within European Union as well as make a separate emphasis on problems related to such regulative approach. Then it is necessary to define the key operational principles of blockchain-based technology and those features that lead to the applicability in legal realm. The next step is dedicated to detailed proposals, based on legal concepts, scholar opinions and technical materials, providing cases of application of blockchain and law. Finally, the work overviews the challenges that may be faced at the stage of implementation and briefly evaluates a degree of national legislations openness towards adoption of the mentioned technology.

Practical significance of this thesis may be given with consideration at various levels. The first group who may have an interest to this work is state legislative and/or administrative

[9] "WIPOLex", World Intellectual Property Organisation, Accessed 05 March 2019, https://wipolex.wipo.int/en/main/legislation.

[10] "Academy Course Catalog", World Intellectual Property Organisation, Accessed 05 March 2019, https://welc.wipo.int/acc/index.jsf?lang=en.

[11] "The EU Copyright Legislation.", The European Commission, Accessed 05 March 2019, https://ec.europa.eu/digital-single-market/en/eu-copyright-legislation.

authorities, the working committees of which are responsible for the creation and development of new legal rules. Individual scholars' or practical experts' may also be given to this thesis while proceeding with the conceptual development blockchain's applicability in legal or business reality. Besides that, private for-profit and non-for-profit companies such as collective management organisations may find the results of the work as innovative for the performing their day-to-day activity.

Various **research methods** were applied in this master thesis. The historical method in combination with the comparable method were used in order to explore the origins of the existing legal regulation of copyright legislation and factors that led to the creation of harmonised regulatory approaches across international and regional levels. Doctrinal and research methods have been used for the establishment of how the copyright regulation is engaged in realisation of different economic and moral rights. The interdisciplinary research method was applied to discover the technical aspects of blockchain's operation, its dealing with the information included to the ledgers and its relation to the area of intellectual property law. The analytical and comparative methods were applied to studies of national, EU and international legislation, while collection of data in books, scientific articles, other relevant sources of literature and while making the conclusions on applicability. The use of the prognostic method was performed, while expressing and evaluating possible legal risks and outcomes after introduction of technology into the system of copyright.

The structure of master thesis. The paper is divided into 5 main chapters aimed to discover a range of issues, namely, brief historical overview, existing legal regulation, challenges faced by the copyright law in view of nowadays development, analysis of technical side of the topic and practical cases of interaction between DLT-based networks and copyrights. The second chapters is comprised of subchapters dedicated to different legislative levels (international, regional and local) while the subchapters of the third chapter can be divided depending on the challenges before the copyright. The final, fifth, chapter consists of above-mentioned cases as well as challenges that may be faced on the way of implementation.

Defence statement. The introduction of blockchain-based solutions to the regulation of legal relationships in the field of copyright law possesses a high potential in view of enhancement of legal protection and should be proceeded further alongside to the concept of Unitary Copyright Title as their certain features complement each other.

1. HISTORICAL OVERVIEW OF COPYRIGHT'S DEVELOPMENT

Starting from the ancient times it was always natural for the human being to produce the creations of mind. Rock engravings, folk music, myths and legends, first inventions and others were at the origins of the something that evolved to such nowadays definition as results of intellectual activity. During the past centuries, the humanity has achieved a great result on the way how to protect the authors' ideas. However, the extent of the technological development after the last decade has shown new opportunities and also brought new challenges. That is why legal environment has to implement new approaches and means, necessary to provide the effective regulation and protection for existing and emerging intellectual property rights.

This historical overview's importance lies in the necessity of establishment how European countries went to the common understanding and practice in organisation of harmonised legal approach in field of copyright. This would lead to the understanding of reasons, why the internationalisation and/or harmonised/unified regulation (as in case of the European Union) maintain their high volume of relevancy nowadays.

Many authors pointed out that at time of the most ancient civilisations as, for instance, Ancient Greece, Roman Empire, the idea of the economic rights' possession did not exist, while the main emphasis was made on the moral rights since the majority of authors were teachers.[12] Copyrights of medieval Europe may be characterised as monopoly times of the Church due to the absence of literacy within society. The situation started to change upon the introduction Gutenberg's moveable type printing[13] which allowed to reproduce copies in faster and cheaper manner.

The following 15th century was challenged by the necessity of legal interventions in order to regulate the arose printing industry which went to practice of granting printing monopolies.[14] In short, successors could be granted with two (2) years monopoly right (in England)[15], three (3) to ten (10) years – in France[16], five (5) years – Venice.[17] The peculiarity of German printing privileges was that they were limited in their capacity within a particular magistracy, like in Nuremberg or Frankfort.[18] The only found mention about the rights, personally related to the work's authors, was related to Venice where in 1486 the author had been granted with exclusive

[12] David I. Bainbridge, *Intellectual Property, Seventh Edition*, (Edinburgh: Ashford Colour Press ltd, 2009), p.33.
[13] Ibid.
[14] Bowker R.R., *Copyright: its History and its Law,* (Boston:Houghton Mifflin, 1912), 19 https://babel.hathitrust.org/cgi/pt?id=hvd.32044011621786&view=1up&seq=18
[15] Ibid.
[16] Anne Latournerie, "Petite histoire des batailles du droit d'auteur*", Multitudes, vol. 5, no. 2, (2001)*: *39,* https://www.cairn.info/revue-multitudes-2001-2-page-37.htm
[17] Bowker R.R., *Copyright: its History and its Law,* 17
[18] Ibid.

rights to publish/authorise publication of his works. The rights were not limited in time and were ensured by the monetary penalty for the violation.[19]

The approach of exclusive monopolies resulted in the emerge of printing guilds or "Stationers' Companies" that were a kind of analogue to the modern Collective Management Organisations consisting of printers and publishers as their members. [20] Such guilds retained the right to reproduce works and any author, willing to print-out copies and receive a remuneration for his work, had either to obtain membership or to withdraw from authorship in favour of such members. It is worth to mention that the term "copyright" as such emerges from those times, which literary means a right to produce copies.[21]

The following logical development of copyright-related legislation was introduced in England due to the market's tension caused by Stationer's Companies that held full monopolistic position and left authors unsecured. The adoption of "An act for the encouragement of learning, by vesting the copies of printed books in the authors or purchasers of such copies, during the times therein mentioned"[22] or simply – Statute of Anne (hereinafter — Statute) in 1710 entitled authors to possess a range of rights concerning their works[23] as well as enhanced supplementary legal regulation.

In particular, authors acquired an exclusive right for the reproduction of works, possibility to transfer or assign their rights to another person, protection against unauthorised uses of works and judicial remedies (i.e. prohibition of unauthorised uses, expropriation of illegal materials, monetary damages) against such infringements, time limitation of rights' protection: for twenty-one (21) or fourteen (14) year. [24] Alongside to that, there were introduced requirements for obligatory works' registrations within Stationer's Company with fixed pricing, remedy to claim damages for refuse or neglect on registrations by the clerk of Stationer's Company, Limitation of action to three months upon the commencement of the infringement, possibility to claim costs for the court's proceedings and obligatory deposit of nine (9) copies of newly printed book to such libraries as Royal Library, the libraries of the universities of Oxford and Cambridge, the libraries of the four universities in Scotland, the library of Sion College in London, and the library belonging to the faculty of advocates at Edinburgh.[25] The following statutory wording of copyright

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[19] Ibid.
[20] Hector L MacQueen, Charlotte Waelde and Graeme T Laurie, "*Contemporary Intellectual Property: Law and Policy*", (Oxford: Oxford University Press, 2007), 34.
[21] Bainbridge, *Intellectual Property,* p.34
[22] Lillian Goldman Law Library. The Statute of Anne; April 10, 1710 [8 Anne, c. 19 (1710)], available: https://avalon.law.yale.edu/18th_century/anne_1710.asp
[23] Diane L. Zimmerman, "The Statute of Anne and Its Progeny: Variations without a Theme", *New York University Public Law and Legal Theory Working Papers, 2010:* 31.
https://pdfs.semanticscholar.org/ecfc/67c524d2f1266faa4c15989f5776922644b7.pdf
[24] Statute of Anne, 1710, 8 Ann., c. 19, § II (Eng.)
[25] Ibid.

law in England included engravings, sculptures, paintings, drawings, photographs to the range of copyright law.[26]

English copyright legislation maintained a leading position in view of legal technic. In contrast to it, French legislation adopted and preserved a system of guilds' printing monopoly without significant changes until the French Revolution (*Révolution française*).[27] By 1791, the French National Assembly abolished a system of privileges and introduced a new rule establishing the enter to public domain of those works whose authors were deceased for more than five (5) years.[28] Several years later, authors, composers and artists were granted with an exclusive economic rights, with their further extension after authors' deaths.[29]

The next significant stage of copyrights' legal development is dedicated to its internationalisation. This was required due to a range of factors, legal inconsistencies with the status of copyright title among states, legal status of foreign works etc. However, it must be admitted that the two key factors of such necessity were piracy and limitations of economic profits' acquisitions (due to legal limitations).[30] As further explained in *"The Evolution of Copyright"*, the piracy obtained an international character and it was decided to adopt measures in order to ensure unified approach to the legal status of literary property and its reciprocal protection abroad.[31] Brander Matthews stated that French nationals were most often despoiled that, in its turn, led to the creation of a bundle of international treaties with neighbouring states.

It is possible to assume that for the reasons mentioned above and with the aim to "promote the international recognition of the legal protection of authors for their intellectual work", the International Literary and Artistic Association *(Association Littéraire et Artistique Internationale)* was founded and governed by Victor Hugo.[32] Exactly this association played a key role for the subsequent creation and adoption the Berne Convention, which is underlined in the following:

> "The *Association littéraire internationale*, a non-governmental organisation, founded in 1878 in Paris, was the original proponent of what then was called *une convention universelle* (a universal convention) for the protection of literary and artistic property and the foundation of a *Union de propriété litteraire* (Literary Property Union)."[33]

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[26] MacQueen, Waelde and Laurie. *Contemporary Intellectual Property: Law and Policy, 35–36.*
[27] *Anne Latournerie, "*Petite histoire des batailles du droit d'auteur*",* 42.
[28] Peter K. Yu. ed, *Intellectual property and information wealth: issues and practices in the digital age,* (Westport, Conn. : Praeger Publishers, 2007), 142.
[29] Ibid.
[30] Brander Matthews, "The Evolution of Copyright", *Political Science,* Quarterly 5, no. 4 (1890): 600–601. https://www.jstor.org/stable/pdf/2139530.pdf
[31] Ibid.
[32] "ALAI - Who Are We?" Alai.org. Accessed 17 April 2020. https://www.alai.org/en/presentation.html.
[33] Arpad Bogsch, *The Berne Convention for the Protection of Literary and Artistic Works from 1886 to 1986*, (Geneva: International Bureau Of Intellectual Property (WIPO), 1986):19 https://www.wipo.int/edocs/pubdocs/en/copyright/877/wipo_pub_877.pdf.

Thus, Berne Convention became the first internationally-harmonized basis for the regulation of copyrights. Besides it, in the 1990s there were adopted a number of other international treaties, i.e. TRIPS, WCT etc. The mentioned instruments aimed to solve a range of issues and provide a subsequent harmonisation on copyright's legal regulation from the perspective of international standardisation, however their analysis falls within the scope the further chapters. Thus, TRIPS enhanced the regulations established before and solve troubles civil, criminal and border enforcement provisions by ensuring common standards, while the WCT covered challenges to the protection of works and authors' rights in the digital environment.

To summarise, the adoption of Bern Convention has fixed an idea of harmonised approach in establishment a universal legal basis and standards for the rights protection of authors and their works, surpass of jurisdictions' limitations etc. for the purposes of counteraction to infringers and causing damages by such actions. The history shows that in particular such phenomena as piracy is subject to cooperated countermeasures between various states in oder to ensure the promotion of intellectual and creative results of their nationals. In the next chapters, the issue of technologically-powered piracy will be raised again alongside to the proposals how EU Member States (in the frame of this thesis) can effectively face this challenge nowadays.

2. ANALYSIS OF EXISTING LEGAL SYSTEM IN COPYRIGHT LAW

This chapter intends to discover and briefly explain the existing copyright legal system through the key legislative provisions. The importance of this highlight lies in the possibility to understand current approach and expose the part of problems that would be relevant for the research of the topic. Comparative analysis of national approaches alongside to analysis of international instruments should provide with the necessary comprehension of the modern challenges faced before the copyrights.

2.1. International Treaties

Berne Convention is considered to be a basis in the legal regulation of the copyright, since this instrument has became the first act of international level, ensuring more or less unified and harmonised legal approach. Its ratification by 177 countries[34] shows the truly international significance as well as providing legal ground for other international treaties such as Trade-Related Aspects of Intellectual Property Rights (hereinafter – TRIPS), WIPO Copyright Treaty (hereinafter – WCT) as well as other regional and national legislations. This necessity responded to a range of reasons, whereby among others the piracy took a high volume of extent both within states and internationally, authors works abroad had different legal status and level of protection, they were translated into national languages, adapted or modified and thus could lost their initial look.[35] Finally, it was nearly impossible to identify infringements and protect the corresponding rights. As a result, the Berne Convention introduced the following key standards[36]:

1. A formulation of non-exhaustive list of copyright protected objects of literary, scientific or artistic domain in the corresponding form of expression, i.e. material form. The article 1 (1) does not clearly specify such form in order to avoid narrowing the possible ways;
2. Introduction of three (3) basic protection principles, namely, principles of national treatment, automatic protection, independence of the protection;
3. Such objects as "translations, adaptations, arrangements of music and other alterations" constitute a separate copyright subject-matter, although considered as derivative ones;
4. Ensuring the explicit division for the economic and moral rights of authors. Under Art.7 of the Convention, the economic rights shall have the time limits, namely fifty (50)

[34] "WIPO - Administered Treaties.", World Intellectual Property Organisation, Accessed 05 February 2020, www.wipo.int/treaties/en/ShowResults.jsp?treaty_id=15.
[35] Brander Matthews, "The Evolution of Copyright.", 600-01.
[36] "Berne Convention for the Protection of Literary and Artistic Works", World Intellectual Property Organization. Accessed 10 March 2019, https://wipolex.wipo.int/en/treaties/textdetails/12214.

years after the death of the author (or the last of authors in case of joint authorship) for the majority of works, fifty (50) years for the cinematographic works after making them publicly available, the same rule – for the anonymous works after being published, and twenty five (25) years – for the photographic works. Unlike the economic ones, the moral rights should be kept by the author irrespectively of any case, this also implicates the possibility to claim authorship, object to any kind of distortion, modification or derogation of the work that could be prejudicial to the authors reputation as Art.6*bis* establishes;

5. The Convention also provides the proprietors with an exclusive right to authorise and/or prohibit the making of reproductions, translations, adaptations of the work, its public performance and communication and broadcasting.[37] This is important to be pointed out as other instruments add a novelty in this bundle of rights and refer to Berne Convention in order to ensure the unanimity of regulation;
6. Creation of the binding legal limitations of the copyrights, namely, free or fair use and compulsory licensing of the works, also including the provision of Art. 9 (2) whereby the reproduction of the works may be allowed under adopted national legislation which would not conflict with "a normal exploitation of the work and legitimate interests of the author".[38]

While the fair use includes the specific acts of copyrighted object's exploitation, i.e. quotations, teaching purposes, broadcasting for the news purposes, the compulsory licensing covers those situations when the work can be lawfully exploited notwithstanding to the possession of the author's consent. However, authors have to be "equitably remunerated" according to the text of the Convention.

Next prominent international instrument is TRIPS Agreement as it is a second document of such extent. The globalisation and coming into being a valuable asset, intellectual property faced a problem of adoption measures facilitating international trade, and, therefore, provision of legal measures that would ensure stability and economic applicability. The solution was achieved by the principles of National and Most-Favoured-Nation Treatment as well as obligatory referring to the provisions of Berne Convention and its Appendix thereto (Part II, Section 1, Art. 9), establishment of common standards in civil, administrative, criminal and boarder measures and remedies as a part of intellectual property rights' enforcement (Part III), dispute resolution mechanisms (Part

[37] "Summary of the Berne Convention for the Protection of Literary and Artistic Works (1886)". World Intellectual Property Organisation, Accessed 9 February 2020, https://www.wipo.int/treaties/en/ip/berne/summary_berne.html.
[38] Ibid.

IV)[39]. Another far-going important provision covers equating of computer programmes and compilations of data to literary works within the meaning of the Berne Convention (Art.10).[40] In order to become a member of the World Trade Organisation (hereinafter – WTO), contracting States undertook an obligation to adopt and ratify the Agreement Establishing the World Trade Organisation, whereby in accordance with the Art.2 (2) of the mentioned treaty, all its Annexes constitute integral part of it.[41] Thus, the TRIPS Agreement was automatically adopted by all WTO members.

