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Application of Electronic Copyright Management System (ECMS) in Optimizing Digital Copyright Protection on Over-The-Top (OTT) Services in Indonesia

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Abstract

Digital copyright protection in Indonesia still faces major challenges amid the rapid development of increasingly popular Over-The-Top (OTT) services. OTT services facilitate the widespread distribution of creative works, but also increase the potential for digital copyright infringement, such as piracy and unauthorized copying. To overcome this problem, the use of adequate copyright protection technology is needed as an effort to optimize digital copyright protection on OTT services. This study aims to analyze the application of the Electronic Copyright Management System (ECMS) as an effective solution in protecting digital copyright on OTT services in Indonesia. Using normative and comparative legal research methods, this study analyzes the applicable regulations related to digital copyright in Indonesia and compares them with regulations in the United States. The results show that although Indonesia already has regulations on copyright, the existing regulations still do not adequately accommodate the protection of digital copyright and the implementation of security technology. Meanwhile, the United States, through the Digital Millennium Copyright Act (DMCA), has implemented ECMS as a digital copyright security technology. This study proposes the implementation of ECMS in Indonesia to optimize the protection of digital copyright, both preventively and repressively, and provides recommendations for more comprehensive regulatory updates.

Keywords: ***Digital Copyright, Over The Top, ECMS, Copyright Protection, Copyright Infringement***

A. Introduction

The rapid development of technology and science, especially in the era of digital transformation, has had a great influence on various fields of life[1]. The birth of the internet and digital media encourages the digitization of copyright, which is the transition of works from physical or conventional forms to digital forms which are then referred to as digital copyright[2]. This digitization facilitates access and distribution of copyrighted works, such

[1] Ahmad M Ramli, Hak Cipta, Disrupsi Digital Ekonomi Kreatif, (Bandung: PT. Alumni, 2018), Hlm. 27
[2] Dwikayanti, N. M. R., and M. G. S. K. Resen. "Legal Protection of Copyright on Digital Creative Works in Indonesia Based on Law Number 28 of 2014 Concerning Copyright." International Journal of Judicial Law 4, no. 3 (2025): 1–6. Hlm 4.

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as music, films, and e-books, which were previously only available in physical form and are now available through internet-based platforms[3]. However, it also poses new challenges in copyright protection, given the greater potential for copyright infringement along with the ease of access and distribution of digital works over the internet.

According to a report by the Indonesian Internet Service Providers Association (APJII), in July 2025 the number of internet users in Indonesia will be recorded at 229.4 million people or around 80.66% of the total Indonesian population of around 284.4 million people, a significant increase compared to 2024 which will be 79.5%[4]. This data shows that the internet has become part of the daily lives of Indonesian people, starting from looking for information, working, shopping, to enjoying creative works, which is in line with the concept of Society 5.0 in Japan, where digital technology is applied to support human life[5]. One of the tangible manifestations of the development of internet technology is the birth of Over-The-Top (OTT) services, which is the provision of application and/or content services through public internet networks that allow people to access them through various devices connected to the internet[6]. OTT services include various forms, ranging from short messaging, voice and video calls, financial transactions, to social media and streaming platforms, such as Netflix, WeTV, Vidio, YouTube, TikTok, Instagram and Telegram, which are now an integral part of the media consumption patterns of Indonesian people.

OTT services allow copyrighted works to be widely distributed and accessed, providing convenience for creators to channel their works through OTT platforms and profit from the works[7], as well as making it easier for the public to access copyright-protected content[8]. Along with the popularity of OTT streaming services, such as Netflix and YouTube, which have an awareness rate of around 80% in Indonesia, other services such as Vidio, Disney+, VIU, and WeTV are also showing increased interest from users. The majority of OTT service users in Indonesia watch content regularly, with 33% of users watching daily, 12% of users more than 5 times a week, 18% of users 4-5 times a week, 20% of users 2-3 times a week, while 8% of users watch once a week[9].

[3] Mayana, R. F., T. Santika, and Z. Cintana. "Digital Copyright Protection as an Implementation of Intellectual Property Development in Electronic Systems." Refleksi Hukum: Jurnal Ilmu Hukum 8, no. 2 (2024): 270–278. Hlm 270.

[4] Mediana, C. "229 Juta Pengguna Internet di Indonesia, Pasar Menggiurkan bagi Perusahaan OTT", https://www.kompas.id/artikel/229-juta-pengguna-internet-di-indonesia-pasar-menggiurkan-bagi-perusahaan-ott diakses pada tanggal 1 Desember 2025.

[5] Safiranita, T. Cybersecurity: Copyright Protection in Telecommunication Services in Indonesia. PT Refika Aditama, 2023. Hlm 6.

[6] Diza, N. "Legal Protection of Copyrighted Works on Over-The-Top (OTT) Services." Technology and Economic Law Journal 1, no. 1 (2022): 52–65. Hlm 53.

[7] Ramli, T. S. Copyright in Over-The-Top Media. PT Refika Aditama, 2022. Hlm 84.

[8] Tobing, A. N. L., R. R. Permata, and T. S. Ramli. "Legal Actions against Copyright Infringement in the Digitalization of Works through Over-The-Top Media." Jurnal Sains Sosio Humaniora 5, no. 1 (2021): 564-574. Hlm 565.

[9] Populix. Populix Survey: The Use of OTT Platforms in Indonesia. 2025. https://info.populix.co/articles/ott-platform/ diakses pada tanggal 1 Desember 2025

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Even so, the development of OTT services actually poses serious challenges in terms of digital copyright protection. The rise of copyright infringement on OTT services is in fact unstoppable. One of the main issues that is developing is the piracy and dissemination of copyrights, especially cinematographic works such as films. This process begins when footage or entire films obtained through official OTT streaming services, such as WeTV and Vidio, are downloaded and then hijacked and disseminated through file-sharing apps like Telegram or social media platforms like TikTok. This phenomenon takes advantage of the ease of access and distribution of content offered by OTT services, which exacerbates copyright infringement on a massive scale. As a result, copyrighted works that should be protected can be accessed freely, even illegally distributed without permission from the copyright owner. This certainly causes material losses for copyright owners, and can damage the creative industry ecosystem.

From a normative perspective, until now Indonesia does not have regulations regarding the protection of digital copyright. Although there has been a Copyright Law and other relevant regulations such as the ITE Law, the protection of digital copyrights, especially in OTT services, has not been fully effective because the substance of the regulation is still oriented towards conventional forms of copyright. The complaint mechanism in the Copyright Law makes law enforcement only possible after a complaint from the copyright owner, while in OTT services, copyright infringement occurs massively, making it difficult for copyright owners to track and report infringement of their copyrighted works. This condition reflects the gap between legal norms and the reality of practice in the field, where the copyright protection system in Indonesia has not been able to adapt to the characteristics of the digital space that demands speed and automation. The current copyright protection regulations can be said to be a few steps behind the advancement of digital technology[10]. Therefore, the renewal of the Copyright Law is necessary, in line with the transformative legal theory by Prof. Ahmad M. Ramli who emphasizes that the law must evolve along with technological advances[11].

