How can emerging technology remedy the deficiency in robust enforcement mechanisms for digital copyright infringement within the South African music industry?

Name: Julita Mushati

Student Number: MSHJUL002

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Supervisor: Prof Caroline Ncube

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CHAPTER 1

INTRODUCTION

1.1. BACKGROUND

The South African music industry is characterised by diverse music genres and styles which depict their culture, emotions, and historical accounts.[1] Within this dynamic industry the notion of intellectual property in particular copyright, surfaces as a foundational matter for artistic expression, legal protection, and economic development.[2] Portraying a complex history of endurance and controversy, the music industry has undergone significant changes due to technological advancements that have challenged the traditional functions of the music industry.[3] The music industry landscape has evolved over the years with the digital era revolutionising the production, distribution, and consumption of music.[4] This transformation democratised the distribution and accessibility of music, affording artists alternatives to distribute their music without the use of traditional channels by introducing online streaming services.[5] The establishment of online streaming services or platforms, such as Spotify, and social media platforms has revealed the impact of technology advancements by enabling artists to independently promote, distribute, and produce their music.[6] While the digital era has facilitated exposure for artists, it has brought about major challenges such as the shift in revenue models, digital copyright infringement, and the dire need for the current copyright regime to mirror the digital era.[7] Artists have struggled to monetise their works due to inadequate pay-outs and the rise of digital copyright infringement through file-sharing networks,

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[1] WM De Villiers 'Aspects of the South African Music Industry: An analytical perspective' Master of Music (Music Technology) mini-dissertation, University of Pretoria, 2006 available at *https://repository.up.ac.za/bitstream/handle/2263/27324/dissertation.pdf?sequence=1&isAllowed=y*, accessed on 25 January 2024.

[2] Simon Frith 'Copyright and the Music Business' (1988) 7 *Popular Music* 57.

[3] Ibid.

[4] Kgasago Tshepho Justice 'Download Culture and the Dilemma of Postmodern Technologies: Legal Digital Music Sharing and its Effects on South African Artistes' available at *https://ulspace.ul.ac.za/handle/10386/4236*, accessed on 24 January 2024.

[5] Ibid.

[6] Tausif Mulla 'Assessing the factors influencing the adoption of the over-the-top streaming platforms: A literature review from 2007 to 2021' (2022) 69 *Telematics and Informatics* 1 at 2.

[7] Christiaan De Beaukelaer 'Mobislising African Music: how mobile telecommunications and technology firms are transforming African music sectors' (2018) 32 *Journal of African Cultural Studies* 1 at 10.

which have stripped the music industry of their rights to control the use and dissemination of their works.[8] Simultaneously, digital copyright infringement challenges the current copyright regime and enforcement measures, consequently, prompting the need for legislative reform that is adequate in addressing the major challenges brought about by technological advancements.

From a historical perspective, music was distributed, consumed and produced through physical formats such as vinyl records, cassette tapes and compact discs.[9] With one of the primary forms of music consumption being vinyl records, which offered a unique form of artistry experience to its listeners. Artists and record labels placed a significant amount of work, effort and art onto the vinyl records and its peculiar sound made them unique and sought after especially by music fanatics.[10] Secondly, cassette tapes were another form of distributing and producing music, and desired because of the mobility and ease of reproducing them. Cassettes enabled consumers to personalise their music consumption choices, giving them the ability to create a collection of desired music genres and artists.[11] On the other hand, compact discs hallmarked the technological era with its introduction in the 1980s offering original digital sound quality and a more durable physical form in comparison to cassettes and vinyl records.[12] These physical formats of music consumption and distribution played a crucial role in the music industry, offering a tangible experience, where consumers could test the music product before making a final purchase. However, these formats also posed several challenges such as storage space especially for avid collectors, as these forms required a considerable storage space for collections.[13] Additionally, these physical forms were prone to wear and tear and scratches or other defects could significantly affect playback quality.

The emergence of the digital era revolutionised the music industry through the introduction of compressed digital formats like MP3's, which allowed audio data to be efficiently stored and distributed without compromising the sound quality, rendering them suitable for electronic storage and distribution.[14] MP3 audios made it possible to store numerous audios due to the reduction in size of audio files. This made it easy to reproduce and share audio files with ease on a global scale.[15] Due

[8] Ibid.
[9] Xiaorui Guo 'The Evolution of the Music Industry in the Digital Age: From Records to Streaming' (2023) 5 *Journal of Sociology and Ethnology* 7-12.
[10] Ibid.
[11] Ibid.
[12] Ibid.
[13] Ibid.
[14] Ibid.
[15] Ibid.

to the ease of reproduction of MP3s, the illegal duplication of music audios became popular following the emergence of a file sharing computer service commonly known as Napster.[16] Napster emerged in the late 90s as an audio file sharing technology, which enabled efficient file sharing and facilitated access to a large database of free music. Despite its popularity Napster brought about legal and ethical concerns, while it did not host copyrighted content itself, it enabled direct user-to-user file sharing which allowed consumers to have access to copyrighted music without the necessary permission from the right holders, thereby facilitating widespread copyright infringement.[17] Consequently, different record companies, which were members of the Recording Industry Association of America, filed a lawsuit against Napster claiming that it facilitated copyright infringement on a large scale and was therefore threatening the rights of copyright holders.[18]

Shaun Fanning established Napster in 1999, in collaboration with Sean Parker and it presented a platform that enabled users to download compressed digital music files.[19] A user would download files onto their computer and connecting to the Napster server allowed other users to access and download those files instantly from any location.[20] The record labels claimed that 'while Napster is a powerful information-sharing tool, it facilitated access to copyrighted material that the right holders would have not granted permission to use, thereby engaging in digital copyright infringement on a global scale.'[21] This case established that Napster's designs and operations amounted to both contributory and vicarious infringement leading to its shut down in 2001.[22] The Napster case highlighted the legal complexity of digital copyright infringement and the court's approach to determining responsibility. In South Africa, courts have been cautious in determining copyright infringement, focusing more on the qualitative significance of the reproduced work rather than the quantitative aspect.[23] This approach was reinforced in *Haupt t/a Softcopy v Brewers Marketing Intelligence*,[24] where the court ruled that copyright infringement arises when a significant or key component of a work is copied or used.

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[16] Peter J Alexander 'Peer-to-Peer File Sharing: The case of the Music Recording Industry' (2022) 20 *Review of Industrial Organisation* 154.
[17] Ibid.
[18] *A&M Records Inc. v Napster Inc* 239 F.3d 1004 (9th Cir. 2001).
[19] Ibid.
[20] Ibid.
[21] Ibid.
[22] Ibid.
[23] *Moneyweb v Fin24* (4) SA 591 (GJ) (5 May 2016).
[24] *Haupt t/a Softcopy v Brewers Marketing Intelligence* (4) SA 458 (SCA) (29 March 2006).

The rise of Napster also marked the growing popularity of file sharing and highlighted the need for legal music channels. In due course, legal streaming platforms and services such as Spotify, iTunes, and Apple Music emerged offering a subscription-based method of legal music consumption and distribution.[25] Streaming platforms function on a subscription fee basis, meaning a consumer pays a particular fee every month and in turn gains access to an unlimited database of music, an array of genres and personalised playlists, and an opportunity to discover new artists.[26] This streaming era moved the music industry from ownership to access and shifted the traditional revenue models from album sales to incentives based on a number of streams. This has become the dominant form of music consumption in the digital era and offers independent artists and upcoming artists an opportunity to be discovered across the globe.[27] While this model offers a variety of benefits, the revenue models are complex and often lead to unfair compensation for artists.[28] Artists are remunerated a fraction based on the number of streams received on each song. In comparison to the traditional methods that brought about income through physical and album sales, this can often lead to under compensation especially for upcoming artists who have not gained much popularity,.[29] Although the streaming platforms offer legal access to music, many challenges arise as Africa is the characterised by low-income countries which have expensive data charges and connections only a few can afford, consequently, leaving some to resort to acquiring illegal copies of music.[30] Digital copyright infringement persists with other individuals utilising circumvention technologies to bypass digital rights management to access the music without the required permission or payment.

Despite the shutting down of Napster, file sharing persisted as more Peer-to-Peer (P2P) platforms emerged and became an ongoing challenge for the music industry. Due to the ease in copying of significant amounts of audios in seconds, it makes it challenging to monitor and control the use and distribution of content thereby making it difficult to mitigate digital copyright infringement.[31] The decentralised nature of file sharing networks complicates enforcement because infringement occurs across on a global scale making it difficult to hold individual infringers accountable.[32] This leaves copyright holders deprived of their rights and the average consumer escapes liability of exploiting

[25] Guo op cit note 9 at 7-12.
[26] Ibid.
[27] Ibid.
[28] Ibid.
[29] Ibid.
[30] Ibid.
[31] Brett Danaher, Michael D. Smith, and Rahul Telang 'Piracy and Copyright Enforcement Mechanisms' (2014) 14 *Innovation Policy and the Economy* 44 at 45.
[32] Ibid.

works without the consent of the owner, despite the absence of guilty knowledge.[33] Additionally, Jurisdiction complexities further impeding the smooth regulation of copyright because some works may be created in one country and infringed in another, given the easy access the internet affords. Therefore, it then becomes nearly impossible to locate a single infringer, especially from other jurisdictions. As a result, in some jurisdictions, Internet Service Providers (ISPs) have been increasingly targeted, as they are seen as intermediaries with greater control over network access.[34]

The South African music industry has taken steps in response to digital copyright infringement through, digital rights management, takedown notices, and streaming services to encourage the legal consumption of music and to enforce copyright law.[35] However, as technology evolves rapidly, new forms of circumvention emerge just as quickly, often outpacing the legislative responses to review, update the law and adjust certain provisions to match the digital era.[36] While South Africa has made efforts through the drafting of the Copyright Amendment Bill (B13B-2017 and the most recent amendment, 13F-2017), the legislative process remains slow and is a process that involves extensive review.

The internet has become a contested space between right holders, consumers, and the public, each with competing interests and priorities. Copyright law aims to strike a balance between the interest of the public in receiving reasonable access to the copyrighted work and the need to protect creators' rights from unauthorised exploitation.[37] Technological advancements have, on one hand, aided the aim of copyright by allowing broader access to creative works; on the other hand, it has become progressively challenging to effectively enforce copyright laws and adapt the law to the constantly evolving digital landscape.[38] Digital copyright infringement is still popular, however, emerging technologies have the potential to revolutionise the music industry and provide modern robust enforcement mechanisms simultaneously grappling with digital copyright infringement in the music industry.[39] Technologies such as blockchain technology, artificial intelligence, quantum computing, machine learning, digital audio watermarking and fingerprinting present opportunities to enhance

[33] Copyright Act 98 of 1978.
[34] Nnnenna Ifeanyi-Ajufo 'Challenges of Digital Music Copyright and the Liability of Internet Service Provider' (2013) 4 *International Journal of Advanced Legal Studies and Governance* 18.
[35] Ibid.
[36] Ibid
[37] Irina Atanasova 'Copyright Infringement in Digital Environment' (2019) 1 *The Journal of Law and economics* 13 at 16.
[38] Ibid.
[39] Ibid.

copyright protection in the music industry in the internet era.[40] While quantum computing is still in its early development stages, it is anticipated to play a future role in data processing and music generation. Together these technologies can be utilised collectively to create robust enforcement mechanisms and mitigate digital copyright infringement in the music industry. This research will examine in detail the emerging technologies that can help to create robust enforcement mechanisms and discourage or reduce digital copyright infringement. It will also discuss the shortfalls of the current legislative framework of South Africa and the impact of digital copyright infringement in the music industry.

1.2 JUSTIFICATION AND IMPACT

The significance of this research is prompted by the rising levels of digital copyright infringement in the South African music industry.[41] South Africa contends with a crucial matter of digital copyright infringement, which therefore prompts a need for robust enforcement mechanisms. Music is an essential way for individuals to express their intellect in return for some recognition and financial gain. The expression itself is then protected by copyright and grants owners exclusive rights to their works.[42] However, copyright permits the exploitation of these works based on licenses, exceptions and limitations like fair dealing.[43] Similarly, this applies to the internet space. Although technology has benefited musicians by enabling them to produce and make their music independently; it has also made these works easily accessible to anyone on the internet.[44] In turn, copyright owners in the music industry fail to maximise the full profits of their works because of the rise in digital copyright infringement.[45] Contemporary technology has the potential to provide effective remedies to address the deficiency in robust enforcement mechanisms. As technology advances, the traditional methods of copyright enforcement in the music industry have become insufficient and inadequate to deal with the major challenges posed.[46] Employing the use of these emerging technologies such as blockchain technology, can strengthen the regulation of copyright enforcement thereby, promoting efficient and

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[40] Ibid.
[41] Caroline Anders 'Online piracy surges as viewers' battle 'subscription fatigue' available at *https://www.semafor.com/article/01/17/2024/online-piracy-surges-as-viewers-battle-subscription-fatigue*, accessed on 3 February 2024.
[42] s1 of the Copyright Act 98 of 1978.
[43] Ibid s12.
[44] Atanasova op cit note 37.
[45] Ibid.
[46] Oscar Rodriguez Espindola et al 'Analysis of the adoption of emergent technologies for risk management in the era of digital manufacturing' (2022) 178 *Technological Forecasting and Social Change*.

adequate remedies to enforce copyright in the South African music industry while protecting the intellectual property of right holders in the music industry.[47] Current technologies such as blockchain, artificial intelligence and recognition algorithms provide a captivating resolution to act as a connection or link to the current gap in the law in the digital era. These technologies provide innovative solutions that present an opportunity to create robust enforcement mechanisms for digital copyright Infringement.[48] Addressing the deficiency in robust enforcement mechanisms by employing innovative technology, the South African music industry can be transformed to grapple with the challenges brought about by the digital era.[49] Consequently, this would help facilitate an equitable and secure atmosphere for artists, musicians and members of the music industry while promoting sustainable growth in the music industry and creative sector.[50]

The implementation of these technologies will have a positive outcome and impact on the South African music industry.[51] To begin with, implementing advanced technology can create a fair environment for artists and safeguard the intellectual property rights of the members in the music industry.[52] Furthermore, the impact of the implementation of advanced technologies can encourage investors to invest into the South Africa music industry. Major record labels normally get discouraged to invest and develop new artists because of the rise in digital copyright infringement of musical works, as there is a high possibility of low album sales and individuals still accessing the music and escaping liability of paying the required fees.[53]

1.2. **RESEARCH QUESTION**

South Africa has encountered significant digital copyright infringement in the music industry. Regardless of the existing legal frameworks such as the Copyright Act and enforcement mechanisms, digital copyright infringement continues to increase rapidly.[54] This highlights the limitations of the current legal framework in addressing the challenges posed by rapid technological advancements. In

[47] Ibid.
[48] Ibid.
[49] Ibid.
[50] Ibid.
[51] Robert P Lambert 'Technology and the Music Industry: Has the recording industry lost sales?' (2005) 28 *JSTOR*.
[52] Pearl Magubane 'Increase in online music piracy since lockdown' available at *https://www.sabcnews.com/sabcnews/increase-in-online-music-piracy-since-lockdown/*, accessed on 28 June 2022.
[53] Kiara Guyton 'How online piracy affects artists' available at *https://howlernews.com/6370/student-life/how-online-piracy-affects-artists/*, accessed 20 June 2022.
[54] Ibid.

this context, emerging technologies present promising alternative avenues for enhancing enforcement mechanisms and reduce digital copyright infringement. However, the extent to which current South African copyright law accommodates the advancing digital era remains uncertain, prompting the need for legal reform to create a more efficient environment for the application of novel technologies.

This dissertation seeks to explore the contemporary copyright laws and their application in the South African music industry. While the music industry tackles the challenges of enforcing copyright law in the digital era, it is crucial to examine and discuss the current copyright regime and its nature within the digital environment. The current copyright laws date back to 1978, and technology has drastically evolved throughout the years, consequently, challenging the existing copyright laws in the digital era. A key issue, therefore, is whether the existing legal regime provides sufficient support for technological enforcement tools such as blockchain, digital audio watermarking, fingerprinting, quantum computing, and artificial intelligence. This dissertation seeks to explore these challenges and assess how South African copyright law may be reformed to accommodate the incorporation and application of emerging technologies, ultimately enhancing copyright enforcement and protection in the digital space.

Expanding on these legal assessments, this dissertation further explores the particular effects of digital copyright infringement on the South African music industry, with a focus on various interested parties such as artists, producers, and distributors, begging the question, what unique challenges do they encounter in the digital environment? The research aims to examine the impact of digital copyright infringement on the South African music industry and the potential role of technology in mitigating these challenges. This study provides an in-depth look at the convergence of law and technology, as well as the specific issues that the South African music industry faces in the digital age.

1.3 METHODOLOGY

This research will take on a desk approach which involves the collection and analysis of data from existing sources such as textbooks, case law, journal articles, published legal internet articles and legislation. The above approach is appropriate for pursuing an in-depth review of current literature and regulatory structures to inform the study's results and recommendations. This research examines how emerging technologies can grapple with the deficiency in robust enforcement mechanisms for digital copyright infringement in the South African music industry. This study commences with a

broad overview focusing on existing legal frameworks and scholarly works to construct a fundamental comprehension of the implications of digital copyright infringement within the music industry. Thereafter, examine and discuss the merging technology that has the potential to transform South Africa's music industry, foster robust enforcement and grapple with digital copyright infringement.

