UNIVERSITY OF CAPE TOWN

FACULTY OF LAW

SCHOOL FOR ADVANCED LEGAL STUDIES

Continually Evolving Technologies: Does South African copyright law adequately protect AI-generated works?

By

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Research Dissertation Submitted for the Approval of Senate in fulfillment of part of the requirements for the Master of Law in Intellectual Property Law in approved courses and a minor dissertation. The other part of the fulfillment for this qualification was the completion of a programme of courses.

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Word Count: 24 050

February 2024

Declaration

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Dedication

A special thanks goes to my parents, brother, and my friends for their constant support and words of encouragement throughout this thesis. Your thoughts and comments are greatly appreciated.

I would also like to sincerely thank my supervisor Dr Lee-Ann Tong for her patience, guidance and unwavering support in the course of writing my thesis. Working under your guidance has been a rewarding experience which has further solidified my passion for Intellectual Property Law.

Abstract

In the context of the Fourth Industrial Revolution (4IR), the breakthrough of increasingly sophisticated artificial intelligence (AI) technologies has marked a change in the way in which creative outputs which would ordinarily be categorised as works eligible for copyright under international and domestic copyright legislation, are created. This unprecedented technological advancement in the ability of AI systems to generate creative outputs has sparked controversy within copyright law because of traditional anthropocentric views of copyright protected works, resulting in a need to develop legislation to keep up with these growing trends and shifts in ways that creative outputs are being generated.

This dissertation aims to explore the protectability of AI-generated content in South Africa within the context of copyright. This will be done by outlining the justification theories of intellectual property law and aligning them with the general purpose of copyright. This is done in order to provide context on which theory/theories specifically informs the South African context. The protectability of copyrightable material will also involve a discussion into who created the work and this is why the concepts of authorship and originality will be discussed. The originality and authorship of the works will be imperative in establishing the ownership implications for these resultant works. Next, the positions of foreign jurisdictions will also be drawn on in order to assess how these countries have dealt with the intersection of AI into the space of copyright law.

Ultimately, it will be shown that these works are worthy of copyright protection, and should not fall to the public domain. The argument will highlight that the AI-generated works should be protected by extending authorship to the human(s) responsible for the machine's composition. In this way, the authorship and ownership will lie, not with the AI, but with a natural or juristic person. The conclusion will, therefore, highlight a need for South Africa to develop its copyright legislation in order to keep up with the everchanging and developing technological trends.

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CHAPTER 1
INTRODUCTION

1.1 UNDERSTANDING AI IN THE CONTEXT OF COPYRIGHT

Artificial Intelligence (AI) systems are developing quickly and modern copyright laws simply cannot keep up with this trajectory. WIPO has also noted how widespread the use of AI is and how this may have a significant impact on the creation of goods in the future.[1] Notably, the WIPO Draft Paper highlighted the issue of attribution of ownership. The paper brought forward a question stating that if copyright can be attributed to AI-generated works 'in whom should the copyright vest?'.[2] AI is defined as social and cognitive phenomena that enables machines to integrate with society and perform competitive tasks which require cognitive processes.[3] In recent years, the concept of 4IR marks the shift and impact of emerging technologies on a number of facets of human development and innovation. It further highlights the intricate interaction between humans and technology and the increasing need to alter legal attitudes in order to adequately cater for these changes. These changes are marked by the increasing display of intelligent behaviour demonstrated by some of these machines in their abilities to achieve specific goals with a degree of autonomy.[4] The release of ChatGPT is one such example of a language software being created to interact with users in a conversational way and generate dialogue.[5] This model works by being trained by human AI trainers to follow instruction(s) and then provide a response.[6] This very complex interplay between 4IR and intellectual property laws is what has resulted in a value shift regarding AI systems and the copyright protectability of works generated by these machines.

As technology advances, the possibilities of these AI systems producing works capable of being protectable under domestic copyright law is also becoming more likely. Therefore, it is imperative to interrogate how AI-generated works are viewed under South African (SA)

[1] WIPO 'WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI)' https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_2_ge_20/wipo_ip_ai_2_ge_20_1.pdf Accessed 15 January 2024.
[2] WIPO 'WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI)'.
[3] H Abbass 'Editorial: What is Artificial Intelligence?' (2021) *IEEE Transactions on Artificial Intelligence* 95.
[4] E Salami 'AI-generated Works and Copyright Law: Towards a Union of Strange Bedfellows' (2021) 16 *Journal of Intellectual Property Law & Practice* 125.
[5] Introducing ChatGPT https://openai.com/blog/chatgpt#OpenAI Accessed 19 July 2023.
[6] Introducing ChatGPT https://openai.com/blog/chatgpt#OpenAI Accessed 19 July 2023.

copyright law and whether the current copyright framework in SA currently allows for such protection. This will raise further questions about whether copyright protection for AI-generated works exists and with whom it shall vest. It is against this backdrop that the issues surrounding authorship and resultant ownership will be discussed.

The main issue to be discussed will be to show what the current copyright framework in SA is, and whether under that system, AI-generated works could stand to be protectedor not. A discussion into authorship and resultant ownership will naturally follow because, traditionally, under section 21(1)(a) of the SA Copyright Act, the author of a work is regardedas the first owner.[7] The fact that AI systems are capable of generating works which are ordinarily protected by copyright highlights the importance of interrogating this issue, becauseit is crucial to show where the ownership and control of these products ultimately lie.

The fact that AI systems have been developed in such a manner that enables these intelligent machines to exhibit learned skills, much like humans[8], means that humans can no longer be considered the only source of creative works. In a sense, these systems are beginning to display a level of 'human intelligence' marked by a capacity to reason and understand rules.[9] Intelligence includes three important aspects which are problem-solving, verbal skills and social competence.[10] This humanness and autonomy that characterises AI are what the general public are attempting to grapple with.

It may be alarming when machine systems are equipped with the ability to match or even out-perform humans in certain tasks, for example, when, in 1997 , a chess-playing machine, Deep Blue, defeated Garry Kasparov, a World Chess Champion.[11] The intelligence of AI systems is often limited to narrow views of abstract reasoning such as performing calculations,[12] as machines are not equipped with the ability to relate emotionally. Regardless, one cannot deny the incredible display of intelligence demonstrated by intelligent machines. It is on this basis that the conversation of AI systems has shifted to the creativity sphere.

[7] Act 98 of 1978.
[8] Hristov (2017) *The Journal of the Franklin Pierce Center for Intellectual Property* 433.
[9] N J Mackintosh *IQ and Human Intelligence* 2 ed (2011) 1.
[10] Mackintosh *IQ and Human Intelligence* 3.
[11] M Newborn *Deep Blue: An Artificial Intelligence Milestone* (2003) v.
[12] B Olivier 'Artificial Intelligence (AI) and Being Human: What is the Difference?' 49 (2017) *Acta Academia* 2.

The ability of these machines to create works such as songs, poems or art, is what links AI systems to copyright law and the possible need to explore whether the resultant works can form protectable subject matter. Ordinarily, such works are protected by copyright laws when produced by legal persons, for example. The issue arises when considering the possibility that the AI systems themselves generate protectable works. This issue forms the starting point of this debate. If such works are protectable under copyright because they meet the requirements for subsistence, then a related concern is where ownership of such works should lie. If, however, such works are not protectable because of requirements about authorship and originality, for example, then we are left with the situation that the works are withoutprotection. However, it is submitted that not recognising such works so that they fall into the public domain on creation is not the most valuable solution. This is so, because the engineers,programmers and users of AI systems will be incentivised to invest time, intellectual effort andmoney into developing and supporting them to produce creative outputs.[13] Additionally, the utilitarian model for justifying intellectual property protection believes that innovative and creative work of individuals should be incentivised by providing them with security to spend time, effort and money on innovation and creation.[14]

Consequently, this thesis argues that there is value in copyright recognising works created by AI and that, to the extent that there are shortcoming/challenges in copyright law, such as the role of authorship and originality requirements, it is possible nonetheless to use copyright to protect the work and to ensure that ownership vests in the appropriate entity.

The centrality of this topic is again evident in the context of the Fourth Industrial Revolution (4IR) and the subsequent technological breakthroughs. Fundamental in this revolution, is the reflection of AI in our everyday lives including in applications that drive cars and now new avenues that learn and create works.[15] The impact that these emerging technologies has on society, dimensions of human development and the law is the cause for all the anxiety surrounding AI and its increasing reach. Concerns grow in this conversation when people begin to think that the machines will essentially 'take over'. In SA, the HumanSciences Research Council (HSRC) has also displayed a vested interest in the AI generative

[13] C Armstrong *et al Access to Knowledge in Africa: The Role of Copyright* (2010) 3.
[14] Williams (2021) *European Intellectual Property Review* 790.
[15] P Zurth 'Artificial Creativity? A Case against Copyright Protection for AI-Generated Works' (2021) 25 *UCLA Journal of Law and Technology* 2.

space. The HSRC committed itself to developing an AI research and development programme to ensure that AI systems are developed in a manner which addresses the unique challenges faced by SA.[16] Additionally, a SA Artificial Intelligence Association (SAAIA) has been formed to address and promote the advancement of responsible AI and further help the government at national and provincial levels with policies involving AI.[17]

The system's ability to work autonomously is the root of the tensions that arise between AI and copyright. This interplay raises questions on authorship and resultant ownership of works generated by an autonomous AI system. In instances where AI systems demonstrate that they can learn, think and perform cognitive tasks with little to no human intervention, are the works capable of even being protected under copyright law? Further, is it possible to afford the system with authorship status and if so, what are the implications? Finally, where would, and more importantly, *should*, ownership in the resultant works lie if they are protectable? These are all important questions to interrogate because they have implications on established copyright principles. Therefore, exploring this issue will shed light on whether there is a need for copyright laws to be developed to fit the trajectory of technological development.

It is for these reasons that looking at AI domestically and internationally through an intellectual property framework that the transformative changes of technology can also be seriously debated. Legal responses, in particular under copyright law, to 4IR have been contentious. Therefore, this dissertation aims to explore whether the products of AI systems can be protected under existing copyright legislation and with whom the ownership will vest. Thus, the aim of this paper will be to highlight the position of AI in SA's copyright dispensation. This discussion will not, however, explore whether or not the AI system itself is protectable, the main focus will be on the AI-generated works and their protectability under copyright laws and ultimately where ownership of these lies. This dissertation will examine the copyright laws as at November 2023 and draw recommendations from foreign jurisdictions

[16] K Chetty *et al* "Navigating the Impacts of Generative AI in South Africa: Challenges, Opportunities and Ethics" https://hsrc.ac.za/news/latest-news/navigating-the-impacts-of-generative-ai-in-south-africa-challenges-opportunities-and-ethics/#:~:text=The%20HSRC%20is%20committed%20to,the%20Global%20SOuth%20are%20facing Accessed 2 November 2023.

[17] The South African Artificial Intelligence Association https://saaiasoociation.co.za Accessed 2 November 2023.

from the United Kingdom, Ireland, Germany, United States and China because these countries have dealt with similar issues.

1.2 THE CONTEXT OF AI AND COPYRIGHT IN SOUTH AFRICA

The framework for SA copyright law aims to achieve an ideal copyright system by governing the protection of creative works by giving copyright owners a monopolyover their original works for restricted durations. Presently, there are steps being taken to reform copyright law in SA through the Copyright Amendment Bill.[18] In as much as the Bill aims to develop copyright law, it is silent on the issues of AI creatorship.[19]

Under the current Copyright Act[20] (SA Copyright Act), there are enumerated restricted acts which the owner of a work can perform once the work has been recognised as being copyrightable.[21] The nature and purpose of copyright is to provide exclusive and limited rights which are subject to exceptions and limitations.[22] The SA Copyright Act provides a number of exceptions including use of works for research, private study and reporting current events.[23] The rights afforded protect the material expression of works from being copied by third parties. Essentially, these rights function negatively to stop counterfeiters from copying works and not crediting the rightful owner of the works thus depriving them of the ability to profit, for example, from the labour they expended in the creative process of the work.[24] In short, copyright laws aim to protect limited products of human creativity. Therefore, the main purpose of copyright can be summarised as being to afford copyright holders with enforceable rights in respect of a work to determine the extent to which the publicinteracts with it.

The focus on authorship and resultant ownership is important because under SA's copyright legislation, it is crucial for the determination of the subsistence of copyrightand first ownership.[25] Therefore, by determining who the author of the works generated by the AI systems is, means the owner will also be identified. This determination will be key in

[18] B13F-2017.
[19] The legislative reform proposed by the Amendment Bill covers issues surrounding the unconstitutionality of the current Act of 1978; Exceptions to rights; Fair use etc.
[20] Act 98 of 1978.
[21] Sections 6-11 SA Act.
[22] A van der Mervwe *et al Law of Intellectual Property in South Africa* 2 ed (2016) 181.
[23] Sections 12, 13, 14, 15, 16, 17, 18, 19, 19A SA Act.
[24] Van der Merwe *et al Intellectual Property in South Africa* 180.
[25] Section 1 definition of 'author' and S 21 read together.

showing where the rights in relation to the products lie and also who may profit from the commodification of the works. The ownership/authorship dynamic and the ascription of certain rights is one reason why copyright only recognises legal persons and juristic persons with copyright. For example, the economic rights which are afforded to a copyright holder can only be actioned by a legal person or a human.[26]

Under the SA Copyright Act, there is a list of nine works which qualify for copyright protection.[27] These works consist of literary works; artistic works; musical works; cinematograph films; sound recordings; programme-carrying signals; published editions; and computer programs. Domestic copyright laws impose a further standard of originality for works to qualify for protection; this requires a creator to have created a work themselves and not have copied or duplicated an existing work.[28] The duration or subsistence of these copyright works is further dependent on the nature of the work, and also possibly the life of the author.

Normally, if an individual were to produce a song, to qualify for protection the first requirement that ought to be satisfied is for the work, i.e., the lyrics of the song, need to be original.[29] Next, the lyrics need to be reduced to material form or be transcribed.[30] This is so, because copyright does not protect ideas, only their expression. Next, the individual needs to be a qualified person; which means they need to be a resident of or domiciled in the Republic,[31] or the work needs to first be published in the Republic.[32] Interestingly, the SA Copyright Act provides that a juristic person can also qualify for protection.[33] This highlights the copyright has the ability to be extended to entities and not solely authors and their personal rights.

At this juncture, it is clear that it will be necessary to interrogate whether a work generated or created by an AI system meets the requirements above for the subsistence of copyright, i.e., originality, reduction to material form, authored by a qualified or juristic person or published in SA. It is only after these requirements have been met that a work may enjoy copyright protection. This analysis will follow under chapter four of the dissertation. This is important to determine because, as it stands, it is unclear where the authorship and

[26] Sections 6 – 11B SA Act.
[27] Section 2(1) SA Act.
[28] Section 2(2) SA Act.
[29] Section 2(1) SA Act.
[30] Section 1(b) SA Act.
[31] Section 3(1)(a) SA Act.
[32] Section 4(1) SA Act.

[33] Section 3(1)(b) SA Act.

residual ownership would lie because the AI system is neither a natural or a juristic person. Further, the importance of assessing where authorship and ownership status lie is strengthened by consideration of the general rule pertaining to ownership of copyright. According to this rule, the author of a work is regarded as the first owner of a work.[34] Therefore, it is clear that the copyright implications of determining where authorship lie will also have an impact of the ownership of the subject matter.

To this end, the main object of this research is to argue for the development of copyright legislation to afford copyright protection to the subsequent works that intelligent algorithms produce. The basis for this argument is that it is becoming increasingly apparent that computer programs and machines are no longer used solely as a tool which only aids in the production of a work. It is observed that some machines are capable of making decisions autonomously and creating works with no human intervention. To illustrate this, a Eurovision song titled 'Blue Jeans and Bloody Tears' was created by an AI system after various musicians and artistsfed songs into a neuron network and algorithms then produced a song.[35] This song will functionas a case study in the development of the discussion.

It is evident that through the above illustration, that works generated by these intelligent algorithms could arguably fall within the nine recognised categories of protectable works, e.g., recognised as a literary or artistic work. The more difficult question to answer is what the copyright implications are for the AI system itself. Is it possible to regard the AI system itself as the creator or the author? Or would authorship and resulting ownership lie with the programmers and engineers of the system? Or with the public using the AI system to make a creative output? The importance in making this determination is crucial because it would shed light on instances when it would be inappropriate or misleading to treat a programmer as the author and owner of the copyright in new works.