In the face of copyright infringement in the digital era, internet technology experts and copyright experts have developed various copyright protection technologies in the digital space known as Security Technology[12]. The use of this security technology is in line with the concept of Lex Informatica which emphasizes that technology has an important role in protecting content in the digital world[13]. The Copyright Law has accommodated the provisions regarding safety technology in Article 52, which states that a means of technological control is any technology, device, or component designed to prevent or limit

[10] Heriani, F. N. "Online Copyright Infringement Protection Remains Ineffective." Hukum Online, 2022. https://www.hukumonline.com/berita/a/perlindungan-hukum-terhadap-pelanggaran-hak-cipta-daring-belum-efektif, diakses pada tanggal 29 April 2025

[11] Ramli, A. M., & Ramli, T. S. (2022). Hukum Sebagai Infrastruktur Transformasi Indonesia. PT. Refika Aditama. Hlm 87.

[12] Irawati. "Digital Rights Management (Security Technology) in Copyright Protection in the Digital Era." Diponegoro Private Law Review 4, no. 1 (2019). Hlm 384.

[13] Ramli, Ahmad M. Copyright, Digital Disruption, and the Creative Economy. PT Alumni, 2018. Hlm 27.

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actions that are not authorized by the copyright owner and prohibited by laws and regulations. However, the Copyright Law has not explicitly explained the method and manner of using this technology[14].

The technologies in the Copyright Law include optical discs, servers, cloud computing, secret codes, passwords, barcodes, serial numbers, as well as encryption and decryption technologies used to protect the Work. From the research conducted by Teguh Rizkiawan, in his thesis it is said that the technology used in the provisions of the Copyright Law has not been able to detect copyright infringement effectively, both preventively and repressively[15].

Security technology is generally known as Digital Rights Management (DRM), which is the technology used by copyright owners to control access and limit the use of their works[16]. Previous research by Khansa & Safiranita (2025), shows that the use of DRM in Indonesia is still ineffective in providing preventive protection against digital copyright infringement[17]. Although DRM technology has been implemented, there are still drawbacks when content is decrypted on the user side, leading to opportunities for piracy[18]. In the context of OTT services, DRM is used by OTT service providers to prevent illegal access and unauthorized modification of content. However, previous research conducted by Kalan and Karsli (2023) explained that DRM technology still has weaknesses in tracking the redistribution of content after legitimate users have gained access [19]. This study shows the need to use watermarking technology to trace the redistribution of content, so DRM alone is not enough to protect copyrighted works on OTT services.

From some of these studies, we can see that the rapid development of digital technology today makes the role of security technology in protecting copyright very crucial. Thus, security technology is needed that can prevent unauthorized access and copying of copyrighted works spread on OTT services. In addition, technology is also needed that can function to identify works, so that they can help track and prevent acts of copyright infringement[20].

To optimize digital copyright protection on OTT services, especially on OTT streaming platforms, Indonesia needs to implement adequate security technology in overcoming rampant copyright infringement. Reflecting on the United States, digital copyright

[14] Riswadi, Budi Agus. Limitations and Exceptions to Copyright in the Digital Era. PT Citra Aditya Bakti, 2017. Hlm 38.

[15] Rizkiawan, T. Adoption of Information Technology in Copyright Law Provisions to Strengthen Copyright Protection in Indonesia. Universitas Islam Indonesia, 2024. Hlm 108.

[16] Irawati. "Digital Rights Management (Security Technology) in Copyright Protection in the Digital Era." *Diponegoro Private Law Review* 4, no. 1 (2019). Hlm 385.

[17] Khansa, R. E., and T. Safiranita. "Optimizing the Implementation of Digital Rights Management to Strengthen Copyright Protection in Digital Streaming Services in Indonesia." Journal of Law, Politic and Humanities 5, no. 4 (2025). Hlm 2710.

[18] Ibid

[19] Kalan, R. S., and E. Karsli. "Illegal Broadcasting: A Way of Protecting Revenue." In Proceedings of the 14th International Conference on Network of the Future (NoF), (2023). Hlm 62.

[20] Rizkiawan, T. Adoption of Information Technology in Copyright Law Provisions to Strengthen Copyright Protection in Indonesia. Universitas Islam Indonesia, 2024. Hlm 110.

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protection has been specifically regulated through the Digital Millennium Copyright Act 1998 (DMCA). The United States through the DMCA has adopted several technology-based copyright protection models that can be used by copyright owners as a legal remedy in protecting their creations in digital media[21]. The Electronic Copyright Management System (ECMS) is a security technology applied in the United States to identify copyrighted works, monitor their use, and distribute appropriate compensation to copyright owners through an automated electronic licensing system[22]. In addition, ECMS allows copyright owners to regulate when and who can access their works, thus minimizing the risk of copyright infringement[23].

Major platforms in the United States have adopted ECMS technology to detect and prevent copyright infringement on their platforms. One example of ECMS is seen in the Content ID System launched by YouTube in 2007 after YouTube faced various lawsuits related to copyright infringement[24]. This system allows copyright owners to identify and manage content uploaded on YouTube. Official content is stored in the database as a Content ID reference to detect similarities, so that any similar uploads will be detected and copyright owners will receive notifications and follow-up options[25]. Copyright owners can block the video or monetize it through ads on the video and can monitor its viewership statistics.

This research has urgency related to the need to optimize digital copyright protection in OTT services in Indonesia, especially in facing the challenges of rampant piracy and illegal redistribution of copyrighted content. This research is important to analyze how the application of ECMS can be a technological solution in increasing the effectiveness of digital copyright protection in OTT services, both preventively and repressively.

The novelty of this research lies in the analysis of the use of new technologies, such as ECMS, as an effort to optimize the protection of digital copyright on OTT services in Indonesia, as well as its association with the need to revise Article 52 of the UUHC by referring to the DMCA.

B. Research methods

The methods used in writing this article are the normative juridical approach and the comparative approach. The normative approach was conducted by reviewing the laws and regulations related to digital copyright protection on OTT services. The comparative approach was used to compare the regulation of digital copyright protection in OTT services between Indonesia and the United States, where the US, through the DMCA, has clearly regulated digital copyright protection and security technology protection such as ECMS.

[21] Mayana, R. F., T. Santika, and Z. Cintana. "Digital Copyright Protection as an Implementation of Intellectual Property Development in Electronic Systems." Refleksi Hukum: Jurnal Ilmu Hukum 8, no. 2 (2024). Hlm 275.

[22] Rahman, I., et al. "Protecting Intellectual Property in the Digital Age with Law." Journal of Research in Social Science and Humanities 4, no. 1 (2024). Hlm 50.

[23] Ahmad, N. "Copyright Protection in Cyberspace: A Critical Study with Reference to Electronic Copyright Management Systems (ECMS)." Communications of the IBIMA 7, no. 3 (2009). Hlm 82.

[24] U.S. Copyright Office. Section 512 of Title 17. In Report of the Register of Copyrights, 2020.