1.3. THESIS STRUCTURE

The structure of the remainder of this thesis is set out as follows:

Chapter 1: Introduction

This chapter outlines a brief historical account of how music was consumed and its transformation from an era of physical copies such as compact discs to digital copies and online streaming as the new mode of music consumption. It has also highlighted the importance of intellectual property in the music industry, the impact of technology, and the deficiency in the traditional copyright regimes in addressing the current challenges brought about by the digital era. Furthermore, this chapter has discussed briefly, the history and background of digital copyright infringement and the impact it has had on the South African music industry. Lastly, this chapter has highlighted the possible emerging technologies that can be employed to remedy the deficiency in robust enforcement mechanisms simultaneously reducing digital copyright infringement in the music industry and fostering a more equitable and secure environment for musicians, artists, and rights holders.

Chapter 2: Copyright Laws and Enforcement Mechanisms in the Context of Digital Copyright Infringement

This chapter aims to examine the current copyright laws that govern the South African music industry in the digital era and the international treaties that give a foundation to the standard in which copyright laws should be established. Through meticulous analysis, the purpose of this chapter is to disclose the complexities connected with enforcing these laws in the protection of music against digital copyright infringement in the digital environment. This will be done by discussing the deficiency in the current South African copyright framework and the challenges that authors and creators face such as royalty payment issues. Additionally, this chapter will reveal the challenges brought about by technological advancements and the course of action taken in response to digital copyright infringement and technology advancements. This chapter will also discuss the efforts taken by the

regulators of the law in drafting the Copyright Amendment Bill 13F-2017 to try and address the issues brought about by technology that the current Copyright Act does not address. Examining the current copyright laws in the internet era provides foundational knowledge that will provide an in-depth understanding of the challenges faced by the music industry in the face of digital copyright infringement. Therefore, laying the groundwork for potential technology solutions in relation to the intersection of music and copyright in the digital era.

Chapter 3: The implications of Digital Copyright Infringement on the South African Music industry

This chapter will focus on the intricate dynamics encompassing the implications of digital copyright infringement on the South African music industry. The study will begin with an analysis of the music industry members such as producers, musicians, and record labels, and the challenges they encounter in the realm of digital copyright infringement. It will discuss the economic consequences on artists and members of the music industry, and how these consequences affect their livelihoods or incentives.

Chapter 4: Emerging technologies to help mitigate digital copyright infringement in the music industry

This chapter will focus on examining emerging technologies and their potential to combat digital copyright infringement in the music industry. It will explore emerging technologies such as blockchain and artificial intelligence and examine the intricate dynamics of these technologies and their function in potentially protecting the intellectual property of the music industry. Finally, the chapter will also discuss the disadvantages and advantages of these technologies in light of copyright enforcement in the music industry and digital copyright infringement.

Chapter 5: Conclusion

This chapter will provide a summary of the key points, and findings presented. It will synthesise the key findings in the fight to mitigate the unauthorised use of intellectual property in the music industry, additionally, it will provide recommendations for the current issues of deficiency in robust enforcement mechanisms and digital copyright infringement in the music industry.

CHAPTER 2

THE IMPLICATIONS OF DIGITAL COPYRIGHT INFRINGEMENT ON THE SOUTH AFRICAN MUSIC INDUSTRY

2.1. MUSIC PRODUCTION AND DIGITAL COPYRIGHT INFRINGEMENT

The music industry has long utilised the internet as a potent marketing tool to advertise artists and their merchandise however, technological developments over the past years have drastically altered the way music is accessed, expressed, and experienced.[1] Formerly, music was a form of art and expression only experienced through live performances, until the invention of a technology that facilitated sound recording called the phonograph.[2] The phonograph enabled the recording of music by engraving grooves into tin foil discs, which, when rotated beneath an aluminium needle, produced sound waves that were amplified through a metal speaker.[3] Its ability to preserve music by capturing the performance fundamentally altered both the artistic and social significance of music. Over time, music mediums shifted from records to cassettes to CDs to current music streaming services like Spotify.[4] These modifications collectively significantly impacted the music industry's commercialisation and the availability of music. Positively, digital recording technology made music more accessible and production much more straightforward while producing finer sound quality.[5]

Early digital recording software and equipment reduced the cost and complexity of the recording process, as CDs are a lot more challenging and costly to manufacture than digital files.[6] Singers and songwriters can now record albums and distribute them through digital channels and streaming platforms hence, making them less reliant on record labels, and artists can now connect with their supporters directly through social media and video streaming services, reducing the need for costly public relations campaigns.[7] On a positive note, the digital era has resulted in the democratic

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[1] Tassos Patokos 'A New Era for the Music Industry: How New Technologies and the Internet Affect the Way Music is Valued and have an Impact on Output and Quality' (2008) 55 *Journal of Panoeconomicus* 233.
[2] Yaman Shrestha 'The transformation of the Music Industry due to Technological Advancements' (Thesis University of Virginia 2021) at 11.
[3] Ibid.
[4] Ibid at 12.
[5] Buddy Ihan 'The Impact of Technology on the Music Industry The music Universe' available at *https://themusicuniverse.com/impact-technology-music-industry/*, accessed on 2 March 2023.
[6] Ibid.
[7] Southern Utta University 'The Impact of Technology on the Music Industry' available at *https://online.suu.edu/degrees/business/master-music-technology/tech-impact-music-industry/,* accessed on 5 March 2023.

development of the music industry, which has enhanced possibilities for artists and professionals of all types.[8]

Initially, technology produced tremendous growth and efficient music creation for the music industry however, the internet evolved to an extent where users could distribute and download music through the internet without the permission of the copyright owner or owners. This was achieved through the inception of peer-to-peer file sharing, which ultimately created a vicious cycle of acquiring illegal work. The music industry certainly acknowledged the positive impact of technology however, digital copyright infringement is another phenomenon that no longer required dubbing tapes and burning CDs instead, people could acquire almost any song they desired without payment to the owners.[9] The constantly expanding phenomenon of file sharing has established the broad perception that the Internet is accountable for turmoil within the industry, based on the severity of digital copyright infringement of music works in the music industry.[10]

Over the years digital copyright infringement has challenged the traditional operations of the music industry and has pushed the music industry to evaluate their traditional functions.[11] Plagued with uncertainty, it seems that digital copyright infringement has varied effects or impacts on the different parties of the music industry. The main and absolute effect of digital copyright infringement is that it violates copyright holders' exclusive rights, which aim to foster artistic endeavours by providing legal safeguards for the economic benefits of that production.[12] It is these rights that artists rely on to be acknowledged and fairly compensated for their works. The complexity of the copyright system in the music industry makes digital copyright infringement more harmful because one single act of copyright infringement in the music industry violates several rights owned by different artists.[13] While some groups of artists in the music industry might not be severely affected, for other artists it is a grave threat to their livelihoods and economic state.[14] The major parties in the music industry are the record labels, musicians or composers and the collecting societies and digital copyright infringement affects the parties on distinct levels.[15] Although copyright infringement previously

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[8] Ibid
[9] Ibid.
[10] Karla Borja et, al 'The effect of music streaming services on the music piracy among college students (2015) 45 *Computers in Human Behaviour* 69.
[11] Keith Nurse 'Copyright and music in the Digital Age: Prospects and Implications for the Caribbean' (2000) 49 JSTOR *Journal of Social and Economic Studies* 53.
[12] Copyright Act s6.
[13] Kurt Dahl *A Change is Gonna Come: The Future of Copyright and the Artists/Record Label Relationship in the Music Industry* (unpublished LLM thesis, University of Saskatchewan, 2009) 5-6.
[14] Ibid.
[15] Mark T. Bender & Yongsheng Wang 'The Impact of Digital Piracy on Music Sales: A Cross-Country Analysis' (2009)

existed, Napster posed a greater threat to the music industry with peer-2-peer file sharing technology, which intensified the efficiency and speed of obtaining illegal musical works.[16] Consequently, peer-to-peer file-sharing technology triggered a massive growth of digital copyright infringement, and the music industry has taken steps to try and curb the problem of digital copyright infringement, however, more illegal file-sharing servers formed continue to pose a threat to the music industry.[17] Therefore, it is not completely obvious that digital copyright infringement in the music industry distresses record sales especially after the music industry has witnessed the discovery of peer-to-peer file-sharing technology.[18]

The music industry has a complex structure involving many key parties who collaborate and communicate to produce the final melodic music that the public enjoys.[19] At the heart of the process is the song itself, and everything begins with its composition. First, songwriters compose the song, laying the groundwork for the subsequent contributions of performers, producers, and sound engineers who help bring the song to life.[20]

Once a song is composed, it moves into the recording stage, where the composition is captured in a recorded format. This is typically when record labels become involved.[21] The recording company engages sound engineers and producers to refine and produce the composition into the final version that the public will hear. In some cases, especially with independent artists, the composer, performer, and producer may all be the same person.[22] When an artist is signed to a record label, the label assumes responsibility for the distributing, promoting, and licensing the song. This process involves collaboration with various parties, including the artist's manager, music publishers, and producers. [23]

When the song is completed, distributed and promoted, a team of different members works to ensure that artists are fairly compensated for their works.[24] This role is usually carried out by Collective Management Organisations, (also known as collecting societies) and Performance Rights

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84 *International Social Science Review* 157.
[16] Amedeo Polatto, Florian Schuett 'Music Piracy: A case of 'The Rich get Richer and the Poorer get Poorer' *Information Economics and Policy* 24 at 31.
[17] Ibid.
[18]Ibid.
[19] Paul Hirsch *The Structure of the Popular Music Industry: An Examination of the Filtering Process by Which Records Are Preselected for Public Consumption* (unpublished PhD thesis, University of Michigan, 1972) 20.
[20] Ibid.
[21] Ibid.
[22] Ibid.
[23] Ibid.
[24] Daniel Gervais *Collective Management of Copyright and Related Rights* (2006) 20-21.

Organisations, which are entrusted by right holders to monitor the use of their works, use of their work negotiate licensing terms with users, set tariffs, collect royalties, and ensure fair distribution of those royalties to the appropriate rights holders.[25]

While many other parties, including social media managers, broadcasters, and marketing teams contribute to the commercial success of music and are impacted by digital copyright infringement, however, this chapter will focus on three central actors in the copyright value chain: artists, record labels, and collecting societies. These parties are directly involved in the creation, commercialisation, and rights management of music, and are therefore most relevant to the discussion that follows.

2.2. **IMPACT ON RECORDING LABELS**

Before recent technological developments, record labels dominated the music industry, primarily investing in the development of music artists with the expectation of earning returns from the profits generated by their musical projects.[26] However, recent technological innovations have diminished the significance of record labels, leading to a loss of artists and a decline in their sales.[27] The importance of record labels lies in their foundational role, which includes providing essential services such as promotion, marketing, creative support, sales, and distribution. It is therefore crucial to examine how this system operates and how digital copyright infringement is transforming its structures and function within the music industry.

Record labels are generally divided into two main categories: major labels and independent labels. Major labels are large international corporations with extensive networks of affiliated companies around the world.[28] These networks allow them to source a range of musical genres, expand their collections and repositories, and form partnerships with major international corporations.[29] Major labels often enforce stringent rules that regional affiliates must abide by when looking for new talent, ensuring alignment with the label's broader objectives and granting access to their internal

[25] Ibid.
[26] Sadie A. Stafford 'Music in the Digital Age: The Emergence of Digital Music and its Repercussions on the Music Industry' (2010) 1 *The Elon Journal of Undergraduate Research in Communications* 112 at 113.
[27] Ibid.
[28] Jason Goldschmeid 'A battle royal: Digital Music Piracy v the Music Industry, an Assessment of Australian Copyright Law' (Doctoral Thesis Bond University 2010) at 77-79.
[29] Ibid.

catalogues.[30]

On the other hand, independent labels typically collaborate with smaller start-ups for distribution and publishing.[31] They appeal to artists who want to retain creative and artistic control over their work. Independent labels also attract musicians with specialised or non-traditional musical tastes who prefer to avoid being associated with the "mainstream" music scene.[32]

The traditional music business operates on a relatively straightforward framework in which record companies have historically served as the primary link between artists and listeners.[33] Under this model, the artist creates the music and submits it to a publisher, manager, or record label, which then facilitates its production, promotion, and distribution.

In the traditional music business model, the artist creates music and submits it to a publisher, manager, or record label. If the label sees potential for profit, a contract is negotiated and signed. The record label then assumes responsibility for producing, marketing, and distributing the music to merchants, media outlets, or directly to the public.[34] In most cases, the label retains ownership of the master recordings. Consumers would typically purchase the music from physical stores or designated outlets. However, technological advancements have significantly transformed this landscape, reducing the dominance of record companies and distributors. This shift has restructured the music industry, granting greater control to both artists and consumers.[35] Before committing to an artist, record labels primarily evaluate whether a record is likely to generate returns that exceed the cost of production. While artistic talent is important, labels are chiefly driven by financial considerations.[36] Without a profitable return on investment, the sustainability of a record label is jeopardised.[37] Although predicting a record's success remains uncertain, labels often favour established or influential artists with large, consistent followings, as they are perceived as lower-risk investments.

First, digital copyright infringement has been particularly scarring to the music industry, with record labels forced to adjust to the altering landscape of the music industry, with some closing down their businesses due to loss of millions of dollars yearly as a result of illegal music downloading and

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[30] Ibid.
[31] Matthew Justin 'Indie vs Major Record Labels: Which is right for you' available at *https://iconcollective.edu/indie-vs-major-record-labels/* accessed on 20 March 2023.
[32] Goldschmeid op cit note 28.
[33] Jazmine A. Valencia 'The Impact of Technology on the Music Industry' (Thesis Florida Atlanta University 2008) at 3.
[34] Ibid.
[35] Ibid
[36] Goldschmeid op cit note 28 at 103.
[37] Ibid.

sharing.[38] Furthermore, with a decline in revenue in the music industry, numerous labels find it strenuous to recuperate their investments in albums and artists.[39] Reduced investment in music production has an inevitable impact on quality.[40] Before digital copyright infringement become a significant concern, albums sales were substantially higher and record labels were more willing to invest in a diverse range of artists. They supported not only established musicians with proven talent but also emerging artists whose style and direction aligned with the label's vision.[41] When albums were economically viable, record labels had the finances to make such investments. However, labels are now convinced that there is no compelling justification to invest in music production if there are no album sales or settlements from internet downloading.[42] Labels now merely produce or make music on electronic devices accumulate publicity for artists and make rapid revenue through performances. This has provoked numerous upcoming artists to presume that record labels have been indirectly coerced to overlook emerging artists and are more likely to remain with their established artists to evade or eliminate losses.[43] Consequently, labels would prefer settling with established artists on account of digital music copyright infringement having little effect on sales, especially for established artists.[44]

Secondly, customers are presented with a range of choices due to the increase in the number of free music resources online.[45] Due to this, record companies now must work harder to promote their artists and albums, which frequently entails higher marketing and promotional costs.[46] They must therefore adapt their business strategies to remain appealing to artists, particularly by offering competitive deals, support and visibility, to dissuade artist from pursuing independent careers and to preserve their central role and influence within the evolving music industry. Additionally, they must consider whom they endorse to be emerging acts, the way they sign them, and what they offer in exchange.[47]

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[38] Stafford op cit note 26 at 113.
[39] Anouche Aprikian 'Major Record Labels' Strategic positioning in the Digital Popular Music Market' (Thesis Erasmus University 2020) at 6.
[40] Ibid.
[41] Giovanni Andrés Camacho Murillo 'Music piracy and illegal sharing: are artists being affected?' (2013) 11 *Criterio Libre* 113 at 118.
[42] Ibid.
[43] Ibid.
[44] Alejandro Zentner 'Measuring the Effect of File sharing on Music Purchases' (2006) 49 *The Journal of Law and Economics* 63 - 90.
[45] Dahl op cit note 13.
[46] Aprikian op cit note 39 at 8.
[47] Stafford op cit note 26 at 113.