The third international treaty that has the major impact and importance, in my opinion, is a WCT. The contracting parties in the amount of 103 states shows this significance.[42] The article 1 (2) of instrument indicates that WCT has a special status within the Art. 20 of Berne convention and shall have no other connection with any other treaty. In other words, it is possible to say that WCT has a derivative character in relation to the Berne Convention and directed to the enhancement of the latter one within, mainly, the framework of digital society. One of the main highlights of it is that the WCT confirms the protection of computer programmes as literary works and also brings compilation of data (databases) in the range of copyright objects.

Furthermore, neither WCT nor TRIPS discover the meaning of the terms "computer programme" and "compilation of data/database". While the first can be defined as a series/set of instructions that are used to carry out certain operation of a computer to achieve certain result[43], the second term is covered by Council Database Directive that can be applied by the analogy. According to it, the "database" shall mean a collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means.[44]In addition to the rights, granted by Berne Convention, WCT adds to this list exclusive rights for authors to authorise distribution ("making available to the public"), commercial rental as well as broader meaning of communication to the public (Articles 6, 7, 8 WCT).

Rapid digitalisation led to a possibility of creation and utilisation of digitalised copyrighted materials, while at the same time, infringers obtained also a new way of copyrights' violations

[39] "The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)", World Trade Organisation, Accessed 16 March 2019, https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm.
[40] Ibid.
[41] "Marrakesh Agreement Establishing the World Trade Organization", World Trade Organisation, Accessed 16 March 2019, https://www.wto.org/english/docs_e/legal_e/04-wto.pdf
[42] "WIPO - Administered Treaties.", World Intellectual Property Organisation, Accessed 11 February 2020, www.wipo.int/treaties/en/ShowResults.jsp?treaty_id=15.
[43] David I. Bainbridge, *Introduction To Information Technology Law*, (Harlow: Longman, 2008), 11.
[44] "Council Directive 96/9/EC on the legal protecction of databases, (1196) Official Journal L77, p.20.", EUR-LEX, 11 February 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31996L0009.

like piracy, free and unlimited unauthorised distribution, override of RMIs etc. The obligations concerning Technological Measures, Rights Management Information introduced upon articles 11-12 WCT[45] were called to provide a technical protection over intellectual property rights thorough wide discretion of its application and become, so to say, "the answer to machine is a machine".[46] Unfortunately, in fact this has not led to significant reduction of illegal access to digital-content.

In its turn, the Rights Management Information, as defined by art. 12(2) WCT, means information which identifies the work, the author of the work, the owner of any right in the work, or information about the terms and conditions of use of the work, and any numbers or codes that represent such information. Alongside to the provisions of the previous article, states are obliged to implement these provision and provide effective civil remedies to any illegal/unauthorised action towards the RMI.

In general, it is quite interesting to discover how intersected these instruments are, where the Berne Convention serves as a basis for the internationally harmonised legal rules as well as for other international treaties. One more important fact to be said in favour of this expression is an additional document to WCT, namely, Agreed statements concerning the WIPO copyright treaty whereby it is agreed that the provisions of the mentioned treaty are also reconciled with the provisions of TRIPS Agreement. This tells us about the serious intention of international community to agree on complex, unified and universal legal rules to both regional and international extent.

2.2. European Union's framework of legal regulation in copyright law

Nowadays, the copyright works as a branch of intellectual property has a significant value not only as a results of intellectual activity but as goods within the meaning of Internal market as well. Thus, the copyright underwent a numerous "legal interventions" on the EU level in order to ensure the efficient enough harmonised legal regulation in the Member States. Overall, the EU Primary legislation did not foresee the specific provision for the copyrights as it had been considered rather a subject to a cultural achievement than the economic one.[47] However, beyond the passed time, it became clear that annual turnover of 535.9 EUR billiards should be treated in

[45] "WIPO Copyright Treaty", WIPOLex, 12 February 2020, https://wipolex.wipo.int/en/text/295157.
[46] Stamatoudi, I. and Torremans, P., *EU copyright law*, (Cheltenham: Edward Elgar, 2014), 489.
[47] Ibid.

a serious manner.[48] As a result, the EU expanded its competence over copyrights, having as goal to settle a unified legal approach and diminish adversity within the Internal Market.

In general, EU's *acquis communautaire*, related to the area of copyright is represented as a bundle of European Court of Justice (hereinafter referred to as ECJ) case law and Directive, whereby each is directed to introduce a harmonisation on regulation of a range of particular matter. Among others, the following Directive may be encountered:

1. Directive on the harmonisation of certain aspects of copyright and related rights in the information society ("InfoSoc Directive");
2. Directive on rental right and lending right and on certain rights related to copyright in the field of intellectual property ("Rental and Lending Directive");
3. Directive on the resale right for the benefit of the author of an original work of art ("Resale Right Directive");
4. Directive on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission ("Satellite and CableDirective");
5. Directive on the legal protection of computer programmes ("Software Directive");
6. Directive on the enforcement of intellectual property right ("IPRED");
7. Directive on the legal protection of databases ("Database Directive");
8. Directive on the term of protection of copyright and certain related rights ("Term Directive");
9. Directive on collective management of copyright and related rights and multi-territorial licensing of rights in musical works for online use in the internal market and others ("CRM Directive").[49]

Unlike other types of intellectual property rights, like trademarks or industrial design, the unification of copyright legislation and creation of single copyright title is considered to be the most recent and controversial.[50] It entails both support from creators, scientific representatives and horrors and oppositions by publishers and record companies. However, it must be retained in mind that since the 2000s and till recent times, the approach implemented by the European Union was sufficient enough in view of provision separate harmonisation Directives. However, nowadays' challenges push the development of unitary title concept across single market. In furtherance of

[48] Catherine Seville, *EU Intellectual Property Law and Policy*, *2nd ed.,* (Cheltenham: Edwward Elgar Publishing 2016), 23-24.
[49] "The EU Copyright Legislation.", The European Commission, Accessed 01 April 2019, https://ec.europa.eu/digital-single-market/en/eu-copyright-legislation.
[50] Irini A. Stamatoudi, *New Developments In EU And International Copyright Law*, (Alphen aan den Rijn: Worlters Kluwer, 2016), 447-8.

research performed under this thesis and overall concept of single European Copyright title, the following intents to outline the key provision of main harmonised law and point out in conclusions why current legal regulation becomes less efficient with regards to counteraction to copyright infringements.

In the number of its rulings, the ECJ followed the practice of Directives' harmonisation, rather then making a parallel between the copyrights and EU Primary Law as the developed system of Secondary Law had diminished the conflicts between them.[51] The ECJ made both answering to posted question and established rulings with regards to the issues that were not subject to a case, like concept of originality in the *Infopaq* case.[52] The authors of "*EU Copyright Law: A Commentary*" stressed that thus the ECJ has made an impact not only on exercise of copyrights, but on its existence as well, which also falls within the scope of Member States' competition.[53]

Software Directive

The Software Directive is intended to provide regulation on several significant points, such as establishment of the link between the computer programmes' protection and the copyright law, provide a specific subject matter of such protection as well as related exclusive rights and the term of their validity.[54] Another point here is the implementation of TRIPS and WCT the provisions whereby it is provided that computer programme is a subject to literary work within the meaning of the Berne Convention that is provided in the article 1 (1) of the mentioned Directive.[55] The same wording, actually, was provided for in this provision and, as a result, logically led to uniformed understanding of the legal status to be applied with regards to such works, however the Directive did not provide a legal definition. In the provision (2) of the same article, it is also specified that the copyrightable subject matter is the form of expression of the computer programme, but not its ideas or principles underlying programme's elements or its interfaces.[56]

The tricky point of any copyrighted work, including computer programmes, is the originality concept. Once computer programmes were introduced as literary works , they also became a subject to the evaluation of the originality, while the Directive explicitly indicates about the this concept as well.[57] Right away, by the impact of ECJ case law, the European concept of

[51] Irini A Stamatoudi and Paul L. C Torremans, "*EU Copyright Law: A Commentary,* (Cheltenham: Edward Elgar, 2014), 11.
[52] Ibid, p.12.
[53] Ibid.
[54] Catherine Seville, *EU Intellectual Property Law And Policy, 2nd ed,*28
[55] "Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (Codified version), OJ L 111, 5.5.2009, p. 16–22", EUR-LEX, Accessed 15 February 2020, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0024.
[56] Ibid.
[57] Ibid.

originality has been formed which is based on British "skills and labour" and German "level of author's creativity and personality".[58] Under the case law, the following may be outlined in order to characterise this concept:

1. The work has to comply with the standard of "author's own intellectual creation";[59]
2. The own intellectual creation may be defined in those cases when the author is able to express his creative abilities by making free, creative choices and to put his "personal touch" to the work;[60]
3. In the work created, where the author has no possibility to introduce his creative abilities due to limited creative freedom are considered as non-original;[61]
4. In cases when the work lacks for the author's personal creative abilities, notwithstanding with the amount of skill and labour invested, it may lead to a non-original character of the work.[62] Thus, the ECJ made an emphasis on the higher importance of qualitative features of works, rather than to quantitive type of author's contributions.[63]

As for the moral and economic rights, the Software Directive explicitly treat them in accordance to the previously discussed international regulation, namely it has established that authors to the work (computer programme) may be natural person only, while the economic rights may be designated for both, natural persons and legal entities under the national legislation of EU's Member States.[64] The beneficiaries of protection shall enjoy exclusive rights on authorisation of reproduction (including those cases when such action requires loading, displaying, running, transmission, storage) and distribution in any form and by any mean of programmes, as well as their translation, adaptation, arrangement or any alterations.[65] At the same time, the Software Directive foresaw the list of limitations to these exclusive rights. The lawful acquirer of the

[58] Stamatoudi and Torremans, *EU copyright law*, 13-14

[59] "Infopaq International A/S v Danske Dagblades Forening, Case C-5/08, EUR-LEX, accessed 15 February 2020, paragraph 35, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62008CJ0005

[60] "Football Dataco Ltd and Others v Yahoo! UK Ltd and Others, Case C-604/10, para 38; Infopaq International A/S v Danske Dagblades Forening, Case C-5/08, para 45; Bezpečnostní softwarová asociace v. Ministerstvo kultury, Case C-393/09, para 50; Eva-Maria Painer v. Standard VerlagsGmbH, Case C-145/10, paras 89, 92", EUR-LEX, accessed 15 February 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62010CJ0145; https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:62009CJ0393_SUM&from=LT; http://curia.europa.eu/juris/liste.jsf?&num=C-604/10.

[61] Football Association Premier League v. QC Leisure and Karen Murphy v. Media Protection Services, 98 [2011]; Bezpečnostní softwarová asociace v. Ministerstvo kultury [2010], 49; Football Dataco v. Yahoo! [2012], 39

[62] "Footbal Dataco v. Yahoo!, Case C-604/10", 46.

[63] Lionel Bently and Brad Sherman, *Intellectual Property Law*, (Oxford: Oxford University Press, 2014), 102.

[64] "Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (Codified version), OJ L 111, 5.5.2009, p. 16–22", EUR-LEX, Accessed 17 February 2020, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0024

[65] Ibid, art.4

programme's copy shall have the right of use in accordance with the its intended use, the right of creation of back-up copies, the right to use the copy of programme to observe, study or test its functioning in order to determine the underlying ideas and principles, and the right to decompile the programme.[66]

Before proceeding further it is important to point out that, in view of copyright's subject matter, the provision of Art. 5 (3) of Software Directive, providing "to determine the ideas and principles which underlie…" leads to certain inconsistency as ideas and principles are out of the copyright protection's scope. Probably, it is possible to assume that the meaning was aimed to provide a lawful user with the possibility to interact the programme's "form of expression" in order to find out the way how it operates. Furthermore, the decompilation is a process of producing the source code from the programme.[67] Thus, the decompilation right confers the licensee, lawful acquirer or other authorised person to produce this source code for the specific purposes, namely if there is a need of information in order to reach interoperability of the independently created programme, and such information has been available previously to the authorised persons.[68]

The final novelty, brought by the mentioned Directive is the obligation for the Member States to ensure special measure of protections in their national legislations against the following range of infringing actions: the putting into the circulation of the programmes's copy, commercial possession of such copy knowing or having reason to know that the copy is infringing one, or both of the mentioned acts – for the intended purpose of facilitation in unauthorised removal or circumvention of technical means of protection.[69] In this case, the purpose of this provision is to clarify that the acquisition of infringing is not the only case of violation and that the subsequent use of such copy, in particular for commercial purposes, constitute an infringement as well.

Rental and Lending Directive

The Rental and Lending Directive is aimed to introduce into the EU legislation and, as a consequence to legislation of its Member State, the provisions of rights of distribution, rental and communication to public that are foreseen by the WIPO Copyright Treaty. However, the Directive goes further and also differentiates authors' lending rights as well as covers aspect on Rights related to copyright (in other words, related rights). Corresponding to article 3 of the above

[66] Ibid, 5,6
[67] "Decompile | Meaning Of Decompile By Lexico", Lexico Dictionaries | English, Accessed 8 March 2020. https://www.lexico.com/definition/decompile.
[68] "Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (Codified version), OJ L 111, 5.5.2009, p. 16–22", EUR-LEX, Accessed 08 March 2020, art. 5(1), https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009L0024.
[69] Ibid.

mentioned instrument, there are four groups of right holders, namely authors (in respect of their works), performers (in respect of fixations of their performance), phonogram producers (in respect of phonograms) and film producers (in respect of their films).[70] The similar rule is foreseen in article 10 whereby the legal rule on distribution right is established. As for the fixation right, the performers are granted with the discretion to authorise and prohibit fixation of their performances as well as their broadcasting and communication to public, however except for those cases when such performances constitute a broadcast performance or are made from fixation. Turning back to terms, it is appropriate to specify that Directive defines:

- Rental as making available for use, for a limited time period and either for direct or indirect economic or commercial purpose; and
- Lending as making available for use, for a limited time period, but neither for direct nor indirect economic or commercial purpose.[71]

Both of them may exist as legitimate under the authorisation or license which can take form of voluntary or compulsory, depending on particular case. Even in cases of compulsory licensing, the Directive establishes a requirement for Member States to introduce the system and the amount of equitable remuneration for such uses. Alongside to that, notwithstanding the fact that authors or performers would have assigned their rental rights, they preserve their right to obtain an equitable remuneration as this right is set as non-waivable.[72] The common practice in administration of remunerations' repayments is usually delivered by the Collective Management Organisations or CMOs. However, exactly this practice may lead to limitation of royalty payments as each CMO acts within its own "specialisation".

Herewith, among the granted rights, according to article 10, there are some so-called classical limitations, like private use, use of short excerpts in connection with news reports, ephemeral fixation by broadcasting organisation and the use for teaching or scientific purposes.[73] Since article 10 of the Rental and Lending Directive implicates that Member States "*may*" provide the mentioned as limitations and since there are many provisions with the formulation "*may"*, it leads to the wider discretion of Member States with regards to these particular issues.

[70] "Directive 2006/115/EC of the European Parliament and of the Council of 12 December 2006 on rental right and lending right and on certain rights related to copyright in the field of intellectual property (codified version), OJ L 376, 27.12.2006, p. 28–35", EUR-LEX, Accessed 10 March 2020, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32006L0115.
[71] Ibid.
[72] ibid
[73] Ibid.

Thus, the Dutch legislation implements each of the mentioned exceptions in Section 10 of Neighbouring Rights Act[74], in French Intellectual Property Code they are provided in article L 211-3, while in German Act on Copyright and Related Rights covers these issues in Sections 83, 85, 87 and 94, referring them to Part 1 Division 6 whereby the full list of limitations' and exceptions' cases is introduced.[75]

Term Directive

The Term Directive resulted out of the arose case between *EMI v. Patricia* whereby unharmonised legal rules have been illustrated.[76] In that case, the dispute appeared on the basis of the marketing of sound recoding in Denmark while the rightholder was in Germany. This marketing was conducted lawfully since the national protection period for sounds recording rights had expired in Denmark.[77] The difference in terms took its place as parties to Berne Convention implemented the provision of minimum protection for 50 years from the author's death, while some of them introduced different terms, like Germany (70 years *post mortem*) or Spain (60 years).[78]

The term Directive intervenes the terms of protection in both copyright and related rights. In particular, it cover authorial works, performance fixations, phonograms, first fixations of films and copies thereof, broadcast fixations, original photographs, unoriginal works, previously unpublished works, critical and scientific works.[79] Thus, accordingly to 1, 2, 6 of Directive, the rights of authors of a literary or artistic works, cinematographic or audio-visual works, original photographs shall be protected for the term of seventy (70) years after author's death.[80] The term of fifty (50) years was established for related rights, namely rights of performers, of phonograms producers, of films producers, of broadcasting organisations, differing only by the moment of such rights appearance (first communication to public, first fixation, first transmission).[81] As for the

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[74] "Act of March 18, 1993, containing Rules on the Protection of Performers, Phonogram Producers and Broadcasting Organizations and Amending the Copyright Act 1912 (Neighboring Rights Act)", WIPOLEX, Accessed 12 March 2020, https://wipolex.wipo.int/en/legislation/details/17871.