[25] Ruru, N. "Understanding YouTube's Content ID System." Eyrcls.com, 2023. https://eyrcls.com/en/research/blog/youtube-dan-sistem-content-id, diakses pada tanggal 15 Mei 2025.

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This comparative study allowed the author to identify weaknesses in the Indonesian regulations and formulate recommendations for updating the regulations in Indonesia. This research is descriptive and analytical in nature to describe and analyze the conditions of legal regulations on digital copyright protection in OTT services, as well as the application of security technology in protecting digital copyright in OTT services[26].

The data used is secondary data obtained through literature studies using primary and secondary legal materials. Primary legal materials include laws and regulations related to copyright and information technology in Indonesia, as well as the Digital Millennium Copyright Act 1998 (DMCA) as a comparison. Secondary legal materials include books, journals, articles, and official documents from the U.S. Copyright Office and WIPO. Data collection was carried out through literature studies and online legal searches.

C. Results and Discussion

1. Legal Protection of Digital Copyright in Over-The-Top Services According to Indonesian Positive Law

Copyright is an exclusive right that arises automatically after a work is realized as stipulated in Law No. 28 of 2014 concerning Copyright (UUHC). These rights include moral rights and economic rights that give the Creator the authority to control the use of his work. Moral rights, as Article 5 of the UUHC, are inherent in the Creator, including the right to include names and protection of the integrity of the creation even though the rights have been transferred[27]. Economic rights as stated in Article 8 of the UUHC are the exclusive right of the Creator/Copyright Holder to obtain economic benefits for their creations. Economic rights include publishing rights, reproduction rights, dissemination rights, adaptation rights, recording rights, and rights to broadcast programs[28].

According to the Theory of Property by John Locke, every individual has the right to life, liberty, and property, which also includes his or her intellectual output[29]. According to John Locke, every individual has a natural right theory to property that the state must protect. Copyright as the exclusive right of the Creator is included in these natural rights, so it must be expressly protected to prevent abuse that is detrimental to the Creator[30].

In today's digital era, OTT services have developed into a means of distribution and access to the largest copyright works in Indonesia. Based on the SE of the Minister of Communication and Information Number 3 of 2016 concerning the Provision of Application Services and/or Content Through the Internet (Over the Top), the definition of OTT services is divided into 3 categories, as follows:

1. Application services through the internet are the use of internet protocol-based telecommunication services that enable various communication activities and

[26] Marzuki, Peter Mahmud. Legal Research. Prenada Media Group, 2019. Hlm 28.
[27] Hidayah, Kholis. Intellectual Property Law. Setara Press, 2017. Hlm 39.
[28] Ibid
[29] Utami, D. W., et al. "Intellectual Property Protection from a Philosophical Perspective as a Natural Right Based on John Locke's Theory." Praxis: Jurnal Filsafat Terapan 1, no. 1 (2023). Hlm 8.
[30] Ibid

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digital services, such as messages, voice and video calls, transactions, data storage, games, and social media, for example WhatsApp, LINE, Instagram, and Zoom.

2. Content services through the internet are the provision of various forms of digital information, such as text, sound, images, music, video, movies, and games, both streaming and downloading, which are distributed through internet protocol-based telecommunication networks, such as Netflix, Spotify, and TikTok.
3. Provision of Application and/or Content Services Through the Internet, or Over the Top (OTT) Services, is the provision of internet-based application and/or content services, such as YouTube and similar platforms.

In other words, OTT services refer to the distribution of multimedia content over the internet without relying on traditional broadcasting infrastructure such as cable TV, satellite, or other conventional broadcasting systems[31]. OTT service providers act as a liaison that offers a variety of digital content without operating the telecommunication network infrastructure directly[32]. The existence of OTT services allows every individual to easily access and enjoy various copyrighted content, such as songs, movies, and writings, without having to have a physical form[33]. Users of OTT services can simply use electronic devices such as smartphones connected to the internet to access copyrighted content anytime and anywhere[34].

One of the conveniences for creators is to reach a wider audience quickly and efficiently through OTT services. For example, in the context of the "sustainable Korean wave", OTT services have become the main medium that supports the spread of Korean content in Indonesia, allowing content producers to distribute Korean dramas to Indonesian audiences more effectively and sustainably[35]. Thus, OTT services provide great convenience for creators in terms of distribution and monetization of their works[36]. But on the other hand, the emergence of OTT services is often misused to commit copyright infringement. This is due to the characteristics of digital technology that allow copying, manipulation, and re-editing freely and easily. As stated by Lawrence Lessig that the world of technology provides space for everyone to have freedom in the era of cyber law[37].

Copyright infringement that is rampant occurs on OTT services in the form of copying, distributing, or using copyrighted works without permission, including piracy of works, dissemination of pirated works, plagiarism, or adapting other people's works for

[31] Hutapea, A. E. M., Damayanti, S. R., & Salsabilla, Z. Layanan Over-The-Top (OTT) Dalam Perspektif Social Construction of Technology (SCOT). Ganaya : Jurnal Ilmu Sosial Dan Humaniora, 8(3). (2025). Hlm 440.

[32] Valentine, L. Z. "Regulatory Perspective Analysis of Over-The-Top Services in Indonesia Using Regulatory Impact Analysis." IncomTech: Jurnal Telekomunikasi dan Komputer 8, no. 3 (2018). Hlm 225.

[33] Diza, N. "Legal Protection of Copyrighted Works on Over-The-Top (OTT) Services." Technology and Economic Law Journal 1, no. 1 (2022). Hlm 54.

[34] Shin You, C., et al. "Recent Developments of OTT Platforms in Taiwan." In 2021 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW), 2021. Hlm 3.

[35] Eun Park, Y. "Utilization of OTT Platforms for a Sustainable Korean Wave: Focusing on the Indonesian Market." Korea Association of Cultural Economics 26, no. 1 (2023). Hlm 38.

[36] Ramli, T. S. Copyright in Over-The-Top Media. PT Refika Aditama, 2022. Hlm 93.

[37] Lessig, Lawrence. "The Law of the Horse: What Cyberlaw Might Teach." Harvard Law Review 113, no. 2 (1999). Hlm 510.

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commercial gain without permission. For example, on the TikTok application, the copyright infringement that occurred was related to the piracy of the cinema film 'Not Cinderella' which was released on July 28, 2022. The film was recorded secretly in a cinema studio, then the footage was uploaded into several parts on the TikTok application and reached around 45,000 viewers, far exceeding the official audience of only 9,000 people[38]. This violation caused material losses of around IDR 2 billion and immaterial losses of around IDR 10 billion for the producers of Super Media Pictures, because it harmed revenue from ticket sales and damaged the reputation of the film. This act is categorized as piracy of cinematographic works, because it involves reproduction and distribution without permission, which violates the economic rights of copyright owners[39].