Moreover, digital copyright infringement in the music industry has not only had a negative financial impact on the music industry, but it has also had an adverse creative impact.[48] Due to an abundance of free music, it can be difficult for new and emerging artists to stand out and amass a following. As a result, popular music has become more standardised, with many record labels placing a greater emphasis on making music that is secure, commercial, and likely to be profitable than they do on taking chances on emerging and innovative artists.[49]

2.3. **IMPACT ON ARTISTS**

The internet has given artists great exposure and global recognition, but it has also enabled digital copyright infringement on a global scale.[50] While this infringement poses substantial challenges for recording companies, often leading to financial losses, its impact on artists appears more uncertain.[51] On one hand, it undermines the author's copyrights, on the other hand, it may indirectly boost their income through alternative revenue streams like live concerts, brand partnerships, and merchandise sales.[52] Therefore, the overall effect of digital copyright infringement on artists remains unclear.[53]

Prior to the internet era, artists largely depended on record labels to transform their raw musical talent into commercially viable products.[54] Artists would create the music, while record labels handled its production, packaging, promotion, and distribution for public consumption. Without the backing of record labels, most artists were limited to local recognition. However, the internet revolutionised the music industry, granting artists greater independence and the ability to reach global audiences.[55] This shift enabled artists to create, produce, promote and distribute their music independently, significantly lowering promotional and production cost while increasing their public exposure. It also demanded that artists develop new skills to navigate the technology space.[56] Despite these advancements, digital copyright infringement has made it increasingly difficult for artists to control their work and protect their intellectual property.[57] Digital copyright infringement has led to

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[48] Ibid.
[49] Dahl op cit note 13.
[50] Ibid.
[51] Patokos op cit note 1.
[52] David Blackburn 'On-line Piracy and Recorded Music Sales' available at *https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=cf034bd5efadb58f211b9acc33e05326a0fa7a39*, accessed on 20 March 2023.
[53] Ibid.
[54] Ibid.
[55] Patokos op cit note 1 at 235.
[56] Ibid.
[57] Jim Rodgers 'The Death and Life of the Music Industry in the Digital Age' (2013) 29 *European Journal of*

an uncontrollable surge of illegally obtained works circulating online, making it virtually impossible for musicians or artists to control, who acquires, duplicates, reproduces, or modifies their works.[58]

Therefore, digital copyright infringement compromises an artist's reputation, dignity, and sense of identity.[59] This is because creative works often hold deep personal value, with many artists drawing from their personal experiences and investing significant time, effort, and emotional energy into their craft. Musicians operate in an industry that demands enormous effort but often yields disproportionately low returns, that are further eroded by the widespread impact of digital copyright infringement.[60]

Secondly, digital copyright infringement in the music industry undermines its economic sustainability by threatening the livelihoods of musicians, who rely on income generated from their creative works to make a living.[61] Artists are particularly affected on a moral level by digital copyright infringement, because their labour and creativity are frequently used without fair compensation.[62] Digital copyright infringement restricts the profit potential for songwriters and producers who rely on royalties, potentially limiting their creativity and deterring them from creating new work.[63]

While some argue that copyright infringement can boost exposure for popular artists, especially through file sharing and digital piracy, the long-term effects are largely detrimental.[64] Although artists may experience short-term benefits through increased concert sales and merchandise sales, these benefits do not compensate for the loss of control over their work. As illegal downloads become more widespread, the number of people willing to pay for the music declines, ultimately reducing the revenue artists rely on.[65]

Communication 236.
[58] Ibid.
[59] Norbert J. Michel 'The Impact of Digital File Sharing on the Music Industry: An Empirical Analysis' (2006) 6 *Topics in Economic Analysis & Policy* 1.
[60] Mysha Didi 'Effects of Pirated music on musicians' (2016). Economics Student Theses and Capstone Projects 15.
[61] Ibid.
[62] Giovanni op cite note 41.
[63] Tin Cheuk Leung 'Music Piracy: Bad for Record Sales but Good for the iPod?' (2013) 31 *SSRN Electronic Journal* 1 at 6.
[64] Didi op cit note 60.
[65] Piolatto & Schuett 'Music Piracy: A case of 'The Rich get Richer and the Poorer get Poorer' (2012) 1 *Information Economics and Policy 24* 35.

2.4. IMPACT ON COLLECTING SOCIETIES

As artistic expressions surfaced, it was imperative to create laws that not only protect authors' works but encourage more innovation and development through access to these works and incentivising creators. However, the enactment of these laws created the need for effective enforcement mechanisms, this is where collecting societies play a crucial role. Economically, collecting societies have a significant role in the copyright system and have a tremendous influence on the music industry.[66] Without collecting societies some markets will possess counterproductive copyright laws, where a substantial number of authors would struggle to authorize permission and users would struggle to obtain permission for copyrighted works.[67] Collecting societies then fill the gap by administering authors' copyrights on their behalf. By definition, collecting societies are legal economic entities, established to manage copyright on behalf of authors and other rights holders. They play a crucial role in the administration of copyright by issuing licenses, collecting royalties, and distributing them to rights holders.[68] Collecting societies also monitor the use of copyrighted works, enforce rights where necessary, and ensure that creators receive fair compensation for the use of their works.[69] By centralizing these tasks, collecting societies provide an efficient mechanism for rights management, particularly in contexts where individual enforcement would be impractical.[70] It is important to note that digital copyright infringement significantly affects collecting societies, as it directly impacts of record labels, artists and other creators they represent.

The major collecting societies in South Africa are the Southern African Music Rights Organisation (SAMRO), the South African Music Performance Rights Association (SAMPRA), the Composers Authors and Publishers Association (CAPASSO), the National Organisation of Reproduction Rights (NORM) and the Performers Organisation of South Africa Trust (POSA).[71]

First, digital copyright infringement economically impacts collecting societies by decreasing the revenue generated from copyright licensing, leading to a significant decline in licensing fee

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[66] Ruth Towse and Christian Handke 'Economics of Collecting Societies' (2007) 38 *Journal of International Review of Intellectual Property and Competition Law* 937.
[67] Ibid.
[68] Ruth Towse and Christian Handke 'Regulating Copyright Collecting Societies: Current Policy in Europe' available at *https://www.gbz.hu-berlin.de/downloads/pdf/SERCIACPapers/towsehandke.pdf*, accessed 16 April 2023.
[69] Phillipe Gillieron 'Performing Rights Societies in the Digital Environment' available at *https://law.stanford.edu/wp-content/uploads/2015/03/GilliieronPhilippe-tft2006.pdf*, accessed on 16 April 2023.
[70] Sebastian Haunss 'The changing role of collecting societies in the internet' (2013) 2 *Internet Policy Review*.
[71] SAMRO 'A look at the various Collecting Societies in SA and the roles they play in the music industry' available at *https://www.samro.org.za/news/articles/look-various-collecting-societies-sa-and-roles-they-play-music-industry* accessed on 28 April 2023.

proceeds. Copyright infringement reduces the value of copyrighted works, making it challenging for licensing organizations to negotiate optimal licensing terms. Since it is often costly and impractical for individual composers, singers, performers, and producers to collect royalties on their own, collecting societies are assigned some rights, allowing them to act on behalf of copyright and grant licenses to users.[72] However, digital copyright infringement disrupts this license system, reducing the amount of royalties to be collected, making it increasingly difficult for collecting societies to generate sustainable income.

In addition to lowering revenue, digital copyright infringement poses greater administrative strain on collecting societies.[73] Prior to the expansion of digital music distribution platforms, there was undoubtedly an increase in music consumers which made it difficult for collecting societies to monitor music consumption and ensure that copyright holders are adequately compensated.[74] Consequently, collecting societies were forced to invest in technological resources and personnel to manage the increased workload, which has impacted their revenues even more.

Lastly, digital copyright infringements places great weight on collecting societies to educate and inform the public about what online copyright infringement constitutes and the dangers of engaging in digital copyright infringement.[75] In their efforts to curb copyright infringement and promote compliance with the copyright system, collecting societies take on the added burden of compiling and managing extensive information information—often with limited resources and inadequate compensation.[76]

2.5 CONCLUSION

On a final note, digital copyright infringement appears to be a socially acceptable behaviour among South African consumers.[77] It has become the "norm" and shifting this prevailing situation proves to

[72] Werina Griffiths 'Collecting societies and the Copyright Act' available at *https://www.polity.org.za/article/collecting-societies-and-the-copyright-act-2013-05-02* accessed on 28 April 2023.
[73] Ruth and Handke op cit note 70.
[74] Ibid.
[75] Ibid.
[76] Ibid.
[77] Denis Sickert 'Why do people engage in Digital Piracy and how does it affect the society' available at *https://www.researchgate.net/publication/332370355_Why_do_people_engage_in_digital_piracy_and_how_does_it_affect_society*, accessed on 31 August 2023.

be complex and time costly.[78] Consumers drift to acquiring music illegally because they are either not able to access legal copies or faced with having to pay substantial amounts for them. Therefore, digital copyright infringement is not a straightforward situation, but rather one that includes social struggles.[79] It is strenuous to get society on one accord and to rectify society at large in a digital world has proven to be ambitious. Digital copyright infringement undermines the copyright in songs and strips copyright owners of their deserved rights.[80] However, it is intractable to determine and reach conclusive effects of digital copyright infringement in the music industry.[81]

Furthermore, artists continue to have conflicting views on the effects of digital copyright infringement on their works. Although most musicians believe that digital copyright infringement may boost their popularity, resulting in improved prospects in additional or related businesses, increased income from alternate sources may simply mask the impact of copyright infringement in the music industry.[82] Although it mostly benefits a relatively small number of musicians, the artists that have their livelihoods on the edge or compromised are composers, arrangers, and engineers who work behind the scenes.[83] While most musicians view digital copyright infringement as a sign of recognition, the causal link may be exchanged or reverted with the notion that popularity causes digital copyright infringement rather than digital copyright infringement causing popularity. This is because relevant digital copyright infringement develops only after a significant number of resources on promotion and an artist has begun to attain a particular level of market popularity.[84]

The rationale is that consumers are unlikely to illegally acquire or access the music of an unknown artist. Since the music industry functions in a chain structure, where the ultimate return depends on consumer behaviour, it is difficult to strike a fair balance across all stakeholders.[85] Completely restricting access to musical works would be very ambitious and could limit creativity and innovation, as many new works build upon existing ones. However, to strip artists and musicians of

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[78] Barry Sherman 'The culture of digital music piracy: a South African perspective' (2008) 8 *Journal of South African Music Studies*.
[79] Leung op cit note 63.
[80] Act 98 of 1978.
[81] Mysha Didi 'The Effects of Pirated Music on Individual Musicians' available at *https://creativematter.skidmore.edu/cgi/viewcontent.cgi?article=1014&context=econ_studt_schol*, accessed on 25 March 2023.
[82] Mark & Wang op cit note 15.
[83] Ibid.
[84] Ibid.
[85] Joel Waldfogel 'Music Piracy and its Effects on Demand, Supply and Welfare' (2012) 12 *The University of Chicago Press Journal*94 at102.

their livelihoods, identity, dignity, and income is equally unjust.[86] Ideally to fight digital copyright infringement from the angle of the various stakeholders in the music industry would be more effective. Musicians in the public scene often have higher prospects to benefit from online exposure, even in cases of infringement. In contrast, other key players like record labels, composers and collecting societies, must work significantly harder to keep up their investment return and sustain their relevance in the music industry.[87]

The vastness of the internet allows individuals from diverse places to access these works, making it difficult, costly, and time-consuming to identify infringers and enforce artists' exclusive rights.[88] Digital copyright infringement has far-reaching consequences that extend beyond a single work. When record labels struggle to recover their investments and sign new artists, collecting societies also suffer, as their income relies heavily on royalties from successful recordings.[89] The key players in the music industry — artists, labels, and collecting societies are deeply interconnected. Infringement disrupts this fragile demand-and-supply chain, weakening the industry's overall ecosystem.[90]

[86] Ibid.
[87] Ibid.
[88] Didi op cit note 60.
[89] Ibid.
[90] Ibid.

CHAPTER 3

COPYRIGHT LAWS AND ENFORCEMENT MECHANISMS IN THE CONTEXT OF DIGITAL COPYRIGHT INFRINGEMENT

3.1 INTRODUCTION

Technology has revolutionised information storage and distribution creating major problems, but it has also created new challenges, such as copyright infringement for creators and owners, thereby raising concerns with the current intellectual property framework.[1] The intellectual property space has seen a massive transformation in recent years and is magnified by technological advancements, the intricate relation between intellectual property law, and the challenges introduced by digital copyright infringement, making it crucial to review the existing legal framework.[2] The present South African Copyright Act, originating from 1978 reveals its ancientness in the digital era therefore, making it ineffective in addressing contemporary technological advancements.[3] The Act's formulation did not anticipate the current digital era and rapid technological advancements, resulting in inadequate provisions for grappling with issues such as digital copyright infringement, particularly in the music industry. As a result, the focus has shifted primarily to enforcement challenges, indicating a gap between the legislation's original intent and the complex challenges posed by cutting-edge technology.[4] Although the current legal framework needs, revision to cater to the digital era, it is important to note the important role of intellectual property law, particularly copyright law, in the music industry.

Copyright is cardinal to protecting intellectual property in the music industry, ensuring the protection of the rights of musicians, composers, and other contributors involved in the creation and production of music.[5] It is a form of intellectual property that ensures that copyright holders are incentivised for

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[1] Eric Fleischmann, 'The Impact of Digital Technology on Copyright Law,' (1987) 8 *Journal of Information Technology and Privacy Law* 1 at 2.
[2] Ibid.
[3] Ibid.
[4] Nikhil Bharadwaj 'Copyright Protection in the Digital Age: Challenges and Solutions' available at *https://www.legalserviceindia.com/legal/article-10639-copyright-protection-in-the-digital-age=challenges-and=solutions.html*, accessed on 12 October 2023.
[5] Rai Prabin "Copyright Laws and Digital Piracy in Music Industries: The Relevance of Traditional Copyright Laws in the Digital Age and How Music Industries should cope with the ongoing Piracy Culture." available at *https://www.researchgate.net/publication/349494949_Copyright_Laws_and_Digital_Piracy_in_Music_industries_The_Relevance_of_Traditional_Copyright_Laws_in_the_Digital_Age_and_How_Music_industires_should_cope_with_the_ongoing_Piracy_Culture*, accessed on 2 November 2023.

their creativity and retain control and profit from their creative works.[6] With the rise of technology, it has become extremely difficult for copyright holders in the music industry to control how their works are utilised or distributed, due to the unauthorised access to their content usually facilitated by file sharing networks or systems.[7]

The music industry has responded to digital copyright infringement by making use of certain technologies such as digital rights management, to limit or restrict access to their protected works, and have utilised civil remedies in cases of identified copyright infringement.[8] This chapter will examine the current South African copyright framework against the digital era and digital copyright infringement. In addition, this study examines the enforcement mechanisms intertwined to address digital copyright infringement.

3.2 CURRENT COPYRIGHT LAWS IN THE SOUTH AFRICAN MUSIC INDUSTRY

In South Africa, copyright is governed by the Copyright Act 98 of 1978, which places certain requirements for copyright to exist.[9] It is important to note that copyright exists automatically, therefore, registration is not a requirement, and unless an agreement stipulates otherwise, the copyright is usually owned by the creator and anyone that the right has been conferred such as employers and commissioners.[10]

South Africa is a contractual party to various international intellectual property agreements such as the Berne Convention for the protection of literary and artistic works and the Agreement of Trade Related Aspects of Intellectual Property Rights (TRIPS).[11] The Berne Convention is an international treaty that sets the minimum standard of protection for copyright for all countries affiliated with the treaty. It focuses on the protection of the rights of creators such as musicians and provides a foundation in which copyright holders can retain control over the use of their works.[12] The convention

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[6] Malebakeng Forere, 'Protecting Music Copyright Owners in Southern Africa: Need for Regulatory Convergence' available at *https://www.wti.org/research/publications/1058/protecting-music-copyright-owners-in-southern-africa-need-for-regulatory-convergence/*, accessed on 27 September 2023.
[7] Ibid.
[8] Nuani Fredrick Ouma, 'Optimal Enforcement of Music Copyright in Sub-Saharan Africa. Reality or a Myth?' (2006) 9 *The Journal of World Intellectual Property* 595.
[9] The Copyright Act s2.
[10] Ibid s1.
[11] Ethel Teljeur 'Intellectual Property Rights in South Africa: An Economic Review of Policy and Impact' available at *https://www.tips.org.za/files/Teljeur_IPRs_paper_2003.pdf* , accessed on 18 October 2023.
[12] Irene Calboli, Maria Lilla Montaganani and Henning Grosse Ruse-Khan 'Intellectual Property and International Law:

stipulates that protection shall be afforded to literary and artistic works in any form or expression. Article 2(1) provides for the recognition of exclusive rights of authorisation, which are the right to translate, and make adaptations of the work, the right to reproduce, and the right to perform their works.[13]

Another international agreement is the TRIPS agreement, which outlines the minimum standards of protection of copyright. This agreement establishes intellectual property into the multilateral trading system and binds all members of the World Trade Organisation and allows members but does not oblige members to have extensive intellectual property rights, provided they do not violate the provisions or terms of the TRIPS agreement.[14] The agreement alludes to the principle of 'National Treatment' which entails that members of the agreement should treat foreign nationals as they treat their locals in regards to the protection of their intellectual property rights.[15] The terms of protection and limitations of copyright are also outlined in this agreement. Furthermore, the agreement states that members shall place limitations and exceptions to the exclusive rights granted provided that they do not conflict with the normal use of such works and are not detrimental to the legitimate interest of the right holders.[16] The agreement also provides performers the right to restrict the reproduction of their fixed performances and to prevent the broadcasting by wireless means and communication to the public of their live performances without their permission.[17] Lastly, it also grants performers the right to restrict and authorise the direct reproduction of their phonograms.[18] These treaties have always set the minimum standards of protection for copyright laws to all countries a party to it, however, the rise of novel technology in the digital environment stimulated the creation and drafting of the WIPO Internet treaties. These treaties were created to address the challenges introduced by technology therefore, ensuring protection of intellectual property rights in the digital era. The WIPO internet treaties were established to bring existing laws up to date with the digital era, provide regulations for copyright protection and protect users' works in the online environment.[19] The two

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A Research Framework' *Handbook of Intellectual Property Research: Lenses, Methods, and Perspectives* (2021) 15 at 30.

[13] Summary of the Berne Convention for the Protection of Literary and Artistic Works (1886) available at *https://www.wipo.int/treaties/en/ip/berne/summary_berne.html* accessed on 18 October 2023.

[14] Article 1 of the TRIPS agreement.

[15] Ibid article 3 para 1.

[16] Ibid article 13.

[17] Ibid article 14 para 1

[18] Ibid article 14 para 2.

[19] 'WIPO Internet Treaties' available at *https://www.wipo.int/copyright/en/activities/internet_treaties.html#:~:text=To%20maintain%20a%20fair%20balance,rights%20in%20the%20digital%20environment*, Accessed on 20 November 2023.

treaties were created to establish international standards in copyright protection in the digital age.