Thus, the two main questions which this analysis intends to answer is whether AI-generated works stand to be protected in the same way as other recognised categories of works under the Act or not and where the authorship and resultant ownership will vest in these outputs.

[34] O Dean and A Dyer *Introduction to Intellectual Property Law* (2014) 25.
[35] Sweaty Machines https://www.youtube.com/watch?v=4MKAf6YX_7M&ab_channel=SweatyMachines.

1.3 BRIEF OVERVIEW ON EXISITING LITERATURE

The following section draws from articles that have dealt with the following issues. Firstly, whether AI-generated works stand to be protected in the same way as other recognised categories of works under the SA copyright legislation; and where the authorship status will be attributed. Importantly, as the author of a work is generally regarded as the first copyright owner, the attribution of ownership will also need to be discussed. The reference to these articles is made to shed light on why attributing ownership to non-humans is such a difficult legislative step to make.[36] Ultimately, an alternative solution will need to be shown which does not derogate from established copyright principles.

In SA, the topic of attributing non-human authorship and ownership has provena difficult obstacle to overcome.[37] Similarly, other jurisdictions are becoming increasingly concerned with how advanced AI systems are in a creative capacity and, as a result, has raisedquestions about whether the human or the AI system itself should be entitled to ownership rights.[38]

Yu emphasises that existing literature fails to answer a fundamental question which asks whether the extension of copyright protection to AI-generated works promotes or hinders the purpose or copyright.[39] This is an appropriate direction to start the analysis as it highlights the importance of the role of justification theories in informing the formulation of copyright principles in common law and civil jurisdictions. The current study will highlight the importance of the utilitarian theory[40] in informing the development of the analysis into the copyrightability of AI-generated material in a SA context.

Perry and Margoni have noted the difficulties associated with protection and ownership of creative outputs generated by a machine. The authors note how legislators in SA has

[36] C B Ncube and D O Oriakhogba 'Monkey Selfie and Authorship in Copyright Law: The Nigerian and South African Persepctives' (2018) 21 *PELJ* 10; J C Ginsburg 'The Concept of Authorship in Comparative Copyright Law' (2003) 52 *Depaul Law Review* 1063 – 64.
[37] Ncube and Oriakhogba (2018) *PELJ* 10 -11.
[38] S Yanisky-Ravid 'Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era: The Human-like Authors Are Already Here: A New Model' (2017) 670; Y Wan and H Lu "Copyright Protection for AI-generated Outputs: The Experience from China" (2021) 42 *Computer Law & Security Review* 5; A Lauber-Ronsberg and S Hetmank 'The Concept of Authorship and Inventorship under Pressure: Does Artificial Intelligence Shift Paradigms?' (2019) 14 *Journal of Intellectual Property Law & Practice* 572.
[39] R Yu 'The Machine Author: What Level of Copyright Protection is Appropriate for Fully Independent Computer-Generated Works' (2017) 165 *University of Pennsylvania Law Review* 1248.
[40] T Pistorius "The Imperial Copyright Act 1911's Role in Shaping South African Copyright Law" in Uma Suthersanen and Ysolde Gendreau *A Shifting Empire: 100 Years of the Copyright Act 1911* 204.

stated in their Copyright Acts that computer-generated works shall be authored by 'the person by whom the arrangements necessary for the creation of the work are undertaken'.[41] This suggests that there is a potential to recognise AI systems and computer-generated works as being similar enough to develop the law to cover works generated by AI under this accepted definition. Other authors have also commented on the issue and supported the idea of 'transplanting' the computer-generated works provision, like the one contained in SA copyright legislation, in order to cope with challenges brough by AI technology.[42]

What is evident from research on this issue, is that there is a gap informing the possible legislative steps which could be taken by SA to inform the issues surrounding AI authorship and ownership.

1.4 METHODOLOGY AND SCOPE

This section explains the methodologies which were used to inform this research paper and further provides a scope of the research.

The current paper drew information from various sources including textbooks, peer-reviewed journal articles, case law, statute, such as Acts, international conventions, and various internet source material. The information extracted is concerned with the framework of international and domestic copyright law principles are how they are used to answer whether creative outputs generated by AI-systems are currently protectable. The scope of the research includes discussions from foreign jurisdictions including, the United Kingdom, Ireland, Germany, the United States and finally China to assess how these countries have approached the subject and determine if there are lessons to be learned by SA.

In particular, lessons are drawn from the United Kingdom and Ireland because both countries have dealt with computer-generated works in a manner which could provide progressive legislative answers on the issue. Germany is considered and juxtaposed against the United Kingdom and Ireland because of its strict adherence to EU acquis. The United States, a non-EU member was chosen to contrast its position and assess whether the country is as anthropocentric in its copyright law as Germany. Finally, the copyright laws of China are

[41] M Perry and T Margoni 'From Music Tracks to Google Maps: Who Owns Computer-generated Works?' (2010) 26 *Computer Law & Security Review* 621.
[42] J Lee 'Computer-generated Works Under the CDPA 1988' (2021) *Artificial Intelligence and Intellectual Property* 179; B Williams 'Painting by Numbers: Copyright Protection and AI-generated Art' (2021) 12 *European Intellectual Property Review* 789.

drawn from to interrogate whether concepts of 'work. 'originality', 'authorship' and 'ownership' would bar or accept works generated by AI as protectable under the Copyright Law of People's Republic of China (Copyright Law of China).[43] These particular aspects have been chosen in order to provide a glimpse into the copyright landscape of each jurisdiction.

1.5 CHAPTER OUTLINE

This thesis has five chapters.

Chapter one is an introductory chapter which provides a background to the topic. The section highlights the effect of technological advancements and the increasing creative powers of AI machines and how their development needs to be considered in light of copyright law principles. The chapter also provides a brief literature review in order to highlight how the issue of protection of AI-generated works and AI authorship has been dealt with in previous research. The section also provides a methodology for the research as well as a scope.

Chapter two discusses the basics to AI systems and how they work. This section reveals that the complex nature of AI systems allows the machines to function with some degree of independence, and illustrates how works are creatively generated by these machines. This is relevant to shed light on the question of whether an AI system would be recognised as an author in the same way as an author of a literary work, for example.

Chapter three provides discussion on copyright more generally and SA specifically by highlighting the theories which underpin and inform intellectual property protection and exploring the concepts of originality an authorial expression. The discussion will aim to explore what is required in order to regard a work as being 'original' and if works generated by AI can be regarded as such. The chapter will also explore authorship and assess where ownership of such works is attributable. Further, the section will explore the definitional requirements of a computer-generated work and assess if it can be transplanted onto AI technology.

Chapter four is a comparative analysis which explores the positions of foreign jurisdictions and how the United Kingdom, Ireland, Germany, the United States and China has responded to the issue of AI-generated works and AI authorship status. This is done to understand whether and

[43] Amendment of 2010. The 2010 Act was amended and entered into force on 1 June 2021, however, the 2010 version will be relied on because the case law which will be discussed was decided on the earlier version.

how other jurisdictions are responding to technological changes and how they are responding to these changes; and if SA's copyright legislation should follow suit.

Chapter five provides a conclusion to the thesis and explores and recommends possible legislative models which would extend some protection to AI-generated works.

CHAPTER 2

ARTIFICIAL INTELLIGENCE BASICS

2.1 INTRODUCTION TO ARTIFICIAL INTELLIGENCE

This chapter aims to explain the foundational precepts underpinning AI systems and to further highlight how such systems function. The nature of AI will be shown as a system autonomous enough to operate without human intervention and generate creative works as a result. It is these works that form the subject matter of this discussion, in terms of their copyright protectability. Since these AI systems are capable of developing learning and logic which allows them to act independently[44] the works they produce have become a compelling issue to explore. The central consideration in this section is to highlight how the mechanisms in an AI system work to generate a creative product, and to further highlight the level of human involvement in this generative process. This is done to show that a human's contributions are oftentimes so little that the works generated actually do not have human authors.[45] The level of innovation and creativity involved in AI processes clearly disrupt foundational concepts of authorship, hence, it is important to describe and explain exactly how these machines operate.

2.2 FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

As a ground-breaking technology, AI will undoubtedly be a major point in history and be a driving force in the capacity to innovate. This concept is defined as the ability of a computer system to simulate human intelligence and cognitive behaviours such as flexibility in problem-solving, decision-making and learning.[46] The core elements of the concept of AI appears to be the presence of a machine-based system's ability to operate with some degree of autonomy.

[44] Z Mazibuko-Makena and E Kraemer-Mbula *Leap 4.0. African Perspectives on the Fourth Industrial Revolution* (2021) 11.
[45] Scannell (2022) *Journal of Intellectual Property Law & Practice* 736.
[46] P S Sajja *Illustrated Computational Intelligence* (2020) 4.

Therefore, it is clear that for a machine to be deemed intelligent it needs to display an ability to learn, reason, understand, and consider meaning.[47]

When discussing the history or origins of AI, the name Alan Turing is one which stands at the forefront. Often dubbed the 'father of AI', Turing focused his work on the concept of a machine that was intelligent.[48] From these workings emerged the 'Turning Test' which revolutionised the idea that a computer can, in fact, be intelligent and autonomous; and further proposed a way to measure this intelligence.[49] In order to test and then measure a machine's intelligence, Turing proposed the Imitation Game.

The Imitation Game is played by three players, and it is generally understood that the object of the test is to try and assess the machine's ability to imitate a human being. The game is played between a machine (A), a human (B), and an interrogator (C).[50] Here, the aim of the interrogator is to be able to discern whether they are conversing with a human or the machine. Thus, if the interrogator is unable to identify whether the entity they are conversing with is a human or a machine, then the computer is presumed to be intelligent.[51] It is these early notions of machine intelligence that led to the development of intelligent algorithms.

The notions of how to model human cognitive processes throughout the years have developed, but the reality is that AI is still in its early phases, and thus still very weak. It is important to note that most AI-based systems operate within two distinct domains; strong AI and weak AI.[52] The concept of strong AI involves the system becoming self-aware and having a completely autonomous mind, and weak is where the system can only focus on specific tasks with varying levels of human input.[53] It is important to frame this to highlight the context at which AI is at presently. Currently, AI is only at the weak stage. Weak AI is categorised by lacking a general intelligence which would enable such a system to be more flexible in its decision-making, for example.[54] Such general intelligence is more characteristic of human beings, thus it is not easily achieved by AI systems. It follows that, at a weak stage

[47] J P Mueller and L Massaron *Deep Learning for Dummies* (2019) 11.
[48] Tauli *Artificial Intelligence Basics* (2019) 2.
[49] A P Saygin *et al* "Turing Test: 50 Years Later" *Minds and Machines* 10 (2001) 464.
[50] Saygin *Minds and Machines* (2001) 465.
[51] Taulli *Artificial Intelligence Basics* (2019) 2.
[52] Taulli *Artificial Intelligence Basics* (2019) 4.
[53] Taulli *Artificial Intelligence Basics* (2019) 16; Salami (2021) 16 *Journal of Intellectual Property Law* 125.

[54] Sajja *Illustrated Computational Intelligence* (2020) 4.

in AI there is some level of human involvement in the creation process which enables the machine to ultimately generate products.

2.3 APPROACHES TO AI

The two main schools of thoughts surrounding the development of AI are the top-down and bottom-up perspectives.[55] The top-down approach is more suited to deal with issues in very specific problem-solving situations which require rational and mathematical logic, for example, DeepBlue which is a chess-playing system.[56] Conversely, the bottom-up approach attempts to build a machine's intelligence by making observations of patterns in the environment and previous experiences.[57]

The most foundational components of artificially intelligent systems in a top-down approach are a knowledge-base, inference engine, explanation and reasoning utility, and a user interface.[58] The knowledge-base provides the system with a means to acquire, store and use knowledge in processes of decision-making.[59] This core feature is essentially a repository from which the machine acquires and infers knowledge. In most instances, the knowledge-base is left a little empty to accommodate instances, when possible, updates are likely. Such an update takes place either through a manual update or through machine learning.[60] Next, the inference engine operates by accessing the knowledge base in order to make intelligent decisions.[61] The explanation and reasoning utility works to make sense of the decision taken by the machine.[62] Finally, the user interface provides a mechanism for end-users and developers to interact with the system.[63]

Commentators have noted that expert systems are not truly intelligent because they do not demonstrate sufficient levels of intelligence.[64] As the system mainly uses a rule-based decision-making process to find solutions, it does not have an ability to learn and, therefore, produce

[55] Dignum *Responsible Artificial Intelligence* (2019) 13.
[56] Dignum *Responsible Artificial Intelligence* (2019) 13.
[57] Dignum *Responsible Artificial Intelligence* (2019) 13.
[58] Sajja *Illustrated Computational Intelligence* (2020) 5.
[59] Sajja *Illustrated Computational Intelligence* (2020) 5.
[60] Sajja *Illustrated Computational Intelligence* (2020) 6.
[61] Sajja *Illustrated Computational Intelligence* (2020) 6.
[62] Sajja *Illustrated Computational Intelligence* (2020) 6.
[63] *Ibid*.
[64] S Yanisky-Ravid 'Generating Rembrandt: Artificial Intelligence, Copyright and Accountability in the 3A Era (2017) 4 *Michigan State Law Review* at 674.

unpredictable results. The incorporation of predetermined parameters in the programming phase renders the system, as a whole, unable to learn and truly exhibit creative characteristics.

The bottom-up perspective is far more advanced, and approaches intelligence in a manner which is reminiscent of cognitive processes of the human brain.[65] The way they function is to solve specific problems based off of experience, and this requires large amounts of data.[66] This domain of AI will form the basis of the discussion because systems using a bottom-up approach more closely resemble the cognitive processes of human beings. Thus, it will be important to unpack two main categories of AI, namely machine learning and deep learning.[67]

2.3.1 MACHINE LEARNING

This concept refers to a computer system's ability to learn and improve processing data without being programmed to specifically perform those tasks.[68] Importantly, machine learning can only simulate specific kinds of learning through analysing datasets using algorithms.[69] Therefore, the range a machine can learn certain tasks is very narrow and depends largely on the datasets that have been set in order for the machine to perform predictive analytics.

Essentially, the system is improving with experience and learning and becoming increasingly autonomous as a result. Through the use of algorithms, systems will essentially 'learn' based on data patterns and similarities it recognises form previous experiences.[70] It is through the understanding of historical data that the technology trains machines to make predictions. A common machine learning application is image recognition software used for cataloguing and detecting an object in a digital image.[71] The most important aspect about this concept bears repeating: a programmer does not need to write the code dictating what actions the system(s) will make in a given situation. This is the aspect of AI which highlights the machine's ability to 'think' or 'act' like humans, i.e., exhibiting facets of intelligent behaviour.

[65] Dignum *Responsible Artificial Intelligence* (2019) 13.
[66] *Ibid.*
[67] Taulli *Artificial Intelligence Basics* (2019) 16.
[68] Taulli *Artificial Intelligence Basics* (2019) 41.
[69] Mueller and Massaron *Deep Learning* (2019) 15.
[70] Dignum *Responsible Artificial Intelligence* (2019) 3.
[71] What are Machine Learning Applications? Top 10 Industry and Real-World Use Cases https://emeritus.org/blog/machine-learning-what-are-machine-learning-applications/ Accessed 26 July 2023

The most basic explanation on how machine learning operates is to understand that the first step involves engineers providing the system with lots of data and the expected result.[72] The machine will then analyse this inputted data and learn how to perform the task.[73] In short, the machines are fed data that has been collected previously and the machines find patterns in the data and make conclusions when given new data.[74] Taking the 'Blue Jeans and Bloody Tears' case study into account, it is clear that the musicians and engineers 'programmed' the system by feeding it a myriad of songs consisting of different lyrics and melodies. The AI system then makes various associations between the clusters of information and form interconnections between the many songs and rhythms it was exposed to.[75] The system then evaluated the desirability of the set parameters and produced the desired outcome, i.e., the song, autonomously. Due to the fact that a large number of parameters were fed, the system was able to produce a song with more combinations of lyrics and melodies.