Copyright infringement on OTT services occurs due to the ease of access and distribution of content, which has an impact on the violation of the moral rights and economic rights of the Creator as an exclusive right. Without the permission of the copyright owner, other parties are not allowed to use the copyrighted work. The development of OTT services presents serious challenges in the protection of digital copyrights, especially because the characteristics of digital technology make it difficult to distinguish between original and counterfeit works, making it difficult for law enforcement and encouraging the rampant use of illegal works[40].

In Indonesia, the protection of digital copyright on OTT services has not been explicitly regulated in the law. However, based on positive law, digital copyrights are still included in the Intellectual Property that is protected by law. Although it does not explicitly mention the term "digital copyright", a number of provisions have implicitly accommodated the protection of digital copyrights.

Article 1 number 11 of the UUHC states that "Announcement is the reading, broadcasting, exhibition, or creation using any means, whether electronic or non-electronic or doing in any way so that a work can be read, heard, or seen by others." Under these provisions, copyright protection is not limited to works that are in physical form, but also includes works published in digital format. Moral and economic rights to the work remain attached to the Creator or Copyright Holder, just like in the original form of the work[41].

Article 1 number 15 of the UUHC states that broadcasting is the activity of transmitting a copyrighted work without using cables so that it can be received by all people in a place separate from the source of transmission. In this case, copyrighted works uploaded through OTT services can be accessed and enjoyed by users through broadcasting mechanisms by utilizing electronic media (Asrofi, 2024). OTT services do not use cable to serve content to

[38] Diananto, W. "Film 'Bukan Cinderella' Starring Fuji Pirated, Producer Reportedly Suffers IDR 2 Billion Loss." Liputan6, 2022. https://www.liputan6.com/showbiz/read/5035089/film-bukan-cinderellayang-dibintangi-fuji-dibajak pengacara-sebut-produser-tekor-rp-2-miliar. Diakses Pada 25 Desember 2025

[39] Amrullah, M., and R. Wahyuni. "Copyright Protection of Cinematographic Works Due to Piracy of Spoiler Films through the TikTok Application." Law Development Journal 6, no. 4 (2024). Hlm 540.

[40] Lindsey, Tim. Intellectual Property Rights: An Introduction. PT Alumni, 2002. Hlm 165.

[41] Ramli, T. S., Ramli, A. M., Permata, R. R., & Ramadayanti, E. (2021). Copyrighted Content Commercialization on OTT Media in Indonesia. Journal of Intellectual Property Rights, 26 (6).

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users, where the transmission process is done over an internet network that allows the content to be received by users in various locations. Then, Article 40 paragraph (1) letter p emphasizes that the compilation of works or data in a format that can be read with computer programs or other media is an object protected by copyright.

Legal protection of copyrighted works on the internet is also regulated in Article 25 of Law Number 1 of 2024 concerning the Second Amendment to Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE Law), which affirms that electronic information and documents, including intellectual works contained on internet sites, are protected as Intellectual Property Rights. Thus, copyright-containing content spread in internet media or digital copyright on OTT services is protected under laws and regulations.

As a personal right, copyright infringement is a complaint offense as stipulated in Article 120 of the UUHC. Therefore, in the event of copyright infringement through OTT services, the Creator has the right to file a complaint. Countermeasures can be carried out through legal mechanisms as stipulated in Articles 54, 55, and 56 of the UUHC, which give the Government the authority to supervise, receive reports, and follow up on copyright infringement in the digital realm through information and communication technology.

Efforts to close copyright-infringing content can be submitted to the Minister of Law and Human Rights and the Minister of Communication and Informatics in accordance with the provisions of the Joint Regulation of the Minister of Law and Human Rights Number 14 of 2015 and the Minister of Communication and Informatics Number 26 of 2015. Complaints are submitted in writing by the Creator or Copyright Holder through DJKI by filling out an official form, both electronic and non-electronic, accompanied by proof of copyright ownership, a description of the infringement, and the identity of the complainant. Once the report is received, the DJKI will conduct an administrative examination, and if it meets the requirements, the report will be recorded. Furthermore, the report is verified by the DJKI verification team within a maximum of 3 (three) days. If evidence of infringement is found, the verification team will recommend the closure of the content or access rights of the user who infringes copyright, which is then submitted to the Directorate General of Informatics Applications of Kominfo for follow-up. Content closure can be done within 1x24 hours for urgent cases, or 5x24 hours for other cases, and announced on the official website of Kominfo.

For material losses suffered, the Creator or Copyright Holder may file a civil compensation lawsuit to the Commercial Court as stipulated in Article 99 of the UUHC, without eliminating the right to criminal prosecution as affirmed in Article 105. Criminally, perpetrators of violations of the Creator's economic rights can be subject to sanctions based on Article 113 paragraph (3) of the UUHC in the form of imprisonment for a maximum of 4 years and/or a fine of up to IDR 1,000,000,000 (one billion rupiah) for the act of illegal duplication and distribution. For perpetrators of piracy for commercial purposes, based on Article 113 paragraph (4) the penalty is imprisonment for a maximum of 10 years and/or a maximum fine of Rp 4,000,000,000 (four billion rupiah).

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Regarding fair use or fair use of copyrighted works in OTT services, the Law does not refer to the term "fair use" but is regulated as a copyright restriction, especially in Article 43 letter d and Article 44 paragraph (1) letter a. Normatively, the use, taking, duplication, and/or alteration of a copyrighted work substantially is not considered an infringement if (i) it is non-commercial, (ii) the source is fully stated, and (iii) it does not harm the "reasonable interest" of the copyright owner, especially for the purposes of education, criticism or review of an issue, research, and others as formulated in Article 44 paragraph (1) letter a. In OTT services, Article 43 letter d is an important basis that regulates the dissemination of copyrighted content through information and communication technology media, as long as it is carried out for non-commercial purposes and/or provides benefits to the Creator and does not cause objections from the Creator, is not categorized as copyright infringement. Thus, several types of content on OTT services can be said to be fair use if they meet the provisions of the two articles of the UUHC. For example, film review content on the TikTok application that only shows trailer clips or short footage of the film for criticism/review purposes, accompanied by substantive comments from reviewers, film sources are said to be complete, and are non-commercial or have the permission of the copyright owner.

OTT service providers have an obligation to be responsible in providing their services. This is stated in the SE of the Minister of Communication and Information Number 3 of 2016 concerning the Provision of Application and/or Content Services Through the Internet (Over The Top), which emphasizes that OTT service providers must ensure that there is no infringement of intellectual property rights in their services. This obligation is in line with the safe harbor doctrine of the DMCA, which limits the legal liability of electronic system providers as long as they have taken active precautions prior to copyright infringement[42]. In the DMCA, safe harbor is regulated in Section 512, which limits the liability of online service providers (OSPs) in the event of copyright infringement by users, as long as the service provider fulfills a series of procedural obligations through a notice-and-takedown mechanism[43]. This mechanism requires service providers to immediately remove or disable access to material identified as infringing upon receipt of notice from the copyright owner[44]. In this case, the initial responsibility for monitoring and identifying infringement remains with the copyright holder, while the service provider gains immunity if they properly carry out their procedural obligations[45].