South Africa is a signatory to the two WIPO treaties namely the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT), however, has not acceded to them. First, the WCT is a particular treaty under the Berne Convention that safeguards works and their authors' intellectual property in the digital domain.[20]

Secondly, the WIPO Performances and phonograms Treaty focus on the rights of performers such as, singers and musicians, and producers which are the legal entities or persons who take on the responsibility of the fixation of the sound.[21] The treaty grants performers the economic right in their fixed performances, the right to reproduce, rent, distribution and the right to make available their fixed performance in phonograms.[22] On the other hand, with unfixed performances the treaty grants performers the right to broadcast, the right of fixation and the right to communicate the work publicly.[23] Similar to article 9(2) of the Berne Convention, the WPPT makes use of the three-step test for exception and limitations, first in certain cases, secondly, does not conflict with the normal use of the work in question and lastly, does not prejudice the interest of the right holders.[24]

The treaty also grants performers the moral rights to be identified or recognised as the performer of the works in question.[25] The two treaties extend copyright to digital works ensuring that the same right granted to traditional or physical work are afforded to digital works.[26] It address digital copyright infringement through establishing rules that regulate the management of digital rights management technologies, technological protection measures and enforcement mechanisms that deal with online copyright infringement as the treaties goal is to protect creators and owners from illegal use of their works on the internet.[27] Lastly, the treaties aims to integrate copyright laws globally to help copyright owners from different countries enforce their rights internationally; thereby the treaties aim to

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[20] Summary of the WIPO Copyright Treaty (WCT) (1996) available at *https://www.wipo.int/treaties/en/ip/wct/summary_wct.html* accessed on 19 October 2023.
[21] Summary of the WIPO Performances and Phonograms Treaty (WPPT) (1996) available at *https://www.wipo.int/treaties/en/ip/wppt/summary_wppt.html* accessed on 19 October 2023.
[22] Article 6-9 of the WPPT and Performers Protection Act s2.
[23] Ibid article 10
[24] Ibid article 16.
[25] Ibid article 5.
[26] WIPO Internet Treaties' available at *https://www.wipo.int/copyright/en/activities/internet_treaties.html#:~:text=To%20maintain%20a%20fair%20balance,rights%20in%20the%20digital%20environment*, accessed on 20 November 2023.
[27] Ibid.

facilitate cross-border copyright enforcement.[28]

3.3 REQUIREMENTS FOR COPYRIGHT PROTECTION

3.3.1 Originality

To enjoy copyright the work in question must be original and the work need not be novel or inventive to be deemed original, however, it should be authentic and involve some form of effort on the author's part.[29] The originality criteria require that the work of art be developed autonomously, with effort and labour. Therefore, creativity is not a requirement but the author should have exercised independent skill and judgment, the so-called 'sweat of the brow' in creating the work even if it is created from existing work.[30]

3.3.2 Material Form

Secondly, for a work to qualify for copyright protection it is a requirement for the work to be reduced to material or digital form such as sound recording and lyrics.[31] Copyright cannot exist in an idea; thoughts, facts, or concepts therefore work should be reduced to material form once created.[32]

3.3.3 Author and Duration

Copyright subsists in a work created by a qualified person, which entails a South African citizen and a person domiciled or resident in South Africa or a Berne Convention country.[33] According to the Copyright Act, 'an author in relation to literary and musical works, is the person who first creates the work and with sound recordings, it is the person whom the arrangements for the first fixing of the sounds of a performance or other sounds were made'.[34] The connection between an author and the work is fundamental therefore, the Copyright Act grants moral rights to the author. These rights allow them to claim authorship of their works and to object to any mutilation, modification or distortion of such works in a manner that is prejudicial to the honour and reputation of the author.[35] Determination

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[28] Ibid.
[29] Dean and Dyer *Introduction to Intellectual Property* (2014).
[30] *Moneyweb (Pty) Limited v Media 24 Limited* [2016] 3 All SA 193 (GJ).
[31] Copyright Act s2(2).
[32] HB Klooper *Law of Intellectual Property in South Afric*a 2016 180.
[33] Copyright Act s3(1).
[34] Ibid s1.
[35] Ibid s 20.

of an author of a work depends on the specific facts of creation, requiring that the person involved has contributed original thought, creativity, or skill.[36]

Additionally, copyright protection is not infinite and the Copyright Act gives a term for copyright protection. For literary and musical works, copyright exists for the life of the author and 50 years from the end of the year in which the author dies, therefore even after the author dies one has to obtain permission to exploit the work or reference such work in instances of fair dealing.[37] The term of copyright for sound recordings is 50 years from the end of the year in which the recording is first published. In the event of anonymous works, it is 50 years from the end of the year the work is made available to the public or from the end of the year in which the author is presumed to have died.[38] In the case of Joint ownership, the Copyright Act states that the period of copyright protection is 50 years from the end of the year of the author who dies last.[39]

3.4 EXCLUSIVE RIGHTS

Music is protected under the South African Copyright Act as a bundle of rights categorised into distinct components.[40] A musical piece is a collection of multiple creative works that are protected under copyright law. These distinct components include the musical composition, which encompasses elements like melody, musical notations and harmony, which the composer usually creates.[41] Secondly, the lyrics, which include the written words of the song and are usually written by the lyricists. Together, these form the foundation of a song and South Africa acknowledges the intellectual property in composition as the initial expression of copyright in music, which is protected as literary works.[42] Another form of music copyright acknowledged in South Africa is the sound recording, which consists of the expression of the primary music composition.[43] The sound recording by definition in the Copyright Act, 'means the direct exclusively aural fixation of sounds of a performance or of other sounds capable of being reproduced; but does 'not include a sound-track associated with a cinematograph film.'[44] Record labels usually retain ownership of sound recordings

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[36] Owen H Dean *Protection of the Authors Moral Rights in South Africa* 1995 40.
[37] Copyright Act s3(2) para (a).
[38] Ibid s3(3) para (a).
[39] Ibid. s 3(3) para (b).
[40] Ibid s2.
[41] Andrew Shandy Utama 'Law Enforcement to Copyright Infringement of Songs on the Internet Media' *(*2018) 12 *Fiat Justisia* 237.
[42] Finn Mackinnon 'An overview of copyrights in South Africa' available at *https://www.musicinafrica.net/magazine/overview-music-copyrights-south-africa*, accessed on 20 June 2022
[43] Copyright Act s2.
[44] Ibid s1.

and in this, phase producers and performers play a crucial role.[45] The producers manage the technicalities of the recording while performers bring the composition to life with their unique expressions. This separation of rights demonstrates the tiered nature of music copyright, with each element conferring distinct exclusive rights on its respective copyright owners.[46]

To understand who retains exclusive rights a distinction between authors and owners of copyright in music needs to be made. According to the Copyright Act,[47] the author in relation to a literary, musical or artistic work, means the person who first makes or creates the work. An "author" in relation to sound recordings, means the person by whom the arrangements for the first fixing of the sounds of a performance or of other sounds were made.' Generally, the first creator is the owner of the work and authors retain rights known as "moral rights" which are recognised by the Copyright Act, and exist separate and authors retain their moral rights, regardless of economic rights assignment.[48] These rights encompasses the right of paternity, allowing the author to claim authorship of their work, and the right of integrity, allowing authors to object to any distortions, alterations, or uses that could hurt their honour or reputation. Moral rights, unlike copyright, are personal in nature and do not result in ownership interests. However, there are limitations to the right of integrity, particularly in cases where modifications are necessary for technical reasons or commercial purposes, such as in film, television, or digital formats. While such alterations may be permissible, they should not be prejudicial to the author's reputation or diminish the personal connection they have with their work.[49]

On the other hand, the owner is not always the author of the work. The owner of a work refers to the entity or the person that currently holds the economic rights of the work, which in the music industry might be a music publisher, record label or another party to whom rights have been assigned. Owners of copyright essentially have exclusive rights to exploit the works commercially and they control these rights for a limited time. Section 6 of the Act grants owners the exclusive right to reproduce, modify, and perform these works.[50] This also stretches to digital reproduction, meaning, illegally downloading and making available copyright material on the internet constitutes copyright

[45] Mackinnon op cit note 42.
[46] Ibid.
[47] Copyright Act s1(iv) para (a) and (c).
[48] Ibid s20.
[49] Ibid.
[50] Copyright Act s6 para (a); Article 8 of the Berne Convention 1886.

infringement.[51] Secondly, to perform the work publicly,[52] meaning they may license or play the song in a public area or perform live concerts. Thirdly, to adapt the work, such as substituting or altering the music to involve a video. Section 9 of the Act grants the exclusive right to the owner of a sound recording to do or authorise the making or generating of a record containing the sound recording, directly or indirectly; allow or market or expose for hire by trade, either directly or through a third-party, a copy of the sound recording; broadcast the recorded sound; cause the sound recording to be disseminated in a dispersion service except such service transmits an authorised broadcast, including the sound recording, and is controlled by the primary transmitter; inform the public with regards to the sound recording.[53] The owner of the copyright also has the right to sue where an infringement of their works occurs.

In instances where two or more people contributed to the creation or production of a work then this is considered joint authorship. Both authors retain equal rights to works unless stipulated otherwise in writing. In the music industry, jointly authored works often occur when a lyricist, producer including the performer contribute to a song and in such instances the parties must agree on royalty shares and prospective roles.[54]

However, there are exceptions to ownership of copyright, such as when a person commissions a sound recording or pays for it then they are the owner off such work, or when the works are created under employment that work is owned by the employer or whosoever commissioned such works unless there is a clear agreement stating otherwise.[55]

3.5 INFRINGEMENT

Anyone who performs any exclusive acts stipulated in sections 6 to 11 of the Copyright Act without the required permission infringes on the owner's copyright.[56] Infringement can occur directly or indirectly and they will both be discussed in detail below.

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[51] Louise Groenewald 'Legal Analysis of Fair Dealing Relating to Music Works in the Digital Environment' available at *https://uir.unisa.ac.za/bitstream/handle/10500/5742/thesis_groenewald_l.pdf;sequence=4*, accessed on 13 August 2022.
[52] Copyright Act s6 para c; Article 9 (1) of the Berne Convention 1886.
[53] Forere op cit note 6.
[54] Ibid.
[55] *King v South African Weather Services* 2 All SA 31 (SCA).
[56] HB Klooper op cit note 32.

3.5.1 Direct infringement

Section 23 of the Act,[57] deals with infringement of copyright and prohibits direct infringement stipulating that copyright infringement occurs when any other person who is not the owner and does not possess the required license to use the work, does or causes another person to perform the acts to which the right holder has exclusive rights.[58] An alleged infringer does not need to be aware of their act of infringement on the work concerned. For copyright infringement to occur the work in question has to be copied in whole or a substantial part thereof, however, should a person carry out prohibited acts with the required permit of the copyright holder, it does not amount to copyright infringement.[59]

3.5.2 Indirect infringement

Section 23 (2),[60] deals with indirect infringement stating that anyone who imports, sells, lets, exposes by way of trade, and distributes an article for trade without the owner's permission has infringed on the owner's right or rights. Indirect infringement usually occurs when a person deals with an infringed work, meaning they might not have directly reproduced it, however, they are using a copy, or infringed article.[61] With music, a person infringes when they do not pay the owed royalties for the musical works in question, or performs the song or musical work in public without the required permit.[62]

3.6 LIMITATIONS AND EXCEPTIONS

It is important to understand that merely using a copyrighted work, such as listening to a song for personal enjoyment, does not amount to copyright infringement.[63] Therefore, the Copyright Act provides a balance between the interests of the right holders and the consumers of the copyrighted works by outlining the exceptions to copyright infringement in sections 12 to 19 of the Act.[64]

3.6.1 Fair Dealing and Limitations for Sound Recordings

Section 12 (1) normally referred to as the ‘fair dealing’ clause,[65] provides for exceptions to copyright the protection of literary and artistic works. The Act states that there shall be no infringement in

[57] Ibid.
[58] Copyright Act s23(1).
[59] Dean and dyer op cit note 29.
[60] Act 98 of 1978.
[61] Ibid s23(2)
[62] Dean and Dyer op cit note 29.
[63] HB Klooper op cite note 32.
[64] Act 98 of 1978.
[65] Groenewald op cit note 51.

literary or musical work without the permission of the author or owner if the sole purpose is for research or private study, personal or private use, criticism or review, and/or reporting events.[66] Additionally, no infringement shall occur in literary and musical works if the purpose is solely for judicial proceedings or reproduction for the purposes of judicial proceedings report,[67] and works available to the public shall not be infringed by way of quotation including quotation from articles in newspapers.[68] The act also states that 'reproduction of a work shall be allowed, however, only in a manner that the reproduction does not conflict with the normal employment of the work and is not unreasonable disadvantage to the legal interests of the author.[69]

3.6.2 General Exceptions to Sound Recordings

The Copyright Act provides for general exceptions for sound recordings. While section 12 provides for general exceptions with section 12(1) specifically being the fair dealing provision, it is important to note that section 12 provisions do not apply in full for sound recordings.[70] Section 17 of the Act states that only section 12(1)(b), 12(1)(c), 12(2) to (5), (12), and (13) apply *mutatis mutandis* to sound recordings. [71] This means that under the fair dealing provision section 12(1) (a), which allows for use of literary and musical works for research, private study, or personal use, does not apply to sound recordings. As a result, while fair dealing may allow private copying of literary or musical works, this exception does not apply to sound recordings. Sound recordings are covered by fair dealing provisions that allow for criticism, review, and reporting on current events.[72] The remaining section 12 clauses that apply to sound recordings,[73] serve as general exceptions rather than fair dealing rules.

Section 12(12) of the Act offers an exemption from copyright infringement.'[74] By permitting dealers of radio, television, recording, and playback equipment to use literary or musical works in legitimate demonstrations for customers. This means that a dealer's use of a song or other literary work to demonstrate a device's functionality does not violate copyright standards. The provision ensures that firms can efficiently market their products without having prior clearance from copyright holders, as long as the use is only for demonstration purposes and not for commercial gain beyond the sale of the

[66] Copyright Act s12(1).
[67] Ibid s12(2).
[68] Ibid s12(3).
[69] Ibid s13.
[70] Ibid s17.
[71] Act 98 of 1978.
[72] Ibid s12(1) para (b) and (c).
[73] Ibid s12 (2) to (5), (12) and (13).
[74] Act 98 of 1978.

equipment itself. This exception strikes a balance between upholding the rights of copyright holders and encouraging ethical business practices in the electronics sector.'[75]

The Copyright Act, allows for unless otherwise agreed, use a literary work in the production of a cinematograph film automatically to include the right to broadcast that film.'[76] This means that if an author gives permission for their work to be made into a movie, the producers do not require further permission to broadcast the finished product.[77] This provision streamlines the licensing process by guaranteeing that broadcasting rights are automatically included in the adaptation agreement unless specifically excluded, thereby protecting the interests of both authors and filmmakers while promoting efficiency in the film industry.[78]

Additional defences to infringement include works in the public domain. Copyright affords protection to works for 50 years and once the term is completed, the right expires and the works are disposed in the public domain.[79] Thereafter, users can utilise the work without an act of infringement provided they give recognition to the author by mentioning the author while utilising the work.[80] Another defence to copyright infringement is direct licensing of the copyright work by owner to another user upon certain terms and conditions.[81]

3.7 CURRENT ENFORCEMENT MECHANISMS

Digital copyright infringement occurs for many reasons reflective of a mix of technological, economic and cultural factors; among these various reasons is a lack of enforcement in light of the technological advancements.[82] In an ideal world, it would be simple to formulate the law and individuals would impeccably harmonize with the law. However, some disregard existing law making

[75] Ibid.
[76] Ibid s12(13).
[77] Ibid.
[78] Ibid.
[79] Albert Olu. Adetunji 'Challenges of Copyright Protection in the Digital Age: The Nigerian Perspective' 2022 *Journal of Library Philosophy and Practice* 11.
[80] Ibid.
[81] Ibid.
[82] Marisella N Ouma 'Optimal Enforcement of Music Copyright in Sub-Saharan Africa: Reality or a Myth?' (2006) 9 *The Journal of World Intellectual Property* 592.

enforcement of the law a crucial step in the legal regime.[83] In light of the technological advancements, there are enforcement measures currently used to mitigate digital copyright infringement, which will be discussed below.

First, South Africa's copyright laws and regulations that protect intellectual property establish the legal footing to enforce copyright and discourage digital copyright infringement.[84] Copyright holders may take legal action against an infringer by filing a lawsuit. Granted that copyright infringement takes place, s 24 of the Copyright Act provides for civil remedies and states that copyright holders have the right to claim damages and seek monetary compensation in cases of infringement. Additionally, copyright holders can also request a court order that prevents further infringement or damage to the copyrighted material.[85] However, the Act also states that ' where an action of infringement is proved or admitted however, at the time of the infringement the defendant was unaware of the infringement or did not have any reason to believe copyright subsists in the work in question, the plaintiff is not entitled to any damages.'[86] However, in such cases the copyright holder may still claim reasonable royalties for the use of the copyrighted work.[87] This means that if anyone unknowingly uses a musical work that copyright subsists for commercial purposes, they may not pay damages instead they may be required to pay a reasonable royalty to the owner as compensation.[88] A reasonable royalty is one that should balance the interests of the copyright owner and the user.[89]

Furthermore, the Copyright Act allows anyone with an exclusive license to use the musical works and have the same rights as those of the owner and can therefore, take action against illegal users.[90] This means that if a person acquires a license to legally use works where copyright subsists, they acquire the same rights the owner is afforded and in cases of infringement can make a claim for damages.