There are various approaches to machine learning including supervised learning, unsupervised learning, reinforcement learning and deep learning. Supervised learning involves the machine being given labelled samples of data and the expected results with the aim of learning what those results will be.[76] So, a machine will be expected to make accurate predictions based off of the data entries made. An example of such a program are digital assistants such as Google Assistant, which use speech recognition to respond to the user's voice.[77] Unsupervised learning uses unlabelled inputted data to draw inferences and identify patterns in the datasets.[78] Self-driving cars are a common unsupervised learning algorithm which enables the vehicle to collect information form surrounding cameras, interpret this and then choose which actions to perform.[79] The difference here is that unsupervised learning does not aim to predict a single outcome, rather, it aims to identify trends in the datasets.

[72] Dignum *Responsible Artificial Intelligence* (2019) 22.
[73] Dignum *Responsible Artificial Intelligence* (2019) 23.
[74] C Gerard *Practical Machine Learning in JavaScript* (2021) 16.
[75] Yanisky-Ravid (2017) *Michigan State Law Review* 677.
[76] Dignum *Responsible Artificial Intelligence* (2019) 24.
[77] What are the Common Applications of Supervised and Unsupervised Learning? https://www.cognixia.com/blog/what-are-the-common-applications-of-supervised-and-unsupervised-learning/ Accessed 31 July 2023.
[78] Gerard *Practical Machine Learning* (2021) 11.
[79] What are Machine Learning Applications? Top 10 Industry and Real-World Use Cases https://emeritus.org/blog/machine-learning-what-are-machine-learning-applications/ Accessed 26 July 2023.

Reinforcement learning techniques, on the other hand, are more centred around applications where the outcome involves a set of actions, such as a game with AI players.[80] Therefore, this learning technique is more goal oriented because the aim of the system is optimise reaching an objective. For example, in a game, the object of the player will be to win a game. As a result, the training process is designed to reward behaviour which works to realise this goal, and penalise behaviour which moves away from the goal, in an effort to develop an understanding of how to win a game.[81] Most pertinent to the immediate discussion, however, is deep learning and an insight to the concept will be provided below.

2.3.2 DEEP LEARNING

Deep learning is a subfield of machine learning and has some similarities to it. The main distinguishing feature of this concept is that it processes large amounts of data in order to find relationships and patterns that are oftentimes undetectable by humans.[82] The concept of learning for computers involves building a database consisting of a neural network which is designed to process data.[83] Deep learning also uses these artificial neural networks which are similar to those networks of neurons located in a human being's brain.[84] These neural networks are what set apart advanced AI systems from the expert systems discussed above.

The information processing capabilities and receptors built in to the system function like a brain and thus enable the machine to function intelligently and further learn autonomously.[85] Structurally, the organisation of such a neural network consists of input and output nodes which enable the recognition of patterns in data and direct a desired outcome.[86] The groups of receptors are able to figure out how and how much to react to a given input and these responses are what govern the whole learning process of the machine.[87] The system approaches the 'learning process' by performing random outputs until it identifies which output is the desired output, and then the next time similar data is inputted, it will repeat the response and, in effect, learn. As a result, the system is equipped with an ability to learn through trial and error, and detecting patterns and similarities in the data without explicitly being programmed to look for

[80] Gerard *Practical Machine Learning* (2021) 12.
[81] Gerard *Practical Machine Learning* (2021) 12.
[82] Taulli *Artificial Intelligence Basics* (2019) 71.
[83] Mueller and Massaron *Deep Learning* (2019) 18 – 19.
[84] Dignum *Responsible Artificial Intelligence* (2019) 27.
[85] Yanisky-Ravid (2017) *Michigan State Law Review* 675.
[86] Dignum *Responsible Artificial Intelligence* (2019) 28.
[87] Yanisky-Ravid (2017) *Michigan State Law Review* 675.

these connections. Virtual assistants are further examples pf deep learning algorithms because they are capable of interacting with the user to learn more about subjects and learn to understand commands.[88]

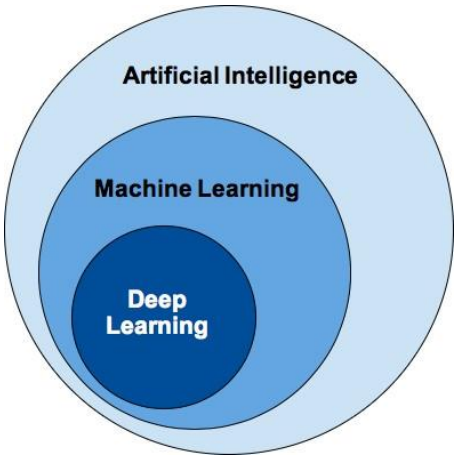

Figure 1.1 This is a representation of how AI, machine learning, and deep learning intersect.

2.4 COMPUTER PROGRAMS

It will then be necessary to explore what computer programs are and how they function. Conventional or traditional computer programs consist of a set of instructions to be performed by a computer which then enables it to process and output data.[89] These instructions are then written by a programmer in a programming language such as C++ or Java. This complex programming language is referred to as the program's source code.[90] This inputted data that is created by the programmer(s) is what produces the desired output. What is noteworthy about the source code, is that it contains explanatory comments or notes written by the programmer, and these are important to establish how the program works.[91] Thus, this is the aspect which is oftentimes copied.

It is clear that for computer programs to run, code needs to be inputted by a programmer in a programming language. Machine learning, on the other hand, learns how to solve or perform

[88] M Chatterjee Top 20 Applications of Deep Learning in 2022 Across Industries https://www.mygreatlearning.com/blog/deep-learning-applications/ Accessed 31 July 2023.
[89] S Karjiker 'Copyright Protection of Computer Programs' (2016) 51 *The South African Law Journal* 55.
[90] Kariiker (2016) *SALJ* 57.
[91] Kariiker (2016) *SALJ* 58.

tasks without explicit instruction. Rather, through learning data, a system relies largely on predictions and set parameters in order to learn and reach the desired goal without programmer intervention. However, at the crux of the functionality of these two systems is that a programmer has to input data or provide instructions in order for the system to run. Essentially, because the AI system is so dependent on data to train and feed the algorithm, the engineers are the ones who have to input a huge amount of data on the task and the expected result in order to run.[92] So, even though the AI technology is more complex in the algorithmic aspects, the foundational similarities in both are evident.

2.5 AI VS COMPUTER PROGRAMS

AI systems are understood as systems which can do things such as reason, learn from experience, solve problems and adapt to environments.[93] Under the SA Copyright Act computer programs are defined as a set of instructions stored in any manner which directly or indirectly direct the operation in a computer.[94] AI systems are able to problem solve and make decisions with some level of autonomy. The autonomy of machines comes in degrees, but is concerned with an ability to follow an algorithm in response to environmental input without real-time human input.[95] In an AI context, this concept involves an understanding into the fact that the system's autonomy is based off on interaction between the system, the task and the environment and, that autonomy is something that is always designed into the system.[96] Therefore, a system will be fed data and through processes involving trial and error, will analyse the set parameters and achieve a goal.

Furthermore, the neural networks of AI. such as machine learning, diverges significantly from traditional computer programs. Traditional computer programs are more deterministic, meaning outputs generated are predictable based on outputs, and this is different from AI which is capable of making future decisions in ways that cannot be directed.[97] This results in autonomous decision-making. The autonomy in AI systems can further be understood in terms of two precepts: tasks and goals.[98] Task autonomy is demonstrated when a system is able to choose between goals and seemingly adjust its behaviour.[99] On the other hand, goal autonomy is seen

[92] Dignum *Responsible Artificial Intelligence* (2019) 22.
[93] P Formosa 'Robot Autonomy vs. Human Autonomy: Social Robots, Artificial Intelligence (AI), and the Nature of Autonomy' (2021) 31 *Minds and Machines* 599; Gerard *Practical Machine Learning* 2.
[99] Dignum *Responsible Artificial Intelligence* (2019) 21.

[94] Section 1.
[95] Formosa (2021) *Minds and Machines* 599.
[96] A Guadamuz 'Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works" (2017) *University of Sussex* 4.
[97] Dignum *Responsible Artificial Intelligence* (2019) 21.
[98] Dignum *Responsible Artificial Intelligence* (2019) 21.

[100] Dignum *Responsible Artificial Intelligence* (2019) 21.

when a system is able to adapt and modify or quit certain goals.[100] These precepts represent the functionality of machine learning systems in AI which learn how to perform certain tasks.

Therefore, one can adopt the view that because machine learning involves techniques where the problem-solving algorithm is not directly programmed, then this means an AI system can exhibit autonomous actions. There are other marked differences because, for example, an AI system does not have to be programmed one line at a time to learn to perform a task. However, as stated previously, the foundational similarities between computer programs and AI technologies are the centrality of a programmer in the developmental stages of the system's life cycle. These points are crucial to mention because the very functioning of these AI systems is with minimal human input which begs the question whether an AI system can be recognised as an author for the works it has produced, and should these resultant works be protected under copyright legislation.

2.8 CONCLUSION

The important takeaways from this section are the meanings behind the bottom-up approach and the machine learning disciplines of AI. These two foundational concepts are incredibly important because they highlight the sophistication of AI systems and how they have developed in a manner which sees its creative capabilities rivalling those of humans. It follows, that these two concepts should be borne in mind from this point in order to inform the understanding of AI in the development of this dissertation. Additionally, since it is clear that computer-generated and AI-generated are similar, then the development of the argument into whether the products should be capable of protection under domestic copyright law must continue.

It is from this point of view that the legal analysis will follow to show that because of the intricate and complex nature of AI systems and their functionality, that the products generated by the machines may be regarded as being produced independently from the programmers and may require copyright protection. It is this scale of human involvement, or lack thereof, which triggers the issues surrounding AI and the protectability of the products the machines produce, and issues of authorship as well. These questions need to be answered with regard to existing copyright legislation within SA. It follows that the focus of this discussion is on

[100] Dignum *Responsible Artificial Intelligence* (2019) 21.

whether the works generated by AI systems are protected and if so, who owns them? In order to unpack this question, it will be necessary to first highlight what copyright internationally looks like.

CHAPTER 3

ANALYSIS OF COPYRIGHT PROTECTABILITY AND RELATED RIGHTS

This chapter provides an analysis of international copyright law, as well as copyright in SA. The aim here is to provide background on the purpose of copyright, how the philosophyof intellectual property has shaped copyright law internationally, and also how international conventions have laid the foundation for how SA, as a signatory to international conventions has ensured their legislation is Berne Convention for the Protection of Literary and Artistic Works ('the Berne Convention')[101] and Trade-Related aspects of Intellectual Property Rights ('TRIPS agreement')[102] compliant. The aim is to show what products can be protected, who can benefit from this protection and under what circumstances such protectioncan be given or denied. Importantly, it will be crucial to show where the ownership of these works could lie. This is crucial to unpack in order to understand whether AI-generated works can be protected by copyright.

3.1 NATURE AND PURPOSE OF COPYRIGHT

This section introduces the philosophy of copyright protection. This discussion is useful in order to frame the purpose of copyright protection, the international system of copyright and author's rights which are founded on these theories.

Firstly, the recognition of copyright is underpinned by a number of intellectual property theories. There are four main underlying justification theories which inform the international copyright system.[103] The generally accepted theories are: (a) natural-justice/natural law argument; (b) economic argument/just reward for labour; (c) cultural argument; and (d) social argument.[104] However this is not a closed list, there is a possibility for others.

[101] Berne Convention for the Protection of Literary and Artistic Works 1886; *Guide to the Berne Convention* World Intellectual Property Organisation (1978) 10.
[102] The Agreement on Trade-Related Aspects of Intellectual Property Rights 1994.
[103] K Garnett *et al Copinger and Skone James on Copyright* 16 ed (2011) 31.
[104] Van der Merwe *et al Intellectual Property in South Africa* 178; Garnett *et al Copinger and Skone* 31.

Copyright protection finds its basis in the natural rights philosophy which is inherent in the law.[105] According to the natural-justice argument, any worker has an exclusive natural right of property and is entitled to the fruits of their labour because they are the creator of their work.[106] Workers are further entitled to control and exploit their work.[107] This is also known as a Lockean approach to justifying intellectual property.[108] This view holds that through labour, a product adding social value has been created and this deserves to be rewarded.[109] Thus, one owns whatever they have created through their own intellectual effort and labour.[110]The natural-law tradition forms the basis for copyright protection in civil-law countries such as France and to a lesser extent Germany.[111] This supports the view that the programmers or engineers of the song 'Blue Jeans and Bloody Tears' should be rewarded for their efforts in inputting the various songs, lyrics and melodies into the AI system which ultimately generatedthe song. Therefore, through their labour, they are entitled to be rewarded.

The next argument is the economic theory which incentivises the creation of works through ensuring adequate compensation.[112] The basis for this being that authors must be renumerated for the exploitation of their works.[113] This right allows for a balancing of interests of the author and the public when accessing goods because the theory assumes that the reward is placed before the authors so that they create works of public value.[114] Thus, many copyright exclusive rights will have an economic element which is aimed at promoting meaningful work and providing a stimulus to creativity[115] on the part of the authors through monetary incentives. Here, it is clear that the engineers or programmers or even users instructing AI systems will be encouraged to make use of AI systems if they know that their outputs will be protected and they will further benefit from their creative efforts economically.

[105] J M Garon "Normative Copyright: A Conceptual Framework for Copyright Philosophy and Ethics" (2003) 88 *Cornell Law Review* 1293.
[106] Van der Merwe *et al Intellectual Property in South Africa* 178.
[107] Van der Merwe *et al Intellectual Property in South Africa* 178; Garnett *et al Copinger and Skone* 31.
[108] R P Merges and J C Ginsburg *Foundations of Intellectual Property* (2004) 331.
[109] Merges and Ginsburg *Foundations of Intellectual Property* (2004) 334.
[110] Du Bois (2018) *PELJ* 7.
[111] T Takenaka *Intellectual Property in Common Law and Civil Law* (2013) 132.
[112] Du Bois (2018) *PELJ* 27.
[113] Garnett *et al Copinger and Skone* 31.
[114] Garon (2003) *Cornell Law Review* 1307.
[115] *Ibid.*

The cultural argument finds that rewarding creativity is in the best interest of society because it leads to an enhanced national culture.[116] The main objective for this approach is providing a structure of social welfare and essentially culture-shaping mechanisms through the protection of creativity and innovation.[117] Therefore, the protection of creativity is founded upon the notion that intellectual property will be protected in order to benefit society as a whole.

Finally, copyright is seen as a social argument because it is in the public interest for authors and other right holders to be encouraged to publish their works to as much of the general public as possible.[118] The premise of this theory is utilitarian and it explains that cultural goods and industrial progress are a form of 'wealth maximisation', which is aimed at making a better society overall.[119] This will ultimately ensure the widest possible disseminationwill lead to social cohesion which is regarded as a social service.[120] Countries with a common-law tradition, such as the United Kingdom, tend to give this argument more weight by favouring a more public-interest approach.[121] The British Imperial Copyright Act (the 1911 Imperial Copyright Act)[122] largely influenced SA copyright, and as a result of this influence, the utilitarian theory has also informed domestic copyright principles. Therefore, thephilosophy informing copyright in SA is one of utility and emphasising the role thata work can do to contribute to the public good. Thus, it will be argued that the subject matter generated by AI systems be afforded protection on the basis that the content will be of great public interest.