In Indonesia, the implementation of safe harbor for service providers is reflected in Article 11 of the Regulation of the Minister of Communication and Information Technology

[42] Yeh, Brian T., and R. Jeweler. "Safe Harbor for Service Providers under the Digital Millennium Copyright Act." The Library of Congress, 2004. Hlm 2.

[43] Urban, Jennifer M., Joe Karaganis, and Brianna Schofield. "Notice and Takedown in Everyday Practice." UC Berkeley Public Law Research Paper, (2017).

[44] Wang, J. "Notice-and-Takedown Procedures in the US, the EU and China." In Regulating Hosting ISPs' Responsibilities for Copyright Infringement. Springer, (2018). Hlm 145

[45] Urban, Jennifer M., Joe Karaganis, and Brianna Schofield. "Notice and Takedown in Everyday Practice." UC Berkeley Public Law Research Paper, (2017)

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Number 5 of 2020 concerning Private Scope Electronic System Operators (PSE). Based on these provisions, OTT platforms based on user-generated content (UGC) that have carried out their legal obligations properly by ensuring that their electronic systems are secure, providing reporting facilities, providing information to users about prohibited uploads, and taking down infringing content, cannot necessarily be held accountable for violations that occur in their electronic systems. However, related to safe harbor in the context of copyright has not been explicitly regulated in the UUHC, so there is still a legal vacuum regarding the limits of the responsibility of OTT service providers for content that infringes copyright.

Although safe harbors provide limited legal protection to OTT service providers, this does not mean that they are completely free from liability. Often this safe harbor collides with the platform's obligation to protect the copyright of the creators of the work. Thus, OTT service providers must also have security technology that can detect violations that occur on their platforms, so that in this case safe harbor is no longer absolute. The use of security technology is one of the important aspects in efforts to protect digital copyright on OTT services. Security technology is a technology that uses a security system to protect and regulate access to copyrighted works in digital format[46]. Technological advances have encouraged the use of security technology in ensuring the protection of the exclusive rights of creators, as well as providing benefits to copyright owners[47].

Regulations regarding security technology have been accommodated in the Copyright Law, including through Article 6 which gives the right to Creators to have management information and electronic information of copyright to protect their moral rights. Article 7 paragraph (3) prohibits the disappearance, alteration, or destruction of such information, while Article 52 prohibits the destruction of technological control means used to protect copyrighted works, except for state interests and other matters regulated by law. Violation of the provisions of Article 7 paragraph (3) and Article 52 for commercial purposes is subject to criminal sanctions based on Article 112 in the form of imprisonment for a maximum of 2 years and/or a maximum fine of IDR 300,000,000 (three hundred million rupiah).

Although the Copyright Law has provided a legal basis regarding security technology, the regulation is still general and has not been formulated in detail to answer the need for the protection of digital copyrights. In addition, the Copyright Law has not regulated the obligation to use safety technology or a comprehensive protection scheme for safety technology. This regulatory vacuum makes digital copyright protection not yet have adequate arrangements to prevent, detect, and take action against infringement more effectively. In terms of supervision carried out by the government, in practice it has not run optimally in overcoming copyright infringement that occurs in the digital space. Although there is a legal basis for the content closure mechanism by Kominfo, its effectiveness is still

[46] Simatupang, K. M. "A Juridical Review of Copyright Protection in the Digital Sphere." Jurnal Ilmiah Kebijakan Hukum 15, no. 1 (2021). Hlm 68.

[47] Irawati. "Digital Rights Management (Security Technology) in Copyright Protection in the Digital Era." Diponegoro Private Law Review 4, no. 1 (2019). Hlm 385

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limited, which is hampered by technical, juridical, social, and cross-border factors[48]. In addition, the complaint mechanism in the Copyright Law can be said to be less responsive to the challenges of copyright infringement in the digital space.

The protection of digital copyright on OTT services is highly dependent on the legal framework applied in each country. Although Indonesia already has regulations that accommodate digital copyright protection, the substance of the regulation still does not explicitly regulate digital copyright protection. As a comparison between Indonesia and other countries such as the United States, there are differences in terms of digital copyright protection in OTT services as follows:

Table 1. Comparison of Digital Copyright Protection in the US and Indonesia

Aspect	United States	Indonesian
Legal Framework	*Digital Millennium Copyright Act* of 1998 (DMCA), which regulates the protection of digital copyrights, including *anti-circumvention*, *safe harbor*, and *notice-and-takedown arrangements*.	Law No. 28 of 2014 concerning Copyright, which is still limited to conventional works and does not fully regulate the protection of digital copyright.
Anti-Circumvention	The DMCA regulates the prohibition of circumvention of copyright protection technologies through the use of *Technological Protection Measures* (TPMs), as well as rules related to the prohibition of the procurement or marketing of systems designed to circumvent security technologies.	The Copyright Act prohibits the destruction, removal, or malfunction of technological control tools used as a protection for creations, but does not regulate the procurement or marketing of tools to damage technology as in the DMCA.
Safe Harbor	The DMCA provides a *safe harbor* provision that protects service providers from liability for copyright infringement by users, provided they comply with proper takedown procedures.	The provisions *of safe harbor* are regulated in the Permenkominfo and there are no special regulations related to copyright in the UUHC.

[48] Doyoharjo, A., and H. B. Laksito. "Illegal Streaming Sites: Legal Analysis and Challenges in the Digital Era." Indonesian Journal of Law and Justice 3, no. 1 (2025): Hlm 3.

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Content Closure Procedure	The DMCA provides a quick and efficient *notice-and-takedown* procedure following notice from the copyright owner.	The procedure for closing content is more bureaucratic which requires government intervention and involves a verification process by the relevant agencies.
Protection Protective Technologies	The DMCA regulates the obligation to provide adequate protection for the security technologies used in protecting copyrights.	The UUHC recognizes the importance of technology protection, but there is no provision that requires the use of technology protection measures.

2. Application of Electronic Copyright Management System (ECMS) in Optimizing Digital Copyright Protection in Over-The-Top Services

In terms of digital copyright protection on OTT services in Indonesia, the implementation of the Electronic Copyright Management System (ECMS) can be an effective solution in optimizing digital copyright protection. ECMS is one of the safety technology models adopted by the United States. ECMS is a technology-based system that functions to manage, monitor, and protect copyrights for digitally distributed works[49]. This system is able to identify copyrighted content, supervise its use in the digital space, and ensure fair remuneration to Creators and/or Copyright Holders through an electronic system-based automatic licensing mechanism[50]. The technology in ECMS includes Intellectual Property Management software that functions to protect digital works from unauthorized copying and distribution[51].

WIPO through the Advisory Committee on Management of Copyright and Related Rights in Global Information Networks explained that ECMS is a development of the traditional copyright management system (Copyright Management System). In general, CMS is designed to detect copyrighted content, as well as regulate the granting of permission to users to perform certain actions that are restricted to the creation[52]. A traditional CMS consists of two main modules, namely a content identification module and

[49] Ahmad, N. "Copyright Protection in Cyberspace: A Critical Study with Reference to Electronic Copyright Management Systems (ECMS)." Communications of the IBIMA 7, no. 3 (2009). Hlm 85.