The South African Copyright Act provides provisions,[91] of penalties for copyright infringement, outlining the specific actions that constitute offences. Under the Act, any individual with knowledge

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[83] Ibid.
[84] Ibid.
[85] Copyright Act s24.
[86] Ibid s24(2).
[87] Ibid.
[88] *South African Music Performance Rights Association v Foschini Retail Group* (Pty) Ltd (50/2015) [2015] ZASCA 188; [2016] 2 All SA 40 (SCA) (30 November 2015).
[89] Ibid.
[90] Copyright Act s25.
[91] Ibid s27(1) to (7).

that copyright subsists in a work and proceeds to make, sell, import, display or distribute copies of that work without the permission of the owner and to such a degree, which harms the owner's copyright, is guilty of an offence.[92] This applies only if the infringement is intentional, done for profit, and does so to the extent that prejudices the owner. Additionally, a person who knowingly possesses infringing copies with awareness that they will be used to produce further infringing copies is also guilty of an offence under the Act.[93] Beyond reproduction and distribution, the Act criminalises the unauthorised public performance of a copyrighted work. Any individual who knowingly performs, or causes the performance of a copyrighted protected work in public without the owner's consent is guilty of an offence.[94] Any person found guilty of the above offences shall be liable to a stipulated fine and imprisonment for less than a year or six months depending on the specific offence.[95]

While the Copyright Act does not provide for a 'Notice and Take Down Procedure,' which is found in s77 of the Electronic Communications and Transactions Act. This mechanism can be used to address online copyright infringement, typically requiring ISPs to remove infringing content upon notification. This system enables copyright holders to alert internet service providers of infringing content, consequently, prompting removal of the infringing content.[96] Internet service providers which provide web access and digital services are generally not held liable for hosting, caching, storing, transmitting, and linking or referring to unauthorised content under the Electronic Communications and Transactions Act.[97] However, upon receiving a takedown request internet service providers must act to remove infringing content. The process begins with copyright holders and internet service provider's monitoring online platforms for unlawful content.[98] Once the infringement is detected the copyright holder submits a formal notice of infringement which includes a location, proof of copyright ownership, and a statement by the standards of honesty stating the infringement.[99] The internet service providers evaluates the notice to establish lawful compliance, and once the verification is complete, the service provider disables or removes access to the copyright material. Thereafter, the infringer is then notified of the takedown and the rationale behind the

[92] Ibid s27(1) para (a) to (f).
[93] Ibid s27(2).
[94] Ibid s27(3).
[95] Ibid s27(6) and (7).
[96] Alex Cominos 'Intermediary Liability in South Africa' available at *https://www.apc.org/sites/default/files/Intermediary_Liability_in_South_Africa-Comninos_06.12.12_0.pdf*, accessed on 20 October 2023.
[97] ECTA s73 to s75.
[98] Cominos op cit note 96.
[99] ECTA s77.

takedown of the content.[100]

Although internet service providers play a major role in enforcing copyright, the downside of this is that internet service providers are protected from liability and therefore cannot be held responsible for infringement of an individual on their network while hosting.[101] Therefore, individuals cannot claim any damages from internet service providers and it is extremely challenging copyright holders to claim from individual infringers mainly due to global restrictions. Additionally, internet service providers can over block copyright content due to the possible implementation of automated systems.[102] These systems are put in place to detect and block copyright content; however, these systems may mistakenly block legitimate content, consequently, resulting in the unintentional suppression of legal uses of copyright work.[103] Implementing effective enforcement requires extensive resources and complex technologies which large internet service providers can possibly afford, however, small to medium sized internet service providers may not have enough resources to employ costly and complex technologies placing a great burden on them trying to effectively enforce the law.[104]

Lastly, the use of technological protection measures such as the employment of Digital Rights Management technologies, which take many forms and this study, will focus on the technologies that apply to copyright protection in the music industry context. Digital rights management is the governance of legal access to digital content executed using various tools and technologies to secure digital data including copyright works from being unlawfully reproduced, modified, amended, and redistributed.[105] It is a form of security mostly used by businesses or copyright owners to protect their digital content because it enables content creators and owners to retain control over the functionality and uses of their work.[106] Digital rights management is mainly used to limit digital copyright infringement and gives solutions for businesses and copyright owners to protect themselves from copyright infringement in digital environments.[107] Digital Rights management technologies or systems make it extremely challenging to share music files across computers and therefore limiting

[100] Ibid.
[101] Ibid.
[102] Cominos op cit note 96.
[103] Ibid.
[104] Ibid.
[105] Buhse Willms 'Digital Rights Management for Music File sharing Communities' (2001) 26 *AMCIS Proceedings* available at *http://aisel.aisnet.org/amcis2001/296*.
[106] Ibid.
[107] Ibid.

illegal file sharing activities among peers.[108]

On the other hand, digital rights management limits access to copyrighted content and this makes it harder for consumers to use products in a manner that pleases them.[109] For example, the digital rights management technology might limit the number of devices that can play the music or restrict the copying and sharing of the songs.[110] Consequently, sometimes limiting access to information as digital rights management technology only serves the rights of the owners or authors.[111] Due to the nature of digital rights management, that restricts how a product is used, most consumers are discouraged and are more likely not to purchase the work.[112] This is because most consumers feel like they are not maximizing on the value of the product because of the limitations imposed by digital rights movement.

Concerning the music industry, one of the enforcement methods employed is the copy protection method. This method restricts access to digital content by preventing users from reproducing copies of the protected file.[113] The copy protection method is commonly accomplished through encryption and only devices with the required key or code will be able to access the protected digital files.[114] Another method is the permission management method which places limitations on the number of users and who can access the digital files. This method is intended to function only on approved hardware and software.[115] While digital rights management technologies are criticised,[116] for its user experience and access to material they serve as a preventative measure enforcing legal consequences for individuals who attempt to bypass restrictions imposed by copyright, and its implementation is crucial to the sheltering of intellectual property rights of members in the music industry.[117]

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[108] Ibid.
[109] Linlang Zhang, et al 'Optimal piracy control and pricing strategies considering quality degradation: The effects of policy instruments' (2021) 48 *Electronic Commerce Research and applications* 6.
[110] Ibid.
[111] Ibid.
[112] Ibid.
[113] Fleischmann, op cit note 1.
[114] Malebakeng Agnes Forere, 'Keeping up with the Developments in Technology: A Look into the Music Industry and the Copyright Laws in Southern Africa', (2019) 7 *South African Intellectual Property Law Journal* 31-52.
[115] Snelling, Alexander Peter 'Digital Piracy: How the media industry is being transformed' available at *https://m.riunet.upv.es/handle/10251/35922*, accessed on 22 October 2023.
[116] Paul Petrick 'Why Drm Should Be Cause for Concern: An Economic and Legal Analysis of the Effect of Digital Technology on the Music Industry' available at *https://papers.ssrn.com/sol3/papers.cfm?abstract_id=618065*, accessed on 20 October 2023.
[117] Ibid.

3.8 DEFICIENCY IN THE CURRENT COPYRIGHT REGIME IN THE DIGITAL ERA

The Copyright Act has limited provisions for digital works as its outdated provisions do not fully accommodate rapid technological advancements. Consequently, the absence of specific provisions to address the contemporary digital challenges creates difficulties in enforcing copyright law effectively.[118]

A major challenge is the inadequate protection against online digital infringement. Contemporary technology enables the prohibited use, distribution, and reproduction of copyrighted works on a global scale.[119] Digital tools enables users to reproduce audio with minimal quality loss, rendering duplicates nearly indistinguishable.[120] Given the expansive nature of technology, identifying infringing parties is strenuous and economically taxing.[121] Additionally, the fundamental right to privacy,[122] poses a significant obstacle to the enforcement of copyright laws as tracking copyright infringement online without violating privacy remains a legal and practical challenge.

Furthermore, the Copyright Act does not include safe harbour provisions which are found in the Electronic Communications and Transactions Act nor sanctions for circumventing technological protection measures, which are provided for in the Cybercrimes Act. The lack of copyright specific anti-circumvention provisions makes it more challenging to hold violators responsible.[123]

Lastly, while the Copyright Act provides a basic framework for royalty payments, it lacks mechanisms to ensure transparent and efficient distribution to all entitled parties.[124] Although it provides a framework for compensation, the Copyright Act falls short in effectively safeguarding the rights of entertainers, producers, and authors to receive fair remuneration under equitable and transparent contractual terms.[125] The gap in enforcement and oversight makes it challenging to effectively implement copyright protection in the digital age, as creative works are easily reproduced and distributed online. Furthermore, the Act leaves remuneration to private agreements, which often

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[118] Marcus Riby-Smith 'South African copyright law –the good, the bad and the Copyright Amendment Bill' (2017) 12 *Journal of Intellectual Property Law & Practice*216 at 220.
[119] Ouma op cit note 82.
[120] Ibid.
[121] Ibid.
[122] Section 14 of the Republic of South Africa Constitution.
[123] Tana PistoriusI; Odirachukwu S. Mwim 'The Impact of Digital Copyright Law and Policy on Access to Knowledge and Learning' (2019) 10 *Journal of the Reading Association of South Africa*1 at 4.
[124] David Hesmondhalgh et al 'Music Creators' Earnings in the Digital Era' available at *https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4089749*, accessed on 1 November 2023.
[125] Ibid.

have a negative impact on authors and performers.[126] In many cases, authors and performers assign their rights in perpetuity, sometimes without fully understanding the long-term implications. This is particularly common in commissioned works, where copyright typically vests in the commissioner rather than the creator. As a result, authors may have limited control over how their works are used and monetised, and some receive inadequate compensation under certain contractual arrangements.[127] As a result, authors may have limited control over how their works are used and monetised, and some receive inadequate compensation under certain contractual arrangements.

Therefore, in most instances, authors have little control over how their works are used and monetised and they often receive unfair compensation under some contractual agreements. In practice, royalty rates for artists working with record labels typically range between 10% to 25%, although in specific cases they may reach up to 50%, depending on factors such as retail pricing and revenue from streaming platforms.

In addition to these challenges, collecting societies in South Africa, such as SAMRO, have faced criticism for inefficiencies in royalty distribution. For example, SAMRO licenses music to business and individuals, collects the corresponding fees, and distributes royalties to artists. However, this process operates on an annual payment cycle, resulting in delayed payment. These delays coupled with instances of and withheld royalties, exacerbate the financial challenges faced by creators and highlighting the need for reform to address systematic inefficiencies in the current system.

3.9. **COPYRIGHT AMENDMENT BILL**

In light of the shortcomings of the current South African Copyright Act, the parliament of South Africa has over the years taken crucial steps to align the intellectual property laws, in particular copyright law to grapple with the contemporary technological issues present. Initial reform commenced in 2009 with the Department of Trade, Industry, and Competition aiming to tackle concerns such as unfair distribution of royalties by collecting societies to artists.[128] Therefore, prodding the drafting of the Copyright Amendment Bill to address these concerns and amend the

[126] Malebakeng Agnes Forere 'Reforming the Right to Remuneration in the South African Copyright Amendment Bill' available at *https://digitalcommons.wcl.american.edu/research/67/* accessed on 20 November 2023.
[127] Ibid 7.
[128] Klaus D Beiter et al., 'Copyright Reform in South Africa: two joint opinions on the Copyright Amendment Bill' (2022) 25 *Journal of Potchefstroom Electronic Law*.

1978 Copyright Act. The Copyright Amendment Bill B13D-2017[129] underwent extensive public consultation before being approved by the National Assembly in December 2018 and the National Council of Provinces (NCOP) in March 2019.[130] However, in June 2020, the President referred the Bill back to Parliament, citing concerns over its constitutionality. After additional modifications and public hearings, both Houses of Parliament passed a revised version of the Bill in September 2023. In February 2024, the National Assembly adopted the NCOP's modifications, and the Bill—now referred to as the Copyright Amendment Bill [B13F]— was returned to the President's office for assent on the 10th of October, where it is currently awaiting final approval.

The Bill aims to advance economic interests while concurrently accommodating technology advancements.[131] The Copyright Amendment Bill [B13F-2017] seeks to modernise South Africa's copyright framework by aligning it with the digital environment and bringing domestic law in line with international standards. The Bill has been drafted to comply with the WIPO internet treaties, namely the WIPO Performances and Phonograms Treaty (WPPT) and the WIPO Copyright Treaty (WCT). Amending the Copyright Act will enable South Africa to accede to these treaties, as alignment with international obligations is a prerequisite for accession.[132]

The proposed amendments seek to protect the economic interest of the authors and creators of works by preventing unauthorised and unlawful exploitation of their works, while also fostering innovation and creative activities.[133] Notably, the Bill seeks to introduce provisions for equitable remuneration and royalty distribution, after assignment of literary or musical works.[134]

Clause 5 of the Copyright Amendment Bill [B13F-2017] seeks to introduce section 6A into the Copyright Act, with the aim of ensuring that creators of literary and musical works receive fair compensation for the use of their works, even after assigning their copyright or granting a license for use. This provision defines "royalty" as the gross profit created by the exploitation of a work and provides the author's right to equitable compensation or a fair portion of royalties, unless otherwise agreed.[135] To give effect to this right, section 6A will require that the author and the copyright owner

[129] Copyright Amendment Bill [B13F] 2017.
[130] Klaus D Beiter et al op cit note 128.
[131] Ibid.
[132] Copyright Amendment Bill [B13F] 2017.
[133] B13F 2017.
[134] Clause 5 s6A of the Copyright Amendment Bill [B13F] 2017.
[135] Clause 5 s6A (1) Copyright Amendment Bill [B13F] 2017.

or authorised user enter into a written agreement outlining the terms of payment, the rights and obligations of each party, and a mechanism of dispute resolution.[136]

For sound recordings, Clause 11 of the Bill proposes section 9A into the Copyright Act.[137] It states that, 'that any person or entity that broadcasts, publicly performs, or streams a sound recording must pay equitable remuneration to the copyright owner and performer.' This remuneration must be agreed upon or determined by an appropriate authority. This will ensure that performers and copyright holders of sound recordings are adequately compensated when their work is exploited commercially. The section also seeks to introduce reporting requirements, that would obligate businesses to register and disclose their use of copyrighted recordings.[138]

The Copyright Amendment Bill [B13F-2017] seeks to reinforce creators' moral rights by expanding the categories of works to which these rights apply, updating terminology, and clarifying that authors retain the right to enforce their moral rights in court even after assigning copyright ownership.[139]

The Bill proposes a new section 22B, which would provide that collecting societies may not lawfully collect royalties on behalf of artists, composers, and performers unless they are accredited by the Commission. Accreditation would require collecting societies to meet strict criteria, including compliance with transformation objectives, effective royalty management, and sound governance practices. These requirements aim to enhance accountability, equity, and transparency in the collection and distribution of royalties.

By introducing these standards, the Bill seeks to protect artists, songwriters, and performers from exploitation by unregulated or poorly managed entities that may mishandle funds or resources. It ensures that only competent and law-abiding collecting societies operate in the sector.

Furthermore, the Bill proposes section 22D, which would empower authors, performers, and copyright holders with direct oversight of the collecting societies managing their rights. This provision is intended to guarantee transparency in operations, ensure fair and timely royalty payments, and limit the use of funds strictly to the benefit of rights holders. [140]

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[136] Clause 5 s6A (2) Copyright Amendment Bill [B13F] 2017.
[137] Clause 11 s9A (1) Copyright Amendment Bill [B13F] 2017.
[138] Clause 11 s9A (1) para (e) Copyright Amendment Bill [B13F] 2017.
[139] Clause 23 s20 Copyright Amendment Bill [B13F] 2017.
[140] B13F 2017 s22D (1) para (a) to (c).

Importantly, the Bill also proposes that royalties must be disbursed as soon as reasonably possible—but no later than five years after collection—and that artists must receive regular, detailed reports on the management of their royalties. Undistributed royalties would be required to be held in interest-bearing accounts and paid out with accrued interest upon request..[141]

The Copyright Amendment Bill [B13F-2017] seeks to introduce a hybrid approach by repealing and replacing section 12 of the Copyright Act with sections 12A-12D, blending aspects of both fair dealing and fair use. This approach would permit a broader range of uses of copyrighted works without prior authorization, provided such use is deemed reasonable, while still retaining certain limitations characteristic of the fair dealing doctrine.[142]

Additionally, the Bill proposes new and amended provisions that would criminalise the manipulation and misuse of information managing copyright and the circumvention of technological protection measures.[143] It also seeks to establish offences for persons who knowingly present infringing works to the public and unlawfully by pass technological protection measures implemented by authors to protect their works.[144]

3.10. **CONCLUSION**

Technology advancements challenge current copyright laws and demand a dynamic and accommodative legal framework. Technology has played a dual role in the protection of intellectual property while affording tools to enforce intellectual property law concurrently, it has provided an ease in reproduction of copyright content.[145] While attempts have been made to grapple with the challenges posed by technology advancements, it is a continuous process. The South African Copyright Act is fundamental to the music industry, however, confronted by digital advancements it grapples with limitations that render it outdated and insufficient in effectively dealing with digital copyright infringement. More specific provisions that directly tackle the problems presented by technology advancements are needed. In enforcing these laws digital copyright infringement makes it challenging to enforce them and therefore rely on civil and criminal remedies to help enforce these

[141] s22D (3).
[142] Clause 15 s12A.
[143] Clause 31 s28O.
[144] B13F 2017.
[145] David Bach "The Double Punch of Law and Technology: Fighting Music Piracy or Remaking Copyright in a Digital Age?" (2006) 6 *Business and Politics Journals* 3.

laws.[146] Although two international treaties were drafted to deal specifically with online copyright infringement in the digital environment South Africa has not ratified to it. These treaties set the minimum standard of copyright protection in the digital realm and address the regulation of technological protection measures and addresses the circumvention of these technologies. Despite South Africa not being ratified to the WCT, South Africa is in line with the internet treaties with laws such as the anti-circumvention provisions.[147] The drafting of the Copyright Amendment Bill 13F-2017 reflects the minimum standards of protection of copyright work in the digital era provided for by the internet treaties, however, it is not in effect yet. Despite the efforts of the music industry, digital copyright infringement is still prominent in the music industry, and to combat infringers' methods of circumventing the law, present procedures must be constantly reviewed and updated to match contemporary advancements.[148]

This chapter reflects on the response taken by the music industry in reducing digital copyright infringement in the music industry. This effort involves the utilisation of certain technologies like digital rights management and takedown notices. These technologies have proven to be effective in enforcing copyright law and bringing awareness to users regarding potential infringements or when they have infringed on a protected work. Regardless of the efficacy of these technologies, some users do circumvent or attempt to circumvent their capture.[149] Although such provisions,[150] criminalises the circumvention of technologies and protect internet service providers from liability while hosting users on their network, digital copyright infringement persists and is the most practiced copyright infringement activity in the music industry.[151] This prods the need for advanced emerging technologies that have the potential to create robust enforcement mechanisms and simultaneously tackle digital copyright infringement.