The language of these theories recognises the relationship between a work and the personality of its creator.[123] The centrality of the author in the creation and subsequent need to protect the products of creativity is thus the basic concept of both common-law and civil-law copyright systems. What is more, the theories highlight that copyright, at its most basic foundations, has two dimensions.[124] These two dimensions are the author as the creator of the

[116] Van der Merwe *et al Intellectual Property in South Africa* 178.
[117] Du Bois (2018) *PELJ* 8.
[118] Garnett *et al Copinger and Skone* 31.
[119] Fisher 'Theories of Intellectual Property' https://cyber.harvard.edu/people/tfisher/iptheory.pdf (Accessed 23 Aug 2022); P Goldstein *International Copyright: Principles, Law and Practice* (2001) 3.
[120] Van der Merwe *et al Intellectual Property in South Africa* 178.
[121] Van der Merwe *et al Intellectual Property in South Africa* 178.
[122] Act of 1911.
[123] Takenaka *Intellectual Property in Common Law and Civil Law* (2013) 126.
[124] Merges and Ginsburg *Foundations of Intellectual Property* (2004) 323; Goldstein *International Copyright* (2001) 3 – 4.

work, and the work itself being a public good.[125] Ultimately, copyright needs to find a way to weigh up these interests by ensuring that a correct balance is struck between accessing these goods or creating avenues to facilitate as wide a dissemination as possible and the incentives provided to creators to provide them to the public.[126]

3.2 INTERNATIONAL COPYRIGHT FRAMEWORK

This section highlights the importance of affording copyright protection to creative works. The value added by these philosophies is compounded by the international conventions which have been established in an effort to unify member states' obligations to the protection of works.[127] Firstly, the rights of authors in their literary and artistic works are protected in accordance with the Berne and clarified under the TRIPS Agreement, both of which SA is a party to, and bound by.[128] These two instruments are related insofar as the TRIPS Agreement was devised as a tool to add to certain Berne Convention obligations. In particular, the TRIPS Agreement adds to the Berne Convention by obliging members to comply with substantive provisions under Berne, which are Articles 1 to 21.[129]

The Berne Convention defines literary and artistic works and the fundamental point to note is that ideas in such works are not protected by copyright, and that only once the idea has been expressed will it enjoy copyright protection.[130] The TRIPS agreement has similarly given expression to this fundamental principle of copyright whilst also establishing minimum standards of protection.[131] The TRIPS Agreement confirms this principle by providing that copyright protection shall only be extended to the original way in which ideas are expressed.[132] This very important principle has been adopted and applied by member states in the establishment of their national laws.

A key feature of the Berne Convention is that it requires automatic copyright protection.[133] In other words, the Convention does not provide any formalities in order for a work to qualify for copyright protection. This principle has been incorporated under the TRIPS

[125] Merges and Ginsburg *Foundations of Intellectual Property* (2004) 323.
[126] Merges and Ginsburg *Foundations of Intellectual Property* (2004) 328.
[127] Merges and Ginsburg *Foundations of Intellectual Property* (2004) 293.
[128] The Agreement on Trade-Related Aspects of Intellectual Property Rights 1994.
[129] *Guide to the TRIPS Agreement* WTO 35.
[130] Article 2; *Guide to the Berne Convention* WIPO (1978) 12.
[131] *Guide to the TRIPS Agreement* WTO 9.
[132] Article 9(2); *Guide to the TRIPS Agreement* WTO 38; Garnett *et al Copinger and Skone* 32.
[133] Article 5(2).

Agreement whereby the provision states that a condition for being awarded protection is compliance with formalities for trademarks, geographical indicators, industrial designs, patents and layout-designs of integrated circuits.[134] In its exclusion of section 1 on copyright and related rights, TRIPS is clearly reflecting the principle laid down under Berne.

Next, copyright has recognised legal persons by affording them with economic and moral rights. The Berne Convention and TRIPS Agreement allows authors to derive some economic value from the utilisation of their works.[135] Under Berne, in addition to prescribing several other economic rights, the instrument establishes minimum standards on moral rights which entitles an author to object to any distortion of their work.[136] TRIPS does not explicitly mention moral rights, but it does create further obligation on members to give authors of computer programmes and cinematograph films the right to authorise or prohibit commercial renting of their products, for example.[137] Thus, the implementation of minimum standards for protectable subject matter and rights have significantly influenced the norms of international copyright.

This section has provided a theoretical background in order to highlight the philosophies which underpin copyright generally. Furthermore, an insight into the two important multilateral treaties followed to highlight which key principles have been adopted by international copyright legislation. The main takeaway being that because SA is a former British colony, that it would have also inherited the indisputably utilitarian thread which runs throughmuch of the intellectual history of English copyright.[138] Thus, the discussion will continue on the premise that the SA copyright system is informed by the criterion of utility. Thenext section will then explore the SA position to highlight whether and how this balance between access and incentives has been struck through domestic legislation in regard to AI.

[134] Article 62(1); *Guide to the TRIPS Agreement* WTO 39.
[135] *Guide to the TRIPS Agreement* WTO 40.
[136] Article 6*bis.*
[137] Article 11.
[138] Goldstein *International Copyright* (2001) 7.

3.3 CURRENT COPYRIGHT FRAMEWORK IN SOUTH AFRICA: PROTECTION FOR AI WORKS?

This section aims to highlight what recent SA government policies there are on AI and then analyse whether AI-generated works can be protected under the SA Copyright Act.

Firstly, at present, policies on AI in SA have not covered the intersection thatexists in copyright and AI extensively. For example, a brief published on AI and data in SA discussed the use of AI in South African society for the purposes of improving service delivery.[139] Importantly, however, is that the Presidential Commission on the Fourth IndustrialRevolution (PC4IR) noted that copyright and IP protection is a high-level recommendation and it is imperative that legislation and policies be developed in this area to enable the skills ecosystem to develop alongside a 4IR society.[140] Furthermore, the PC4IR mentioned the importance of IP protection and ownership, especially in the creative economy, and because ofthis it is crucial to engage with the Copyright Amendment Bill to look at what it means in the context of 4IR, and this includes AI.[141] Therefore, it is evident that copyright has been identified as an area of intervention where AI and 4IR are concerned, and it is clear that the SA government has identified this as an area which needs to be updated. To this end, there are nodevelopments as yet that can speak to the current SA Copyright Act. As such an analysis into the current Act will follow insofar as it relates to the requirements for the subsistence of copyright.

The elements for copyright protection are firstly that a product has to be considered as a work,[142] originality,[143] reduction to material form,[144] and the work must be authored by a qualified person,[145] or first published in SA.[146]

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[139] R Adams *et al* "Can AI and Data Support A More Inclusive and Equitable South Africa?" available at https://policyaction.org.za/sites/default/files/PAN_TopicalGuide_AIData1_IntroSeries_Elec.pdf (Accessed 15 November 2023).
[140] Presidential Commission on the 4th Industrial Revolution GG NO. 42388 of 9 April 2019.
[141] Presidential Commission on the 4th Industrial Revolution GG NO. 42388 of 9 April 2019.
[142] Section 2(1).
[143] Section 2(1).
[144] Section 2(2).
[145] Section 3(1).
[146] Section 4(1); Van der Merwe *et al Intellectual Property in South Africa* 203; O Dean and A Dyer *Introduction to Intellectual Property Law* (2014) 16.

3.3.1 WORK

The Act recognises nine distinct categories of works eligible for copyright protection which are literary works; artistic works; musical works; cinematograph films; sound recordings; programme-carrying signals; published editions; and computer programs.[147] Once a creative output is shown to fall under one of these enumerated categories, it will then need to be show other inherent features before vesting of copyright.[148] The song 'Blue Jeans and Bloody Tears' could fall under a musical work, for example, as defined by the SA Copyright Act.[149]

3.3.2 MATERIAL FORM

Importantly, these works must also be reduced to material form.[150] This is because copyright does not subsist in ideas or thoughts, copyright will only vest once an idea has been expressed in material form.[151]

3.3.3 ORIGINALITY

This section explores the concept of originality because it is crucial in determining authorship of a work.

The concept of originality is a threshold requirement for copyright protection under all nine categories of work in the SA Copyright Act.[152] The Act provides that works will only be guaranteed with protection if they are original. Therefore, in determining whether the products generated by AI systems can be protected by copyright, they first have to satisfy this originality standard. In addition, it is a key factor in the determination into authorship as it defines the relationship between the author and the work.[153] Though reference is made to originality, no specific definition is given. Domestically, the exact nature and scope of originality has similarly not been defined under the Copyright Act, but the concept has been dealt with extensively under case law. The accepted views, however, are that originality requires substantial independence, judgment, skill and labour from the creator and this is tested against the 'sweat-

[147] Section 2(1).
[148] Van der Merwe *et al Intellectual Property in South Africa* 204.
[149] Section 1.
[150] Section 2(2). Note that section states that a work, except a programme-carrying signal, shall not be eligible for copyright unless it is reduced to material form.
[151] Article 9 TRIPS Agreement; Dean and Dyer *Introduction to Intellectual Property Law* 1.3.3.
[152] Section 2(1).
[153] D O Oriakhogba 'The Scope and Standard of Originality and Fixation in Nigerian and South African Copyright Law' (2018) 2 *African Journal of Intellectual Property* 119.

of-the-brow' doctrine.[154] This doctrine requires the creation of a work to demonstrate a substantial (not trivial) degree of skill, judgement or labour.[155]

In the case of *Klep Valves (Pty) Ltd v Saunders Value Company Ltd,*[156] the court held that originality does not necessarily require an idea to be novel, rather, there should be an exercise of independent skill and labour on the part of the author.[157] So, in order for a work to be seen as original it must be the author's own creation and not a reproduction from another source.[158] Furthermore, for the purposes of copyright, what is meant by originality is the originality in the skill or labour and not the originality in the expression of thought.[159] Here, there is a clear connection between the authorship of a work and the originality that lies in the work. To this end, if an author of a work can demonstrate that they expended labour and used a sufficient amount of skill to produce a work, then there is clear evidence of originality in terms of the Copyright Act. The 'test' for originality it thus simply: skill or labour.

Similarly, in the case of *Haupt t/a Softcopy v Brewers Marketing Intelligence (Pty) Ltd,*[160] the court also needed to determine the originality of a computer program. The court reiterated the principles espoused in *Klep Valves* by stating that originality under domestic copyright law does not mean a work must be inventive or unique.[161] Therefore, the requirement that a work be original does not refer to something that is novel or new.[162] This requirement relates solely to the labour involved in the maker's endeavours to create a work. Therefore, the test for originality in South African copyright law provides that where a work is created, it should not have been copied from an existing source and its production should have required a substantial (or not trivial) degree of skill, judgement or labour.[163]

[154] L T C Harms '"Originality" and "Reproduction" in Copyright Law with Special Reference to Photographs' (2013) 16 *PELJ* 493 and 494.
[155] Simon (2006) *Journal of Intellectual Property Law* 698; Van der Merwe *et al Intellectual Property in South Africa* 204.
[156] 1987 2 SA 1 (A).
[157] 1987 2 SA 1 (A) 4I – J; Van der Merwe *et al Intellectual Property in South Africa* 205.
[158] Van der Merwe *et al Intellectual Property in South Africa* 205.
[159] 1987 2 SA 1 (A) 22H – J.
[160] 2005 (1) SA 398 (C).
[161] 2005 (1) SA 398 (C) 412F – G.
[162] Van der Merwe *et al Intellectual Property in South Africa* 205.
[163] *Ibid.*

Additionally, in *National Soccer League t/a Premier Soccer League v Gidani (Pty) Ltd (Premier Soccer League)*[164] the court had to determine whether fixtures belonging to Premier Soccer League were protected by copyright. Importantly, the court needed to assess the originality of the work since original literary works, which include tables and compilations, are eligible for copyright protection.[165] In dealing with the definition of what constitutes 'originality', reliance was placed on *Haupt.* It was held that extensive effort in making a compilation, even where there may be less skill involved, may be enough to render a work original.[166] This is a rather low standard of originality which simply requires work and energy, i.e., skill and labour, to be present in the development of a work in order to render a work original.[167] Ultimately, however, the court held that the determination of how much skill or labour is necessary for copyright to attach to a work should be decided on a case-by-case basis.[168] This means that in certain instances works may require more labour, e.g. making a compilation, thus requiring less skill.[169] Accordingly, where enough effort is present, this will be enough to render a work original even though less skill was involved.[170]

The recent decision handed down in *Moneyweb (Pty) Ltd v Media24 Ltd*[171] interrogated this and the judgment could be interpreted as possibly creating a new standard for originality,[172]but this is not the case. The court held that in determining originality, the time and effort expended by an author is a material consideration,[173] but this cannot be looked at in isolation. Instead, the time and effort must be construed in a manner which shows that there was not anyslavish copying involved in the creation of the work as a whole and not just select parts.[174] Thus, the inquiry into originality is still expressed through the "sweat of the brow" doctrine, but looked at through a prism which considers more than just the time and effort of a creative.

[164] [2014] 2 All SA 461 (GJ).
[165] [2014] 2 All SA 461 (GJ) para 61; Section 2(1)(a) SA Copyright Act.
[166] [2014] 2 All SA 461 (GJ) para 63; Van der Merwe *et al Intellectual Property in South Africa* 205.
[167] N I Moleya 'Evaluating the Copyright Protection of Databases in South Africa: A Comparative Analysis with the European Union' (2020) 8 *South African Intellectual Property Law Journal* 66.
[168] [2014] 2 All SA 461 (GJ) para 68.
[169] Van der Merwe *et al Intellectual Property in South Africa* 204.
[170] Van der Merwe *et al Intellectual Property in South Africa* 205.
[171] 2016 BIP 236 (GJ).
[172] Geyer (2022) *THRHR* 185; 2016 BIP 236 (GJ) 330A – D.
[173] 2016 BIP 236 (GJ) 330H – 331A.
[174] 2016 BIP 236 (GJ) 331A – C.

It aims to consider the effort and time holistically in order to determine whether the work is original or merely a slavish copy.

The threshold for originality under South African copyright law is thus: skill, labour or judgement. The presence of these will, depending on the nature of the work, render it original. Nevertheless, the skill and labour ought to be relevant to the work in order for it to create a copyright, as it is not enough for the skill and labour to just be present.[175] Therefore, the determination into originality is a subjective exercise which examines the quality of the labour expended by the author of a work in order to bring a work into existence. This contrasts the consistently held view of earlier courts which found that the test for originality does not involve a subjective inquiry.[176] Thus, it is true that originality tests actually remain a subjective value judgment into whether that time skill and effort produced something that is original.[177]

Therefore, the requirement of originality is not only crucial in the determination of the protectability of a work, the concept is also important in the determination into authorship because it closely relates to and defines the relationship between the author and the work.[178] This relationship is made clearer in the above cases. In *Klep Valves,* the court held that the copyright legislation is specifically enacted to protect authors, who by their skill and labour, produced original works.[179] Additionally, the judgment in *Premier Soccer League* highlights that in some cases extensive labour where minimal skill is applied can be enough to render a work original.[180] This clearly shows that the requisite skill and labour which is judged in determining whether a work is original must come from the author of a work.

As discussed above, the statutory requirements for a work to be protected under SA copyright law are as follows: the work must fall under the categories of protectable works;[181] the work must be original and reduced to material form;[182] and the author must be a qualified person/first publication must take place in SA.[183]

[175] Geyer (2022) *THRHR* 187.
[176] *Waylite Diary CC v First National Bank Ltd* 1995 (1) SA 645 (A) 649H – J.
[177] Van der Merwe *et al Intellectual Property in South Africa* 205 – 206.
[178] D O Oriakhogba 'The Scope and Standard of Originality and Fixation in Nigerian and South African Copyright Law' (2018) 2 *African Journal of Intellectual Property* 119.
[179] 1987 (2) SA 1 (A) 21A – B.
[180] [2014] 2 All SA 461 (GJ) para 63; Van der Merwe *et al Intellectual Property in South Africa* 205.
[181] Section 2(1) SA Act.
[182] Section 2(1) SA Act.
[183] Section 3(1) SA Act.