[75] "*Urheberrechtsgesetz* – Copyright Act of 9 September 1965 (Federal Law Gazette I, p. 1273), as last amended by Article 1 of the Act of 28 November 2018 (Federal Law Gazette I, p. 2014)", Gesetze im internet, Accessed 12 March 2020, https://www.gesetze-im-internet.de/englisch_urhg/englisch_urhg.html.

[76] "*EMI Electrola GmbH v. Patricia Im- und Export,* Case C-341/87" , EUR-LEX, Accessed 13 March 2020, para 79, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A61987CJ0341.

[77] Seville, *Intellectual Property Law And Policy*, 44.

[78] ibid

[79] Justine Pila, Torremans, *European Intellectual property law,* (Oxford: OXFORD UNIV PRESS, 2016), 228.

[80] "Directive 2006/116/EC of the European Parliament and of the Council of 12 December 2006 on the term of protection of copyright and certain related rights (codified version), OJ L 372, 27.12.2006, p. 12–18", EUR-LEX, Accessed 14 March 2020, 12–18", EUR-LEX, Accessed 14 March 2020, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32006L0116.

[81] Ibid.

time period of previously unpublished works and critical/scientific publications, then they are granted with the terms of twenty five (25) and thirty (30) years respectively from the moment of being made available to public domain.[82] What is interesting here is that the Directive left almost no discretion for Member States in the issues of implementation. The Term Directive has clearly provided time periods for each particular type of rights, except for critical and scientific publications which *may* be protected for a maximum term, not exceeding thirty (30) years. However, it seems that none of national instruments provides such term.

Resale Right directive

The *droit de suite* or resale right is inalienable and non-waivable authors' right under EU legislation that adopts the rule, firstly introduced by Berne Convention in art.14*ter*[83]. By its sense, the resale right contemplates the right of author to receive a royalty payment upon the subsequent resales of his works. Both, the Berne Convention and Resale Right Directive intentionally specifies that compulsory repayment of royalties are subject to only subsequent sales of work excluding the first sale. Alongside to that, pursuant the art.2 of the mentioned Directive, it contains an exclusive list of works that are subject to resale right, in particular works of graphic or plastic art such as pictures, collages, paintings, drawings, engravings, prints, lithographs, sculptures, tapestries ceramics, glassware and photographs.[84] The threshold minimum sale price to trigger the right is a subject of Member States' determination, however Directive sets the limit of such price not exceeding the amount of 3000 euro.[85] In view of this, France adopted the minimum amount as of EUR 750[86], while in Germany this amount equals to EUR 400[87] as well as the Netherlands where the minimum threshold is set for EUR 3000.[88] In its following provisions, the Resale Right

[82] Ibid.

[83] "Berne Convention for the Protection of Literary and Artistic Works". WIPOlex. Accessed 15 March 2020. https://wipolex.wipo.int/en/treaties/textdetails/12214.

[84] "Directive 2001/84/EC of the European Parliament and of the Council of 27 September 2001 on the resale right for the benefit of the author of an original work of art, OJ L 272, 13.10.2001, p. 32–36", EUR-LEX, Accessed 15 March 2020, art. 2(1), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001L0084

[85] Ibid, art. 3.

[86] "Code de la propriété intellectuelle de la République Française", Legifrance, Accessed 16 March 2020, Art. r122-5, https://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006069414.

[87] *Urheberrechtsgesetz* – Copyright Act of 9 September 1965 (Federal Law Gazette I, p. 1273), as last amended by Article 1 of the Act of 28 November 2018 (Federal Law Gazette I, p. 2014)", Gesetze im internet, Accessed 16 March 2020.

[88] "Information on Resale Rights for Art Market Professionals", Pictoright, Accessed 17 March 2020, https://pictoright.nl/english/professional-art-dealers/

Directive provides the range of royalties' rates with their maximum limitation of EUR 12 500.[89] The rates are the following[90]:

- 4 % for the portion of the sale price up to EUR 50000;
- 3 % for the portion of the sale price from EUR 50000,01 to EUR 200000;
- 1 % for the portion of the sale price from EUR 200000,01 to EUR 350000;
- 0,5 % for the portion of the sale price from EUR 350000,01 to EUR 500000;
- 0,25 % for the portion of the sale price exceeding EUR 500000.

By its nature, *droit de suite* has closer relation to moral rights, rather than to economic ones as it is practically impossible to inalieate this right or to waive it. Furthermore, the resale right has the time limitation period which equals the term of economic rights' protection, what is more is that this should be the only right, closely related to author, that is a subject of transfer from the author's death (art.6).[91]

Database Directive

Databases as another object of copyrights has had their significance since the beginning of 1990s. The challenging environment of rapid IT development brought it as an importance of high level to adopt the harmonised regulation not only towards computer programmes but databases as well. Accordingly to art. 1 (2), databases shall mean a collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means.[92] This instrument has also clearly indicated the the limitations of its scope, whereby the Directive should not be applied with regards to computer programmes (used in the making or operation of databases), the legal protection of computer programmes, rental, lending and certain rights neighbouring to copyright as well as scope of protection in time.[93] Concerning the latter, the Directive sets the term of fifteen (15) years for the *sui generis*, starting from the January 1st of the year following the date of completion, while the general protection would have lasted for 70years.[94]

[89] "Directive 2001/84/EC of the European Parliament and of the Council of 27 September 2001 on the resale right for the benefit of the author of an original work of art, OJ L 272, 13.10.2001, p. 32–36", EUR-LEX, Accessed 15 March 2020
[90] Ibid.
[91] Ibid.
[92] "Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, OJ L 77, 27.3.1996, p. 20–28", EUR-LEX, Accessed 15 March 2020, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31996L0009.
[93] Ibid.
[94] Ibid.

In fact, it worth to be admitted that this regulation went significantly beyond the standard framework of databases protection. It means the Directive implicates not only classical legal protection under copyright law, but also it establishes the so-called *sui generis* rights. Thus, for the better understanding it worth to treat them separately. Under classical approach, the author (or other designated person) shall have moral an exclusive rights for the database created by him. The only requirement provided for in legislation is that such work has to be author's own intellectual creation[95] which means that the concept of originality, discussed above, is totally applicable here. In accordance with Directive, within the scope of exclusive (economic) the rightholder shall carry out or authorise the following acts:[96]

- temporary or permanent reproduction by any means and in any form, in whole or in part;
- translation, adaptation, arrangement and any other alteration;
- any form of distribution to the public of the database or of copies thereof;
- any communication, display or performance to the public;
- any reproduction, distribution, communication, display or performance to the public of the results of the translation, adaptation, arrangement, any other alteration.

As it may be noticed, the Directive established a full range of economic rights concerning the databases as they constitute fully-featured copyright object. Alongside to that, the Directive has a provision of exceptions in exclusive rights, stated in the article 6. According to this, the Member States shall have the discretion to implement such exceptions in particular cases, like the reproduction for the private use of non-electronic version of database, illustration for teaching/scientific purposes, use for public purposes.[97]

The significant innovation to the regulation was laid down by the introduction of *sui generis* right, which put additional requirement for the eligibility as well as extra exclusive rights for the holder. The object of protection is formulated in the article 7 of Database Directive and looks as follows:

> "Member States shall provide for a right for the maker of a database which shows that there has been qualitatively and/or quantitatively a substantial investment in either the obtaining, verification or presentation of the contents to prevent extraction and/or re-utilization of the whole or of a substantial part, evaluated qualitatively and/or quantitatively, of the contents of that database."[98]

[95] ibid.
[96] ibid
[97] ibid
[98] ibid.

Under such formulation, It follows that substantial investment of qualitative and/or quantitive nature into the content of database is the key feature in obtaining legal consideration under *sui generis* basis. The only issue is about the determination which investment shall be considered as substantial and shall not. The ECJ has clarified that investment in obtaining the contents of a database have to be understood as *"referring to the resources used to seek out existing independent materials and collect them in the database"*, while the investment into verification of the contents of a database means *"the resources used, with a view to ensuring the reliability of the information contained in that database, to monitor the accuracy of the materials collected when the database was created and during its operation"* as well as investment in the presentation of the contents of the database means *"resources used for the purpose of giving the database its function of processing information, that is to say those used for the systematic or methodical arrangement of the materials contained in that database and the organisation of their individual accessibility".*[99]

Subsequently, the Directive specifies the meaning of the such actions as "extraction" and "re-utilization". Accordingly to art. 7 (2) of the mentioned instrument, the "extraction" shall mean the permanent or temporary transfer of all or a substantial part of the contents of a database to another medium by any means or in any form. In its turn, the "re-utilization" has to be understood as any form of making available to the public all or a substantial part of the contents of a database by the distribution of copies, by renting, by on-line or other forms of transmission.[100] As for the limitations, then the cases of extraction from a non-electronic database for private purposes, extraction for teaching and scientific purposes, public purposes may be encountered, however it must be taken into account that the Member States are not subject for obligatory introduction of the mentioned exceptions as Directive implicates a discretion for such actions.

Collective Rights Management Directive (CRMD)

The CRM Directive is a next instrument on a way of establishment of harmonised basis in legal approach to the authors rights' management by empowering authors to be involved into such management, improving the functioning and accountability of CMOs as well as facilitating the

[99] Judgement in *Fixtures Marketing Ltd v. Oy Veikkaus Ab*, C-46/2, ECLI:EU:C:2004:694, paras 34 and 37; Judgement in *The British Horseracing Board Ltd and Others v. William Hill Organisation Ltd,* C-203/02, ECLI:EU:C:2004:695, paras 31 and 34; Judgement in *Fixtures Marketing Ltd v. Svenska Spel AB,* C-338/02, ECLI:EU:C:2004:696, paras 24 and 27; Judgement in *Fixtures Marketing Ltd v.Organismos Prognostikon agonon podosfairou AE (OPAP),* C-444/02, ECLI:EU:C:2004:697, par. 49.

[100] Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, OJ L 77, 27.3.1996, p. 20–28", EUR-LEX, Accessed 16 March 2020, art. 7(2), https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31996L0009.

intra EU licensing of author's right in musical works.[101] Accordingly to the EC website, as its objectives, the Directive aims to establish common governance, transparency and financial standards in order to improve the operation of CMOs, to establish a framework of common standards in cross-boarder licensing of authors' rights for online services provision and, finally, introduction of conditions that would lead to expansion of online music offering.[102]

For the further needs, the collective management organisation, within the meaning of article 3 CRM Directive, shall mean any organisation which is authorised by law or by way of assignment, license or any other contractual agreement to manage copyright or neighbouring rights on behalf of more than rightholder.[103] In its turn, accordingly to above-mentioned instrument, the member shall be understood as rightholder or any entity representing rightholder that fulfil the membership requirement of CMO and is admitted by it.

In case of this thesis, there is no necessity to arrange a deep and comprehensive analysis on CRM Directive since the topic has not covered all the issues. Therefore, it would be appropriate to make an emphasis on extent of authors' rights, their participation in CMOs operations as well as transparency issues and licensing. First of all, the Directive imposes a requirement for Member States to oblige each CMO to introduce a compulsory list of rights for members, stated in article 5 CRM Directive. The range of such rights include:

1. a right of rightholder to authorise a chosen CMO for the management of their rights, types of works, particular territory of such management;
2. a right to grant non-commercial licenses for uses of any rights, categories of rights, types of works, other matters;
3. a right to terminate the authorisation of rights' management or withdraw from a CMO any assigned rights for the purpose of their management;
4. a right to obtain benefits appeared before the termination/withdrawal of rights' management authorisation;
5. guarantee that in case of execution of two (2) previously mentioned rights, authors would not be restricted in assignment their rights to other CMO than the one with which the relationship have been terminated;

[101] "Collective Rights Management Directive - Shaping Europe'S Digital Future - European Commission". The European Commission, Accessed 16 March 2020, https://ec.europa.eu/digital-single-market/en/collective-rights-management-directive.
[102] Ibid.
[103] "Directive 2014/26/EU of the European Parliament and of the Council of 26 February 2014 on collective management of copyright and related rights and multi-territorial licensing of rights in musical works for online use in the internal market, OJ L 84, 20.3.2014, p. 72–98", EUR-LEX, Accessed 16 March 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0026.

6. guarantee that in order to assign a CMO rights for management, the rightholder shall give a consent for each particular type of right, its category, type of work etc.;
7. a rightholder shall be entitled to be informed by the CMO about the range of his rights before providing authorisation.[104]

It is possible to assume that such a particular formulation has been created in order to avoid any manipulations with the rights assigned to CMO as organisation may create and, subsequently, impose not fair conditions that would be excessively harmful for the normal exploitation of rightholders copyrights. Besides that, CMOs of EU Member States are also obliged to ensure that their statutes or membership terms possess a list of criteria for acceptance of new members based on objective, transparent, non-discriminatory principles as well as the possession of appropriate and effective mechanisms of CMO members' participation in decision-making process.[105] At the same time, the CMO members constitute a general assembly of such organisation and are subject to perform annual meetings whereby they adopt decision on many aspects, in particular, amendments to the statute, appointment/dismissal of directors, various policies (i.e. distribution amounts, non-distributable amounts, general investments, risk management), approvals etc.[106]

In relation to the licensing regulation, the Directive provides an obligation to perform negotiations for the use of rights in a good faith, basing on objective and non-discriminatory criteria. At the same time, the rightholders are entitled to receive equitable and reasonable remuneration for the use of their rights.[107]

InfoSoc Directive

InfoSoc Directive or Directive on the harmonisation of certain aspects of copyright and related rights in the information society is a reflection to the world's rapid digitalisation, in particular taking into account the intellectual property rights that is widely brought to digital sphere and is constantly used there. The importance of adoption this directive was brought by the necessity of creation and implementation a raw of specific provisions that would be harmonised across the Community, formulated in a universal way to cover digital means and, at the same time, intervene the regulation into newly emerged possibilities of copyright and related rights' uses.

In particular, the Directive sets out its scope of application, in particular reproduction rights, right of communication to pubic, distribution rights, however it does not affect the regulation of other legal rules concerning computer programmes, databases, rental and lending,

[104] Ibid.
[105] Ibid.
[106] Ibid, art. 8
[107] Ibid, art 16 (1),(2).

broadcast rights as well as terms of protection.[108] It is done so in order to exclude the overlap in regulation of the identical subject matters. As for range of subjects and subject matter, it is important to point out that accordingly to articles 2, 3 of Directive, the five (5) major groups of authors (or rightholders) and their works are covered, namely, authors and their works, performers and fixation of their performances, phonogram producers and their phonograms, film producers and their films, broadcasting organisations and their broadcast fixations.[109] Another aim achieved by this instrument is an implementation of provision of articles 11 and 12 WCT whereby the parties to this treaty have been obliged to implement into their legislations the legal rules concerning technological measure to be applied and the rights management information (RMI). The necessity here lies down in the issue of harmonisation, since Member States have implemented such provisions within the meaning of international treaty, however with a great discretion if we speak in view of Community.

In case of obligation as to technological measure established in article 6 (1) Directive, it may be seen that the formulation of the legal rule is quite broad in order to make it possible to interpret it for each particular case.[110] In fact, this provision is an analogue provided by WCT, however the Directive went further and also imposed an obligation to counteract "against the manufacture, import, distribution, sale, rental, advertisement for sale or rental, or possession for commercial purposes of devices, products or components or the provision of services which are promoted, advertised or marketed for the purpose of circumvention of, or have only a limited commercially significant purpose or use other than to circumvent, or are primarily designed, produced, adapted or performed for the purpose of enabling or facilitating the circumvention of, any effective technological measures".[111] This has a great importance in view of establishment prevention measures. While "effective technological measure" are called to prevent or restrict unauthorised acts infringing the rights by utilisation of any technology, device or component[112], in fact the provision of Article 6 (2), introduces preliminary prevention measure in order to enhance the "adequate legal protection" performed by state.