South Africa's continuous efforts,[152] to try and align copyright to the digital era and reduce digital copyright infringement are essential in helping to establish a legal framework as technology continues to transform how creative content is created and disseminated. It is a journey characterised by a never-

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[146] Ibid.
[147] Cybercrimes Act s2.
[148] Bach op cit note 145.
[149] Ibid.
[150] Cybercrimes Act s2 and ECTA s73 to 75.
[151] Exploring Copyright Infringement in the Music Industry, available at *https://www.yellowbrick.co/blog/music/exploring-copyright-infringement-in-the-music-industry#:~:text=One%20of%20the%20most%20common,peer%2Dto%2Dpeer%20platforms*, accessed on 22 October 2023.
[152] Copyright Amendment Bill [B13F-2017] supra note 132.

ending search for a balance between protecting creators' rights and fostering a digital environment that fosters creative thinking and access to information.[153] The following chapters focus on the nature of digital copyright infringement and the implications it has on the music industry and its members. Additionally, emerging technologies can help mitigate digital copyright infringement and create robust enforcement mechanisms.

[153] Flynn, Sean "Copyright Legal and Practical Reform for the South African Film Industry." (2015) 16 *The African Journal of Information and Communication*38 at 39.

CHAPTER 4

EMERGING TECHNOLOGIES TO HELP MITIGATE DIGITAL COPYRIGHT INFRINGEMENT IN THE MUSIC INDUSTRY

4.1 INTRODUCTION

The dynamic nature of technology makes it beneficial for development, innovation, and the promotion of intellectual property. However, the relentless evolution of technological aspects exerts pressure on the law, particularly copyright law to harmonise with these dynamic changes and execute effective enforcement.[1] This phenomenon is particularly noticeable within the music industry as novel technologies including peer-to-peer networks have enabled the illegal dissemination of copyrighted music works, consequently, exerting significant pressure on existing legislative constructs.[2] This makes it challenging for traditional forms of enforcement to tackle digital copyright infringement in the music industry.[3] The music industry is constantly engaging in vigorous efforts to navigate the abrupt change emanating from digital copyright infringement and emerging technologies may offer a solution to reducing digital copyright infringement and promoting effective enforcement.[4]

New technologies like artificial intelligence and blockchain-based smart contracts can assist in the fight against digital copyright infringement in the music industry.[5] Artificial intelligence is a modern approach for processing and comprehending data to replicate the reasoning processes of the human mind. It is the ability of machines or computer systems to mimic human processing.[6] Artificial intelligence has the potential to deliver outcomes that are speedy and neutral, and it can acquire knowledge through experiences. A possible solution to digital copyright infringement lies in the integration of artificial intelligence into the intellectual property rights system.[7] Artificial intelligence can be used to detect intellectual property infringements and minimise unlawful use of copyrighted materials. For example, sites like YouTube use AI-powered technologies like Content ID to detect

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[1] Zatarain Jesus Manuel Niebla 'Artificial Legal Intelligence on the Internet: The Next Approach to Enforcing the Law Online' (2015) 2 *Edinburgh Student Law Review* 64.
[2] Ibid.
[3] Ibid.
[4] Ibid at 65.
[5] Ibid.
[6] Ibid.
[7] Na Li, 'Combination of Blockchain and AI for Music Intellectual Property Protection' (2022) 1 *Computational Intelligence and Neuroscience*1 at 2.

and handle copyrighted music and movies. Content ID scans uploaded content, compares it to a database of copyrighted works, and detects potential infringements, enabling content owners to claim and commercialize their work. Similar AI-powered tools are being employed to protect copyrighted content on streaming services and social media platforms.[8] The amalgamation of artificial intelligence with the intellectual property system has the potential to establish a secure platform for copyright holders to protect their creations.[9] This is because systems powered by artificial intelligence can process significant amounts of data, identify patterns and trends and accelerate operations that are ordinarily tedious and lengthy.[10] Therefore, artificial intelligence could serve as a vital instrument in identifying and avoiding digital copyright infringements using artificial intelligence algorithms which can investigate auditory fingerprints and recognise instances of infringement.[11] In doing so they empower rights holders in safeguarding their works and enforcing copyright restrictions. By employing artificial intelligence technologies, record companies can digitally manage essential aspects of intellectual property administration such as ownership monitoring, licensing, and copyright registration for other countries as registration is not a requirement in South Africa.[12]

The artificial intelligence technologies that can be used to mitigate digital copyright infringement and promote effective copyright enforcement are blockchain technology, machine learning, content-based MIR (Music Information Retrieval)/ Content identification like audio fingerprinting and digital watermarking.[13] Content-based MIR, such as audio fingerprinting and watermarks, can be used to detect infringed copies. The fingerprinting technique essentially detects infringed files however, it also offers various advantages to consumers such as facilitation of efficient browsing by locating a precise match for a search.[14] Secondly, it ensures download authenticity by fetching exactly what the name implies. Finally, the user can utilise it to arrange their personal music collection by correctly labelling the meta-data.[15] This chapter therefore, examines in detail the emerging technologies

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[8] Ibid.
[9] Khare Aryan and Kumar Singh Ujjwal and Kathuria Samta *et al* 'Artificial Intelligence and Blockchain for Copyright Infringement Detection' available at *https://ieeexplore.ieee.org/abstract/document/10212277?casa_token=zLp4iQdmuPYAAAAA:RVXLOIak6iVWy96TiVE4nWSxH4iH6kqOD9Vr1yhFHfsyCCyiuxUYYnqgoIArt33fhEBlyc_wwqc*, accessed on 21 August 2023.
[10] Sean Tu 'Use of Artificial Intelligence to Determine Copyright Liability for Musical Works Shine' (2021) 123 *The Research Repository* 855.
[11] Ibid.
[12] Mohammed Ali Al-Garadi 'A Survey of Machine and Deep Learning Methods for Internet of Things (IoT) Security' (2020) 22 *IEEE COMMUNICATIONS SURVEYS & TUTORIALS* 1650.
[13] Ibid.
[14] Prarthana Shrestha Ton Kalker 'Audio Fingerprinting in Peer-to-Peer Networks' available at *https://www.researchgate.net/publication/220723029_Audio_Fingerprinting_In_Peer-to-peer_Networks* accessed on 20 June 2023.
[15] Ibid.

available for the creation of robust enforcement mechanisms to help reduce digital copyright infringement.

4.2 BLOCKCHAIN TECHNOLOGY

Blockchain technology is a peer-validated decentralised digital ledger that presents permanent and transparent records in chronological order.[16] It contains an advanced distributed database that stores data in chain-linked blocks that grant transparent data transmission between networks.[17] Blockchain technology functions by storing data in a decentralised but secure manner, where a transaction is created, and presented in block form containing a digital fingerprint called a 'hash' which is then transmitted to all networks or parties within that network for validation.[18] Once the block is validated it is then linked to the previous block forming a chain structure and should a change occur, all networks are notified and must validate the change before the block is added, removed, or altered.[19] This design makes blockchain extremely difficult to hack thereby ensuring transparency, consensus, security, and a digital trace or footprint of each transaction.[20] Originally blockchain technology was created for cryptocurrency. However, the core principals of blockchain technology have the potential to positively impact various industries, including the music industry.[21] The nature of blockchain technology proves to be beneficial to the music industry by potentially establishing a channel to reduce digital copyright infringement through, transparency, licencing and providing a universal database for music copyright.[22]

One of the most significant challenges facing the South African music industry is the inefficiency of collecting societies, which are often plagued by delayed payments, a lack of accountability, and limited transparency. As intermediaries responsible for ensuring that artists receive their royalties, their effectiveness has increasingly come into question. Given the ongoing challenges artists face in accessing timely and fair compensation, blockchain technology presents a promising solution—

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[16] Larry Michael & Cristina '*The Cambridge Handbook of Smart Contracts, Blockchain Technology and Digital Platforms*' (2019) 162.
[17] Ibid.
[18] Sabrina K. Escalona 'Digital Music Piracy Beget; A Revitalization of Copyright Law?' available at *https://digitalcommons.usf.edu/honorstheses/253/*, accessed on 5 August 2023.
[19] Ibid.
[20] Ibid.
[21] Ibid.
[22] Ibid at 35.

offering transparency, decentralisation, and automated systems that could streamline and enhance royalty payment processes.

Firstly, the music industry can employ blockchain technology to reduce digital copyright infringement by operating music on blockchain systems, as blockchain technology can enable the tracking of copyright ownership by functioning as a decentralised rights database.[23] One of the cause of digital copyright infringements is that consumers are unaware of the right holders. Since blockchain can store vast amounts of data it could potentially help with consumers identify the copyright owner by establishing a copyright database of songs which will help users identify who the owner of a work is through the database.[24] If an individual illegally copies music on a platform that operates with blockchain technology, the platform can detect the illegal activity, where it was copied, and who or which server it stemmed from, easing the challenge of tracking derivative works.[25] Blockchain technology brings about fundamental change because it operates as a network and database, where information is stored on a public ledger, this promotes transparency and in turn makes it easy to verify ownership thereby reducing confusion and unauthorised use of works.[26]

Secondly, blockchain technology can establish a decentralised relationship between consumers and musicians, artists, and copyright holders by providing more affordable platforms, consequently, abolishing the need for intermediaries and promoting a peer-based music platform.[27] Blockchain technology operates using nodes which would be the artists, right holders of record labels and consumers thereby, giving artists or record labels and right holders more advantage, and control as well as providing cost effective music purchase for consumers.[28] Additionally, blockchain can discourage digital copyright infringement by offering rewards, bonuses and discounts to users or consumers by participating, listening and distributing music on that platform, which motivates consumers to carry out legal distribution and purchase of music.[29]

Furthermore, blockchain-based smart contracts can assist in issuing licenses to users who want to use

[23] Ibid at 36.
[24] Marcus O'Dair, Zuleika Beaven 'The Future of Money and further Applications of the Blockchain' (2017) 26 *Strategic Change Journal*417 at 420.
[25] Escalona op cit 18.
[26] Beaven op cit note 24 at 420.
[27] Almigdad Yahya 'Music Royalty Payment Scheme Using Blockchain Technology' available at *https://ieeexplore.ieee.org/document/9604559*, accessed on 5 August 2023.
[28] Ibid.
[29] Ibid.

copyrighted content. Smart contracts are software programs that run when certain requirements are achieved and remain accessible on a blockchain.[30] They are frequently employed to automate the application of an agreement so that each party is assured instant outcome, eliminating the assistance of a third party or an expense.[31] Smart contracts operate by encoding simple commands into blockchain code. Once pre-set conditions are met and validated, a network of computers executes these commands.[32] This can eliminate inefficiencies in manual licensing by automatically granting permissions based on predefined rules and ensuring far compensation for artists.

Smart contracts allow for instant royalty payments to artists. Currently, royalty payments take place a few times in each year, and some take longer to pay however, blockchain technology can make royalty payments instantly or after a user listens to a song.[33] Each license is uniquely encoded in a file which functions through the hash feature of blockchain, ensuring all the artists' information is then stored in a block that automates payments when streaming or listening to a song, essentially functioning as micropayments.[34] The transparency and immutability of blockchain technology allows right holders to release their rights and works and blockchain will then automatically issue license to users on request.[35] This helps users who desire to use copyrighted works but have no information on the owner or cannot reach the owner to obtain a license. Therefore, encouraging consumers to seek permission to use copyrighted works and reduce costs of scouting for the owner and artists can be compensated and have their moral rights recognised and respected.

Lastly, although blockchain based systems offer potential benefits to the music industry, they are currently not legally enforceable under the South African copyright law. To fully integrate this technology, copyright law must be amended to recognise and regulate blockchain-based collecting societies, ensuring fair and transparent operations.[36] Given that information on a blockchain is stored across a distributed network rather than in a centralised database, all participants can access the same verified transaction data, which enhances transparency and trust.[37] Additionally, blockchain

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[30] Yahya op cit note 27.
[31] Ibid.
[32] Ibid.
[33] Sciaky, Davide 'The digital transformation of the music industry through applications of blockchain technology' available at *https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1375894&dswid=-209* accessed on 27 July 2023.
[34] Ibid.
[35] Beaven op cit note 24 at 421.
[36] Ignacio De Leon Ravi Gupta 'The Impact of Digital Innovation and Blockchain on the Music Industry' available at *https://publications.iadb.org/publications/english/viewer/The-Impact-of-Digital-Innovation-and-Blockchain-on-the-Music-Industry.pdf* accessed on 5 July 2023.
[37] Ibid.

technology contains immutable ledgers which means that the data cannot be altered or tempered with making it accurate, secure and reliable.

4.3 SMART CONTRACTS

Smart contracts obtain their functionality through blockchain technology, an inherently decentralised technology (DLT). It is the decentralised nature that ensures that smart contracts remain impermeable to cyber-attacks and thereby increasing security and confidence in their execution.[38] Smart contracts can automate royalty payments as they contain pieces of code that execute transactions when certain conditions are met, giving users access to digital works and once the remuneration is generated the smart contracts automatically distribute royalties into the accounts. The blockchain platform that supports smart contracts in the music industry is the Ethereum, which is a decentralized platform that enables their execution.[39] Ethereum is a publicly traded, open source blockchain network that originally used a Proof of work consensus mechanism but has since transitioned to a more efficient Proof of Stake model.[40]. One of Ethereum's most important features is the Virtual Machine (EVM), which enables smart contract to automatically function. Smart contracts are self-executing in nature; therefore, these contracts have the capacity to efficiently automate regular transactions, resulting in significant lowered expenses.[41]

Secondly, smart contracts enable transparent revenue sharing by establishing revenue-sharing agreements between the parties in the music industry, which are the artists, record labels, and producers.[42] They enable the creation of design that enhance the distribution of stipulated fees, even in small amounts thus establishing micro-payments.[43] The transparency makes sure that all parties involved receive their fair compensation and eliminating disputes between parties.

Thirdly, smart contracts enable immutable record-keeping as all smart contracts are stored and recorded on the blockchain, which creates a perpetual record. Thus, ensuring that ownership rights,

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[38] Nautiyal, Radhika and Jha, Radhey Shyam and Bahuguna, Rajesh *et al* 'Amalgamation of Blockchain and Smart Contracts in Copyright,' available at *https://ieeexplore.ieee.org/document/10072582*, accessed on 15 August 2023.
[39] Ibid.
[40] Mouloud Kessir, 'Blockchain In The Music Industry: A Study of Token Based Music Platforms' available at *https://projekter/files/311422024/Master_thesis_report_Mouloud_Kessir.pdf*, accessed on 26 July 2023. .
[41] Bala´zs Bodo, Daniel Gervais and Jo~ao Pedro Quintais 'Blockchain and smart contracts: the missing link in copyright licensing?' (2018) 26 *International Journal of Law and Information Technology* 311-336.
[42] Neysen, 'Blockchain and Smart Contracts in the Recording Industry' (2020) 23 *European Research Studies Journal* 174 at 180.
[43] Ibid.

licensing agreements, and revenue-sharing terms are permanently documented, making it easier to verify rightful owners and reducing the risk of unpaid royalties.[44] Thus, by providing an auditable, tamper- proof history of ownership and transactions, smart contracts aid in reducing digital copyright infringement which therefore makes it harder for unauthorised parties to claim or exploit such works.

However, obstacles persist, involving ambiguities about the alignment of code-based contracts with traditional contract law, the oversight of unknown parties within blockchain-driven smart contracts, solving breaches, navigating legal jurisdiction issues, and settling disputes.[45] In cases where an artist wishes to challenge or renegotiate terms, the immutable nature of smart contracts may present issues with modification, as that requires network consensus. These ambiguities have the potential to limit their use in increasingly complex copyright licensing schemes on blockchain systems.