As mentioned previously, the 'Blue Jeans and Bloody Tears' song was produced by an AI system. Under normal circumstances, such a song would stand to be protected under the Copyright Act because it falls within the bounds of what is defined as a musical work.[184] Here, the first element of being a work eligible for copyright is satisfied. The song also satisfies the material form reduction requirement because it has been recorded.[185]

The standard for copyright originality has been confirmed through the judgments in *Klep Valves, Haupt, Premier Soccer League* and *Moneyweb*. These landmark cases have maintained the standards for originality as skill, labour or judgement.[186] According to *Klep Valves,* to be original it needs to be apparent that original sill or labour was expanded in the execution or creation of a work.[187] In short, the work must not have been slavishly copied and then later reproduced. Importantly, when reference is made to 'slavish copying' it refers to what it took to make a copy and not necessarily the similarity of the two copies.[188] *Haupt* also reiterated this by holding that the skill and judgement are the requirements for the eligibility for originality.[189] Next, *Premier Soccer League* held that extensive effort in making a compilation,even where there may be less skill involved, may be enough to render a work original.[190] Finally, the court in *Moneyweb* held that in determining originality, the time and effort expended by an author is a material consideration.[191]

3.3.4 MADE BY QUALIFIED PERSON/FIRST PUBLICATION

The final requirement is that the work must be made by a qualified person[192] or the work must be first published in SA.[193] Qualified person relates to either a natural person, i.e., a person who is a South African citizen or is domiciled or resident in the Republic, or a juristic person, i.e., a body incorporated under the law of the Republic,[194] or a person domiciledor resident in a member country of the WTO.[195] Alternatively, the requirement of 'publication'

[184] Section 1 SA Act.
[185] Section 2(2) SA Act.
[186] 1987 2 SA 1 (A) 4I – J; 2005 (1) SA 398 (C) 412F – G; 2016 BIP 236 (GJ) 330H – 331A.
[187] 1987 2 SA 1 (A) 22H – J.
[188] Geyer (2022) *THRHR* 180.
[189] 2005 (1) SA 398 (C) 400A – B.
[190] [2014] 2 All SA 461 (GJ) para 63; Van der Merwe *et al Intellectual Property in South Africa* 205.
[191] 2016 BIP 236 (GJ) 330H – 331A.
[192] Section 3(1).
[193] Section 4(1).
[194] As defined under Section 3(1); Van der Merwe *et al Intellectual Property in South Africa* 205.
[195] Van der Merwe *et al Intellectual Property in South Africa* 210; section 37 SA Copyright Act which provides extends the application of the SA Copyright Act to other countries in line with national treatment.

also appears in the SA Copyright Act. This is an important factor because it provides a means of copyrighting a work where it has not been authored by a qualified person.[196] Works are deemed to have been published if copies have been disseminated with the consent of the owner.[197]

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[196] O Dean and A Dyer *Introduction to Intellectual Property Law* (2014) 5
[197] O Dean and A Dyer *Introduction to Intellectual Property Law* (2014) 5
[198] Section 2(1) SA Act.
[199] Section 2(1) SA Act.
[200] Section 3(1) SA Act.
[201] Section 1 SA Act.
[202] Section 2(2) SA Act.
[203] 1987 2 SA 1 (A) 4I – J; 2005 (1) SA 398 (C) 412F – G; 2016 BIP 236 (GJ) 330H – 331A.
[204] 1987 2 SA 1 (A) 22H – J.
[205] Geyer (2022) *THRHR* 180.
[206] 2005 (1) SA 398 (C) 400A – B.

original.[207] Finally, the court in *Moneyweb* held that in determining originality, the time and effort expended by an author is a material consideration.[208]

Next, it will then be necessary to discuss authorship because the author is central to the birth of a work.[209]

3.5 AUTHORSHIP

Authorial expression is at the heart of copyright law and key international instruments such as the Berne Convention.[210] This section is important to discuss because it will aid in answering whether an AI system can be recognised as an author under the SA Copyright Act. Generally, authors have noted how several conceptualisations of authorship exist and these include regarding an author as the person responsible for the creation of the material embodiment or intellectual effort expanded in relation to a work; or that authorship should include a human that exercises autonomy in creating a work.[211] However, under copyright in SA, the ordinary meaning of 'author' as the maker or creator of the work applies mainly to literary, musical or artistic works.[212] The originality tests above have highlighted originality is tested based on the amount of time skill and effort expanded by a creator in order to render a work.[213]Therefore, this 'creator' is the one responsible for authoring this work and it is their efforts which render the work original.

What is clear, however, is that most constructions of 'author' do not clearly set out its definitional parameters and still leaves some questions unanswered. This is clearly seen because domestic copyright law does not necessarily provide concrete criteria from which to reference when determining who or what constitutes an author.[214] The default position, however, is to regard the maker or creator of a work as the author, however, this only relates to literary, musical or artistic works.[215]

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[207] [2014] 2 All SA 461 (GJ) para 63; Van der Merwe *et al Intellectual Property in South Africa* 205.
[208] 2016 BIP 236 (GJ) 330H – 331A.
[209] O Dean and A Dyer *Introduction to Intellectual Property Law* (2014) 19.
[210] Article 1.
[211] Ncube and Oriakhogba (2018) 21 *PELJ* 11.
[212] This dissertation will limit the scope of its interrogation of this definition to these forms of protectable works because the case study of 'Blue Jeans and Bloody Tears' is in this realm or works.
[213] Van der Merwe *et al Intellectual Property in South Africa* 205 – 206.
[214] Ncube and Oriakhogba (2018) 21 *PELJ* 13.
[215] Section 1 SA Act; Van der Merwe *et al Intellectual Property in South Africa* 221.

Authorship is usually always a fact-based question which finds application in the person responsible for the creation or reduction to materiality of a work. This term is not explicitly defined under any of the international instruments, and this suggests that the definitions should necessarily be constructed at a national level.[216] According to SA's copyright law, reference to an author will always be determined by reference to the type of work.[217] In terms of the Act, authorship in a literary, musical or artistic work, besides a photograph, is the personwho first creates the work.[218]

Domestic copyright legislation confines authorship to natural and juristic persons only. [219] Natural persons are human beings, and according to South African law of persons, all human beings are legal subjects and are granted rights, duties and capacities.[220] This position is in line with the justification theories for intellectual property which were mentioned above. A discussion of these theories under this section will not be necessary. The crucial point which needs to be derived from the natural law, utilitarian, reward and economic theories is that at their foundation, they identify the personality of the author.[221] Therefore, when discussing works generated by AI, it will be crucial to identify the individual who has created the work in order to further identify who owns the creative outputs.

Within this context, the definitions of author under the SA Copyright Act make reference to a person being involved to some degree in the creative process and any associated effort, time, money, control and personality which directly led to the creation of a work. The guiding theories underpinning intellectual property also make reference to personhood in determining an author of a copyrightable work. In effect, this excludes non-humans, except for juristic persons, from being granted with the ability to hold the status of author. Therefore, the point of contention in attributing ownership to non-humans, such as AI systems, stems from an inability to exercise subjective rights over certain property, for example, disposing the legal object,[222] or an inability of non-humans to reap the fruits of their labour.[223]

[216] D O Oriakhogba 'Authorship, Ownership and Enforcement of Copyright: The Nigerian Situation' (2015) 40 *South African Intellectual Property Law Journal* 42.
[217] O Dean and A Dyer *Introduction to Intellectual Property Law* (2014) 19.
[218] Section 1.
[219] Sections 3 and 4.
[220] H Kruger and A Skelton *Law of Persons in South Africa* (2018) 2.4.1.
[221] Fisher 'Theories of Intellectual Property'; Ncube and Oriakhogba (2018) *PELJ* 18.
[222] Ncube and Oriakhogba (2018) *PELJ* 11.
[223] Ginsburg (2003) *Depaul Law Review* 1065.

The SA Copyright Act also defines the author of a computer-generated work as 'the person by whom the arrangements necessary for the creation of the work were undertaken'.[224] Therefore, it will be crucial to determine whether AI-created works are the same as computer-generated works. The concept of computer-generated works is quite similar to that of AI-generated works. As such, if computer-generated works are protected by copyright, then an argument can be furthered along similar lines for AI-created works. In answering this question, the cases of *Payen Components SA Ltd v Bovic*[225] and *Haupt* will need to be discussed.

In *Payen*, the main contention on the part of Bovic was that of authorship, because the author of the material in dispute was not a human author, but a computer.[226] The court then had to distinguish between 'computer aided' and 'computer-generated' works. Computer aided works are created in instances where the computer is used as a tool, much like a pen.[227] Conversely, computer-generated works are generated with relatively little human input using sophisticated devices.[228] This little human input is important because it means that the steps taken by the operator may not be substantial enough to make them an author of such a work.[229]

In *Haupt*, the distinction was again drawn between computer-assisted and computer-generated works. [230] The judgement held that the SA Copyright Act does not define 'computer-generated' but it should be taken to mean works created by a computer in circumstances where there is no human author.[231] Therefore, if there is a human author, the work will be computer-assisted.[232] The court went further to state that the database which formed the subject matter of the case was created using a computer program, but this program merely assisted in the process because the creator, Coetzee decided on things such as the columns and their field names, and for this reason the is computer-assisted.[233] Therefore, a work will be computer-generated when there is no human author.

[224] Para (h) of S 1 definition of author in SA Copyright Act.
[225] 1995 (4) SA 441 (A).
[226] 1995 (4) SA 441 (A) 448D – E.
[227] 1995 (4) SA 441 (A) 448G – H.
[228] 1995 (4) SA 441 (A) 448H – I.
[229] 1995 (4) SA 441 (A) 449A – B.
[230] 2006 (4) SA 458 (SCA) 471H – J; I Simon 'South African Supreme Court rules on copyright in software and computer-generated works' (2006) 1 *Journal of Intellectual Property Law & Practice* 696.
[231] 2006 (4) SA 458 (SCA) 471H – J.
[232] Simon (2006) *Journal of Intellectual Property Law* 696.
[233] 2006 (4) SA 458 (SCA) 472A – C.

These principles distilled form the judgment are extremely important to this discussion because the definition of computer-generated works seems to align with the definition of AI-created works, as they too, do not necessarily have a discernible human author who can be traced back to the actual generative process of the work.[234] Moreover, the judgment in *Haupt* highlighted that because it was Coetzee who was responsible for deciding on field names etc.,[235] then, the work could not have been computer-generated. The complexity of AI and their ability to learn and process data without being programmed to do so, shows the autonomous capabilities of AI[236] and how it closely resembles the definition of computer-generated. However, because AI is still in the weak stages,[237] it is too premature to find that no human input was present at all in the generative processes of creating works.

The examination above revealed that the domestic copyright doctrine on authorship is sparse and does not extensively address what authorship means, nevertheless, recognises that an author is a human being who has expended effort in the subjective composition of a work and subsequently has powers of control over the work.[238] It is clear that the standpoint supports an authors' rights enthusiasts' approach which supports the notion of a human being as an author in order for them to enjoy the fruits of their labour which are their moral and economic rights as creatives.[239] However, what is also clear is that the case law (*Payen Components SA Ltd v Bovic)* and legislation[240] make room for computer-generated works to generate protectable works which are authored by a human.

To this end, if the definition of computer-generated works is extended to AI-gnerated works, then then human responsible for making the necessary arrangements for the creation of the work will be regarded as the author of this work. In doing so, a human author will be attributed authorship status whilst also acknowledging the significance of the AI's input in generating the work.

[234] Dignum *Responsible Artificial Intelligence* (2019) 27.
[235] 2006 (4) SA 458 (SCA) 472A – C.
[236] Taulli *Artificial Intelligence Basics* (2019) 41.
[237] Taulli *Artificial Intelligence Basics* (2019) 4.
[238] Ginsburg (2003) 52 *Depaul Law Review* 1063 – 64.
[239] Ginsburg (2003) *Depaul Law Review* 1065.
[240] Section 1(1) (h) under 'author' in SA Act.

The discussion must now move on to ask whether, under the current copyright framework, who will own the AI-generated works.

3.5 RESULTANT OWNERSHIP OF AI-GENERATED WORKS?

In terms of the SA Copyright Act, ownership is determined by making reference to the author of a work.[241] Therefore, an author of the work is considered to be the first owner of the work.[242] This general rule applies except for when there is an exception which results in the ownership of a copyright work vesting in a person who is not the author.[243] These instances which are set out in the SA Copyright Act highlight when a distinction will be made between the **author** and the **owner** of a copyright work.[244]

Relevant to this discussion is the exception related to literary or artistic works. According to the Act, when a work is made by an author in the course of employment or under a contract of service, then the proprietor is regarded as the owner of the work.[245] This exception operates only in the context that the work is created for publication in a newspaper or magazine.[246]

Therefore, in applying the definition of an author of a computer-generated work to AI-generated works, the author of 'Blue Jeans and Bloody Tears' will be taken to be the 'person by whom the arrangements necessary for the creation of the work were undertaken'[247] (perhaps the engineer(s) involved in putting together the AI system). Attributing the authorship to the human(s) responsible for making the necessary arrangements that brought about a creative work will result in the particular human(s) being considered as the owner of the work. The general rule for ownership under SA copyright law will therefore apply and render these humans as the first owner(s) of the work. In establishing this causal connection between the human author and the input of the AI in generating the work, the work will be protected and a human will be vested with authorship and resultant ownership of the work.

In addition, authorship and resultant ownership could alternatively vest with the individuals using the AI i.e., the people that are not the engineers, and giving the system user prompts.

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[241] Section 21(1)(a).
[242] O Dean and A Dyer *Introduction to Intellectual Property Law* (2014) para 1.6.1.
[243] O Dean and A Dyer *Introduction to Intellectual Property Law* (2014) para 1.6.1.
[244] Section 21.
[245] Section 21(1)(b); O Dean and A Dyer *Introduction to Intellectual Property Law* (2014) para 1.6.2.1.
[246] Section 21(1)(b).
[247] Section 1(1) (h) under 'author' in SA Act.

This may be determined on a case-by-case basis because it will require a subjective inquiry into how much time and effort was expended by the individual in the creation of the work.[248]

So, if this person has demonstrated that in the creation the AI system which generated the song, they exercised independent and substantial skill, judgement or labour, then the song would be regarded as original. In this way, the statutory requirements for a work to be protected will be satisfied allowing the AI-created works protection under SA copyright laws.

3.6 CONCLUSION

The findings suggest that there is space in the SA copyright framework to extend protection to AI-generated works. The definition of an author of a computer-generated work[249] could be extended to AI. In this way, the AI is regarded under copyright law as more of a tool which can assist in the creation of the outputs. However, as the position currently stands, no works generated by AI could be protected under the domestic copyright framework. Therefore, in keeping with the objectives of the PC4IR, it is imperative that legislation and policies be developed to enable the skills ecosystem to develop alongside a 4IR society.[250]

Next it will be important to examine the positions of select foreign jurisdictions to determine if their domestic copyright legislations accept or deny the protection of AI-created works.

CHAPTER 4

INTERNATIONAL RESPONSES TO AI-GENERATED WORKS IN COPYRIGHT LAW

4.1 INTRODUCTION

An analysis into the copyright considerations of foreign jurisdictions as they relate to AI will be the focus of this chapter. Exploring comparative approaches is important because the context that other countries provide can aid SA in its implementation and possible development of copyright legislation as it relates to AI. The analysis will draw references fromforeign law including the United Kingdom, Ireland, Germany, the United States and China to understand whether protection is given to AI-generated works.

[248] [248] 2016 BIP 236 (GJ) 330H – 331A.
[249] Section 1(1) (h) under 'author' in SA Act.
[250] Presidential Commission on the 4th Industrial Revolution GG NO. 42388 of 9 April 2019.

4.2 EU COPYRIGHT FRAMEWORK

In this section, EU copyright law is drawn on in order to determine whether there is a harmonised or general definition for what authorship in copyright entails. Case law will then be examined to determine how courts have interpreted principles of originality and how these principles relate to authorship and finally whether there is room to consider AI within these parameters. The main EU legislation which will be drawn from in order to shed light on protectability requirements and definitions of key concepts is the EU Copyright Directive (the Directive),[251] jurisprudence extracted from the Court of Justice of the European Union (CJEU) and the European Commission's "White Paper on Artificial Intelligence".[252]

Firstly, the White Paper defines AI systems broadly as a collection of technologies which encompass a combination of data, algorithms and computing power to function.[253] The document provides a comprehensive look into the application of AI in industrial and professional markets and how such systems can be applied in the global economy to achieve Sustainable Development Goals, but, crucially, it is silent on matters surrounding copyright and its intersection with AI.[254]

The Directive's main objective is to provide copyright protection in the context of the information society such as computer programs.[255] No explicit mention is made to AI systems under the scope of protection that the Directive covers. The Directive further affords authors exclusive rights to prohibit reproduction of their works.[256] The concept of authorship is not explored further, as a general definition of the concept is not provided. Therefore, a closer look at judicial decisions of the CJEU will be necessary.