The final, most important and significant issue of this Directive is a preset list of exceptions and limitations, foreseen under the article 5 of InfoSoc Directive. The peculiarity is that Member State are obliged to implement, as exclusion, temporary acts of reproduction of transient or

[108] Directive 2001/29/EC on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society, OJ L 167 22.6.2001, p. 10", EUR-LEX. Accessed 12 March 2019, art. 1-4, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02001L0029-20190606.
[109] Ibid, 2, 3.
[110] Ibid, art 6
[111] ibid
[112] Ibid.

incidental nature, that constitute a part of technological process and purpose of which is to facilitate a lawful use or transmission between third parties within a network.[113] The following article 5 (2) and (3) contains a further list of exceptions to reproduction and communication rights, stating that it is up to the Member States to decide which provision have to be applied. In particular, French Intellectual Property Code (IPC) implements the provisions of article 5 (2) (a) – (d) Directive and, thus, introduces as allowed the following actions:

(a) , (b) to conduct copies or reproductions from a lawful source for private purposes strictly, excluding any commercial uses and by providing a fair compensation to the author (L 122-5, 2* CPI);

(c) to reproduce a work and its performance for conservation, research or private study purposes, made by publicly accessible libraries, museums or archive services, clearly defined that such reproduction is not used either for direct or indirect purposes (L122-5, 8*);

(d) to reproduce and preserve ephemeral recording performed by broadcasting organisation and by its own facilities for the purpose of own broadcasts (L 214-1).[114]

In case of German Act on Copyright and Related Rights ("*Urhebergesetz" or "UrhG")* the provisions of article 5 (2) have been fully implemented under Sections 53-55, including Directive's subsection (e), stating that schools, teacher training and further training institutions, various welfare services are allowed to make copies of works, communicate them to public and/or use for teaching purposes with a requirement to pay an equitable remuneration in certain cases.[115] As for the Dutch Copyright Act, it went the same way as French IPC by implementing point (a) to (d) and excluding the (e).[116]

While pursuing the analysis and comparison of the following provision of Directive, namely section (3) article (5), it can be noticed that these Member States applied their discretion and introduced different subsections into their legislations. In particular, German *UrhG* implemented the subsections (a) to (m) and avoided (n), (o), and thus covered as rights' limitations:

(a) Private uses for teaching or scientific purposes with a subsequent indication of source and for non-commercial aims;

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[113] Ibid.
[114] Martine Hebette et al., *Copyright Law In The EU: Salient Features Of Copyright Law Across The EU Member States,* (Brussels: European Parliamentary Research Service, Comparative Law Library Unit, 2018), 179-181. https://www.europarl.europa.eu/RegData/etudes/STUD/2018/625126/EPRS_STU(2018)625126_EN.pdf.
[115] Ibid, Pp.73-77.
[116] Ibid, Pp.263-271.

(b) Uses for the people having certain disabilities that are directly related to such disabilities and for non-commercial purposes;
(c) Reproduction by press or other communication to public for the purposes of daily news matters;
(d) Review and criticism quotations of the work that have been lawfully made available to the public;
(e) Uses for public security and functioning of administrative, parliamentary, judicial proceedings;
(f) Uses of political speeches and extracts from public lectures or other work of similar nature with an indications of sources/authors;
(g) Uses for religious or official celebrations organised by public authorities;
(h) Uses of works that are permanently located in public places (architecture, sculptures etc.);
(i) Incidental reproduction, distribution, communication to public of the work in the other material;
(j) Use for the sole purpose of promotion or advertisement of public event, exhibition, sales of artistic works;
(k) Uses for the purposes of caricature, parody, pastiche;
(l) Uses in connection with the demonstration or repair of equipment;
(m) Uses of works for the sole purpose of building, drawing, planning of reconstructions the buildings.[117]

At the same time, the French Intellectual Property Code adopted the mentioned subsections, except for subsections (g), (i) and (m), while adding the (n) and (o) which, in their turn, allow to use works and other objects for the purposes of research or private study by the means of dedicated terminals on the premises of public libraries, educational establishments, museums or archives; or uses under other cases of minor importance.[118] Unlike the previously mentioned national instruments, the Dutch Copyright Act foresees the implementation of all of the mentioned subsections, with an exception for (f), (m) and (o).[119]

2.3. Peculiarities foreseen by national legislations

In order to be able to make an overall conclusion on the legislative part, it would be also appropriate to make an general analysis of other differences and similarities of national legislations of France, Germany and the Netherlands. Although, due to high level of harmonised legal regulation, the peculiarities cannot be of major significance. Thus, in France, the copyright

[117] Ibid, Pp.78-85.
[118] Ibid, Pp. 181-185.
[119] Ibid, Pp. 271-276.

legislation is majorly regulated under the French Intellectual Property Code (*"Code de la Propriete Intellectuelle")* [120] , in Germany – by Act On Copyright And Related Rights (*"Urheberrechtsgesetz", "Urhg"*)[121], while in the Netherlands these matters are regulated by Copyright Act *("Auteurswet").*[122] Alongside to that, another prominent feature of national main laws' is that none of the Constitutions of the mentioned countries consist a notice concerning intellectual property, thereby, for instance, German and French Constitutions interpret this subject-matter within the terms of property.[123] Subsequently, French Intellectual Property Code defines copyright by the following wording:

> "The author of a work of the mind shall enjoy in that work, by the mere fact of its creation, an exclusive incorporeal property right which shall be enforceable against all persons.
>
> This right shall include attributes of an intellectual and moral nature as well as attributes of an economic nature…" (L 111-1).[124]

In case of German *Urheberrechtsgesetz*, the copyright may be defined in the combination of several sections as each of them defines specific features in the understanding of copyrights under German law. In particular, Sections 1 provides with the following basis:

> "The authors of works in the literary, scientific and artistic domain enjoy protection for their works".[125]

In its turn, the Dutch *Auteurswet*, gives the most precise and clear definition on the nature of copyrights, providing that:

> "Copyright is the exclusive right of the author of a literary, scientific or artistic work or his successors in title to disclose the work to the public and to reproduce it" (Section 1).[126]

In view of protected works, each state created a non-exhausted list of works that are understood as protected within the means of copyright legislation, in particular the similar copyright subject-matters are books, brochures, newspapers and other literary or writing works

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[120] "Code de la propriété intellectuelle de la République Française", Legifrance, Accessed 18 March 2020, https://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006069414.
[121] "*Urheberrechtsgesetz* – Copyright Act of 9 September 1965 (Federal Law Gazette I, p. 1273), as last amended by Article 1 of the Act of 28 November 2018 (Federal Law Gazette I, p. 2014)", Gesetze im internet, Accessed 19 March 2020, https://www.gesetze-im-internet.de/englisch_urhg/englisch_urhg.html.
[122] "Copyright Act ("*Auteurswet*")", Overheid, Accessed 19 March 2020 https://wetten.overheid.nl/BWBR0001886/2015-07-01.
[123] European Parliament, *Copyright Law In The EU: Salient Features Of Copyright Law Across The EU Member States,* 68, 171, 260.
[124] Code de la propriété intellectuelle de la République Française", Legifrance.
[125] *Urheberrechtsgesetz* – Copyright Act, Gesetze im internet, Accessed 19 March 2020.
[126] Copyright Act ("*Auteurswet*")", Overheid, Accessed 19 March 2020.

(including software), dramatic (artistic), drama-musical or musical works, photographic and cinematographic, other graphical (i.e. drawings, paintings, works of architecture, sculpture etc.) and typographical works, geographical maps (including plans, sketches and others under French IPC), works of applied art and industrial drawings and models (known as simply "applied art" under French IPC and as "illustrations of a scientific or technical nature…" under German *UrhG*).[127] The only significantly differing subject is formulated under French IPC in the provision 14 of article L 112-2, which covers the creations of the seasonal industries of clothing and adorning (with a subsequent explanation of meaning).[128]

Although, the national Copyright Acts have different structural form and different, mainly they treat various issues in a similar manner. Such level of harmonisation of the substantial law has been achieved primarily by the ratification and subsequent adoption of international treaties' provisions as well as being precisely shaped by the discussed above examples of European Union Directives and ECJ's case law. All of them have also fixed the legal status of derivative works (i.e. translations, adaptations, arrangements), ,provided the criteria for the legal eligibility of protection (like originality, material form of fixation), division for moral and economic rights (in particular reproduction, distribution, communication to public, broadcasting etc.), conditions of transfer or assignment of economic rights (notwithstanding whether by contract, license or under employment agreement) or the enforcement of rights in case of their infringement and so on.[129]

Despite the similar structure of the current legal regulation of the copyright law within the European Union, it is possible to note that copyright has still no unitary character, but comprise a bundle of national laws only.[130] In particular, at least two sectors may encountered as such, namely:

- Moral rights, limitations and exceptions, copyright contract law;
- Peculiarities existing in national legislations resulting from historical and cultural development of countries as well as differences laid down due to implementation options, provided for by Directives (as it has been shown previously).[131]

As for the moral rights, there are currently two existing models: French *droit d'auteur* approach and copyright approach (emerging from common law jurisdictions) and notwithstanding the rulings of the ECJ's case law, mentioned above, there are still peculiar nuances making

[127] Code de la propriete intellectuelle, art. L 112-2, *Urheberrechtsgesetz,* Section 2 (1), *Auteurswet,* para 3, Section 10 (1).
[128] Code de la propriete intellectuelle, ibid.
[129] Code de la propriete intellectuelle, *Urheberrechtsgesetz, Auteurswet.*
[130] Annette KUR and Thomas Dreier, *European Intellectual Property Law: Text, Cases And Materials*, (Cheltenham [UK], Northampton [USA]: EDWARD ELGAR PUBLISHING, 2013), 426.
[131] Ibid, 425.

difference between these two approaches. It is possible to assume that there is a possibility to observe any new developments on this issue after the finalisation of Brexit's transitional period. In case of exceptions and limitations, as they have been discussed within the framework of InfoSoc Directive whereby there is a wide discretion of exceptions' implementation. It is undoubtfull that it is better to have at least narrowed and exhausted list of cases, however they may lead to uncertainties in particular situations. While mentioning the copyright's contractual agreements, it could be noticed that there is a lack of particular "hard" rule which would establish either principles of contracts' formation or definition of substantial provisions in contracts necessary for their conclusion etc.

It is worth to point out that the EU copyright legislation, including legislation of its Member States, has reached a unique extent of harmonisation, built on the same basis – Berne Convention and other international instruments. The legal intervention of European Union was and still is aimed to provide a harmonisation rather on particular and specific direction then establish a unified approach by the way of adoption of Copyright Regulation. This conclusion can be made on the basis of timeframe and range of adopted Directives. It is believed that the a huge difference in cultural domain as well as peculiarities of national legislations preclude the possibility of implementation of single approach across the EU. This was also used as an argument for an explanation why the InfoSoc Directive provides a list of rights' exceptions/limitations and wide discretion for Member States to decide which provision shall be adopted and which shall not. The previous statement has to be also applicable in relation to, for instance, licensing agreements as a way of IP management and capitalisation.

Finally, it is possible to conclude that various EU Directives as well as ECJ case law cover a vast amount of legal issues related to regulation and protection of work and the rights of their authors. It creates a sophisticated system combining the national legal rules, introduced upon the ratification of international treaties, and built-on EU Secondary Legislation, adopted for the more precise exercise of the mentioned rights. Due to constantly increasing close intersection of economic, legal relations and digital means between Member States, practically it becomes more difficult, timely and costly to secure, prevent, investigate and enforce copyrights. Notwithstanding the fact that there is a fully established regulations as well as Regulation No 1215/201 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters (Brussels Regulation), providing a possibility to enforce a judgement across EU, the efficiency remains in question. At the same time, the discretion for Directives' implementations remains also wide especially towards the digital area, thus additional creating a discretion for infringing activity, especially on cross-jurisdictional level. Therefore, it is believed that derogation from this approach

to the side of Unitary Copyright, finally should lead to the introduction of the novel basis whereby the new legal models could potentially be built-on. The practice showed that international cooperation facilitates establishment of more sustainable regulation as had been provided by Berne and other Conventions, and EU copyright-related Directive afterwards.

3. CHALLENGES OF EXISTING COPYRIGHT LEGAL SYSTEM

This part of thesis is dedicated to the bringing up a range of problems currently challenging for copyright law matter within the digitalised world with the subsequent exposure of modern technological means that are considered as able to make a positive impact to the enhancement of particular spheres of copyright regulation. Following the technical analytic description, the work also proposes the possible ways on how interaction of the mentioned matters may lead to significant changes or at least to make a first step on the way of enhancement of legal regulation by means of modern technologies.

This constitutes an important issue, since the introduction of Internet has brought to a new ways of information processing, its sharing, novel legal relations between newly emerged player in business reality. Probably, the previous wave of such technological breakthrough was achieved by the personal computers. Mentioning the European Union, it is possible to point out that around 80% of households have the Internet services supply and that this amount is likely to be increased.[132] As João Pedro Quintais further states:

"When individuals stream music, download a film, access an e-book, create a mash-up, share a video online, or (in some cases) post hyperlinks to protected content, they are usually carrying out copyright relevant acts"[133]

The only difference is that these acts are performed in online space, where the copyright rules should exist by the analogy to their force in the reals life (although certain exceptions and peculiarities are also relevant to online space).

3.1. Legal status of the copyrighted work and proof of proprietorship

The Berne Convention had clearly fixed the rule eliminating any formality in relation to acquisition of rights' protection in its article 5[134] and, as a consequence, EU Member States undertook an obligation to exclude such requirement. As it is widely known, in order to obtain a protection under copyright, the author's work has just to be created. Besides that, there are some other requirements, like an originality or making the work available to the public, but let us assume that all requirements are in compliance. This is a perfect basic situation, however what happens in cases when, for instance, there is a claim to court on the ground of copyright infringement. The

[132] João Pedro Quintais, *Copyright In The Age Of Online Access*, (Alphen aan den Rijn: Wolters Kluwer, 2017), 1.
[133] Ibid.
[134] "Berne Convention for the Protection of Literary and Artistic Works", World Intellectual Property Organization, Accessed 21 March 2020.

answer is that the author is a real author and factual proprietor for economic rights. In view of this, it may lead to difficult, burdensome, expensive and time-consuming costs of such actions, and notwithstanding to the wording of presumption in article 15 Berne Convention ("in the absence of proof to the contrary")[135], the real legal practice of Contracting States may significantly vary from state to state.

There are quite often situations when it is absolutely not enough for the judge to be convinced in such simple way. In its turn, France, Germany and the Netherlands maintain non-obligatory character of protection issuance, but at the same time they all propose to make a depositary registration of works through national patent offices and, as a result, to provide a rightholder with additional guarantees for similar matters. The existing approach can be effectively exploited by those right holder that either have become famous or have huge amounts of purchased copies of their works or something similar as most likely they would be able to invest a bigger amount of resources in order to protect their rights. Unlike "successful" proprietors, the beginners could suffer from non-registered right as in the digital age the creation, copying and distribution of information have reached excessively enormous speed and it is not only difficult to compete within such informational exchange, it is also problematic to retain and to control own rights.

Another side of the issue of non-registered rights is the legal status of copyrighted works. The absence of transparent and centralised information on right owners creates impediments on the way of determining proprietors of various types of works which may be quite important, in particular, in view of copyrights' subsequent utilisation for business purposes and making the equitable remuneration to the right holders.[136] It is further stated that there are many statements about such right holder, however they are not accessible due to economic value of such data and, as a result, it leads to the increase of transaction and timing costs.[137] From another side, it would not be possible to formulate a universal legal rule on acquisition of copyright protection suitable for each subject-matter and for national legislations of Contracting States as done so by the Berne Convention.

3.2. Copyright piracy

Probably, piracy can be called as the most obvious challenge for the copyright and the whole creative industry during the rapid development of digital technologies. While the classical copyright covers, in particular, the legal protection on reproduction of works and subsequent

[135] Irini A Stamatoudi, Paul L. C Torremans, *EU Copyright Law: A Commentary* , 561.
[136] Alexander Savelyev, "Copyright in the Blockchain Era: Promises and Challenges." *Computer Law & Security Review 34, no. 3 (2018)*: 550–61. https://doi.org/10.1016/j.clsr.2017.11.008.
[137] Ibid.

distribution by means of granting rightholders' authorisation, the amount of uncontrolled and not punished infringements is still enormous. Currently, the technological development gave means to interact with the works in any possible and desirable manner, the reproduction of any kind of works became so precise, low cost and simple then whenever before.[138] At the same time, thanks to the Internet, the distribution of such copies for various purposes, between many and different devices and across territories appeared as simple, fast and also cost effective instrument, resulting in the formation of wide pool of works.[139] As a result of the mentioned above, the dissemination of non-authorised copies of works is totally beyond rightholder's control and they are neither traceable nor enforceable.