4.4 DIGITAL AUDIO FINGERPRINTING

Audio Fingerprinting is technology employed to tackle digital copyright infringement and involves the process of creating a unique signature or fingerprint that will be used to identify and track content across digital platforms.[46] It is normally applied in music identification, content-based retrieval and copyright protection. It enables for music audios to have their own fingerprint similar to a music ID and this is achieved through the technology analysing songs by examining the details in each song such as the melody, rhythm and other characteristics.[47] The original audio fingerprint and prospective fingerprint are then compared to assess if the candidate fingerprint matches the original fingerprint.[48] The process of identifying unique audio characteristics is achieved through cross-correlation which is crucial in identifying copyrighted material used unlawfully.[49] In instances of content identification in the music industry, the technology operates by collecting and storing musical elements from audio material and it is the extraction of the essential components of the audio that makes it resilient to attacks, and an attempt to remove the information can easily be detected because it will alter the quality of the audio.[50] Unlike watermarking that requires prior analysis of the existing data to create

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[44] Ibid.
[45] Ibid.
[46] Healy Ron 'Digital Watermarking for broadcast monitoring and content identification' available at *https://mural.maynoothuniversity.ie/1971/*, accessed at 27 July 2023.
[47] Ibid.
[48] Ibid.
[49] Ibid 18.
[50] Leandro de C.T. Gomes, Pedro Cano, *et* al 'Audio Watermarking and Fingerprinting: For Which Applications?' (2003) 32 *Journal of New Music Research*1 at 5.

a mark that will then be embedded, fingerprinting extracts the most relevant components of the existing audio.[51] Therefore, when a user uploads music or shares music online, fingerprinting technologies will inspect for any audios with the same signature or fingerprint. The unrecognized portion of audio information is delivered, its characters are examined and compared to those in the existing database, if matches are found it suggests that a copyrighted audio is being used without permission.[52]

Fingerprinting systems use massive databases to preserve digital versions of copyrighted songs, and when new files are uploaded to a system-enabled web site, it searches the database for matches.[53] Depending on whether it is licensed for use on the site, copyrighted information can then be restricted or posted.[54] An ideal audio fingerprinting system must be accurate, secure, computationally efficient and robust enough to be able to identify and extract the fingerprint despite going through distortions during the transmission channel.[55] Audio fingerprinting technology is commonly applied in music recognition to extract unique properties of songs or signals, facilitating accurate retrieval from millions of databases.[56] An effective investigating algorithm is needed for reliable outcomes with the simplest technique being direct comparison of digitalised waveforms.[57] One of the reasons why fingerprinting technologies are beneficial is because of their accuracy in identifying songs and services like Shazam and Sound Hound utilise the fingerprinting technologies to identify songs, especially in the background. The technology makes use of advanced algorithms which examine the distinct characteristics of the audio.[58]

Secondly, audio fingerprinting can be used to protect copyright content from unlawful use. The nature of the technology facilitates for content creators to track their content over the internet and detect infringements of their works.[59] It enables real-time monitoring for musicians, artists and record labels to monitor the use of their works on online platforms including streaming services and websites, and

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[51] Ibid.
[52] Ibid.
[53] Salvatore Serrano and Marco Scarpa 'Accuracy comparisons of fingerprint-based song recognition approaches using very high granularity' (2023) 82 *Multimedia Tools and Application* 31591 at 31595.
[54] Ibid.
[55] Yashwant singh Katailiha' Music Identification based on Audio Fingerprinting' (2019) 3 *International Journal of Scientific research in Engineering and Management*1 at 2.
[56] Ibid
[57] Ibid.
[58] Ibid.
[59] Myo Thet Htun, 'Compact and Robust MFCC-Based Space-Saving Audio Fingerprint Extraction for Efficient Music Identification on FM Broadcast Monitoring' (2022) 16 *Journal of ICT Research and Applications*226 at 227.

through detection be able to sue for copyright infringement should it be detected.[60] This afford right holders control over the dissemination and access of their works concurrently making it easier to enforce copyright law.[61] Fingerprinting encourages the use of legitimate content through taking action in cases of infringement. Additionally, in instances of copyright infringement lawsuits, fingerprinting technology can provide a footing for evidence in legal proceedings. In the legal proceedings it serves as a unique identifier that is difficult to replicate for various music audios.[62]

Furthermore, digital audio fingerprinting can be used in real-time analysis where audios can be analysed in real-time such as live performances. It can be utilised to analyse unlawful use copyrighted material while one is performing live.[63] Notably, it is a privacy friendly solution as it analyses audio tracks and therefore, does not require the user's information to detect infringement rendering it a non-intrusive technology.[64] Despite all its positive and accurate functions, digital audio fingerprinting falls short on identifying modified or altered audio. When the audio is altered it becomes difficult for the technology to find the perfect math and therefore, making it difficult to identifying infringement in modified audios.[65] To create a fingerprint, fingerprinting technology depends on the unique features of the audio track, therefore, if the quality of the audio is poor the system will find it strenuous to find the exact match with the fingerprint.[66] Another limitation of this technology is the noise interference, reveals that where there is extreme background noise the accuracy of the fingerprinting technique is compromised and therefore may give false positives.[67]

Instances where there is a limited database the system or technology will not be able to match the fingerprints due to some audio tracks not being available in their database. Meaning upcoming songs or less recognized songs may not be detected by the fingerprinting system due to their lack in their database, while popular audios get proper recognition.[68] Although fingerprinting is an effective technology to create robust enforcement mechanisms while mitigating digital copyright infringement,

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[60] Ibid.
[61] Ibid.
[62] Haitsma and Kalker, 'A Highly Robust Audio Fingerprinting System.' available at *http://ismir2002.ircam.fr/proceedings/02-FP04-2.pdf*, accessed on 26 August 2023.
[63] Cano et al op cit note 50.
[64] Borkar et al., 'Music Plagiarism Detection Using Audio Fingerprinting and Segment Matching.' available at: *https://ieeexplore.ieee.org/abstract/document/9587927?casa_token=O441jdAiqpQAAAAA:yhoGUoyiMQwo3LbvjhaZ5s_8DhSJJhGA_pGGtDLdaATRb11emxFTm-WgzXildEPpQ5O6Ahp787Ic*, accessed on 22 October 2023.
[65] Ibid.
[66] Ibid.
[67] Mehmood et al., 'Potential Barriers to Music Fingerprinting Algorithms in the Presence of Background Noise' available at: *https://ieeexplore.ieee.org/abstract/document/9044274*, accessed on 20 November 2023.
[68] Ibid.

the potential of utilising digital fingerprinting in conjunction with other technologies such as deep learning, artificial intelligence and Blockchain technology to improve on accuracy, efficiency and identification.[69]

4.5 DIGITAL AUDIO WATERMARKING

Watermarking has been a traditional approach used to prevent unauthorised reproduction of copyrighted works and enable easier identification of the works. One major example in understanding the concept of watermarking is the watermarking embedded in currency, which involves placing a distinctive mark on a banknote. When the note is held against the light to distinguish between a genuine or counterfeit note.[70] Another example of watermarking can be seen in images, where a transparent watermark is placed on images. The watermark may be recognisable, through the inclusion of ownership notice or the recipient's given name and, although transparent watermarks are not particularly strong; they, however, could function as a barrier to entry.[71] Watermarking generally retains a portion of steganography, which is a Greek translation for 'covered or something hidden', is mainly used for evading illegal copies; however, it can additionally be used for content detection where the watermark contains information that can be extracted by a device known as a detector.[72] Watermarking is used for content identification, ensuring the interests of the copyright holder are protected, discouraging copyright infringement, identifying any changes or attacks on the existing data, and establishing proof of copyright infringement and who tampered with or illegally acquired and distributed the data.[73]

Digital watermarking refers to a signal or communication that is encoded in digital media for copyright protection and content identification.[74] It is commonly used to protect intellectual property, authenticate the original content creator, enforce copyright, monitor the circulation of media content and prevent the unlawful use or distribution of copyrighted works such as audio recordings. To effectively prevent digital copyright infringement digital water marking to prevent, it is imperative that it must contain certain qualities namely, imperceptibility, Capacity, security and robustness.[75]

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[69] Ibid.
[70] Ibid.
[71] Eric Diehl 'Content Protection' (2008) 50 *Broadcast Engineering* 2-3.
[72] Cano et al op cit note 50.
[73] Ibid.
[74] Ibid.
[75] Megías David Kuribayashi Minoru Qureshi Amna. 'Survey on Decentralized Fingerprinting Solutions: Copyright

Imperceptibility implies that the audio watermark should not be noticeable, and the original audio output should be retained. The watermark should be clear and not degrade or distort the quality of the audio but should function as it should prior the watermark.[76] Secondly, the watermark must be robust entailing that it must be strong and powerful enough to withstand the aggressive signal processing operations.[77] Additionally, the watermark must be able hold multiple bits or digital information in an audio without losing audibility, and lastly, the watermark must be secure enough to resist ill-natured attacks and must not be detectable, and the encoded data should not be easy to extract or alter.[78] Digital audio watermarking incorporates two collective systems which are, watermarking embedding element and Watermark recovery element, commonly referred to as the extractor which detects or extracts the watermark information.[79]

Watermarking embedding can be done through either the time form or transform domain. Time domain watermarking involves encoding the watermark directly into the host audio which is achieved through changing arrays or including a pseudorandom noise sequence to the data of the audio. This technique incorporates the least significant bit coding' (LSB), which is a low bit coding.[80] LSB coding conceals noises ingrained in the acquiring process of the digital signal and modifies the least significant bit of a single sample within a digital audio stream to embed a watermark.[81] To ensure inaudibility, the watermark signal is designed before insertion shaping the watermark prior to embedding allows the system to safeguard the underlying audio signal fidelity while keeping the watermark inaudible.[82] Embedding a watermark in time domain poses fidelity and robustness problems, therefore, shaping the watermark prior to embedding allows the system to safeguard the underlying audio signal fidelity while keeping the watermark inaudible.[83]

Watermarking technology in relation to the music industry is crucial for the establishment of copyright ownership especially in cases of infringement, preventing unauthorised reproduction of

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Protection through Piracy Tracing' (2020) 9 *Computers* 26.
[76] Maha Charfeddine 'A new DCT audio watermarking scheme based on preliminary MP3 study' (2012) 70 *Multimedia Tools and Applications*1521 at1525.
[77] Ibid.
[78] Amna op cit note 75.
[79] Patil A Shelke 'Digital Audio Watermarking: Techniques, Applications, and Challenges' available at *https://link.springer.com/chapter/10.1007/978-981-16-6369-7_62*, accessed on 27 August 2023.
[80] Ibid.
[81] Ibid.
[82] Ritu Jain, Munesh Chandra Trivedi, Shailesh Tiwari 'Digital Audio watermarking; Survey' (2028) 554 *Advances in Computer and Computational Sciences* 42.
[83] Ibid.

copyrighted audio and identifying infringed content.[84] It is also usefull for metadata encapsulation that can contain the author's information, time and date of creation of works and the copyright this, making it manageable to enforce licensing agreements. [85] The embedded watermarks in the audio function as a concealed marker that contains the information about a piece of music, such as ownership details, content, and copyright information. Through specialised algorithms right holders are able to detect these embedded watermarks in instances of copyright infringement.[86] Digital audio watermarking's major advantage is its covert nature. It offers covert protection because it is characterised by an imperceptible embedded process that does not compromise the audio quality, ultimately affording listeners a consistent experience.[87] Secondly, it offers accurate traceability function to copyright holders in the music industry, through the unique and imperceptible mark embedded in the audio it is easier to trace the origins of the audio contents and this is essential in enforcing copyright and taking legal action against infringers.[88] Lastly, digital audio watermarking offers control to right holders and acts as a deterrence for infringers. Watermarks allow right holders to input information about their copyright, such as ownership, terms of use, terms of licensing agreements, and remuneration or royalties agreements promoting clear and concise communication between parties.[89] Furthermore, it acts as a deterrent to infringers because of the knowledge of the presence of a watermark, infringers are less likely to infringe on a work with knowledge of this act possible tracing back to them.[90]

On the other hand, balancing protection and audio integrity or accuracy is difficult because of the complex nature of the watermarking process. Despite the efforts made to avoid such degradation during the embedding of the water mark process, audio degradation may occur regardless.[91] Secondly, digital watermarks may be susceptible to removal due to rapid technology advancements. Measures have been taken to ensure robust watermarking technology however, technological advancements are rising rapidly and new circumvention methods are discovered or created, thereby creating a vicious cycle of constantly developing new or upgraded technology to overpower the circumvention technologies.[92] Lastly, they digital audio watermarking technology implementation is costly, and in

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[84] Ibid.
[85] Ibid.
[86] Embaby, Wahby Shalaby, and Elsayed, 'Digital Watermarking Properties, Classification and Techniques' (2020) 9 *International Journal of Engineering and Advanced Technology*2742 at 2743.
[87] Ibid.
[88] Ibid.
[89] Gudisa, 'Copyright Protection in the Digital Era' (2022) 4 *Indian Journal of Law and Legal Research*1 at 6.
[90] Ibid.
[91] Ibid.
[92] Ibid.

most cases the technology itself is very expensive to acquire. The embedding process is a complex process that involves sophisticated computerised methods which are costly to implement and therefore, making it difficult for upcoming musicians and industry members.[93]

4.6 ARTIFICIAL INTELLIGENCE MACHINE LEARNING

Machine learning is a component of artificial intelligence that enables computer programs to develop and become progressively better at making predictions based on data patterns without manually programming them to do so.[94] Machine Learning can grasp concealed patterns among data, calculated results, and optimise performance through their own experiences and use historical data to anticipate new results. There are two types of machine learning namely supervised machine learning and unsupervised machine learning.[95] Supervised learning is a type of machine learning that predicts outcomes based on pre-existing input data. The most important aspect of machine learning is that it works by providing the algorithm with labelled examples, where both input and desired output are known.[96] Supervised learning incorporates training data with a significant number of demonstrations, establishing an architecture, an error penalty, and updating algorithms to increase performance and accuracy.[97] To validate the data, the algorithm will map the known input to the known result throughout the training phase and when the training is complete, the machine will be given a new collection of unmarked "real world" data to categorise depending on its previous instruction. As a result, when the machine classifies "real world" data, it generates a conclusion between the data and the identified result.[98]

When dealing with copyright infringement the algorithm can learn about song similarities through an established "training dataset" consisting of song evaluation and categorised as "similar" or "not similar". The algorithm can then classify songs as "similar" or "not similar" or use regression analysis to calculate the percentage of similarity between songs.[99] The program can anticipate similarities in in the melodies and composition of the new songs, therefore helping in identifying copyright

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[93] Ibid.
[94] Ibid.
[95] Shine Sean Tu 'Use of Artificial Intelligence to determine Copyright Liability for Music' (2021) 123 *The Research Repository* 855.
[96] Ibid.
[97] Ibid.
[98] Ibid.
[99] Aryan Khare Ujjwal Kumar Singh Samta Kathuria *et al* 'Artificial Intelligence and Blockchain for Copyright Infringement Detection,' available at *https://ieeexplore.ieee.org/document/10212277*, accessed on 10 August 2023.

infringement in cases where the song is similar to another song.[100] On the other hand, unsupervised learning is essentially the opposite of supervised learning. The main objective with unsupervised learning is to uncover hidden patterns to draw accurate conclusions, and this is achieved by giving the algorithm unlabelled data and allowing it to discover certain patterns and learning the output with no guidance or instruction, consequently, organising similar patterns and trends between datasets. In instances of digital copyright infringement in the music industry, the algorithm will be given a few songs and explore their patterns, trends, and similarities among songs.[101] Machine learning discovers digital copyright infringement by monitoring content solutions, and it functions with a three-layered system.[102] The first system is utilised to observe user requests, while the second systems is used to research and assemble a list of legal and illegal websites and finally, the third system constructs statistics reports established on user requests and then transfers it to the administrators. The administrators will in turn send out warnings and requests to users.[103]

4.7 QUANTUM COMPUTING

Quantum computing is a rising technology that makes use of quantum mechanics to solve complex challenges that regular or classic computers cannot.[104] The technology is a computer science study takes advantage of basic main principles of quantum physics to solve complex problems quicker. It employs the fundamentals of quantum theory, which is a theory that explains the patterns and behaviours of matter and energy on atomic level.[105] While classic computers operate on bits, which is a unit of information which can store only one number, for example 1 or 0. Contrary to classic computers quantum computers operate on qubits or quantum bits which are able to exist in multiple states until measured.[106] Unlike classic computers that only store either a number, quantum computer can allow qubits to hold multiple potential state, enabling parallel computations which is normally referred to as superposition.[107] Quantum computers excel at solving specific types of problems than classic computers due to their larger space which can manoeuvre many paths simultaneously, making

[100] Sean Tu op cit note 95.
[101] Ibid.
[102] Kathuria *et al* cit note 99.
[103] Ibid.
[104] Surya Teja Marella, Hemanth Sai Kumar Parsara 'Introduction to Quantum Computing' available at *https://www.researchgate.net/publication/346739822_Introduction_to_Quantum_Computing*, accessed on 12 January 2024.
[105] Ibid.
[106] Ibid.
[107] Chris Bernhardt *Quantum computing for everyone* 2019 1.

it easier and faster.[108] Due to the ability of quantum computing to process and analyse vast amounts of data and can transform the music industry by providing new techniques for music content analysis and pattern identification.[109] Consequently, facilitates the fight against digital copyright infringement by identifying infringement patterns within the music industry data.

Quantum computing has the potential to transform the music industry particularly in copyright enforcement and the reduction of digital copyright infringement.[110] One of its primary contribution lie in cryptographic advancements could foster robust enforcement mechanisms and strengthen copyright protection.[111] This technology has the ability to circumvention any cryptographic algorithms being utilised to secure digital content in the music industry, however, the creation of quantum resistant cryptographic technique will need to be developed using quantum technology to safeguard copyrights in music and restrict illegal access to copyright files in the music industry.[112] This emerges as a more resistant alternative to enforce copyright effectively simultaneously discouraging digital copyright infringement.