Next, the discussion aims to analyse case law which has contributed to copyright jurisprudence on originality and authorship. The case of *Infopaq International A/S v Danske Dagblades Forening*[257] concerned the reproduction by Infopaq of certain newspaper articles

[251] Directive 2001/29/EC of The European Parliament and of the Council of 22 May 2001 on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society.
[252] European Commission 'White Paper on Artificial Intelligence' https://ec.europa.eu/info/sites/default/files/commission-white-paper-artificial-intelligence-feb2020_en.pdf (Accessed 22 November 2022).
[253] European Commission 'White Paper' 2.
[254] Vehar and Gils (2022) 15 *Journal of Intellectual Property Law & Practice* 724.
[255] Article 1(2)(a).
[256] Article 2(a).
[257] C-5/08, EU:C:2009:465.

for commercial purposes without the authorisation of Danske.[258] The important parts for the analysis are the conceptualisations of originality of works in the EU. The court premised its judgment by holding that the protection of works from unauthorised reproduction is informed at a national level by the Berne Convention, which states that certain subject matter, namely artistic and literary works, will be protected provided they are intellectual creations.[259] As such, works will be deemed to be original and subject to copyright protection if it is the author's own intellectual creation.[260] Authors in agreement find that 'in order to reach the required level of originality, it suffices that authors make some free and creative choices', particularly in the selection, sequence and combination of words (when dealing with literary works).[261] Therefore, originality is determined by making reference to the work and whether the author has expended intellectual effort to create a work.

Next, the decision of *Eva-Maria Painer v Standard VerlagsGmbH, Axel Springer AG, Süddeutsche Zeitung GmbH, Spiegel-Verlag Rudolf Augstein GmbH & Co KG*[262] is an important case to consider because the CJEU further refines the originality criterion. The court had to answer whether photographs enjoyed copyright protection and in answering this cited *Infopaq* with approval and held that protection will only be given if the photograph is original by being the author's own intellectual creation.[263] The court extended the definitional requirements of originality by holding that a work will be original if the author has demonstrated creative abilities by making free and creative choices in the creation of the work and thus reflecting the author's personality.[264] Thus, it can be deduced that the court requires some kind of human input if the creation must reflect the author's personality.[265]

Finally, in *Funke Medien NRW GmbH v Bundesrepublik Deutschland*[266] the matter involved a publication by a German daily newspaper of certain Parliament briefings which was

[258] C-5/08, EU:C:2009:465 para 15.
[259] C-5/08, EU:C:2009:465 para 34.
[260] C-5/08, EU:C:2009:465 para 37.
[261] T Margoni 'The harmonisation of EU copyright Law: The originality standard' in M Perry *Global governance of intellectual property in the 21st century: Reflecting policy through change* (2016) 14; P B Hugenholtz and J P Quintais 'Copyright and Artificial Creation: Does EU Copyright Law Protect AI—Assisted Output?' (2021) 52 *International Review of Intellectual Property and Competition Law* 1197.
[262] C-145/10, EU:2011:239.
[263] C-145/10, EU:2011:239 para 87.
[264] C-145/10, EU:2011:239 para 89 and 99.
[265] Lauber-Ronsberg and Hetmank (2019) *Journal of Intellectual Property Law & Practice* 572.
[266] C-469/17, ECLI:EU:C:2019:623.

later challenged on the grounds of a copyright infringement by the Federal Republic of Germany.[267] It was up to the court to determine whether the briefings were in fact works capable of attracting copyright protection. The court held that in order to qualify as aprotectable work, it is crucial to show that an author made free and creative choices in draftingthe reports; thus, satisfying the originality requirement.[268] Therefore, in its judgement, the CJEU confirmed a twofold requirement of originality requiring the subject matter to be the author's own and the author's intellectual creation, which implies making personal and creativechoices.[269]

It is clear that under EU copyright jurisprudence, a lot of emphasis is placed on the requirement of originality. An interpretation of the criterion for originality relies on an exercise of the author's intellectual creation to produce a work through making free and creative choices, which was a principle extracted from the CJEU's judgment in *Infopaq.*[270] This principle was later cited with approval in both *Painer* and Funke Medien. This highlights thatEU copyright law recognises that the personality of the author should be reflected in a work inorder for it to be regarded as original.[271] It follows that the CJEU's criterion of personal intellectual creation is a key factor in determining authorship. It is from this understanding thatthis discussion can continue to analyse the legislations of the next jurisdictions.

4.3 COPYRIGHT LEGISLATION IN THE UNITED KINGDOM

The Copyright, Designs and Patents Act (the UK Act) will be drawn on to discuss whether, in the UK, having a human author is a requirement for the protection of a work produced by an AI system. Firstly, the UK Act protects 8 categories of works which are literary, dramatic, musical or artistic works; sound recordings, films or broadcasts; and the typographical arrangement of published editions.[272] In particular, a copyright will subsist in a literary, dramatic, musical or artistic work provided a work of any of those descriptions is

[267] C-469/17, ECLI:EU:C:2019:623 para 10 – 11.
[268] C-469/17, ECLI:EU:C:2019:623 para 23.
[269] Hugenholtz and Quintas (2021) *International Review of Intellectual Property* 1196.
[270] Hugenholtz and Quintas (2021) *International Review of Intellectual Property* 1196.
[271] Vehar and Gils (2022) *Journal of Intellectual Property Law & Practice* 719.
[272] Section 1(1).

'original'.[273] Additionally, copyright will only subsist in a literary, dramatic or musical work provided it is recorded in writing, i.e., reduced to material form.[274]

Next, authorship of the work is determined by looking at the *person* who creates it.[275] Interestingly, the Act makes it clear that in some cases, a work may not be generated or authored by a person. The UK appears to have deviated from the norm of requiring a human originator of a work.[276] The UK Act states that an author "[i]n the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken".[277] The minor definitions section of the UK Act explains that 'computer-generated' means that the work is generated by a computer in circumstances where there is no human author of the work.[278] A purposive interpretation of these provisions could permit a wider meaning of 'computer-generated' to mean 'AI-generated'. If that were the case, then the UK Act seems to have a clear view of what authorship and ownership for works generated by AI systems looks like. In this way, the authorship and ownership rights over the works generated by intelligent systems will be given to the person who has created an environment necessary to facilitate the creation of the works by the AI system.[279]

This progressive approach is in line with the UK's National AI strategy which aims to recognise the potential of AI to maximise growth and competition in innovation.[280] This strategy was developed alongside a number of government sectors including the AI Council which functions to advise the government on the responsible adoption of AI for the betterment of society.[281] The National Strategy paper noted how public comments on AI and IP were invited, and the government published a response and committed to: (a) consulting the extent to which copyright and patents should protect AI generated inventions and creative works; (b)

[273] Section 1(1)(a).
[274] Section 3(2).
[275] Section 9(1).
[276] Scannell (2022) *Journal of Intellectual Property & Practice* 734; L Bently "The UK"s Provision on Computer Generated Works: A Solution for AI Creations?" https://europeancopyrightsociety.org/wp-content/uploads/2018/06/lionel-the-uk-provisions-on-computer-generated-works.pdf (Accessed 10 November 2024).
[277] Section 9(3).
[278] Section 178.
[279] P Devarapalli "Machine Learning to Machine Owning: Redefining the Copyright Ownership from the Perspective of Australian, US, UK and EU Law" (2018) 40 *European Intellectual Property Review* 6.
[280] Secretary of State for Digital, Culture, Media and Sport 'National AI Strategy' https://www.gov.uk/government/publications/national-ai-strategy (Accessed 29 August 2023).
[281] AI Council Terms of Reference

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/836907/AI_Council_Terms_of_Reference.pdf (Accessed 29 August 2023).

consult on measures to make it easier to use copyright protected material in AI development; and (c) enhance the understanding of the role the IP framework plays in incentivising investment in AI.[282] Importantly, the document stated how, before the end of the year, consultations on copyright areas of computer-generated works will be launched.[283] This shows that there are areas in UK copyright law which may develop to accommodate AI within copyright and potentially protect AI-generated works.

It is clear that the UK copyright law has made efforts to integrate the protection of non-human creations into copyright protection in instances that they are generated by computers. However, this provision still does not provide much legal certainty with regard to ownership. This is so, because it is unclear with whom the copyright to the copyright would vest, as oftentimes, there are several parties involved in the process of the creation of the AI system.[284] Section 9(3) merely states that the author will be the person who took the necessary arrangements to enable the work to be created. Would that authorship then reside in the programmer, the person providing the data analysed by the AI or the person applying the AI?[285] In this case, however, perhaps the work could be considered a product of joint authorship.[286]

The question of where authorship would reside by virtue of section 9(3) was answered in *Nova Productions Ltd v Mazooma Games Ltd.*[287]The case was a copyright infringement case concerning a game (Pocket Money) which was copied and supplied to defendants in the case.[288] The main principle which the court clarified was the meaning of 'the person by whom the arrangements necessary for the creation of the work are undertaken' under the UK Act.[289] It was held that the author of such a computer-generated output is the individual who wrote the relevant rules and logic of the computer program, suggesting that only a user who contributes skill and labour of an artistic kind could be declared the author of the work.[290] To this end, it appears the question of authorship has been answered when there is a clear and identifiable individual that can be traced to the output of a work. However, it is difficult to

[282] Secretary of State for Digital, Culture, Media and Sport 'National AI Strategy' https://www.gov.uk/government/publications/national-ai-strategy (Accessed 29 August 2023).
[283] Secretary of State for Digital, Culture, Media and Sport 'National AI Strategy' https://www.gov.uk/government/publications/national-ai-strategy (Accessed 29 August 2023).
[284] Lauber-Ronsberg and Hetmank (2019) *Journal of Intellectual Property Law & Practice* 574.
[285] Lauber-Ronsberg and Hetmank (2019) *Journal of Intellectual Property Law & Practice* 576.
[286] Section 10(1).
[287] [2006] EWHC 24 (Ch).
[288] [2006] EWHC 24 (Ch) para 379.
[289] Section 9(3).

[290] [2006] EWHC 24 (Ch) para 398; A Guadamuz "Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works" (2017) *University of Sussex* 10.

apply this reasoning and logic to AI where it is clear the AI has used unsupervised generative algorithms to produce a creative work.[291]

This is a more reasonable approach, because it does not completely do away with the requirement of a human in order to award authorship, and for copyright to vest. As such, this model is particularly progressive, whilst not derogating from established and internationally established copyright principles.[292] In addition, the UK's National AI Strategy may provide even more clarity on the extent to which copyright should protect AI- generated creative works.[293] The next part of the discussion will explore legislation in Ireland which, much like the UK, has adopted a progressive approach to authorship.

4.4 COPYRIGHT LEGISLATION IN IRELAND

At the forefront of this discussion will be Ireland's approach to authorship. The aim here, is to discuss whether there is room in Ireland's copyright legislation to extend copyright protection to AI-generated works. Copyright in Ireland is governed by the Copyright and Related Rights Act. This Act recognises nine categories of protectable works, namely: original literary, dramatic, musical or artistic works; sound recordings, films, broadcasts or cable programmes; the typographical arrangement of published editions; and original databases.[294] In order for a copyright to subsist in a work, it must not be copied from someone else,[295] i.e., the work must be original. The Act requires that literary, dramatic or musical works and original databases be recorded in writing,[296] i.e., the work must be reduced to material form. The Act then deals extensively with the concept of authorship under chapter two and providesthat an author is a person who creates a work.[297]

Interestingly, the Copyright and Related Rights Act has specifically legislated for instances where a work does not have a human author.[298] The Irish Copyright Act defines a computer-generated work as a work which is generated by a computer in circumstances where the author

[291] Gerard *Practical Machine Learning* (2021) 11.
[292] Zurth (2021) *UCLA Journal of Law and Technology* 3.
[293] Secretary of State for Digital, Culture, Media and Sport 'National AI Strategy' https://www.gov.uk/government/publications/national-ai-strategy (Accessed 29 August 2023).
[294] Section 17(2).
[295] Section 17(6).
[296] Section 18(1).
[297] Section 21.
[298] Scannell (2022) *Journal of Intellectual Property Law & Practice* 734 – 35.

of the work is not an individual.[299] This definition seems to be extending protection to AI-generated works and even going as far as recognising that non-humans are capable of generating creative works in some circumstances. This definition is broad enough to allow for a wide enough interpretation to include AI works because, from an EU law perspective, AI systems are generally understood to be systems that operate with some degree of computing power.[300]

Albeit, the definition is rather simplistic, it is submitted that it does somehow acknowledge that it is not always an easy task to attribute authorship of AI-generated works to humans. This is so because of the intricacies involved in the functionality of the system itself and the degree of human involvement. The complex nature of identifying a human author in the context of AI-generated works becomes apparent when understanding that even though people essentially 'train' and 'create' the AI system, they are not necessarily aware of the calculations an algorithm is or will perform.[301] This lack of predictability demonstrates that, to some level, the AI system is actually exhibiting a capacity to perform creative acts.

However, this provision poses a number of challenges for AI and the EU IP framework. Firstly, the definition is difficult to reconcile because, as it stands, AI systems are not completely autonomous as there is a minimal degree of human involvement in the create process. As such, it would be tricky to identify who exactly made the creative choice which brought about the work. Secondly, as was discussed above, the CJEU's case law has laid down clear guidelines on the question of authorship. The concept has been fully harmonised and understood as an author's own intellectual creation.[302]

The Act then proceeds to cure this confusion by further defining an author in the case of a work which is computer-generated, as the person by whom the arrangements necessary for the creation of the work are undertaken.[303] This suggests that for an AI system, the resultant works would be authored or co-authored by the programmers or engineers who created the machine, for example. Thus, the song entitled 'Blue Jeans and Bloody Tears' would be authored by the

[299] Section 2(1).
[300] European Commission 'White Paper' 2.
[301] Scannell (2022) *Journal of Intellectual Property Law & Practice* 735 – 36.
[302] C-5/08, EU:C:2009:465 para 37; C-145/10, EU:2011:239 para 89 and 99; C-469/17, ECLI:EU:C:2019:623 para 23.
[303] Section 21(f).

engineers responsible for feeding the songs into the machine. This approach is in line with the harmonised guidelines of CJEU case law and EU copyright laws requiring a natural person to be the author. In this way, the works are protected and copyright principles are not disregarded. Therefore, an AI system is not deemed the author of a work, however, the works generated by the system can be protected if authored by the person by whom the arrangements necessary for the creation of the work are undertaken.[304]

4.5 COPYRIGHT LEGISLATION IN GERMANY

The discussion of the UrhG aims to highlight whether this piece of legislation has any provisions which could be interpreted as to extend some form of copyright protection to AI-generated works Firstly, the UrhG extends copyright protection to literary works; musical works; pantomimic works; artistic works; photographic works; cinematographic works; and illustrations of a scientific or technical nature.[305] There is no explicit provision which requires that the protected works be reduced to material form before being protected, however, it is generally understood that only actual concrete expressions of ideas are protected.[306] The UrhG also provides that the authors of these works enjoy protection for their works.[307] An author is defined simply as the person who creates the work,[308] and it is this author's own intellectual creations which constitute works under the UrhG.[309]

Therefore, in order for a work to be protected in terms of the UrhG, it ought to fall under the recognised categories of works, it must be authored by a person, and it must be original in that it should be a personal intellectual creation. This suggests that the German copyright stance is one which is extremely anthropocentric and reflective of the CJEU's criterion of an author's own intellectual creation,[310] and established principles under the Berne Convention. The *Funke Medien* case is a further clear example of how the German copyright law is aligned with that of the CJEU. Both reflect the copyright jurisprudence which requires an element of 'creative choices' in deeming a work original.[311] This standard of originality is always made in reference

[304] Section 21(f).
[305] Section 2(1).
[306] Vehar and Gils (2022) *Journal of Intellectual Property Law & Practice* 719.
[307] Section 1.
[308] Section 7.
[309] Section 2(2).
[310] Hugenholtz and Quintais (2021) *International Review of Intellectual Property* 1196.
[311] C-469/17, ECLI:EU:C:2019:623 para 23.

to a human author because the creative elements in the work are oftentimes reflective of the authors own personal touch,[312] which is a distinctly human trait.

This approach to copyright means one thing for the AI authorship issue: purely mechanical creations are not protected,[313] because authorship in relation to a work is always determined by referring to the person who expended intellect to create the work. This approach is vastly different to the Irish and UK approach which is more open to accommodating mechanical creations; even though both are EU member states. To this end, since the 'Blue Jeans and Bloody Tear' song was not authored by a person, the German copyright laws would preclude it from protection entirely. Secondly, a machine's personal intellectual creation cannot be determined and this is a factor which will ultimately preclude the AI created works from being protected.