[50] Mayana, R. F., et al. "Intellectual Property Development and Commercialization of Non-Fungible Tokens (NFTs): Opportunities, Challenges, and Legal Issues in Practice." Acta Diurnal Jurnal Ilmu Hukum Kenotariatan 5, no. 2 (2022)

[51] Hatti, S. "E-Copyright Management System (ECMS) in Library Environment." Journal of Emerging Technologies and Innovative Research (JETIR) 8, no. 8 (2021). Hlm 469.

[52] Gervais, Daniel J. "Electronic Rights Management and Digital Identifier Systems." World Intellectual Property Organization Journal 3, no. 1 (1998).

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a licensing module. With the addition of an electronic component in the CMS, ECMS leverages computer and network assistance to manage copyright data at scale. The systematic information component in the CMS is transformed into an electronic database that contains content and data rights within the scope of the ECMS. In addition, ECMS allows the process of individual license transactions from users, such as licenses to use a work that is done automatically[53].

ECMS aims to give copyright owners greater control over the access, use, and distribution of their works in the digital space. This system is used to protect digital works by actively monitoring their use, and in a more sophisticated form is able to limit the time and parties who have the right to access the work[54]. On OTT services, ECMS can serve to ensure that copyrighted works, such as movies, music, or other digital works, are not distributed without permission and remain under the control of the copyright owner. ECMS works by combining various technical features with an electronic-based automatic licensing mechanism to support copyright protection[55].

One form of technology in ECMS that can be applied is digital watermarking, which is a technique in which encrypted information is hidden embedded into digital works[56], such as movies or music. This digital watermark allows copyright owners to track and identify illegal copies of copyrighted works spread on digital platforms, as each pirated copy will store a digital mark that can be traced back to its original source[57]. The embedded information is not directly visible, but can be detected using software that is able to track the existence of the work on the internet. If an illegal copy is found, the copyright owner has the right to request the removal of the copy from the server that stored it. Copies of works that have been downloaded and distributed between users will still be detected, because the copyright owner has the ability to find the digital changes that occur in the work[58].

In Indonesia, many OTT service providers offer streaming of licensed cinematography works on a subscription or pay-per-view model. These cinematographic works are often hijacked and illegally distributed on the Telegram application. Telegram is a cloud-based messaging application that allows users to exchange messages, make voice or video calls, share media and files in any format (doc, zip, mp3, and so on), as well as create groups with up to 200,000 members or channels for broadcasting to unlimited subscribers[59]. In the Telegram application, there is a Channel feature which is divided into two categories, namely Private Channel and Public Channel. The Public Channel feature on Telegram is used as a means of sharing any kind, such as movies and drama series, that can be followed by all users. This Public Channel feature has been used by irresponsible parties to illegally

[53] Ibid
[54] Ahmad, N. "Copyright Protection in Cyberspace: A Critical Study with Reference to Electronic Copyright Management Systems (ECMS)." Communications of the IBIMA 7, no. 3 (2009). Hlm 87
[55] Dusollier, S. "Electrifying the Fence: The Legal Protection of Technological Measures for Protecting Copyright." European Intellectual Property Review 21 (1999).
[56] Ahmad, op. cit., hlm. 88.
[57] Ibid
[58] Ibid
[59] Telegram.org. Channels FAQ. 2021.

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disseminate films without permission from the copyright owner[60]. This violation is carried out by downloading movies without permission from official platforms, such as Netflix, Vidio and WeTV, then sharing them on the Telegram application for personal gain or just sharing. To make a profit, channel owners attract a lot of users and redirect them to other platforms such as Snack Video using referral codes, which through these codes will generate coins that channel owners can exchange for cash once collected[61].

One of the real cases of copyright infringement through Telegram occurred in the series 'Layangan Putus'. The series, which aired on WeTV, was reportedly hijacked and illegally distributed through the Public Channel Telegram without permission from the copyright owner. The producer, Manoj Punjabi, revealed that exact data regarding the number and scale of piracy could not be ascertained due to the difficulty of tracking the illegal spread[62]. This piracy resulted in huge losses for the production party, which was supposed to benefit from official airing through licensed OTT streaming services. In practice, the series is shared on Telegram so that it can be accessed by the public for free.

Based on these cases, the use of digital watermarking technology can be carried out, both by OTT service providers and by copyright owners to protect their creations spread on OTT services more effectively. A digital watermark embedded on a cinematographic work will allow the copyright owner to track and identify illegal copies of his work. Any copy of a movie or series uploaded without permission will retain a tag that can trace its origin, allowing the copyright owner to identify the source of the distribution. Even if the copy has been widely distributed between users, this digital mark can still be detected using special software, which allows the copyright owner to request the removal of the illegal copy from the server that stored it and take the necessary legal measures.

The implementation of digital watermarking not only provides advantages in terms of tracking and enforcing copyright, but also serves as a preventive measure. Knowing that every copy of a work can be tracked, pirates will be more cautious in distributing their illegal content, given the high risks associated with copyright infringement. Although the use of digital watermarking does not completely eliminate piracy, this technology provides copyright owners with a more powerful tool to combat violations that occur on platforms such as Telegram, where piracy often occurs without strict supervision. This is important in OTT services, where content can be easily downloaded, copied, and distributed without adequate control. Thus, with digital watermarking technology on ECMS, copyright owners can maintain control over their work and enable faster and more effective legal action.

In the use of digital watermarking technology, there are several important criteria that need to be met in order for the system to work effectively. These criteria include robustness,

[60] Rini, W. O., T. D. Hariyana, and I. Makhali. "Illegal Re-Uploading of Indonesian Films through Public Telegram Channels." Yustitiabelen 8, no. 2 (2022). Hlm 121.

[61] Ibid

[62] Al-Farisi, B., and A. M. K. Pangerang. "Producer States 'Layangan Putus' Was Most Pirated on TikTok and Telegram." Kompas.id, 2022. https://www.kompas.com/hype/read/2022/02/25/134520566/produser-sebut-layangan-putus-paling-banyak-dibajak-di-tiktok-dan-telegram. Diakses Pada 25 Desember 2025

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imperceptibility, and security[63]. Robustness refers to the ability of a watermark to survive various attacks aimed at eliminating it, such as cropping, scaling, filtering, and compression[64]. Imperceptibility means that the watermark inserted should not be visible to the human eye and does not cause degradation or degradation of quality in the original image[65]. Security in digital watermarking means that the watermark inserted cannot be detected or eliminated through general statistical analysis or other methods[66]. This is important to ensure that the watermark is not easily forged or removed by irresponsible parties, so that the integrity of copyright ownership can be maintained.