Secondly, quantum computing could be used to foster enforcement through data analysis. Its ability to retain significant amounts of data could possibly enhance data analysis techniques employed in copyright enforcement.[113] The algorithms can be developed to identify the usage patterns of digital music, track the distribution of infringed content more efficiently and detect instances or cases of infringement.[114]

Quantum computing can also assistant in developing robust digital watermarks and watermarking techniques to effectively embed watermarks into the music files.[115] The watermarks will not be susceptible to breach and thereby assisting in the identification of infringed copies and content and additionally providing evidence in instances of legal proceedings in the court of law.[116] Additionally, quantum computing can also be used to improve content recognition algorithms that are utilised by online streaming platforms to identify copyright content online.[117] This is done by increasing the

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[108] Ibid.
[109] Ibid.
[110] Colin P Williams *Explorations in Quantum Computing* 2011 2ed 7-8.
[111] Ibid.
[112] Ibid.
[113] Scot Aaronson, Jiahui Liu, Ruiche Zhang 'New Approaches for Quantum Copy-Protection' 2021 *Advances in Cryptology*526 at 529.
[114] Ibid.
[115] Elhameh Farri & Peyman Ayubi 'A robust digital video watermarking based on CT-SVD domain and chaotic DNA sequences for copyright protection' (2022) 14 *Journal of Ambient Intelligence and Humaniszed Computing*13113 at 13132.
[116] Ibid.
[117] Ibid.

efficiency, speed and accuracy, consequently, improving the content recognition and identifying infringing instances and removing illegal copies of music content.[118]

Lastly, in the realm of licensing and royalty, quantum computing can assist in licensing and royalties by streamlining the complicated process involving royalty payments.[119] Due to quantum technologies efficient nature, it will enable and ensure faster and accurate royalty payments to the right holders of the works in question.[120]

Quantum computing has potential to transform the music industry and foster robust enforcement mechanisms while discouraging digital copyright infringement however, like any other emerging technologies, quantum computing emerges with its disadvantages, such as it being in its experimental phase despite significant advancements being made.[121] Unlike classic computers, the computers needed to operate quantum technology are massive, expensive and challenging to grapple with making them time costly.[122] Additionally, quantum computers are extremely sensitive to noise making it difficult to correct any errors that occur because qubits can take an infinite number of states simultaneously, in comparison to the classic computers that deal with one number at a time.[123] The exterior characteristics of quantum hardware and its surrounding atmosphere constitute another problem.[124] Since quantum computers require the process of slowing down atoms to almost-stillness, their central processing units must have temperatures maintained below certain temperatures.[125] However minimal variations may generate undesirable motion therefore, it is important to establish an environment away from atmospheric pressure. This is the reason quantum computers are mainly used in laboratories.[126]

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[118] Jeffery Atik & Valentin Jeutner 'Quantum computing and computational law' (2021) 13 *Law, Innovation and Technology*302 at 303
[119] Ibid.
[120] Ibid.
[121] John Himes, 'What are the disadvantages of quantum computing?' available at *https://www.sdxcentral.com/security/quantum/definitions/what-are-the-disadvantages-of-quantum-computing/re*, accessed on 1 January 2024.
[122] Ibid.
[123] Ibid.
[124] Ibid.
[125] Ibid.
[126] Ibid.

4.8 CONCLUSION

With the dynamic nature of technology, it has become increasingly difficult for the music industry to tackle digital copyright infringement.[127] The same technology developed for the main objective of sharing information has the "dual effect" of providing a simple way to breach copyright through the sharing of copyrighted content by unethical means.[128] However, more technological advancements and novel technology are emerging not only for the music industry but the economy and society as a whole. Technologies such as blockchain, smart contracts have the potential to revolutionise the music industry. The advanced nature of blockchain technology allows it to cater and solve most of the issues in the music industry that are affected by digital copyright infringement like copyright data base, owner identification, digital copyright infringement detection and licensing.[129] The manner in which a blockchain functions allows it to create vast data base which makes it easy for musicians to ensure their works are listed and are being recognised, therefore having the effect of reducing digital copyright infringement executed by ignorance or accidentally.[130] The merging of these artificial intelligence technologies blockchain technology, machine learning, digital audio watermarking, and audio fingerprinting has rendered novel prospects for preserving artists' and content providers' intellectual property rights.

While these novel developments demonstrate immense potential, they don't come without obstacles. Concerns like data integrity and immutability in blockchain for example, and potential abuse of copyright enforcement systems must all be considered. In addition, to achieve an equilibrium between copyright protection and user rights, a regulatory and legal structure that supports new technologies is required.

Concerning the emerging technologies, it is critical to recognise that their efficiency is contingent on their incorporation and coordinated use within the music industry environment. To realise the full potential of these instruments, artists, record companies must work collaboratively.[131]

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[127] Lauren P. Haberstroh 'Pirates, AI, and Privacy: The Use of AI in Combatting Media Piracy Online' available at *https://scholarship.shu.edu/cgi/viewcontent.cgi?article=2210&context=student_scholarship*, accessed on 31 August 2023.
[128] Ibid.
[129] Ibid.
[130] Denis Sickert 'Why do people engage in Digital Piracy and how does it affect the society' available at *https://www.academia.edu/38781952/Why_do_People_Engage_in_Digital_Piracy_and_how_does_it_affect_society*, accessed on 31 August 2023.
[131] Ibid.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

In conclusion, the lack of robust enforcement measures for digital copyright infringement in the South African music industry demands a tactical adoption of newly developed technology. It is clear that South African copyright law although fundamental, is outdated and does not specifically address the contemporary challenge of advanced technology.[1] The lack of provisions that deal with the digital environment creates a gap within the South African music industry, where the current law does not adequately protect the rights of authors and owner's within the digital era.[2] In the internet era it has become extremely challenging for intellectual property laws to keep up with the rapid changes in technology and the outdated laws make it challenging to effectively enforce intellectual property laws, which seek to protect the rights of creators and owner's, stimulate development while incentivising creators for their works.[3] With digital copyright infringement as a growing concern, rising technology provides endless online platforms that facilitates infringement activities which makes it difficult to track down many infringers in different locations.[4] Consequently, it is difficult to address cross-border complexities with the current copyright laws and tackle digital copyright Infringement.[5] South Africa has taken steps to try and pace with the contemporary technology through the drafting of the Copyright Amendment Bill 13F-2017. It has done this by drafting provisions that aim to cater for authors, creators and owners' rights in the digital environment.[6] However, the process of drafting legislation can be time taxing and therefore, hindering timely legal updates. Additionally, drafting legislation that anticipates certain technology advancements is strenuous and trying to achieve a balance between protecting the rights of creators and stimulating innovation and development without compromising the growth of the industry is difficult with the rapid technology changes. Furthermore, enforcing copyright law in the digital era raises issues of privacy because seeking infringers may facilitate the access of users' information without their

[1] Marcus Riby-Smith 'South African copyright law –the good, the bad and the Copyright Amendment Bill' (2017) 12 *Journal of Intellectual Property Law & Practice* 216.
[2] Ibid.
[3] Ibid.
[4] Ibid.
[5] Ibid.
[6] Clause 2 of the Copyright Amendment Bill B13F.

consent.[7] This is because internet service providers monitor users online activity and this usually require examining user data such as browsing history and download patterns, to detect instances of copyright infringement.[8] During the process of monitoring user activity, internet service providers may collect personal information of their users, such as IP address and device identifiers, in turn raising concerns of internet service providers gaining access to personal information without the users consent.[9] Balancing protection of Intellectual Property and privacy of users is challenging because using technology to find infringing activities without accessing user`s private information is nearly impossible.

5.2 SUMMARY OF FINDINGS

Digital copyright infringement has serious implications not only on enforcement of copyright but also on the livelihoods of the parties in the music industry. It has left artists being under compensated and having to rely on live concerts and brand deals to compensate for the gap left by digital copyright infringement.[10] Infringement deprives the right holders in the music industry control over the use, distribution and reproduction of their works. For most musicians their works are not just works but an intricate part of their identity as the author is closely tied to their work dating their personal experiences in their music pieces.[11] Therefore, digital copyright infringement strips them of the dignity and the control they have over their works. Where intellectual property laws are designed to encourage innovation and creativity and the legal access of the public to that material, digital copyright infringement discourages musicians, artists, and producers from producing creative and authentic works due to the potential infringement that may take place.[12] Most artists and musicians are forced to momentarily create music that is economic, trending and attention catching or internet popular songs. Consequently, compromising the art of creation and therefore, producing music that

[7] Dayne Skolmen 'User perceptions regarding Internet Service Providers' assurance of online privacy and confidentiality' available at *https://www.researchgate.net/publication/260277562_User_perceptions_regarding_Internet_Service_Providers'_assurance_of_online_privacy_and_confidentiality* accessed on 2 January 2024.
[8] Ibid.
[9] Ibid.
[10] Neil S. Tyler 'Music Piracy and Diminishing Revenues: How Compulsory Licensing For Interactive Webcasters Can Lead The Recording Industry Back to Prominence' (2013) 161 *University of Pennsylvania Law Review* 2101 at 2106.
[11] Ibid.
[12] Ibid.

does not have generational impact but only makes sales for a limited period.[13] Ultimately, this deters potential investors from investing into the music industry because with digital copyright infringement on the rise possibilities of greater returns is minimal.

The dynamic nature of digital copyright infringement has prodded the use of advanced technology and advancing current technology to reduce infringement in the music industry's digital space. Prevalent technologies such as Blockchain technology, machine learning and artificial intelligence have the potential to create robust enforcement mechanisms to reduce digital copyright infringement in the music industry.[14] Additional technologies which have been advanced to tackle digital copyright infringement are digital audio watermarking and fingerprinting. Digital audio fingerprinting is revolutionary to the music industry offering accurate and efficient content identification for audio tracks and with more advanced technologies fingerprinting is promising for the music industry.[15] While known for its accurate and real- time analysis capabilities it is limited in its capacity, because the process used to fingerprint relies on the components of the audio to create a fingerprint and therefore if the audio is biased or of poor quality, the process and end result are compromised.[16] In certain instances audio fingerprinting may produce false negatives if there is noise interference, evidently this weakens the system and therefore limits the function of the fingerprinting system.

Quantum computing is one of the emerging technologies that have potential and pose promising results in the protection of the music industry intellectual property rights. Although, it is deemed complex and costly, it nature has the potential to upgrade existing technologies and build robust techniques for technologies such as digital audio watermarking and digital audio fingerprinting.[17]

Digital audio watermarking is another useful technology tool for the music industry. Watermarking is more meticulous than fingerprinting. Unlike fingerprinting watermarking embeds additional information and does not rely on existing information in the audio tracks to identify, track or enforce agreements.[18] Watermarking can be embedded at any frequency or variations and detection remains

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[13] Ibid.
[14] Marcus O'Dair Zuleika Beaven 'The Future of Money and further Applications of the Blockchain' (2017) 26 *Strategic Change Journal* 417.
[15] Yashwant singh Katailiha' Music Identification based on Audio Fingerprinting' 2019) 3 *International Journal of Scientific research in Engineering and Management*1 at 2.
[16] Ibid.
[17] Scot Aaronson, Jiahui Liu, Ruiche Zhang 'New Approaches for Quantum Copy-Protection' 2021 *Advances in Cryptology*526 at 530.
[18] Yashwant singh Katailiha op cit note 15.

accurate, whereas fingerprinting limited by audio variations and detecting the fingerprint is difficult if modifications have taken place with the audio.[19] While these technologies are limited in certain areas their nature is well equipped to be utilised in certain aspects in the music industry. For example, watermarking can be used for content identification and tracking and fingerprinting can be used for real-time analysis like live performances.[20] Collaboratively these technologies can function together where the limitation of the other is the strength of another.

Furthermore, Blockchain technology serves as a major key technology in enforcing copyright while protecting right holders and affording consumers legal access to copyright material. Blockchain is decentralised which reduces risks of fraudulent activity, eliminating third parties and creating a direct relationship between consumers and artists or right holders.[21] It is particularly desirable in the music industry because of its smart contract element which enables automatic royalty payments to right holders in the music industry. This is a problem and South Africa has been grappling with this as royalty payments are not being fairly received and collecting societies are lacking in the accountability of royalty pay-outs.[22] Due to Blockchain technology's ability to create a major database for storage, ownership is easy to establish and therefore royalty payments are instant and accurate. Blockchain technology is a very secure platform and it minimises the risk of digital copyright Infringement in the distribution of music. However, Blockchain technology is a very complex technology and its implementation is time consuming and costly.[23]

5.3 RECOMMENDATIONS

Copyright law is cardinal to the music industry and without it the music industry will not enjoy the benefits and rights given to them for the creation of their works. It is paramount that the protection of intellectual property rights is balanced with the promotion of the development of the music industry.[24] Laws must alongside technological advancements to allow for legal and fair use of copyright material in the digital era. A proposal for a more holistic and future-forward reform

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[19] Ibid.
[20] Ibid.
[21] Na Li, 'Combination of Blockchain and AI for Music Intellectual Property Protection' 2022 *Computational Intelligence and Neuroscience*1 at 2.
[22] Ibid.
[23] Ibid.
[24] 'Why Intellectual Property is Essential for your Business' *https://www.wipo.int/sme/en* accessed on 12 January 2024.

approach is necessary, while digital copyright infringement will persist it is paramount to ensure the protection of right holders, promote innovation, creativity and development and growing the music industry as a whole.[25] Firstly, a reform to the ancient and current Copyright Act is paramount, provisions that cater to digital works and definitions to what constitutes digital works should be included. The inclusion of provisions that cater to digital works will allow for better enforcement of copyright laws in instances of digital copyright infringement.

Secondly, the current Copyright Act needs to be amended to introduce 'fair use', as proposed in the Copyright Amendment Bill [B13F-2017], which borrows this from the United States of America. South Africa currently provides for fair dealing which has a narrow scope which only applies to the purposes stated by the Copyright Act.[26] On the other hand fair use is extensive, flexible and adaptable.[27] It not concerned with whether the purpose is stated however, it is mainly concerned with the fairness of the use of a copyrighted work even if the purpose is not mentioned.[28] The fair use doctrine caters for the digital environment and adopting this approach or a combination of fair dealing and fair use assists with effective enforcement considering the rapid technology advancements.[29] The fair use provisions already accommodate new technologies and the advancements in the 4rth industrial revolution.

The law can be amended to provide for clearer definitions and include provisions for digital works, the new distribution methods, and online platforms, which promotes and provides all-encompassing copyright protection. In addition to clearer definitions and inclusive provisions the law can be amended to increase penalties for digital copyright infringement. This discourages individual to use copyright work illegally and encourages compliance with the law.

According to the findings of this study, a combined use of emerging technologies to create robust enforcement mechanisms whilst simultaneously tackling digital copyright infringement is suitable. Emerging technologies indirectly engage in enforcement in its functioning, the law regulators should consider emerging technology when updating the law as it need to align with the technology advancements and be at par with the current digital era. The point of departure being the current

[25] Ibid.
[26] Copyright Act s12.
[27] Sanskar Garg 'Comparative Analysis Between Fair Dealing and Fair Use' 2023 *Journal of Legal Research and Juridical Sciences* 1.
[28] Ibid.
[29] Ibid.

Copyright Amendment Bill 13F-2017, which has significantly addressed major issues surrounding the internet era and provided for an extensive protection of authors, owners and creators of work. First, enhancing the existing legal frameworks, strengthening and updating the current copyright regime to comprehensively tackle digital copyright infringement in the digital era and synthesise laws globally.[30] Furthermore, encourage greater international corporation between governments, law enforcement agencies and private businesses in the music industry to effectively grapple with cross-border digital copyright infringement.[31] This can be achieved through the usage of blockchain technology which facilitates the establishment of a database. This data base contains all copyright information of musical works and therefore, facilitates tracking of cross-border infringement and international enforcement of copyrights.[32]

Machine learning can be used for predictive enforcement. Artificial intelligence machine learning is predictive by nature, it uses previous or existing data to improve itself and its functioning and to predict future trends, identify potential areas of infringement. This allows for adequate time to efficiently respond to copyright infringement and establish robust effective enforcement.[33]

Additionally, using technology solutions to assist in the effective enforcement of copyright laws, by investing in strengthening or upgrading existing technologies such as digital rights management and content recognition algorithms like watermarking to deal with digital copyright infringement.[34] Investing and developing technologies that assist in the detection and prevention of digital copyright infringement such as to implement decentralised Peer-to-Peer licensing.[35] Blockchain can be used as smart based contracts to help with efficient and fair royalty payments directly to the owner, author of the musical work. This afford the owners an opportunity to license their work directly to the users or consumers and eliminate the traditional methods and removing third parties and reducing digital copyright infringement opportunities.[36] Additionally, leveraging blockchain will help collective management organisations to maintain accurate records of the rights of artists and how copyrighted work is being used and improves licensing process.[37] This reduces ownership disputes and provides

[30] Ibid.
[31] Ibid
[32] Ibid.
[33] Shine Sean Tu 'Use of Artificial Intelligence to determine Copyright Liability for Music' (2021) 123 *The Research Repository* 855.
[34] Malka N Halgamuge, Dilmi Guruge 'Fair rewarding mechanism in music industry using smart contracts on public-permission less blockchain' (2022) 81 *Multimedia Tools and Applications* 1523 at 1526.
[35] Ibid.
[36] Ibid .
[37] Ibid.

an opportunity for artists to receive compensation.[38] Blockchain also includes smart contracts which are self-executing, which in turn assists in keeping collective management organisations accountable as smart contracts self-execute and compensate the artist directly with accurate records.[39]

Lastly, the combination use of blockchain for efficient payment and ownership identification and digital audio marking will be used for the identification of copyright infringement online.[40] This makes it easy to identify infringing content and alleged infringers as well as assist in court proceedings as evidence should there be a law suit.[41]

[38] Ibid.
[39] Ibid.
[40] Ibid.
[41] Ibid.

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