4.6 COPYRIGHT LEGISLATION IN THE UNITED STATES

Next, the United States' copyright legislation will be examined to determine if there is room to protect AI-generated works under copyright. US Copyright legislation is embodied in the Copyright Act[314] which provides for the types of subject matter and a scope of protection for works. The United States Copyright Act recognises eight categories of eligible works, namely: literary works; musical works including accompanying words; dramatic works including accompanying music; pantomimes and choreographic works; pictorial, graphic and sculptural works; motion pictures; sounds recordings and architectural works.[315] These works will only be protected if they are original.[316] The Act is very clear that no copyright protection shall be afforded to any idea unless the work is fixed in a copy once it has been created.[317] Furthermore, the Act protects both unpublished and unpublished works.[318] The protection of published works is dependent on the nationality or the domicile of the author(s).[319]

Importantly, United States' copyright law cannot be discussed without mentioning the landmark case of *Feist Publications, Inc., Petitioner v Rural Telephone Service Company,*

[312] Hugenholtz and Quintais (2021) *International Review of Intellectual Property* 1198.
[313] Scannell (2022) *Journal of Intellectual Property Law & Practice* 731.
[314] Act of 1976.
[315] Section 102(a).
[316] *Ibid.*
[317] Section 101 and 102(b).
[318] Section 104(a) – (b).
[319] Section 104(1).

Inc.[320] The case concerned the extent of the availability of copyright protection to telephone directory white pages published Rural Telephones.[321] The court dealt with the concept of originality, insofar as it pertains to the copyrightability of a work. The court held that the scope of originality relates to the originality of a work to an author.[322] It follows, that the author must have created this work with some degree of creativity and independence as opposed to copying it.[323]

Importantly, this landmark decision has continued to be cited with approval in various copyright cases whenever the question of originality has been brought before courts.[324] The court then distilled the meaning of an author, and held that it means 'he to whom anything owes its origin',[325] which alludes to a person being responsible for the composition of a work. In its analysis of the copyrightability of the white pages, the court then criticised the 'sweat of the brow' doctrine. The court held that rewarding copyright for the hard work that went into compiling facts was flawed because facts are not necessarily original to authors as they are something one usually discovers the existence of, as opposed to creating it.[326] Thus, the fundamental criterion for affording a work in the US copyright protection is fixation in a tangible form and originality in the authorship.

More recently, the US Copyright Office (USCO) drafted a policy document dealing with the registration of works generated by AI technology.[327] This document is crucial to analyse because it aids in distinguishing between what works are copyrightable and noncopyrightable according to US copyright law standards. This policy document answers the question surrounding generative AI and whether the material they produce is capable of protection by copyright.[328] This question was answered in the negative in November 2022 when an

[320] 499 U.S. 340 (1991).
[321] 499 U.S. 340 (1991) para 1.
[322] 499 U.S. 340 (1991) para 10.
[323] 499 U.S. 340 (1991) para 10.
[324] *Carmichael Lodge No. 2013 v. Leonard* 2009 U.S. Dist. LEXIS 84857 (E.D. Cal. Sept. 16. 2009) para 24 (court held to be eligible for protection, selection or arrangement must be made independently by the compiler and entail a minimum degree of creativity); *Silverstein v Penguin Putnam, Inc* 522 F. Supp. 2d 579 (S.D.N.Y. 2007) para 49 (court cited that for works to be deemed original, they must possess at least some minimal degree of creativity).
[325] 499 U.S. 340 (1991) para 13.
[326] 499 U.S. 340 (1991) para 15 and 29.
[327] United States Copyright Office 'Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence' *https://www.copyright.gov/ai/ai_policy_guidance.pdf* (Accessed 29 August 2023).
[328] United States Copyright Office 'Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence'.

application was brought to the USCO by Kristina Kashtanova who applied for a copyright registration for the work titled *Zarya of the Dawn.*[329] The salient facts are that the applicant lodged this application, which was approved, without disclosing that she used AI to create any part of the work.[330] When the USCO became aware that the comic book was created using Midjourney AI, it was determined that the application was incomplete.[331]

In reaching its decision to cancel the registration in the work, the USCO referenced the Compendium of U.S. Copyright Office Practices.[332] The Compendium states that for a work tobe copyrightable it ought to satisfy the human authorship requirement.[333] This is in line with established copyright principles which only protect intellectual conceptions of the author.[334] Therefore, the USCO will refuse to register a claim if it determines that a human being did notcreate the work.[335] Therefore, any AI-generative input will render a work ineligible forcopyright protection because it does not satisfy the human author element.

Furthermore, in the case of *Thaler v Perlmutter*[335], The US Copyright Office denied Thaler's application on the basis that the work lacked necessary human authorship. The plaintiff argued that the work was generated by an AI and lacked traditional human authorship and that AI should be acknowledged as an author if it would meet the authorship criteria and any copyright ownership should vest in the AI's owner.[336] The court found that the reading of "author" in the US Copyright Act, should be read to mean an originator with capacity for intellectual, creative or artistic labour.[337] It is evident that the court's understanding of "authorship" requires human creation.

The clearest formulation of US copyright law is that it acknowledges that, for a work to be protected, it needs to fall within the enumerated categories of works; be fixed in a tangible formand be original. This originality need not be merely 'sweat of the brow' or laborious production,but it ought to be accompanied with an independent creation plus a modicum of creativity.[336] The height of the threshold for originality suggests an element of personal creativity which canonly be achieved by humans. This standard will ultimately preclude any AI created works frombeing created because the originality of the work cannot be tied to a human that exercised independence and creativity in the creation of a work.

4.7 COPYRIGHT LEGISLATION IN CHINA

This section aims to determine the legal status of AI-generated works under theCopyright Law of China. As a starting point, it is important to note that the theory underpinning copyright law in

[335] No. 22-CV-384-1564-BAH 2023.
[336] No. 22-CV-384-1564-BAH 2023 13-5.
[337] Section 102(a).

China is utilitarian in nature.[337] This is reflected under the Copyright Law of China where it is stated that the purpose of copyright law is to encourage the creation and dissemination of works which would contribute to the construction of the socialist civilization and promotes the development of the socialist culture and sciences.[338] In other words, works which lead to the betterment of society will be protected. It is from this standpoint that the discussion into Chinese copyright law will continue to distil the courts' interpretation of what a work is, what originality entails and the implications for authorship and ownership of such works in the context that they are generated by AI systems.

[329] U.S. Copyright Office, *Cancellation Decision re: Zarya of the Dawn*, https://www.copyright.gov/docs/zarya-of-the-dawn.pdf (Accessed 29 August 2023).
[330] *Cancellation Decision re: Zarya of the Dawn* 2.
[331] *Cancellation Decision re: Zarya of the Dawn* 3.
[332] U.S. Copyright Office, *Compendium of U.S. Copyright Practices (*3ed) 2021.
[333] *Compendium of U.S. Copyright Practices* 306.
[334] *Compendium of U.S. Copyright Practices* 306; see also in *Feist Publications* para 10.
[335] *Cancellation Decision re: Zarya of the Dawn* 4.
[336] Gisburg (2003) *Depaul Law Review* 1078.

In terms of Chinese copyright law, 'work' is regarded as works of literature, art, naturalscience and engineering technology in modes or forms provided for under legislation.[339] This provision does not define 'works', however, Article 2 of the Regulation for the Implementationof the Copyright Law of the People's Republic of China (Regulation for Implementation of Copyright in China)[340] expands more on this. Under the Regulation, a work is regarded as an intellectual creation with originality in the literary, artistic or scientific domain, insofar as theyare capable of being reproduced in a tangible form.[341] Therefore, by combining the two piecesof legislation mentioned above, to qualify for copyright protection in China, a work must satisfy five requirements, namely: (1) it should be original; (2) it should be created; (3) it shouldbe an intellectual achievement; (4) it must be in the literary, artistic or scientific domain; and
(5) it must be reproduced in a tangible form.[342] The fourth and fifth requirements are achievablefor AI, it is the first three that will need to be unpacked.

To this end, determining whether AI-generated output can be considered as copyrightedworks will require a look at the concept of originality. The Beijing Higher Court's Guidelinesfor the Trial of Copyright Infringement Cases held that in determining originality, close attention should be paid to whether expression was independently created by the author and whether the arrangement of expression shows the author's selection and judgement.[343]

[337] Wan and Lu (2021) *Computer Law & Security Review* 3.
[338] Article 1.
[339] Article 3.
[340] Regulation of 1991.
[341] Article 2.
[342] Article 3 of Copyright Law of China; Article 2 of Regulation for Implementation of Copyright in China.
[343] Article 2.2.

In addition, courts in China have dealt with this concept and the judgments have shed more light on originality. The courts in *Beijing Film Law Firm v Beijing Baidu Netcom Science & Technology Co Ltd (Beijing Film)*[344] and *Shenzhen Tencent Computer System Co Ltd v Shanghai Yingxun Technology Co Ltd (Shenzhen Tencent)*[345] have significantly influenced domestic and international copyright because the cases provide a valuable scheme for copyright protection of AI-generated works in a human-centred copyright framework.[346]

The court in *Beijing Film* needed to determine whether a copyright infringement has occurred in the plaintiff's work 'the Analysis Report on Judicial Big Data of the Entertainment Industry'.[347] The question before the court was whether the analysis report generated by Wolters Kluwer Database was original and where ownership of the report resided.[348] The court held that 'originality' is not a sufficient condition for a written work to be protected by copyright, this is so because prevailing law holds that works should be created by natural persons to be protected.[349] As such, because neither the developer's nor the user's original thoughts were conveyed in the analysis report, it cannot be deemed to be created by the software developer or the user.[350] Therefore, though the work is original because it was produced using a combination of input keywords, algorithms, rules and templates, the Beijingcourt held it is not a work as defined by Chinese copyright law since it is not created by a natural person.[351] Interestingly, even though the work was not granted protection, the Beijing Court found that the report could not be freely used by the public.[352]

The main issue in *Shenzhen Tencent* is whether AI-generated content is copyrightable or not. the plaintiff sued the defendant on the grounds of copyright and unfair competition infringement in relation to texts generated by Dreamwriter and the creative team, an AI generated software which was developed by the plaintiff's affiliate Tencent Technology.[353]

[344] (2018) Jing 0491 Min Chu No 239 (Beijing Internet Court).
[345] (2019) Yue 0305 Min Chu No 14010 (Nanshan District Court of Shenzen).
[346] Wan and Lu (2021) *Computer Law & Security Review* 4.
[347] (2018) Jing 0491 Min Chu No 239 (Beijing Internet Court) 2.
[348] (2018) Jing 0491 Min Chu No 239 (Beijing Internet Court) 16.
[349] (2018) Jing 0491 Min Chu No 239 (Beijing Internet Court) 16.
[350] (2018) Jing 0491 Min Chu No 239 (Beijing Internet Court) 16.
[351] (2018) Jing 0491 Min Chu No 239 (Beijing Internet Court) 16; definition of 'work' under article 2 of the Regulation for Implementation of Copyright in China.
[352] Wan and Lu (2021) *Computer Law & Security Review* 3.
[353] Decision of the People's Court of Nanshan 'Tencent Dreamwriter' (2020) *International Review of Intellectual Property and Competition Law* 652 – 653.

The plaintiff published a financial report and cited that it was automatically written by the Tencent Robot Dreamwriter.[354] It is this article which was claimed to have been infringed upon. Therefore, the issue before the court was whether the involved article constitutes a written work in terms of Regulation for Implementation of Copyright in China,[355] and whether the work constitutes the work of a legal entity.[356]

In dealing with the first issue, the court held that to determine whether the report constitutes a work, an inquiry into its originality will be necessary.[357] The court held that the article possesses originality because its content reflects the selection, analysis and judgement of stock market information without replicating existing works.[358] Further, the plaintiff's creative teams' ability to run the Dreamwriter software and make the selections and arrangements all contributed to rendering the creative process compatible with copyright legislation.[359] In reference to the second issue, the court held that the report was hosted and later completed by the plaintiff's creative team using Dreamwriter software.[360] To this end, the court held that the report was a work of a legal person created under the plaintiff.

4.8 COMPARATIVE ANALYSIS

It is clear that the harmonized EU laws and the CJEU case law in *Infopaq, Painer* and *Funke Medien,* have adopted a standard of originality which requires the author's creativity to be a crucial factor in determining the copyrightability of a work.[361] The German UrhG is also clear in requiring the author of a work to be a person making intellectual creations in order for a work to attract copyright protection.[362] Therefore, the possibility of AI-generated works being protected by these law's copyright frameworks is highly unlikely because of the author-centric approach to copyright adopted. Therefore, no purposive reading in of the legislation would provide any protection for AI-generated works.

[354] 'Tencent Dreamwriter' (2020) *IIC* 653.
[355] 'Tencent Dreamwriter' (2020) *IIC* 656.
[356] 'Tencent Dreamwriter' (2020) *IIC* 658.
[357] 'Tencent Dreamwriter' (2020) *IIC* 656.
[358] 'Tencent Dreamwriter' (2020) *IIC* 656.
[359] 'Tencent Dreamwriter' (2020) *IIC* 657; work regarded as a 'creation' in terms of article 3 of the Regulations for the Implementation of Copyright Law.
[360] 'Tencent Dreamwriter' (2020) *IIC* 658.
[361] C-5/08, EU:C:2009:465 para 37; C-145/10, EU:2011:239 para 87; C-469/17, ECLI:EU:C:2019:623 para 23.
[362] Section 2(2) UrhG.

Similarly, this standpoint resembles that adopted in the US in that originality and authorship are broadly characterised by some refence to a human. According to the *Feist* case, originality is a requirement necessary for copyright protection, and it will be defined as independent creation along with a modicum of creativity.[363] As such, the originality standard requires more than just effort expended in producing a work. Therefore, in order for a work to be granted copyright protection in the US, it ought to be reduced to material form, original and authored by an individual. In addition, the USCO clearly illustrated in the *Zarya of the Dawn* case that works created with the assistance of AI technologies will not be protected by copyright.[364] This is because the Compendium of U.S. Copyright Office Practices strictly states that works in the US will be protected if it satisfies the human authorship requirement (in addition to other requirements).[365] Therefore, these stringent copyright frameworks make no provision for AI-generated works to be protected.

Conversely, the UK has developed a copyright framework which also accommodates for computer-generated works. The UK Act states that 'computer-generated' works are works generated by a computer in circumstances where there is no human author of the work.[366] The Act then states that where a work is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken.[367] This wording may be interpreted purposively and may accommodate instances where AI systems have generated creative works that need to be protected by copyright laws. In addition, the UK developed a National Strategy for AI whereby a commitment has been made to consulting on the extent to which copyright and patents should protect AI generated inventions and creative works.[368] To this end, it appears that the UK has made clearer steps to recognize the creative powers that AI possesses and is willing to include this in their copyright framework.

Next, the national copyright law in Ireland illustrates how protection may similarly be extended to protect works that have been computer-generated. Under the Copyright and

[363] Ginsburg (2003) *Depaul Law Review* 1078.
[364] U.S. Copyright Office, *Cancellation Decision re: Zarya of the Dawn*, *https://www.copyright.gov/docs/zarya-of-the-dawn.pdf* (Accessed 29 August 2023).
[365] *Compendium of U.S. Copyright Practices* 306.
[366] Section 178 UK Act.
[367] Section 9(3) UK Act.
[368] Secretary of State for Digital, Culture, Media and Sport 'National AI Strategy' https://www.gov.uk/government/publications/national-ai-strategy (Accessed 29 August 2023).

Related Rights Act, computer-generated works are defined as works generated by a computer in circumstances where the author of a work is not an individual.[369] The Irish legislative approach has been heavily criticised for being incompatible with fully harmonised standards laid down by CJEU case law regarding the author's intellectual creation.[370] Thus, the definition of computer-generated is similar to that in the SA and UK copyright frameworks because these jurisdictions allow for a reading-in of the possibility of AI-generated works being protected by way of giving the person by whom the arrangements necessary for the creation of the work the title of author.