In fact, there are at least several ways how the counteraction to infringements is organised. Among other the following may be named:

1. Creation of attractive legal offers;
2. Educational initiatives aimed to explain the importance of legal content;
3. Rights' enforcement;
4. Cooperation with Internet Service Providers by i.e. obliging them to counteract with infringing online content;[140]
5. In relation software, the Open Source Software Licensing can be named which automatically precludes the possibility of infringement (in fact, there exist a vast amount and types of sources);
6. Certain technological measures that exclude a possibility to perform certain actions, like copying, forwarding, extracting, displaying etc. For Instance, video games industry fights with piracy in a way of creation a kind of obstacles that make it almost impossible to have a progress in such games;
7. Convenient and cost effective digital platforms with digital content, for instance, Netflix or Apple Music;
8. Cases filed against secondary copyright infringements providing platform or intermediary services for sharing of unauthorised content.[141]

However, it must be clearly understood that in practice, there will always be a particular range of persons, willing avoid restrictions, override limitations and hack programmes' protective measures. Objectively assessing this situation, it is important to create and develop such means

[138] Quintais, *Copyright In The Age Of Online Access*, p.2.
[139] Ibid.
[140] Trisha Meyer, *Politics of online copyright enforcement in the EU*, (Cham: Springer international, 2018), 129.
[141] "DL-511 Software Licensing Including Open Source, Module 1", World Intellectual Property Organisation, Accessed 12 March 2020, https://welc.wipo.int/lms/enrol/index.php?id=4031.

and ways how to increase the prevention of such infringements and, at the same time, to reduce their amount because the total elimination of copyright violations is non-achievable goal nowadays.

3.3. International and intra-EU licensing agreements

Each agreement, no matter whether it is transfer of rights or their licensing, constitutes a type of contract. In its turn to become concluded and legally binding, it is important to achieve a consent on four major points, namely, offer and acceptance, competent parties, consideration and legal purpose.[142] Furthermore, nowadays entering into contractual relationship may obtain various forms, like classical paper-based and duly signed contracts, oral agreements or even by making a single click on acceptance of terms&conditions (so-called "clickwrap agreements")[143] or removing packaging (also known as "shrink wrap contract")[144] like in cases of software licensing. In case of licensing agreements, the most common structural approach comprises the defining of terms, grant, royalties' payments, representation and warranties (that are not always applicable), terms and termination, assignment and transfer provisions.[145] Taking into account the mentioned above, nothing should draw the attention, the issues appear when parties from different states or even legal systems begin the negotiations as they face the difference in terms, conditions of protection, exceptions and limitations (that are relevant in view of InfoSoc Directive), dispute resolution and others.

The emphasis of this issue may be outlined as one in favour of copyright's unification within European Union as most likely it would lead to the creation of legal certainty regarding the entering into such agreements either by parties located in different EU Member States or between party from Member State and third country. In case of the latter, the unified standards on major terms and legal rules would simplify negotiations as well as provide simplicity and transparency to such agreements, which in their turn would have led to the increase of economic incentives and reduce transaction costs to certain extent. As it was outlined above, peculiarities of contract law of each Member State may vary and be affected by various factors, therefore they have different copyright-licensing legal model. Another side of single copyright title and standardised approach to licensing within EU can also serve as a basis for the further development of entering into such agreements on the terms noted above, however shifted from classically-prevailing to totally

[142] Alexander Poltorak and Paul J Lerner, *Essentials Of Intellectual Property*, (Hoboken, N.J.: Wiley, 2013), 9.
[143] "The Origin of Click-Wrap: Software Shrink-Wrap Agreements", WilmerHale, Accessed 13 March 2020, https://www.wilmerhale.com/en/insights/publications/the-origin-of-click-wrap-software-shrink-wrap-agreements-march-22-2000.
[144] ibid.
[145] Poltorak and Lerner, *Essentials Of Intellectual Property*, 15.

digitalised contracting between the prospective parties. This could also diminish the necessity of personal presence while concluding an agreement and introduce efficient technological means able to substitute, for instance, personal signature with digital signature of stamp.

3.4. Subsequent sells of the work (resale rights)

Upon the adoption of Resale Right Directive and its subsequent implementation into national legislations, the authors obtained non-waivable and inalienable right to receive royalty payments from the sells of their works except for certain cases. In general, the range of persons responsible in repayment of royalties covers, in particular, sellers buyers or intermediaries art market professionals (i.e. salesrooms, art galleries, dealers in work of art).[146] The amount due to be paid to the author of the work is calculated on the basis of the purchase price. The issue worth to be mentioned is a way of organisation payment which may include additional intermediaries until the moment when reward has reached the beneficiary.

In order to be able to perform such obligation the seller has to be aware either of contact (bank account) details of the author or any contact information about his/her representative or collective management organisation acting on behalf of author's interest. In cases when the requirements impose are in full compliance with legal requirements, it leads to the increase of transaction costs by involving, for instance, CMOs or representatives, notary's accounts (applicable in certain cases and jurisdictions) and imposing fees for their services. From another side, the issue may appear when the participants of resale operation are willing to avoid the repayment of lawful reward to the author. These situations could be diminished by the way of compulsory registration of rights and acquisition of copyright certificates while the first may be achieved through the introduction of implemented into works the easy-accessible means of payments (to be discussed in subsequent chapters).

3.5. Income taxation from acquired rewards (royalties)

The importance and necessity of duly performed tax obligation by corresponding residents is beyond any disputes. The variety of tax obligations and their differences with regards to tax base or source of income maintain a great significance in view of the fair tax liability. From another side, the occurrences of tax avoidance or base erosion as well as lost incomes (in relation to situations when the rightholder did not receive a fair remuneration for the use of his rights) happen

[146] Directive 2001/84/EC of the European Parliament and of the Council of 27 September 2001 on the resale right for the benefit of the author of an original work of art, OJ L 272, 13.10.2001, p. 32–36", EUR-LEX, Accessed 25 March 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001L0084

quite often and that is why states and tax authorities are in charge of identification of such cases and their elimination.

However, even if the taxpayer follows all legal prescriptions, he or she may face certain difficulties while performing his obligation as such taxpayer has to be acquainted with taxation system, requirements, statements for submission as well as terms of performance. In order to diminish these difficulties and increase transparency in relation to tax payments from received royalties of another income, it is possible to introduce automation system which could be potentially responsible, for instance, for arrangements of tax liability and for formation of necessary documents and statements (currently many online services for the documents formation may be named as examples).

3.6. Moral rights' problems

Nowadays the moral rights of authors has also become a subject to new risks associated with the reproduction of works in digital space. For instance, while the printed materials or recorded on a CD, such objects may preserve the original name and relevant rights management information[147] as well as in the case of illegal reproduction, most likely, the infringer would be interested in keeping author's name.[148] In its turn, the only identification data in digital files is file's name and metadata that can undergo removals, alterations, changes and amendments while transferring such files or transforming their formats.[149] As further explained, it leads to the difficulties in the attribution of a work to an author or other rightholder due to the ease of reproduction, modification, copying and dissemination by means of various computer software.[150]

3.7. Collective management organisations and use of works

Collective management organisations or CMOs are a types of organisation whereby the rights of a particular holder are administered in exchange for the certain fees and deductions. According to Directive 201/26/EU (CRM Directive), collective management organisation shall mean any organisation which is authorised is authorised by law or by way of assignment, licence or any other contractual arrangement to manage copyright or rights related to copyright on behalf of rightholder, for benefit of rightholders, as its sole or main purpose, and which is owned or

[147] Bernd Justin Jütte, *Reconstructing European Copyright Law For The Digital Single Market*, (London: Hart Publishing 2017), 57.
[148] Ibid.
[149] Ibid, p.58
[150] Ibid.

controlled by its members and/or it is organised on a not-for-profit basis.[151] Any rightholer willing to authorise the exploitation of his rights (including their representation in cases of infringement) has to assign a range of actions to a chosen CMO. Besides the CMOs' casual members (rightholders) it may also include other CMOs as member and also sign a so-called "Reciprocal Representation Agreements" which entitle a CMO to license the rights' exploitation and collect revenue for it.[152]

Although, there is no mandatory form, for instance, CISAC or International Confederation of Societies of Authors and Composers provides with a template agreements recommended for use.[153] In its turn, the assignment of rights (mandates) is usually performed under conclusion of membership agreements which usually covers two parts: transfer of rights and the right of all members within CMO.[154] As for the exploitation by users, then there are two main approaches in licensing, namely:

- Blanket licensing, also called "repertoire" or "comprehensive" licensing, that entitles an user to exploit any works in the CMO's repertoire; and
- Transactional licensing which covers permission to use only limited (chosen) works or at particular digital licensing areas.[155]

At the same time, the monitoring and reporting for the usage of works are comprised of several types of measuring actions, namely, full reporting, partial reporting and statistical surveys.[156] In the first approach the licensee has an obligation to provide a CMO with a data on each instance of use, in partial such licensee has to provide such data on a given period of time, while the statical covers usages' habits which are measure on given intervals.[157]

The mentioned key provisions in CMOs' operation constitute a range of complex actions directed to manage and remunerate rightholder for the uses of their works, however it may also be noticed that such extent of sophistication may lead to particular inconveniences at least with the point of mutual representation between CMOs as they include mutual licensing, mutual deductions

[151] "Directive 2014/26/EU of the European Parliament and of the Council of 26 February 2014 on collective management of copyright and related rights and multi-territorial licensing of rights in musical works for online use in the internal market, OJ L 84, 20.3.2014, p. 72–98" EUR-LEX, Accessed 25 March 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0026

[152] "DL-201 Copyright and Related Rights, Module 10", World Intellectual Property Organisation, Accessed 14 March 2020, https://welc.wipo.int/acc/index.jsf?page=courseCatalog.xhtml&lang=en&cc=DL201E#plus_DL201E.

[153] "CISAC Membership Application Guide", CISAC, Accessed 14 March 2020, https://members.cisac.org/CisacPortal/initConsultDoc.do?idDoc=36263

[154] "DL-201 Copyright and Related Rights, Module 10", World Intellectual Property Organisation, Accessed 14 March 2020.

[155] DL-201 Copyright and Related Rights, Module 6", World Intellectual Property Organisation, Accessed 14 March 2020

[156] Ibid.

[157] Ibid.

and administration fees. They lead to the increase of transaction costs and the reduce of authors' fair remuneration. From another side, there are different models of agreements for such authorisations that inevitably lead to the complexity of contract administration and management in order to provide a smooth continuation of legal relationships and avoid undesired risks and expenses. Finally, the most prominent and the most weak feature is the monitoring of uses in order to provide rightholders with remuneration. It is significantly easier to perform such actions by means of use centralised platforms like in Apple Music, Spotify, Netflix, however these are limited examples of such service providers.

The issues of rental and lending rights are usually administered in the same way notwithstanding the fact that they have a particular regulation provided for in Directive 2006/115/EC.[158] They are also subject to assignment, for instance, to CMO and subsequent licensing for their use.

Many questions arise when it comes to the point of numerous amount of works, authors or rightholders and precise calculation of their rights' uses as practically there will always be leaks and data losses of such information. These inconsistencies inevitably result in the losses of economic incentives for various categories of rightholders simultaneously. Therefore, the introduction of automatic system of calculations would significantly decrease the amount of such situations occurred. At the same time, the common framework of principles in licensing agreements could potentially simplify the establishment of legal relations, while their digitalisation would make it more convenient and transparent to arrange the contracting and between various parties. The last but not least issue is timing costs necessary for the legal arrangement of lawful exploitation as the potential user has to enter into negotiations before signing license agreement with the rightholder or CMOs. Thus, the standardised provisions or agreements' templates with the appropriate automatisation of process are able to make the process more time-friendly as well as provide with a possibility to the needed works to be exploited at any convenient time despite the time zones, public holidays or whatever.

Finally, the performed above analysis of the nowadays' challenges has outlined at least main, notable and most crucial ones that are obvious in view of modern technological development and are common for each Member State. If ones goes deeper to peculiarities of each national regulation systems, the amount of such issues spotted would have been significantly bigger. However the more detailed observation of national legislation would also bring a significant

[158] Directive 2006/115/EC of the European Parliament and of the Council of 12 December 2006 on rental right and lending right and on certain rights related to copyright in the field of intellectual property (codified version), OJ L 376, 27.12.2006, p. 28–35", EUR-LEX, Accessed 25 March 2020, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32006L0115.

amount of things that are not directly relevant to the topic of this thesis and would constitute excessively broad spectre of existing problems in current copyright law. Thus, the following chapters are aimed to disclose the technical peculiarities of the blockchain and other related novelties alongside to the ways and possibilities of the intersection between law and technology in order to tackle at least the mentioned issues.

4. ANALYSIS OF BLOCKCHAIN'S TECHNICAL SIDE

This chapter intends to discover and describe the principles of operation of such technological means as distribute ledgers technology [159] (hereinafter referred to as "DLT"), Blockchain[160], cryptocurrency[161], smart contracts[162]. The problematic points of this chapter lie in the several aspects, such as misuse and misunderstanding of terms, discovering programming architectural structure (in order to outline and provide understanding which ones are responsible for which functions), typology of DLTs — for the subsequent argumentation which to be chosen, forms of DLT such as blockchain and smart contracts, cryptocurrencies. All of them play inalienable role in view of the next chapter which shows a conceptual proposal on combining blockchain and copyrights.

After the creation, emission and several years of Bitcoin's existence, it did not attract so much attention amongst the world. However, nowadays these cryptocurrencies are taken into serious account, the DLT and Blockchain are the subject for the discussion of their wide utilisation and implementation, where the law is not an exception at all. Currently, it is possible to find a huge amount of ideas and proposals of how these technologies can be implemented into various directions of legal environment as well as benefits and threats that can be faced by the use of them. As a result of the existence of legal gaps and weaknesses in the copyright legislation, the use of these modern technological means may lead to, for instance, the significant reduce of infringements, increase of efficiency in the operation of CMOs, simplify the proof of authorship and belonging of rights as well as the creation of new challenges on the way of implementation. Therefore, it is considered to be appropriate to explain the "technical" part of the issue step by step in order to be able to provide arguments on favour of DLT, blockchain, smart contracts, assess risks and possible weak sides.

First of all, the word "cryptocurrency" has come into general use and fixed within the worldwide community, however it is important to clarify that vast majority of currencies are based on another technology, namely blockchain. In its turn, the blockchain is only one of the types of

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[159] F. R. Yu, J. Liu, Y. He, P. Si and Y. Zhang, "Virtualization for Distributed Ledger Technology (vDLT)", *IEEE Access, vol. 6, pp. 25019-25028, (2018*): 1.

[160] Satoshi, Nakamoto. "Bitcoin: a peer-to-peer electronic cash system (2008)" bitcoin.org, Accessed 15 February 2020, bitcoin.org/bitcoin.pdf

[161] Houben, R., Snyers, A., *Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion : Study Requested by the TAX3 Committee.",* (*Brussels: European Parliament*, 2018), 20.