Previous research conducted by Meng, Z., Morizumi, T., Miyata, S., & Kinoshita, H., (2018), proposed the integration of digital watermarking with blockchain technology, which is one of the technologies in ECMS [67]. Blockchain technology is basically a form of decentralized digital ledger that allows data to be recorded permanently, transparently, and difficult to manipulate, so it is very relevant to answer the challenge of copyright protection in the era of massive digital content distribution in Indonesia[68]. The data is stored in interconnected blocks through data encryption mechanisms and consensus algorithms[69]. Through the consensus mechanism and data encryption used, blockchain provides authentic records of the creator, time of creation, and changes to the work, thus reducing the space for forgery, plagiarism, and unauthorized ownership claims[70]. The use of blockchain technology in the protection of digital works can play an important role in preventing piracy and plagiarism practices, as it allows for the storage of detailed information on copyrighted works that include the identity of the creator, the time of publication, and the time of first publication[71].

The integration of digital watermarking with blockchain technology offers a more comprehensive approach to digital copyright protection. Blockchain in this case functions as a distributed ledger that stores watermark information and copyright metadata securely, immutable, and equipped with a timestamp to prove the order in which the work was

[63] Zhi-Ming, Z., R.-Y. L., and L. W. "Adaptive Watermark Scheme with RBF Neural Networks." In International Conference on Neural Networks and Signal Processing, (2003).

[64] Asroni, O., and D. R. Serumena. "Digital Image Copyright Protection Using Hybrid SVD-DWT Watermarking Techniques." Jurnal Syntax Admiration 2, no. 11 (2021). Hlm 2148

[65] Ibid

[66] Ibid

[67] Meng, Z., et al. "Design Scheme of Copyright Management System Based on Digital Watermarking and Blockchain." In 2018 IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC), (2018). Hlm 3.

[68] Sutrisno, G. A. H., and M. A. P. Putra. "The Role of Blockchain Technology in Copyright Protection: Opportunities and Challenges in Indonesia." Jurnal Media Akademik 3, no. 3 (2025): 1-15. Hlm 7.

[69] Ibid

[70] Sutrisno, G. A. H., and M. A. P. Putra. "The Role of Blockchain Technology in Copyright Protection: Opportunities and Challenges in Indonesia." Jurnal Media Akademik 3, no. 3 (2025). Hlm 10.

[71] Ruhtiani, M., and Y. T. Naili. "Legal Protection of Copyrighted Works through Blockchain Technology from an Intellectual Property Perspective in Indonesia." Jurnal Ilmiah Galuh 11, no. 2 (2023). Hlm 205.

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created and owned[72]. By placing hash watermarks, creator information, and copyright data into blockchain blocks, any transactions or changes in copyright status are recorded transparently and can be verified without relying on a single central authority.

If contextualized in OTT services in Indonesia, the integration of digital watermarking and blockchain can be a technology for optimizing the protection of digital copyrights, such as films, series, music, and other digital works distributed through OTT services. Each digital work uploaded to the OTT platform can first be inserted with a digital watermark containing the hash of the content and the identity of the copyright owner, then the information is recorded in the blockchain as authentic proof and the time of publication of the work. That way, when OTT content is illegally disseminated, the embedded watermark can be extracted to trace the official source and copyright owner, while the records on the blockchain provide strong evidence in law enforcement. This can increase the trust of copyright owners in distributing their works through OTT services because of the security guarantee, transparency, ease of tracking and ease of proving copyright infringement.

Furthermore, there is also a more advanced ECMS technology that can be applied to OTT services, namely ECMS which is designed not only to manage copyright after a copyrighted work is distributed, but also to prevent access to the work in the first place without permission from the copyright owner. This ECMS works by involving the use of databases and licensing combined with hardware that has special semiconductor chips[73]. This system also regulates the granting of use licenses by setting certain terms and conditions, so that only those who have a permit can access and utilize the work according to the predetermined limits[74].

An advanced ECMS system that combines a database of licensing licenses, license management, and device-specific semiconductor chips, offers a new approach that is more preventative than the DRM that OTT is prevalent today. On OTT such as Netflix, WeTV, and similar platforms, DRM generally focuses on content encryption and key management with algorithms such as AES for encryption and ECC for license keys, but still leaves loopholes in the form of screen recording, illegal downloading, and redistribution through third-party channels[75]. The case of the 'Layangan Putus' serial piracy that was redistributed through the Public Channel Telegram illustrates the limitations of a protection model that only emphasizes security when streaming, without layered controls at the device level and without a strong track record (trace of leak sources).

In this type of ECMS, the granting of licenses is carried out according to terms and conditions, for example, licenses are granted only for personal access, non-commercial, and

[72] Meng, Z., et al. "Design Scheme of Copyright Management System Based on Digital Watermarking and Blockchain." In 2018 IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC), (2018). Hlm 3.

[73] Ahmad, N. "Copyright Protection in Cyberspace: A Critical Study with Reference to Electronic Copyright Management Systems (ECMS)." Communications of the IBIMA 7, no. 3 (2009). Hlm 83.

[74] Ibid

[75] Tiwari, A., et al. "Algorithms for DRM (Digital Rights Management) of OTT Platforms: A Survey." In 2025 World Skills Conference on Universal Data Analytics and Sciences (WorldSUAS), (2025).

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prohibition of duplication. So that access requests that do not meet the requirements will be automatically rejected before the decryption key is provided. The system combines device authentication and automated licensing policies, plus a hardware security layer that has not been widely implemented in Indonesia. Linked to piracy cases on Telegram, this ECMS can significantly reduce the chances of obtaining high-quality copies from the official platform. Technically, ECMS integration with multi-algorithm DRM (e.g. AES for encryption and ECC for license keys) can provide layered protection to reduce the risk of piracy and illegal redistribution.

The automated licensing system on ECMS allows for individual transaction processes from users, such as granting licenses to access certain works which can then be automatically assigned to users[76]. As Professor I. Trotter Hardy said, the ECMS scheme is designed to make it harder to copy digital works and make the licensing process easier for them[77]. This not only protects copyright, but also helps OTT services to maximize revenue from digital content distribution. Similarly, copyright owners can earn appropriate income and can strengthen the protection of their economic rights.

The digitization of copyrighted works requires security technologies such as ECMS to make it easier to track and identify illegal use of content. The implementation of ECMS is expected to create effective and adaptive digital copyright protection against technological developments in Indonesia, especially in protecting digital copyright in OTT services.

In implementing ECMS, Indonesia can reflect on the United States which already has a digital copyright protection regulation, namely the Digital Millennium Copyright Act 1998 (DMCA). The DMCA provides legal protection for the technology used in ECMS, as well as establishes an obligation to protect digital copyright protection technologies. In the United States, the proposal to protect ECMS was first proposed in the Report of the Working Group on Intellectual Property Rights which is part of the National Information Infrastructure Task Force (NII Report)[78]. The United States government adopted the strict approach recommended by the NII Committee, whose provisions were enacted in Chapter 12 of the DMCA.

Section 1201 of the DMCA expressly governs the obligation to provide adequate and effective protection against the safeguards used by copyright owners[79]. This provision stipulates that copyright owners can apply Technological Protection Measures (TPM) to protect works from unauthorized access and reproduction[80]. TPM is classified into two

[76] Gervais, Daniel J. "Electronic Rights Management and Digital Identifier Systems." World Intellectual Property Organization Journal 3, no. 1 (1998).