In China, the court in *Beijing Film* did not grant a work generated by AI protection. The court held that because the work was not created by a natural person, it could not be afforded protection.[371] However, the court in *Shenzhen Tencent* came to a different conclusion on the same issue. The court needed to determine whether AI-generated content (content generated by Dreamwriter) is copyrightable.[372] The court found that the report was original because I did not replicate existing works.[373] It was further held that the plaintiff's team ran the Dreamwriter software in making arrangements which contributed to the report's creation.[374] To this end, Chinese copyright law can be interpreted in a manner that awards copyright protection to AI-generated works.

Therefore, in the event that engineers and programmers have used an AI system to generate a work which can be regarded as original in terms of copyright principles, then they will be deemed co-authors of the work.[375] Alternatively, where an AI product has been created, and the AI user has instructed the AI system to create that work, it shall be determined that such user would be the author and owner of the resultant work, provided the creative work satisfies all other elements for copyright protectability under the Act.[376]

It goes without saying that the general consensus across international waters is that the starting point for affording a work copyright protection, is that it must fall in one of the

[369] Section 2(1).
[370] Scannell (2022) *Journal of Intellectual Property Law & Practice* 735.
[371] (2018) Jing 0491 Min Chu No 239 (Beijing Internet Court) 16; definition of 'work' under article 2 of the Regulation for Implementation of Copyright in China.
[372] 'Tencent Dreamwriter' (2020) *IIC* 652 – 653.
[373] 'Tencent Dreamwriter' (2020) *IIC* 656.
[374] 'Tencent Dreamwriter' (2020) *IIC* 658.
[375] S 21 SA Copyright Act.
[376] *Ibid.*

legislatures enumerated categories of protected works. This is in line with South African copyright laws as well.[377] Similarly, the works need to further be reduced to material form, because copyright does not protect ideas. Then the work needs to satisfy a level of originality which is determined differently depending on the jurisdictions, as it is apparent that some states are proponents of the sweat of the brow doctrine and others are against it.

The AI and IP framework in the EU, particularly in Germany and the US is stagnant and shows a reluctance to compromise the personhood element necessary for the creation of works and their resultant protection under copyright frameworks globally. This hurdle if ever overcome, would open the door to the possibility of the vesting of authorship in AI systems and thus resulting in the protection of works generated by these machines. However, the laws in the UK, Ireland, China and SA have showed some development in the ways that AI-generated works may attract copyright protection. China has already shown, in the case of *Shenzhen Tencent*, that AI-generated works are copyrightable. The UK has committed to making similar developments to its copyright framework. In Ireland and SA, the definition of 'computer-generated' also reflects some flexibility in affording copyright protection to AI-generated works. In this way, it is clear that SA copyright laws could be developed more, similar to the steps taken by the UK's National AI Strategy, to attempt to accommodate AI-generated works.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

The aim of this discussion was to explore the extent to which the works created by AI systems could be protected under copyright law in SA, and where authorship and ownership of these resultant works would lie. This dissertation aimed to bolster the discussionby further drawing on lessons from foreign jurisdictions in order to establish whether SA could adopt practices established in those jurisdictions. The topical nature of this issue becomes apparent when looking at the creative powers of AI systems and how they have evolved at a rate which has resulted in the generated works encompassing the subject matter listed under the Berne Convention in conjunction with the TRIPS Agreement.[378] Thesetechnological realities have created challenges for copyright legislation because it is clear that

[377] Section 2(1).
[378] Article 2(1); *Guide to the TRIPS Agreement* WTO 35.

the AI systems are becoming increasingly capable of producing works which would ordinarily be eligible for copyright protection.[379]

The analysis highlighted that in SA, originality is determined with reference to an author's independent exercise of their skill and labour and not necessarily the creation of something new and novel.[380] Importantly, the work ought not to be a slavish copy of any previous work.[381] Contrasted with the positions of foreign jurisdictions, the EU standard of originality in works is determined with reference to how much free and creative choices are demonstrated in the creation of resultant works by an author.[382] Further, the works will be regarded as original if the author's intellect was used to create the works.[383] The United Statesshares a similar position by requiring that a work be created by an author with some degree of creativity and independence in order to deem it original.[384]

It is evident that the requirements for originality and authorship go hand-in-hand, thus the next logical analysis was to interrogate where authorship would lie in such works, especially in the event that it could generate 'original work'. Under domestic law, authorship is always determined with reference to a type of work, and always makes reference to a 'person'[385] or a juristic person.[386] The Berne Convention similarly states that a legal person or body corporate's name can be used as an identifier for authorship,[387] suggesting that authorship is not a distinctly human title. However, this title is only extended to non-humans in the form of juristic entities and nothing more. Equally, the EU's position requires the author's personality to be reflected in a resultant work, and this is a distinctly human attribute.[388] In the United States, the position is again mirrored with the standard requiring originality through a demonstrable element of personal creativity which can only be achieved by humans.[389] The US demonstrated its strict adherence to this principle by denying the protection of an AI-generated-assisted output in the

[379] Salami (2021) *Journal of Intellectual Property* 124.
[380] 1987 2 SA 1 (A) 22H – J; 2005 (1) SA 398 (C) 412F – G.
[381] 2016 BIP 236 (GJ) 331A – C.
[382] C-145/10, EU:2011:239 para 89 and 99.
[383] C-5/08, EU:C:2009:465 para 37.
[384] 499 U.S. 340 (1991) para 10.
[385] Section (1).
[386] Section 3(1)(b).
[387] Article 15(2).
[388] Vehar and Gils (2002) *Journal of Intellectual Property Law & Practice* 719.
[389] Ginsburg (2003) *Depaul Law Review* 1078.

case of *Zarya of the Dawn.*[390] This jurisdiction will only protect works through copyright if it satisfies the human authorship requirement in line with the Compendium of U.S. Copyright Office Practices.[391]

Interestingly, Ireland's and the UK's positions under the Copyright and Related Rights Act and the Copyright Designs and Patents Act are more flexible than the EU's status quo, as provision is made for instances where computer-generated works can be protected by copyright laws.[392] This definition suggests that if technology keeps advancing exponentially, there are mechanisms which will be relied on in order to protect AI-generated works. This is made possible by providing that the author of this work will be taken to be the person responsible for the arrangements for the creation of the work.[393] A similar provision exists under the SA Copyright Act which provides a similar definition for computer-generated works.[394]

The option of possibly extending authorship status to AI systems is not currently feasible because it would derogate longstanding copyright principles requiring either a natural or corporate body to be an author of a work.[395] Therefore, giving authorship status to the person(s) responsible for the arrangements of the creation of the work, i.e., programmers or the AI user, is the best possible approach to afford AI-generated works protection in SA copyright law. This approach to adopt a broader definition reflects legislative steps already taken by Irish and UK copyright legislation on computer-generated works.[396] In attributing authorship to the individuals whose efforts were vital to the creation of the AI or responsible for instructing the AI system to create a work, the resultant works are given an opportunity to be protected under copyright law. This approach has been proven to work in Chinese courts where an AI-generated report was granted copyright protection after the court assessed that the joint efforts of the creative team ultimately led to the production of the creative work; thus, guaranteeing it protection in terms of Chinese copyright law.[397]

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[390] U.S. Copyright Office, *Cancellation Decision re: Zarya of the Dawn*, https://www.copyright.gov/docs/zarya-of-the-dawn.pdf (Accessed 29 August 2023).
[391] *Compendium of U.S. Copyright Practices* 306.
[392] Section 2(1) Ireland Copyright Act; Section 9(3) UK Copyright Act.
[393] Section 2(1) Ireland Copyright Act; Section 9(3) UK Copyright Act.
[394] Para (h) of S 1 definition of author in SA Copyright Act.
[395] Article 15(2).
[396] Section 2(1).
[397] 'Tencent Dreamwriter' (2020) *IIC* 658.

Therefore, the most feasible model would be to recognise the programmer or AI user as the author of an AI-created work and in doing so enable the works to be protected under domestic copyright law and recognise the human as the owner of the works. This is possible because, as previously mentioned, AI technology is still in the weak stages and this means that some human involvement is necessary for the systems to function. This will enable copyright principles of human authorship to be adhered to, whilst protecting the works that AI technologies can generate. These legislative steps are all in the framework of the utilitarian approach which underpins South African copyright and regards the public interest as a crucial component in the protection of creative goods.

It follows that a recommendation on the development of SA's current copyright framework will be made in the next chapter in order to ensure that legislative safeguards are put in place to protect AI-generated outputs.

PROPOSED LEGISLATIVE MODEL

5.2 INTRODUCTION

The approach to authorship and the protection of AI-generated works is a rather complicated one. The point of contention is the natural person requirement which immediately disqualifies AI systems as the authors of the works, even though AI can generate output which typically belongs to the entire spectrum of works listed under the Berne Convention[398] and domestic copyright legislation.[399] The dominant stance adopted by jurisdictions abroad and here in SA is to only afford natural, and in some cases, juristic persons with the statusof an author for copyright purposes.[400] The human author requirement will undoubtedly persistand the issue of AI authorship will never actually be resolved, because what current AI is capable of requires a level of human involvement which means these machines are not completely autonomous.[401]

Nevertheless, the problem that remains is that when AI systems play a large role in the execution or creation of such a work, the resultant work falls into the public domain. Therefore,

[398] Article 2(1).
[399] Section 2(1).
[400] Section 3(1).
[401] Scannell (2022) *Journal of Intellectual Property Law & Practice* 728.

it is crucial to assess whether the role of natural or juristic persons at the conception stage, for example, could be a sufficient formula to remedy the uncertainty regarding AI and copyright protection. This will ensure that an author is recognised and the value of their contributions are acknowledged and rewarded by making their products profitable. This chapter will thus explore possible legislative recommendations or solutions which can be adopted to remedy any AI associated copyright gaps in SA.

In order to protect the incentivisation of creatives, it is important to establish solutions which can adequately protect the AI systems and the works they produce without derogating from established copyright principles. As such, the option to ascribe AI systems legal personhood in order to recognise the system as an author is an impossibility. This is so, because established principles under the Berne Convention and national laws globally highlight the necessity behind there being a human author responsible for the creation of a work.[402] Further reference to the duration of the subsistence of copyright protection being the 'lifetime' of the author suggests that it is an inherently personal attribution.[403] Therefore, it is clear that, notwithstanding the creative aspects of machine learning and AI, it is extremely unlikely that the law will soon develop to give recognition of authorship status to such machines. As such, alternative avenues will need to be explored.

5.3 POSSIBLE RECOMMENDATIONS

The current SA copyright framework defines the author of a computer-generated work as the person by who the arrangements necessary for the creation of the works were undertaken.[404] This resembles the framework under Irish and UK copyright legislation.[405] It is submitted, however, that SA look to the UK for guidance for a way to develop its copyright framework to strengthen measures to protect AI-generated works. Recently, the UK, through its National AI strategy, underwent a public comments process on AI and IP.[406] The strategy made a commitment to consult on the extent to which copyright and patents should protect AI-

[402] Article 3(1) Berne Convention; S 1 of SA Copyright Act; Section 7 of UrhG.
[403] Article 7(1).
[404] Para (h) of S 1 definition of author in SA Copyright Act.
[405] Section 21(f) Irish Act; Section 9(3) UK Act.
[406] Secretary of State for Digital, Culture, Media and Sport 'National AI Strategy' https://www.gov.uk/government/publications/national-ai-strategy (Accessed 29 August 2023).

generated inventions and creative works.[407] This will likely see the UK developing its copyright framework to specifically legislate for the protection of AI-generated works.

Therefore, in the event that an AI system generates a song such as 'Blue Jeans and Bloody Tears', the first step would be to determine whether the work falls under the nine categories of protected works under the domestic copyright legislation.[408] Sincethe work is a song, it would fall under the musical works category. Next, the work would needto be fixated or reduced to material form, in this instance recorded.[409] The song also needs to satisfy the originality requirement.[410] This requirement will be assessed by making reference to the judgments of *Klep Valves*, *Haupt* and *Premier Soccer League.*

The main principles espoused from the judgments being that a work must not be inventive or creative, but that there must be a demonstrable degree of labour, on the author's part, involved in the endeavour to create the work.[411] Due to the fact that the AI system cannot be regarded as the author, the individual(s) who undertook efforts to bring about the results will be regarded as the authors, and their efforts in the production of the musical work will be assessed in order to determine how much time and effort was spent in creating the song, and that it is further not a slavish copy of a previous work.[412] If the work satisfies all the requirements, it will be eligible for copyright protection, and the status of authorship will be given to the individual(s) whose creative efforts were instrumental in the creation of the works, i.e., engineers and programmers of the AI responsible for the song. This approach also reflects the legislative positions of both UK and Chinese law, because both jurisdictions adopt a view of looking at the human contribution behind the creative work generated by the AI system.[413]

[407] Secretary of State for Digital, Culture, Media and Sport 'National AI Strategy' https://www.gov.uk/government/publications/national-ai-strategy (Accessed 29 August 2023).
[408] Section 2(1).
[409] Section 2(2).
[410] Section 2(1).
[411] 1987 2 SA 1 (A) 22H – J; 2005 (1) SA 398 (C) 412F – G.
[412] 2016 BIP 236 (GJ) 331A – C
[413] Section 9(3) UK Copyright Act; 'Tencent Dreamwriter' (2020) *IIC* 657.

Next one can consider how the similarities in the foundations of AI and computer programs may be expanded under the embrace of copyright law. Firstly, the AI system is currently in the weak stage, and this is where the system can only focus on specific tasks with varying levels of human input.[414] Furthermore, under chapter two, it was explained how with machine learning, the engineers are the ones that provide the system with large amounts of data, from which the system will 'learn' from.[415] The machine will then train itself to make certain predictions without the programmer needing to intervene again. Similarly, with computer programs, a set of instructions are written by a programmer, and these instructions are key in how the program itself work as it produces the desired output.[416] The difference here being that the programmer in the case of AI does not know what the desired outcome or product will be. However, it is clear that the programmer plays an instrumental role in both AI systems and computer programs. To this end, it is evident that the origins of an AI-generated work can possibly be worked back to the programmer.

As such, it is submitted that the definition of 'computer-generated' be recognised in the same way as 'computer-aided' works under SA copyright law.[417] The proposed legislative reform will recognise computer-generated works, and by extension AI systems as systems which operate with certain input without being limited to specific instructions and with limited human involvement.[418] Under this amendment, an AI-created work will be regarded as a species of work which can have an author. The author will thus be seen as the person who undertook the necessary arrangements to create the work in the same way that the author of computer program is recognised under the SA Copyright Act.[419] The identification of a human author will ensure that the value of their work is protected, and that they are in a position where they can maximise the profits of their work.

Here, the legislature is acknowledging the innovation power of AI systems and their capacity to create, but also reflecting that only natural persons can demonstrate a level of creativity that enables their works or creations to be protected. The definition's inclusion of the Berne Convention's and EU's harmonised principles on copyright originality will allow either

[414] Taulli *Artificial Intelligence Basics* (2019) 16; Salami (2021) 16 *Journal of Intellectual Property Law* 125.
[415] Dignum *Responsible Artificial Intelligence* (2019) 22 – 23.
[416] Kariiker (2016) *SALJ* 58.
[417] 1995 (4) SA 441 (A) 448G – I.
[418] Scannell (2022) *Journal of Intellectual Property Law & Practice* 728.
[419] Section 1.

the creator of the AI or the end user, or both to be considered as the author(s) of the works generated by the AI. This is so, because the authorship allocation falls on the individual(s) responsible for the arrangements which were necessary in the creation of the resultant works.[420] Then, from identifying the author, a first owner will similarly be discernible. This approach will be a step in the right direction for domestic copyright in SA because it will protect the creative power of works associated with AI and ultimately develop at the same pace as technological advancements.

Alternatively, an approach similar to the one adopted by the court in *Shenzhen Tencent* could be adopted. The court, without further developing its existing copyright framework, was able to afford an AI-generated report copyright protection.[421] Importantly, the court was able to find that the plaintiff's team ran the Dreamwriter software in making the arrangements to the report's creation.[422] In this case, the court was able to afford a juristic person authorship status and protect an AI-generated work. Thus, SA courts could reach a similar decision if a case is presented on similar facts. This will ensure that copyright principles are applied but can be developed to keep up with technological advancements.

[420] Scannell (2022) *Journal of Intellectual Property Law & Practice* 736.
[421] 'Tencent Dreamwriter' (2020) *IIC* 652 – 653.
[422] 'Tencent Dreamwriter' (2020) *IIC* 658.

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