[162] Binns, W., "ethereumbook", GitHub, Accessed 15 Feb. 2020, https://github.com/ethereumbook/ethereumbook/blob/develop/07smart-contracts-solidity.asciidoc#what-is-a-smart-contract.

so-called distributed ledgers technology or DLT[163]. The DLT operates on the basis of the peer-to-peer (P2P) protocol which enables a connection between particular users, also called as nodes. [164] In the DLT, the information that is stored in the data unit – ledger, is shared, synchronised between and dispensed within a network of certain amount of devices.[165] It encounters several key features, such as: data's distributed character and the mechanisms of consensus and cryptography.[166] Alongside to this, the DLT technology does not require an intermediary that is responsible for the information's processing or validation process due to the delegation of these functions to several or every member of the network – it depends upon the type of DLT[167]. Currently, the application of DLT is usually considered in view of database[168], for instance, by enterprises[169] or, in case of Internet, for the emailing, sharing of media files, internet telephony.[170]

4.1. Structural architecture of DLT

As is it stated in the article "Virtualisation for Distributed Ledger Technology (vDLT)", each DLT system consists of a number of layers: "a data layer, network layer, consensus layer, ledger topology layer, incentive layer, privacy layer, contract layer, and application layer". According to this, each layer is responsible for the execution of certain function and interrelated among themselves. Further, authors explain, the data layer unite the information, generated from different, including previous, actions. Different type of network undermean different approaches, for instance, the blockchain protocol forms each transaction into blocks, containing several type of data, namely, metadata, hash of previous block, hash of current block and a timestamp (to be discovered further).[171] The next element is a network layer, which serves as a basis for the interaction of the mechanism of distribution, forward and verification of the data among the members of the network.[172]

The third, consensus layer, covers the important issue of truth-worthy between the DLT's nodes.[173] In other words, safety and fairness are ones of the key elements within the "society" of

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[163] Houben, Snyers, *Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion : Study Requested by the TAX3 Committee ,*15.
[164] Michael Abramowicz, "Cryptocurrency- Based Law," *Arizona Law Review 58, no. 2 (2016):* 368.
[165] Yu, Liu, He, Si and Zhang, *"*Virtualization for Distributed Ledger Technology (vDLT)*",* p.1.
[166] Harish Natarajan, Helen Gradstein, Solvej Krause, *Distributed Ledger Technology And Blockchain,* (Washington, D.C.: The World Bank, 2017), 5.
[167] Ibid.
[168] Imran Bashir, *Mastering Blockchain - Second Edition, (*Birmingham: Packt Publishing ltd., 2018), 31.
[169] Oliver Belin,"The Difference Between Blockchain And Distributed Ledger Technology", Tradeix, Accessed 14 February 2020, https://tradeix.com/distributed-ledger-technology/.
[170] Natarajan, Gradstein, Krause. "*Distributed Ledger Technology And Blockchain"*. p.1
[171] Yu, Liu, He, Si and Zhang, *"Virtualization for Distributed Ledger Technology (vDLT)",* p.4
[172] Ibid.
[173] Lakshman, T. and Agrawala, A., *Efficient decentralized consensus protocols,* (College Park (MD): University of Maryland. Computer Science, 1986): 600-607.

unknown members. Currently, there various existing models of consensus mechanisms, which will be covered further alongside with blocks' data.

A ledger topology layer establishes the architectures of the network and the way how it will operate. For instance, as it has been noted above, the blockchain is simply a chain of blocks with recorded data about the past and current transaction and it grows continuously by recording the new blocks to its architecture.[174] Unlike blockchain, the DAG adds these new transactions directly to the graph and it may look as of chaotic character, however it is not like that.

The next type is called "incentive layer" which introduces a mechanism of rewards for adding of the new data into the network by its participants.[175] As it has been mentioned before, the DL technology is also applied in several fields and while some of them do not need this aspect, other could find it as important due to the specificity of the work performed to which this DLT is applied for. This layer is closely connected to consensus layer, as nodes participating in the consensus mechanism (like Proof of Work) use their computing and energy resources for the validation process. Once the validation is done, the nodes are rewarded with some value for their involvement into the process.

The so-called privacy layer is needed to provide a sufficient privacy for the transaction's parties.[176] In the majority of blockchain systems, all transactions, their sums, parties are visible to every member of the network since the data has been shared between all of them.[177] Thus, in order to prevent third parties from undesirable access to someones' identifying data, the system is built in way that each user use the so-called "public key".[178] This key exists in the form of similar to digital signature[179] and serves as an identificator of the particular person for the transaction.[180]

The last two layers are the contract and applications. The first one is used for the programming of the whole DLT system or, in other words, this layer determines the spectrum of functions that will be performed by the system.[181] While all previous layers have had rather internal character, this one has an external one since "various scripts, codes and smart contracts can be used to enable more complex programmable transactions".[182] Finally, the application layer lies on the top of the structure and defines the sphere of DLT's factual applicability such as

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[174] Natarajan, Gradstein, Krause, *Distributed Ledger Technology And Blockchain,* 5-6.
[175] Yu, Liu, He, Si and Zhang, "Virtualization for Distributed Ledger Technology (vDLT)", p.5.
[176] Ibid.
[177] Nakamoto, "Bitcoin: a peer-to-peer electronic cash system (2008)" bitcoin.org, Accessed 18 February 2020, bitcoin.org/bitcoin.pdf
[178] Natarajan, Gradstein, Krause, *Distributed Ledger Technology And Blockchain,* 8.
[179] Jonathan Katz, *Digital Signatures*, (New York: Springer, 2010), 3.
[180] Natarajan, Gradstein, Krause, *Distributed Ledger Technology And Blockchain,* 8-9.
[181] Yu, Liu, He, Si and Zhang, "Virtualization for Distributed Ledger Technology (vDLT)", 5.
[182] Ibid.

cryptocurrencies, Internet of Things etc.[183] The Focus Group on Application of Distributed Ledger Technology of International Telecommunication Union (ITU) prepared a number of technical reports with the comprehensive analysis of DLT.[184] In the report, called "Distributed ledger technology use cases", authors mention that technically it is possible to use application layer as a bridge for the interaction between different DLT system.[185] However, as further explained, this issue is a subject of additional standardisation and further development due to the current existence of various technical mismatches.

Once the structural peculiarities have been explained, it is incumbent to cover the issue of DLT's typology as this is another key feature that worth separate attention. The distributed ledger system can be programmed in several ways, depending, in particular, on whether the "intermediary" party is introduced to it. There are two main organisational types, that are important for now: permissionless or permissioned.[186] The first one, permissionless, allows any perspective participant to join the network without the necessity to approved by central host. In this type, all the participants take part into verification process by keeping a copy of previous transactions.[187] For example, the first cryptocurrencies, such as, bitcoin or etherium use this approach in their work.[188]

The second type is permissioned, where the intermediary or administering party is introduced and network participants can join after their selection[189], thus increasing the level of trust and reliability.[190] In this case, members can be a subject of various compliance matters as their access to the network would depend on the administrator's decision. In its turn, the permissioned DLT may also be divided for two more subcategories, namely open (public) permissioned DLT and close (private) permissioned DLT.[191] While the first one allows to be joined freely and only imposes limits on the access to transaction (authorisation), the second one provides with a strict control where the administrator either performs actions on its behalf or personally introduces members of such closed type of network.[192] Generally speaking, there could be found a bigger amount of DLT's variations, however some of them are theoretically-based,

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183 Ibid.
184 "Focus Group On Application Of Distributed Ledger Technology", International Telecommunication Union, Accessed 18 February 2020 https://www.itu.int/en/ITU-T/focusgroups/dlt/Pages/default.aspx.
185 "Distributed Ledger Technology Use Cases", International Telecommunication Union, Accessed 18 February 2020, https://www.itu.int/en/ITU-T/focusgroups/dlt/Documents/d21.pdf#page35. Pp.33-34.
186 Natarajan, Gradstein, Krause, *Distributed Ledger Technology And Blockchain, 11*.
187 Bashir, *Mastering Blockchain - Second Edition,* 32.
188 Ibid.
189 Ibid.
190 Houben, Snyers, *Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion : Study Requested by the TAX3 Committee,* 15-16.
191 Ibid.
192 Ibid.

others are under their development. Therefore, for the current purposes, it is considered enough to name these two main approaches.

4.2. Blockchain as a type of DLT

After the brief analysis of DLT's building, operation and interaction principle, it is important to focus on one of its subsequent types, namely blockchain as it requires a separate attention alongside to the several terms that have not been discovered yet. Since, various authors do not differentiate term bitcoin from the term blockchain due to the fact that one is created on the basis of another, it would be appropriate to use them as interchangeable (in some cases) for the purpose of their analysis. The blockchain, as it has already been mentioned, is a type of distributed ledger whereby the information about the transaction (or action performed) is written and structured in the blocks of data and linked with each previous block, thus forming a chain. This principle of operation served as an origin for the blockchain's naming.

Each block consists of three main component parts, they are data, hash of newly generated block, hash of previous block.[193] The data of the block is an information being transferred from one node to another, which is encrypted and non-visible for other participants of the network. For example, in bitcoin, data part is comprised of payer, payee and amount to pay.[194] However, as it is discussed above, the DLT network may be programmed in different way, so that payment details are not the end point of blockchain's capacity.

The next element is a hash which represents the data in the form computed digital finger print (or digital signature) and applies the timestamp of transaction.[195] According to the report of the Focus Group on Application of Distributed Ledger Technology, "Hash, hash function, hashing is a method of calculating a relatively unique output (called a hash digest) for an input of nearly any size (a file, text, image, etc.)."[196] For each particular file there is a particular unique hash generated, therefore if there is a little change of input, the hash would be different.[197] The hash of previous block is an element of the identical nature, however possessing different hash (due to different information in its data). This method is used for the prevention of tampering in transaction

[193] Nakamoto, "Bitcoin: a peer-to-peer electronic cash system (2008)." bitcoing.org, Accessed 18 February 2020, 2, http://www.bitcoin.org/bitcoin.pdf.
[194] Ibid.
[195] Michael Nofer, Peter Gomber, Oliver Hinz, and Dirk Schiereck, "Blockchain". *Business & Information Systems Engineering 59 (3) (2017)*: 183-184. doi:10.1007/s12599-017-0467-3.
[196] "DLT Terms And Definitions", International Telecommunication Union, Accessed 19 February 2020, 3, https://www.itu.int/en/ITU-T/focusgroups/dlt/Documents/d11.pdf.
[197] Ibid.

activity as any alterations to data sections automatically bring changes to hash [198] and this would lead to a conflict at another stage, namely, consensus mechanism.

In order to perform actions (or execute transactions) parties have to use two types of so-called "keys": public and private, that are presented in the form of alphanumeric code.[199] The public key is responsible for identification of the node in two cases: as designation address or simply – addressee and for the validation of the action performed by the network. The private one serves for the authorisation of new transaction by signing it with the kind of digital signature (also called encryption).[200]

The last but not least issue that has to be mentioned is the way how the DLT network performs the check of newly generated transaction and ensure payments' security which is considered to be one of the core blockchain's (as well as DLT's) features. In order to prevent the risk of fraud and exclude the necessity of intermediary, the transactions have to be a subject of control by all nodes of the network. This can be achieved through the means of "consensus mechanism". In its turn, consensus mechanism is a cryptographic method of validation that assess the correctness of transaction and ensure the maintenance of valid chain of blocks.[201] There are many types of consensus mechanisms available currently. Among others, the following may be encountered as examples: Proof of Work (PoW), Proof of Stake (PoS), Practical Byzantine Fault Tolerance (PBFT), Delegated Proof of Stake (DPoS), Proof of Elapsed Time (PoET), Proof of Deposit (PoD), Proof of Importance (PoI) and others.[202] From the mentioned examples, two main conclusions can be made:

1. A great variety of currently existing consensus mechanisms gives a possibility to choose the most suitable option, depending on the particular DLT's demands;
2. Even though, non of the mentioned above matches to specific needs, the right option can be created in order to make it suitable, for instance, in legal fields, like intellectual property.

It would inappropriate to analyse each model due to their variety. However, it is worth to discover the most widespread one for the purpose of better understanding. The Proof of Work implies the verification by the network members in a way of solving complex mathematical tasks or puzzles.[203]

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[198] Natarajan, Gradstein, Krause, *Distributed Ledger Technology And Blockchain,* 8

[199] Crosby, M, P Pattanayak, S Verma and V Kalyanaraman. "Blockchain technology: Beyond bitcoin." *Applied Innovation 2 (2016):* 9.

[200] Ibid.

[201] Houben, Snyers, "*Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion : Study Requested by the TAX3 Committee. European Parliament"*, p.18

[202] Bashir "*Mastering Blockchain - Second Edition"*, p.37-38

[203] Crosby, Pattanayak, Verma and Kalyanaraman. "Blockchain technology: Beyond bitcoin." Applie*d Innovation 2 (2016):* 11-12.

In simple words, the puzzle can be imagined as a process of fitting of existing chain of hashes and newly created one. This calculation process is considered as complex to perform and easy to verify, and involves an amount of energy consumed.[204] The nodes that have taken part into this process as a consequence are rewarded with certain amount of value (in case of bitcoin, this value is BTC itself) in order to provide an economical incentive for the work performed [205], grounding on principles highlighted within the analysis of incentive layer. Thus, once the mathematical solution or consensus is found, the block is being implemented into the chain.

To summarise, the analysis of blockchain's parts, the following example resembles the picture as a whole. Let us assume two parties or payer and payee that willing to execute a transfer of some bitcoins. Payee shares his or her public key to the payer, while the payer, by using this key as address, inputs the amount of coins to be transferred to the payee. Then, payer applies his private key in order to encrypt the data and to validate the transaction. From this moment, the new block has been created with the necessary encryption and uploaded hash data. Just after the creation, the block is disseminated across the network of nodes on order to be validated. These nodes starts to perform complex mathematical calculations in order to check the newly created block. Once it is done, the block is added to the general chain of transactions and transaction is executed. Upon the reception of transaction, the payee can utilise payer's public key in order to verify whether the action has been done by him or not.

4.3. The nature of smart contracts

Another prominent technological novelty within DLT was brought after the creation of Etherium cryptocurrency. Initially, the idea of smart contracts had emerged in 1990s and belonged to Nick Szabo, who defined them as "a set of promises, specified in digital form, including protocols within which the parties perform on the other promises".[206] In other words, it means that legally binding agreement may be put not to the paper, but to the computer programme and to be controlled and performed automatically upon the occurrence of the specified event. Although, the creators of Etherium make an emphasis that the approach used in this technology, is neither of smart nor legal nature, anyway the term has stuck to it.[207]

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[204] Natarajan, Gradstein, Krause, *Distributed Ledger Technology And Blockchain,* 6.
[205] Crosby, Pattanayak, Verma and Kalyanaraman. "Blockchain technology: Beyond bitcoin." Applie*d Innovation 2 (2016):* 12.
[206] Binns, "Ethereumbook ", Github, Accessed 01 March 2020, https://github.com/ethereumbook/ethereumbook/blob/develop/07smart-contracts-solidity.asciidoc#what-is-a-smart-contract.
[207] Ibid.

The way of smart contracts' operation is based on several principles. One of them is not only the use of classical accounts (as described above in section, related to Bitcoin) known as externally owned accounts (hereinafter referred to as "EOAs"), but a differentiation of so-called contract accounts.[208] As further stated, the latter ones are subject to be controlled and executed by programme, called Etherium Virtual Machine (hereinafter referred to as "EVM") that exists .[209] EVM takes a core place in smart contracts as it excludes and isolates the programmed contract from the rest blockchain in order to ensure its security and prevent any external overriding.[210] Once smart contract becomes binding, it is given with its personal address, linking to a balance (similar by nature to EOA), and uploaded to EVM.[211] Thus, the parties may be considered as entered into agreement. Finally, upon specified legal action, the contract send transaction to a particular EOA or another smart contract[212] since programme possesses a control over objects (value) that are subject to performance.[213] The phrase about further transfer to a different smart contract also implicates about the possibility of creation of sophisticated and interlinked contractual agreements within EVM digital platform.

In the paper "*The Law And Legality Of Smart Contracts*" the author comes to the division of smart contracts into strong and weak smart contracts, explaining that difference between them is in the possibility to alter the consequences after their performance.[214] While the hard smart contracts would lead to excessively high costs of any modification and/or revocation, the weak one would not cause such a result.[215] This differentiation has significance in view of legal approach, in particular, how to deal with such situations if the court faces them. For instance, there are examples of automated contracting between several parties which have, for example, continuous manufacturing line. Ones some components have almost been run out of, the computer automatically creates an order to a set of new components. Even if there are any legal issues arise, it is possible to alter, amend, cancel provisions or actions, however this is not a case for blockchain-based transactions as they are not irrevocable. Anyway, all such issues are subject to separate section that will cover risk-related assessment of blockchain's implementation.

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[208] Ibid.
[209] Bashir, *Mastering Blockchain - Second Edition, 417*
[210] Madhusanka Liyanage, Kanchanet al, *Blockchain-Based Smart Contracts - Applications And Challenges*, (New South Wales: University of New South Wales, 2019), 4-5, https://www.researchgate.net/publication/328230865.
[211] Ibid.
[212] Ibid.
[213] Max Raskin, "The Law And Legality Of Smart Contracts". *SSRN Electronic Journal Volume 1:2* (2017): 310-311. https://ssrn.com/abstract=2959166.
[214] Ibid.
[215] Ibid.

4.4. Cryptocurrencies

A little notion has to be dedicated to the cryptocurrencies. In 2012 European Central Bank in "Virtual currency schemes" defined cryptocurrencies as one of virtual currencies' type.[216] In fact, cryptocurrency is a number of virtual "coins" or so-called "tokens", represented in the form of programming code and can be transferable between users if particular blockchain network.[217] The most prominent examples are Bitcoin and Etherium that are used as traceable commodity, possess their value and served as means of payment between several parties. Since FinTech sector is a primary example of blockchain's and cryptocurrencies' application they are used, mainly, there. The necessity of their notion can be explained by the fact that they will be mentioned in subsequent chapter, dedicated to practical cases of technological applicability in copyright.