[77] Hardy, I. T. Project Looking Forward: Sketching the Future of Copyright in a Networked World. U.S. Copyright Office, 1998

[78] Ahmad, N. "Copyright Protection in Cyberspace: A Critical Study with Reference to Electronic Copyright Management Systems (ECMS)." Communications of the IBIMA 7, no. 3 (2009). Hlm 85.

[79] Copyright Office Summary, The Digital Millennium Copyright Act of 1998 (1998)

[80] Sihombing, A. K., R. R. Permata, and T. S. Ramli. "Comparison of Digital Copyright Protection on Over-the-Top (OTT) Streaming Content Media in Indonesia and the United States." Padjadjaran Journal of Law 8, no. 2 (2021).

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categories, namely technology to prevent unauthorized access and technology to prevent unauthorized copying of copyrighted works[81].

Section 1201(a)(1) of the DMCA prohibits any party from circumventing protective technologies that effectively control access to copyrighted works. Further, Section 1201(b)(1) prohibits the production, importation, public offering, supply, or trade of systems intended to circumvent safeguarding technologies, thereby suppressing potential evasion of digital copyright protection and ensuring that ECMS can function effectively in protecting copyrighted works. The rule is strengthened in Section 1204 which provides sanctions for violations of Section 1201. A party that intentionally destroys security technology, which is done for commercial purposes or personal financial gain is considered a criminal offense. Based on Section 1204, the penalty imposed is a fine of USD 500,000 or imprisonment of up to 5 (five) years for the first offense, and a fine of USD 1,000,000 or imprisonment of up to 10 years for the next offense.

As such, the implementation of ECMS in the United States is closely related to the provisions in the DMCA. The DMCA expressly regulates the use of the use obligation and prohibits the destruction of security technology. ECMS as a digital copyright safeguarding technology is recognized and protected by the DMCA through the provisions of Section 1201. This article provides adequate legal protection regarding safety technology from possible abuse or copyright infringement.

Although the Copyright Law has accommodated the regulation regarding technological control facilities in Article 52, this has not been comprehensively regulated and the effectiveness of its implementation is still not optimal. When compared to the DMCA, there is a difference in settings between the two as shown in the table below:

Table 2. Comparison of Section 1201 DMCA and Article 52 UUHC

Section 1201 DMCA	Pasal 52 UUHC
1201(a)(1) No person shall **circumvent a technological measure that effectively controls access to a work protected under this title**. The prohibition contained in the preceding sentence shall take effect at the end of the 2-year period beginning on the date of the enactment of this chapter. **1201(b)(1)** **(1)** No person shall **manufacture, import, offer to the public, provide, or otherwise traffic in any technology,**	Every person is prohibited from damaging, destroying, removing, or rendering inoperative technological control measures used to protect a Work or Related Rights products, as well as safeguards for Copyright or Related Rights, except for purposes of national defense and security, or for other reasons in accordance with the provisions of laws and regulations, or as otherwise agreed. **Elucidation of Article 52** What is meant by "technological control measures" refers to any technology,

[81] Copyright Office Summary, The Digital Millennium Copyright Act of 1998 (1998)

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product, service, device, component, or part thereof, that— "**(A) is primarily designed or produced for the purpose of circumventing protection** afforded by a technological measure that effectively protects a right of a copyright owner under this title in a work or a portion thereof; "**(B)** has **only limited commercially significant purpose or use other than to circumvent protection** afforded by a technological measure that effectively protects a right of a copyright owner under this title in a work or a portion thereof; or "**(C)** is **marketed** by that person or another acting in concert **with that person with that person's knowledge for use in circumventing protection** afforded by a technological measure that effectively protects a right of a copyright owner under this title in a work or a portion thereof. **1201(b)(2)** **(2)** As used in this subsection— "**(A)** to 'circumvent protection afforded by a technological measure' means **avoiding, bypassing, removing, deactivating, or otherwise impairing a technological measure**; and "**(B)** a technological measure 'effectively protects a right of a copyright owner under this title' if the measure, in the ordinary course of its operation, **prevents, restricts, or otherwise limits the exercise of a right of a copyright owner** under this title.	device, or component designed to prevent or restrict actions that are not authorized by the Author, the Copyright Holder, the owner of Related Rights, and/or that are prohibited by laws and regulations.

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From table 2, it can be seen that Section 1201 of the DMCA specifically prohibits the circumvention of technologies used to control access to copyrighted works (anti-circumvention provisions), accompanied by a definition of circumvent action. This provision not only prohibits circumvent measures, but also regulates the prohibition of devices or systems designed to evade the protection provided by safety technology. As such, the DMCA provides more adequate legal protection for safeguarding technologies by regulating and ensuring that the technology used to protect copyrighted works cannot be infringed, either by users or other parties who wish to misuse copyrighted works. Meanwhile, Article 52 of the Copyright Law is only limited to prohibiting the destruction of technological control facilities, without regulating the prohibition on the procurement, import, and marketing of devices or systems designed to damage technological control facilities. In addition, the Copyright Law does not regulate in detail the exceptions from Article 52, but only mentions "other causes in accordance with the provisions of laws and regulations", which can be interpreted broadly in its application.

D. Conclusions and Recommendations

The protection of digital copyright on OTT services in Indonesia still faces serious challenges due to the increasing consumption of digital content and the rampant piracy and illegal redistribution of copyrighted works through various OTT platforms. Positive legal frameworks, particularly the UUHC and the ITE Law, have essentially recognized digital works as objects of protection, but have not explicitly formulated a regime for the protection of digital copyrights, including detailed arrangements related to security technologies. The use of existing security technologies has not been effective enough in preventing and overcoming piracy, duplication, and illegal redistribution, especially when the content is already on the user's side.

Instead, the United States through the DMCA has established a more comprehensive digital copyright protection regime, including through anti-circumvention arrangements, safe harbor and notice-and-takedown mechanisms, as well as strict recognition and protection of the application of security technologies. ECMS as a safety technology is adopted to identify copyrighted works, monitor their use, automatically manage electronic licenses, and distribute appropriate compensation to copyright owners, thus functioning as a preventive and repressive function against infringement in the digital space.

The implementation of ECMS can be a technological solution in optimizing digital copyright protection on OTT services in Indonesia. ECMS offers a protection technology model that is more aligned with the characteristics of digital content distribution and the intensity of infringement on OTT platforms, by giving copyright owners greater control over the more efficient access, use, and monitoring of the distribution of their works. Therefore, the implementation of ECMS supported by regulatory updates is an important prerequisite for realizing a safe, fair, and sustainable OTT ecosystem for creative industry players in Indonesia.

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This research is expected to make a real contribution to the development of digital copyright law in Indonesia by offering a more adaptive protection model for the characteristics of digital spaces and OTT services, and can be a normative-technological reference for policymakers in the process of updating regulations in the field of digital copyright.

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