In conclusion, it would be appropriate to mention that the technology of distributed ledger is not a result of recent and modern discoveries or developments, however the novelty of such permissionless DLT as blockchain may have a serious impact on the future of many things. The possibility of secured transactions' performance and their "non-centralised" approach in validation process put financial intermediaries and rules on international financial transactions under doubts as they can be avoided without losses. In my opinion, one of the most prominent features is programming-friendly layers in DLT network since developers are able to choose the type of data to be transferred, the how transactions will be processed and validation, the openness of external functions as well as application layer which according to the ITU's Focus Group on Application of Distributed Ledger Technology may be potentially developed in a way that a DLT would be able to interact with other DLT networks.[218] In its turn, it leads to bigger amount of possible areas of use, although this opinion has been expressed as of theoretical and potential views. The another one is a range of smart contracts' possible applications. In view of copyright law, there is no need to cover each and every aspect of legal side, however the automatisation of at least several processes, based on trustworthy DLT network, would make a positive impact on promotion of intellectual property's protection.

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[216] *Virtual Currency Schemes*, (Frankfurt am Main: European Central Bank, 2012), 23.
[217] Jakub Podobas Wojciech, *Cryptocurrency Encyclopedia: The Comprehensive Guide through the 100 Most Important Cryptocurrencies*, (Warsaw, Poland: Kozminski University, 2019), 13-14.
[218] "Focus Group On Application Of Distributed Ledger Technology", International Telecommunication Union, Accessed 18 February 2020, https://www.itu.int/en/ITU-T/focusgroups/dlt/Pages/default.aspx.

5. CASES OF PRACTICAL APPLICATION OF BLOCKCHAIN TECHNOLOGY IN COPYRIGHT

As it has been mentioned above several times, this chapter of thesis work directly cover the issues of intersection between novel technological means, i.e. blockchain, smart contracts, and copyright law. This plays a key importance in view of making proposals for protection measures applied to authors and/or proprietors as well as their copyrights. However, it must be noted that despite the great interest from both legal practice and science, the mentioned issues have been researched quite poorly. While analysing the legal and scientific literature it has been noticed that interaction of copyright law and blockchain bear shallow parsing character without proposing deeper ideas.

5.1. Existing possible implementations

The most obvious use of blockchain in copyright law is dedicated to the creation of blockchain-based registers of intellectual property rights.[219] This approach exists around the idea of registering of works and, therefore, the rights of their authors or others proprietors. In this regard, some authors implicate the blockchain-based databases, containing an "unalterable digital certificates" which, in their turn, may address to variety of issues including ownership evidence, publication, first and genuine use (the article itself does not make an emphasis on particular type of rights involved).[220] Unlike the case of cryptocurrencies, where the blockchain's application, contact and data layers are built in a way of transferring the so-called 'value' between different users, in this case the system is assumed to be built on databases principles with the preservation of classical blockchain's protective measures. The only reasonable question here is how organise legal side of such registrations and make it either of compulsory or "highly recommended" nature. Some authors propose different solutions, like privately held initiatives[221], realisation of such initiatives through CMOs as an important prerequisite of management[222] or even centralised internationalised registry.[223]

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[219] Donald Vella, et al., "Blockchain'S Applicability To Intellectual Property Management". *Licensing Journal: Aspen Publishers Inc, (2018):* 10-11.

[220] Ibid, p.10

[221] Dominik Thor, "Blockchain Technology in the Context of Intellectual Property.", *The Patent Lawyer: CTC Legal Media, (2016).*

[222] Balázs Bodó, Daniel Gervais, and João Pedro Quintais, "Blockchain and Smart Contracts: The Missing Link in Copyright Licensing?", *International Journal of Law and Information Technology 26 (4) (2018)*: 311–36, https://doi.org/10.1093/ijlit/eay014.

[223] Annabel Tresise, Jake Goldenfein, and Dan Hunter, "What Blockchain Can And Can't Do For Copyright", *Australian Intellectual Property Journal 144 (2018):* 3-7, https://ssrn.com/abstract=3227381.

However, it must be clearly understood that none of these ways can exist solely as, for instance, private initiatives will not be able to acquire the required extent of rightholders' trust, manage the interoperability between internal blockchain databases as well as will constitute evidences of weak nature before, for instance, judicial or law enforcement bodies. In case of internationalisation, it is practically impossible due to significant differences in national legal systems. If one analyses the texts of any international treaties, he would notice the general form of rules' formulations in such instruments as the specific provisions in multinational treaties would lead to mismatches in their practical implementation and application. Concerning, the CMOs, it is also necessary to understand that CMOs do not manage every type of copyright including their quantitive factor and the vast amount of rights will be out of registry scope as CMOs are specialised on particular types.

In this regard, the most consensual approach would be the introduction of public permissioned DLT network with derogation of its administration to public bodies, like national intellectual property offices and possibly such EU agency as European Union Intellectual Property Office (EUIPO). As it was discussed previously, the public permissioned blockchain network is administrated by someone, however it allows to join it freely without any limitations. In such way, the transparency of network will be preserved as well as other DLTs' key feature with an exception that limited range of users would have administration rights. This peculiarity would lead to the increase of trust to such approach as it is powered by the state represented by the corresponding authority.

As it may seem, this concept solves one issue and brings another one, namely, the derogation from requirements imposed by Berne Convention whereby the copyrights are not subject to any formalities. This will be discussed in the following. Such result may be avoided, in particular, by the introduction of novelties into legal regulation such as establishment of, parallel to existing model, *sui generis* Community copyright. The common copyright regulation would ensure the basis for the unification of legal rules and further blockchain's implementation as the current extent of EU's Secondary Legislation allows harmonisation across all Member State without risks of significant mismatches and controversies in national legislations. In particular, the Community copyright *sui generis* regulation would be able to impose an obligation to register proprietors' rights in order to acquire enhanced protection. It is not clear whether such registration should be compulsory or not, however it seems that there should exist a range of incentives to do so as well as extended circle of subjects, responsible for such registrations.

From another side, the programmability of DLT's network allows to reach several goals simultaneously. The ideal form of it would be, as it has been mentioned, public permissioned

network with administration rights given to national IP offices and EUIPO. Unlike the classical blockchains where data layer contains the metadata from previous transactions, the copyright's DLT should also add the information regarding the work (irrespectively of its type), its unique generic cryptographic signature, information with regards to author(s) and rightholder(s) if different including their public addresses, transaction's hash and timestamp and other relevant to the work information. The huge amount of additional information would lead to significantly increased amount of stored information on node's devices. In order to prevent the use of huge data, the key information regarding hash data could be used as it is realised so in classical bitcoin network by means of Merlke Tree[224], while the other 'heavy' files with works could be uploaded to servers of patent offices/EUIPO as a depositary) with providing linking information to data layer. This would be a serious issue to be solved as for instance bitcoin's blockchain metadata reached the amount of 130Gb by September 2017.[225]

The next important issue is data entry into DLT register. The creation of copyrights is linked to the creation of the work by its author, however in order to ensure applicability of blockchain technology it is also important to arrangement the entry of such works into public registers. For these purposes, it would be appropriate to establish semi-voluntary approach by giving a right to intellectual property rights' proprietors and authors to be able to register their rights within the mentioned network as a part supplementary protection's acquisition. From another side, it would be also appropriate to authorise CMOs, notaries, courts, intermediaries dealing in the field of art and other persons engaged into interaction with intellectual property rights for the performance of such registration on behalf of the authors and/or rightholders, including the cases when the rights are transferred from one person to another. It is a matter of time, however in such way the issue of legal status of particular work as well as ownership titles would be solved covering the huge range and variety of copyright works.

Another aggregated range of solutions may be called as ones targeted to fight against the piracy. In particular, the issue of authorised content use constitute a crucial problem in view of counteraction against uncontrolled and unauthorised uses, copying and distribution of copyrighted materials. In this regard, the control over digital copies[226] or traceability of works may help, however until recent time it has not been technically possible. Once upon the adoption of blockchain-based registers and subsequent filing them with copyrighted works, it would become possible to name and number each digital copy of the work that is within the legal circulation by

[224] Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System.", Bitcoin.org, Accessed 05 March 2020, https://bitcoin.org/bitcoin.pdf.
[225] Savelyev, "Copyright in the Blockchain Era: Promises and Challenges.", 13-14
[226] Ibid, p.10

the use of proposed earlier "generic cryptographic signature" of each works and including the appropriate DRM information into the files.

As it is known, while the Member States are subject to provide reasonable technical prevention measures (TPMs) as well as DRM information in relation to works, the infringers are still able to override both TPMs and alter DRM data. Thus, the application of derivative cryptographic signature of each file, based on automatic (programmed-basis) approach could provide content with unique signature for each particular lawful users. Alongside to that, there should be an obligation prohibiting the alteration, changes, removal or any other action of similar nature in relation to files. As a result, it would become significantly easier to determine infringers of copyright, not limiting with secondary violation but including primary violations as well.

From another side, there are various concerns with regards to the practical realisation of this proposal as it would be necessary to create additional software and interfaces that would be able to ensure interaction between users, administrator and input/output of the mentioned data to the common network. As it has been mentioned in ITU's technical report on the Distributed ledger technology uses, the potential of application layer is still subject of further considerations and discoveries as exactly it is able to provide interoperability between DLT network with other software, no matter whether it is another network or any kind of software.

The next possibility in counteraction against the piracy is devoted the use of blockchain-based networks in the sphere of parallel import and grey markets. The inclusion of this concept to the piracy block has been made only on view of information organisation and avoidance of conceptual diversification. The potential of blockchain-based databases' applicability in parallel import and grey market may possibly obtain importance for manufacturing, distribution and franchising industries.[227] Although the idea is not directly relevant to the current topic, it is also important to retain in mind that copyright may be engaged in these business areas as well as the use of intellectual property rights usually constitutes the application of bundle of such right. Thus, as a consequence it is worth to be mentioned.

The authors emphasise that traceability of DLT databases could potential allow manufacturer to "monitor and control leaks from their distribution networks".[228] In its turn, such detection and control are based on the special kind of tags (most likely block's hash is meant here).[229] However, it is not specified and, as a consequence, not clear how in practice this should

[227] Falzon Vella, Cassar, Valenzia. "Blockchain'S Applicability To Intellectual Property Management", The *Licensing Journal, Volume 38, n 1 (2018):* 11.
[228] Ibid.
[229] Ibid.

be performed. In the ITU's technical report, there is an analysis of analogous approach that is mainly related to supply chain management, stating that consensus-based nature of DLT provides with an opportunity to see the custom and ownership for an asset and tamper-proof chain of event, depending on the permission scheme.[230]

The next block of solutions is comprised of several directions mainly targeted to contract law issues as well as monetisation of intellectual property rights. In particular, in the capacity of basis the smart contract technology has to be applied. As it has been previously discussed, a Smart contract—a software with predefined terms that can certify and facilitate a transaction and thereby allow a legal contract to self-perform.[231] However, it must be noted, that smart contract's full-time applicability to copyright is possible only upon the creation and fulfilment of DLT database as it would provide a direct legal certainty towards ownership and origin of works[232], a set of questions discussed above as well as create basis for the further development and enhancement of legal relationships between various parties.[233]

The most widespread concept of smart contracts' applicability in copyright law is the arrangement of licensing of the above mentioned rights. Taking into account the extent of international law that has been harmonised until nowadays, there are still a range of concerns regarding peculiarities of national legislations, notwithstanding the availability of numerous licensing agreements' templates provided by a various organisations or platforms.[234] However, in case of EU secondary legislation related to copyrights, it is possible to note the greater extent of harmonisation as well as its unification. Upon the creation, digitalisation and adoption to digital environment it would become easier to enter into licensing agreement between the potential user and the holder of IP rights, regardless whether it is CMO or a particular rightholder as the data regarding them should be entered into the common registry. In order to reach this goal, it is necessary to develop a platform through which a potential contracting party could obtain an access to entering into agreements, pass the validation process (as the identification of the party and its legal capacity has a significant importance in view of contract law matters) and even deposit currency in the form of tokens (subject to doubts since the blockchain platforms powered by smart contracts include the circulation of tokens). To explain the last statement, it is worth to mention

[230] "Distributed Ledger Technology Use Cases", International Telecommunication Union, Accessed 03 April 2020, p. 33-34, https://www.itu.int/en/ITU-T/focusgroups/dlt/Documents/d21.pdf#page35.
[231] Lutz Riede, Laura Adriana Grinschgl, "Digital Transformation: Managing IP Rights through the Blockchain." T*he Licensing Journa,l June/July (2018)*: 10–11.
[232] Ibid, p.10
[233] Gönenç Gürkaynak, İlay Yılmaz, Burak Yeşilaltay, and Berk Bengi,"Intellectual Property Law and Practice in the Blockchain Realm.", *Computer Law & Security Review 34 (4) (2018):* 847–62, https://doi.org/10.1016/j.clsr.2018.05.027.
[234] Savelyev, "Copyright in the blockchain era: promises and challenges", 11-12

that until now it is not precisely clear how to arrange the smart contracting and DLT-based databases, or in other words should there be an above mentioned platform and two separate network with adjusted application layers for their interoperability or the platform with single network and simply increased functionality. From one side, the single network would allow to avoid the complexity in building of software architecture, however from another side the public permissioned network, theoretically administered by state authorities, could potentially create an overlap between publicly administered network and private business interests.

Besides that, Alexander Savelyev implicates about those issues when the license agreement is royalty free (like in cases with OSS – open source software).[235] Upon the assumption that the solution is found in relation to organisation of smart licensing contracts, it would become necessary to analyse various models, conditions and templates of such agreements in order to be able to develop the standardised principles in contracting across the EU with a possibility to form the required conditions for a particular agreement (within an established framework of principles). The greatest potential drawback is the huge list of exceptions and limitations to proprietors' rights, provided for in by InfoSoc Directive.[236] As for the royalty-free agreements, then this issue may be avoided upon the establishment of miserable or "nominal" value of smart contract that would be enough for the programme to accept and would also be out of legal scope (i.e. income acquisition).

Furthermore, a smart contracts system would be able to facilitate the performance of range of transactions depending on the type of agreement and involved parties.[237] In particular, those cases when the work involves several separate rightholders (i.e. film or music industries), the contract may be formed in way that each of the rightholder would receive a corresponding part from common royalty payment upon the licensing assignment.[238] This should also cover sole rightholders' cases and, as a consequence, automatical and fair division of funds would be able to diminish a problem of fair remuneration and increase the transparency of income's acquisitions (for the taxation purposes) since existing licensing is time-consuming, expensive and leads to a range of problems.[239]

Besides that, there is a potential idea to include resale rights of authors in deals between the buyers and intermediaries in the sphere of art. Once the work is registered and labelled with its unique cryptographic signature alongside with public address of its author it would become

[235] Ibid, p.12
[236] Directive 2001/29/EC on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society, OJ L 167 22.6.2001, p. 10", EUR-LEX. Accessed 05 April 2020..
[237] Tresise, Goldenfein, Hunter. "What Blockchain Can And Can't Do For Copyright", 8-10.
[238] Ibid.
[239] Stef van Gompel, Daniel J. Gervais (ed.), "Collective Management in the European Union", *Kluwer Law International, (2015):* 139-174. https://ssrn.com/abstract=3166890

possible to simplify the performance of royalties' repayment to such authors. For example, to adopt the practice of performance of sale/purchase agreements between mentioned parties within the smart contract system with the establishment of royalty deduction in favour of the author(s). This approach could potentially reduce the costs of payments' delivery, again increase transparency and simplify the arrangement of payments executed by seller/buyer.

To consolidate the ideas of vast possible applications, the ideal result would be in the form of two separate and interoperated blockchain networks where one would be perform the function database or registry, while another one – for the application of smart contracts between rightholders and potential licensees/proprietors of economic rights etc. Besides that, the access platform for parties will also be necessary as node's public address does not provide any particular information regarding its owner and it is crucially important to identify party for the contract to be concluded. Furthermore, in order to ensure demand for such technological solution, it is important to develop standardised terms and general principles of licensing agreements that would have the same power across the European Union as well as the corresponding interface, allowing general potential user to interact with the network and choose the appropriate variation of agreement. This would simplify the way of entering into agreements between parties located within EU or when the party is located in Third Country. In view of currency, the DLT networks use their internal so-called tokens (i.e. Bitcoin, Etherium etc.) with a fluctuating price for such digital assets, therefore, it would be appropriate to introduce own type of token for smart contracts system which exchange rate would be equaled to the rate of euro. This is logical since the database, smart contracts, unified terms of licenses and so on shall be established within a framework of European Union. Finally, by the possession of public address of the rightholder, cryptographic signature of his work(s) and predetermined set of rules, the parties would be able to enter into agreement. Once the consent is reached, the terms, amount of payments to be performed etc. are uploaded to Virtual Machine, while the system obtains an information regarding the work(s) from the database registry and issues a personal cryptographic signature (as a confirmation of entitlement to use rights related the work) in exchange to the payment performed. Consequently, the whole network validates the action performed and confirms entering into agreement.

5.2. Current status of national legislations with regards to blockchain

The greatest attention to blockchain technology is nowadays paid by states in view of its FinTech opportunities as cryptocurrencies and functionality of DLT network has been initially developed for the simplification of financial transactions between several parties, excluding the intermediate player and limitations imposed by boarders and jurisdictions.

For instance, in France the general recognition of blockchain technology took place in 2016. However, since that time the main emphasis has been on made so-called Initial Token Offering ("ICOs") alongside to crypto investing.[240] To the research of blockchain's financial potential are involved such French institutions as Financial Market Authority, Strategy and Prospective General Commission, National Accounting Standards Authority, Central Bank and government of France etc.[241]

In Germany cryptocurrencies have also obtained their reflection from the state and have undergone some legal interventions which are also related rather to financial sector[242] than to the sphere of intellectual property. The same is applicable to the Netherlands, where the focus is made on FinTech and counteraction of uses crypto assets for the criminal offences' purposes.[243]

In general, these states began to reflect the challenges brought by cryptocurrencies and blockchain approximately in 2016-2017 with an emphasis of original blockchain's functions and adaptations of new technology to the existing models in financial sector, AML etc as their appearance brought a number of new challenges into nowadays world. Taking this into account, it is possible to assume that in several years the European Union alongside to its Member States could potentially commence officially-powered researches with regards to blockchain's applicability in the sphere of intellectual property and, in particular, copyright law. However, it must be beared in mind that legal science, public consideration and law-making processes are not time-friendly and they require more time for this.

5.3. Impediments on the way of DLT-based networks' implementations

The primary issue is about the timeline when the DLT network are going to be taken into serious consideration. For the reasons, explained above, the governments and other corresponding authorities will not be engaged in the research of these issues especially in view of working old system. In its turn, the only way out is the further maintenance of interest towards interaction between blockchain and copyright made by the scientific society and separate initiatives until this field will not be researched to more or less significant extent.

Another issue is the range of material, financial, educational, human, technical and other resources that have to be applied in order to put into practice these theoretical concepts as it is necessary to develop various platforms, basic software, involve deeper legal analysis as well as the performance of corresponding legal intervention to this area by drafting instruments,

[240] Dewey, Josias, *Blockchain and Cryptocurrency Regulation*, (London: Global Legal Group Ltd, 2019), 282-283.
[241] Ibid, p.282-289.
[242] Ibid, Pp. 290-300.
[243] Ibid, Pp. 394-400.

instructions etc.[244] Besides that, it is necessary to create a kind of "sandbox" in order to run various scenarios and calculate all the possible mismatches, fails, data losses and other relevant risky factors. Furthermore, the ITU's technical report on blockchain cases has clearly defined that, the application layer that serves as a possible bridge for the interoperability provision of DLT network with other types of software is still a subject to a further research. This is to be explained by the fact that nowadays there are not many existing DLT networks as well as there are absent any standards and interoperability requirements while the applications of blockchain do not bear the unified approach in architecture and software design.[245]

From entirely legal point of view, the vast amount of legal instruments have to be developed. These, in particular, includes Secondary EU legislation as the harmonised implementation across the EU would require the adoption of entirely new legal Regulations as well as development of such legal rules that would not contradict to existing multinational agreements. Besides that, there will be a necessity of creation of national legislative provision, i.e. instruction, orders, act, decisions and rulings that would be able to provide a precise legal regulation at all steps of *copyright sui generis* application and other supplementary legal rules, for instance, in tax, administrative and even criminal law. Finally, the judicial systems have also be prepared for a number of cases as in practice upon the introduction of any novelty into legal relationships, there will be a number of disputes.

One more subsequent challenge is the data amount contemplated to be engaged into DLT networks as upon the factual application of such approach the use and transfer of data amongst the whole network can potentially increase to huge amounts.[246] It is challenging issue especially in view of proposed application of two separate DLT networks (as well as additional software platforms, i.e. for the identification purposes) and while the one would transfer mainly text-based information (contracts) the another one should deal with works and media files. The depository of copyrighted works in IP register will be an essential prerequisite in order to ensure the implementation of subsequent features, however the issue of data storage is not precisely clear. It has been assumed that a kind of central servers should be created where the works will be stored and personally linked, however this will be a subject for IT-specialist to decide about such possibility.

The next issue arises due to one of DLT's features, namely, unalterable data input or, in other words, impossibility of alteration, changes or modifications of record performed. The trouble

[244] "Distributed Ledger Technology Use Cases", International Telecommunication Union, Accessed 07 April 2020, p. 23, https://www.itu.int/en/ITU-T/focusgroups/dlt/Documents/d21.pdf#page35.
[245] ibid
[246] Gürkaynak, Yılmaz, Yeşilaltay, Bengi, "Intellectual Property Law and Practice in the Blockchain Realm.", 860.

appears in those cases when the user mishandles the data input and sends the block of data for the networks' verification as this person will have no possibility to alter action or cancel it. Such mistakes would lead to significant losses, disclosures or other undesired results. The IT-specialists would have to discover whether it is possible to programme a network in a way that administrator could potentially influence on such situations. Most likely that no, however may be alternative ways of records' revocations would be introduced.

Another issue is dedicated to the enforceability of smart contracts. Initially, they are developed in a way that they are performed automatically without the necessity of their enforcement. In cases of any attempts to alter, change or revoke any of contract's clause would lead to its non-acceptance by the network. In this realm, the issue on how the court is able to influence on such agreements and possible consequences appears as appropriate. Max Raskin in his paper "the law and the legality of smart contracts" implicates the division of smart contracts on hard and weak smart contracts.[247] According to him, the hard smart contracts are the ones which alteration would lead to excessive costs and make such action senseless, while the weak smart contract may be affected with relative ease.[248] That means that if the court's decision or prescription would be related to these hard smart contracts, the interested party will be helpless *ex post*.[249] In its turn, the contact's enforceability as well as judicial power will be lead inefficiency and increase risk of abuses/manipulations in these situations which are inappropriate for the democratic state. In any case, it is extremely problematic to calculate all the spectre of such inconsistencies, however the scope of smart contracts' application should be built as simple and with limited scope of subjects matter (i.e. only for licenses' assignments) in order to preclude the possible negative outcomes.

One more point shall be dedicated to the data protection issues. Under article 8 of Charter of Fundamental Rights[250] every persons obtains a right for the protection of his personal data and, at the same time, the General Data Protection Regulation (GDPR)[251] is aimed to enhance the right provided in Charter by means of implementation of single approach in treatment of personal data. In this regards, the blockchain-based system are a kind of two-sided coins because they are built in a way that "everyone can see everyone" openly and without any obstacles. From one side, the

[247] Raskin, "The Law And Legality Of Smart Contracts", 310-311.
[248] Ibid, 310.
[249] Ibid, 311.
[250] "Charter of fundamental rights of the European Union(2000/C 364/01)", European Parliament, Accessed 10 April 2020, https://www.europarl.europa.eu/charter/pdf/text_en.pdf
[251] "Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)", EUR-LEX, Accessed 11 April 2020, https://eur-lex.europa.eu/eli/reg/2016/679/oj.

classical blockchains identify their nodes and users by the provision of their pubic address which is freely accessible information, however there are certain concerns with regards to the information's organisation in IP registers and smart-contract system for licensing, based on the same principles. Since the public address of particular person will have personal character and linked to the deposited work in the registry, while EOA in smart contract system will be linked to particular licensee/rightholders. The transparency feature may a subject to data leaks unless there will be adopted measure ensuring the protection os such information.

Finally, the most common feature to any technological device or software is the risk to be hacked and overrided. The DLTs are considered safe due to the method of data's sharing – between every member of the network. In order to override them and alter the information in the chain of data blocks, infringers have to obtain a control over majority (51%) of existing nodes and users.[252] In November 2018, there was a case of such override which led to losses in the amount of 200 000 USD.[253] This means that it is overwhelmingly important to provide not only the additional means of protection to the nodes and main servers, but to introduce legal instruments and mechanisms allowing to mitigate possible negative consequence. The latter means, that there should exist a procedure on how to provide the rightholders/licensees (either all or only the ones who suffered from such acts of omission) with the prejudicial fact certifying the possession of rights, financial means etc.

To conclude, objectively assessing the existing environment, nowadays it is difficult to say about practical realisation in the nearest future due to a range of challenges on a way of blockchain's applicability in the sphere of copyright. However, the perspectives exist and upon passing of certain period of time, the vast majority of solutions will be found. Once technical side reaches certain level of its development, legal science would be able to perform the creation of the corresponding legal regulation suitable for the further use in the creation of the Community *sui generis* copyright law, based on distributed ledgers technology.

[252] Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System", Bitcoin.org, Accessed 14 Apr. 2020.

[253] Mike Orcutt, "Once Hailed as Unhackable, Blockchains Are Now Getting Hacked." MIT Technology Review, Accessed 14 April 2020, www.technologyreview.com/2019/02/19/239592/once-hailed-as-unhackable-blockchains-are-now-getting-hacked/.

CONCLUSIONS

1. The copyright infringements, in particular, in the form of piracy is the phenomenon appeared centuries ago. However, depending upon the time, it was given an appropriate possible response by means of legal intervention and establishment of legal remedies for such cases. However in view of nowadays technological development, the practice shows that only legal approach in counteraction to piracy and other copyright infringements has little efficiency. The digital space as well as software facilitating in reproduction, alteration, editing and finally transfer of information between users require a modern approach. Current legal regulation and simple technical protection measures are insufficient for the provision of protection of rightholders' rights and interests.

2. The extent of harmonisation of copyright-related legal rules, provided by international treaties, as well as European Union's Secondary Legislation in relation to copyright have proved their reasonability and significance in relation to the "promotion of international recognition of the legal protection of authors for their intellectual work". Although, there are many concerns regarding the wide discretion in some Directives, the implementation of harmonised legal provisions plays indispensable role in the creation of common legal framework, especially in such directions as software, databases, terms of protection, collective management and detailed elaboration on reproduction, distribution, communication rights etc. In my opinion, the only possible way to overcome nowadays' challenges is the continuation of unification process and subsequent provision of the single *sui generis* copyright title within the European Union. While until recent times there were a range of concerns regarding such idea due to, mainly, having no objective reasoning to do so, nowadays' revolution brought by distributed ledgers technology, started to turn this conceptual proposal to the real side. Upon the adoption of such approach it will become possible to reach several goals simultaneously, i.e. establishments of a framework with enhanced transparency, ease, cost and time efficiency, while the requirement to comply with modern copyright's legal standards (upon dealing with IP rights within EU space) will also lead to their application by third countries.

3. From technical point of view, the potential of blockchain has been discovered properly yet. There are still many concerns and uncertainties with regards to a range of issues, like architecture structuring's standardisation, interoperability with different software, including other DLT networks etc. However, it must admitted that nowadays level of its understanding allows to define that blockchain's features implicate the range of possible practical application in various legal fields. Due to its initial orientation to FinTech sector, the practical experience of blockchain's application in copyright law is absent. However once it obtains a positive assessment of truth-

worthy technology, the attention will be shifted to this field as well since such huge topic is able to make a breakthrough to successful improvement of intellectual property rights protection.

4. Once the solutions on technical issues are found, in particular, regarding interaction of a DLT-based network with other software, it will become possible to achieve additional reasonable argument in favour of adoption *sui generis* copyright title and create platforms whereby discussed problems may be influenced in a positive way. EU Copyright Law has undergone a range of legal interventions, which in its turn serves as a strong basis for the consideration of Unitary Title. The historical overview as well as EU Directives have shown that close cooperation between states results in the adoption of efficient measures suitable for a particular period of time.

5. The application of blockchain-based networks together with the Unitary approach in regulation of copyright legal relationship can potentially enhance the prevention of copyright infringements, would simplify the identification of infringing action in relation to the rightholders, increase efficiency in managing economic rights as well as their transfers or assignments.

RECOMMENDATIONS

1. It is important to conduct a deeper research regarding technical opportunities of DLT-based databases and smart contracts' platforms. In particular, it would be appropriate to create prototypes of the mentioned networks for the aims of analysis of their functionality, strong sides and weaknesses.

2. To develop the most consensual approach into defining of standards and common principles for the licensing of copyrights, acceptable by the EU Member States. Besides that, it would be appropriate to involve companies from private sector to participate in application of the mentioned networks for the performance of their activity, related to copyrights by means of making incentives and ensuring their rights with traditional ways.

3. Upon the creation of basic blockchain's platforms and their acceptance for the implementation to copyright law field, it will be required to develop a range of legal documents, covering substantial law issues of single copyright title, national legislation corresponding to EU Secondary Law, instructions and procedures for national intellectual property offices.

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ABSTRACT

The Master Thesis is focused on the application blockchain technology into the field of copyright law. It provides with the origins and nature, theoretical and legal framework of copyrights as well as technical analysis and cases on practical realisation of blockchain's operability in this field. Among others, Thesis brings up questions of copyrighted works' status, transfer of economic rights, identification of both primary and secondary infringements, mechanisms of rightholders' fair remuneration etc. It covers international, EU levels of legislation and several national jurisdictions. The aim of this Master Thesis is to outline existing regulative approach, identify significant challenges caused by development of digital technologies and propose tech-based solutions.

Keywords: blockchain in copyright law, copyright law challenges in digital society, copyright technical protection, smart contracts and copyright law, European Unitary copyright.

SUMMARY

Blockchain in Copyright Law: Legal Analysis of Implementation Perspectives

The topic of this Master Thesis was chosen as a result of several factors, namely the absence of novel developments aimed to enhance the protection of economic and moral rights of authors, onrush of blockchain-based solutions in the sectors of finance and financial law, appearance of ideas to introduce blockchain technology into the field of copyright law. Due to the adoption of the mentioned technology in a range of countries, it became possible to assume that in relevantly nearest future the attention would be shifted to intellectual property law as well. Therefore, it was decided to undertake, as an aim, to perform an analysis of the existing copyright legal system, establish the range of challenges it faced as well as provide a theoretical argumentation on how they may be solved by means of technology application. In view of objectives, it was agreed to provide a description of EU-based copyright regulation, taking into account EU Secondary Legislation and particular examples of German, French and Dutch copyright-related legal instruments, as well as establish the origins why exactly such approach had been formed. Further, the study goes through the identification of the most common and widespread copyright infringements. After acquisition of the necessary solid background the research went beyond the legal aspect to technical analysis in order to make an emphasis on features and characteristics that may be potentially adjusted to copyrights' realm. As a solution, there was pointed out the concept whereby the issues of works legal status, digital piracy, works copies' traceability as well as transfer of rights or their simple licensing could be enhanced to a novel level of regulation and protection. Grounding on the conclusion that the most effective rights' protection is based on the international cooperation, as it may be noticed from origins and subsequent add-ons by Secondary Legislation, the research comes to a conclusion that the concept of Unitary Copyright Title and blockchain-based databases as well as smart contracts for licensing complement each other to a significant extent. Finally, it will be a reasonable step to continue amore comprehensive development of this concept which in future may potentially lead to a significant reduction of copyright infringements as well as facilitate economic relations around copyright works.

HONESTY DECLARATION

10/05/2020

Vilnius

I, Bogdan Naugolnyy, a student of Mykolas Romeris University (hereinafter referred to University), Mykolas Romeris Law School, Private Law Institute, European and International Business Law Programme

confirm that the Master thesis titled

"Blockchain in Copyright Law: Legal Analysis of Implementation Perspectives":

1. Is carried out independently and honestly;

2. Was not presented and defended in another educational institution in Lithuania or abroad;

3. Was written in respect of the academic integrity and after becoming acquainted with methodological guidelines for thesis preparation.

I am informed of the fact that student can be expelled from the University for the breach of the fair competition principle, plagiarism, corresponding to the breach of the academic ethics.

(signature)

Bogdan Naugolnyy

(name, surname)