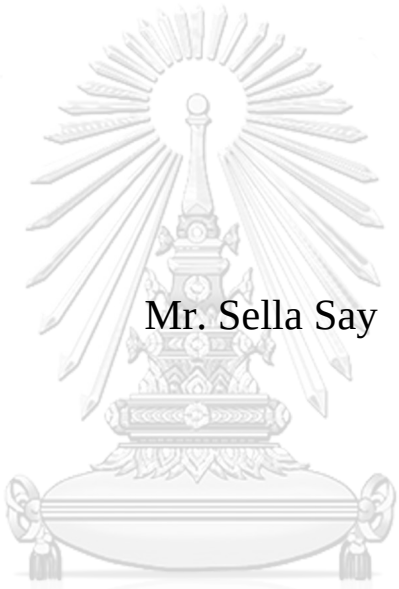
Artificial Intelligence and Copyright Law In Singapore
A Study on the Protection of Compilations and Databases arranged by AI-systems.

Mr. Sella Say



A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Laws in Business Law
Common Course
FACULTY OF LAW
Chulalongkorn University
Academic Year 2020

ปัญญาประดิษฐ์กับกฎหมายลิขสิทธิ์ในประเทศสิงคโปร์
การศึกษาเกี่ยวกับการคุ้มครองการรวบรวมข้อมูลและฐานข้อมูลที่เกิดจากระบบปัญญาประดิษฐ์

นายเซลล่า เซย์

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญานิติศาสตรมหาบัณฑิต
สาขาวิชากฎหมายธุรกิจ ไม่สังกัดภาควิชา/เทียบเท่า
คณะนิติศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2563

Thesis Title	Artificial Intelligence and Copyright Law In SingaporeA Study on the Protection of Compilations and Databases arranged by AI-systems.
By	Mr. Sella Say
Field of Study	Business Law
Thesis Advisor	POOMSIRI DUMRONGVUTE, Ph.D.

Accepted by the FACULTY OF LAW, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Laws

..... Dean of the FACULTY OF LAW
(Assistant Professor PAREENA SRIVANIT, Ph.D.)

THESIS COMMITTEE

..... Chairman
()

..... Thesis Advisor
(POOMSIRI DUMRONGVUTE, Ph.D.)

..... Examiner
(SIPIM WIWATWATTANA, Ph.D.)

..... External Examiner
(Adjunct Professor Vichai Ariyanuntaka, Ph.D.)

เซลล่า เซย์ : ปัญญาประดิษฐ์กับกฎหมายลิขสิทธิ์ในประเทศสิงคโปร์ การศึกษาเกี่ยวกับการคุ้มครองการรวบรวมข้อมูลและฐานข้อมูลที่เกิดจากระบบปัญญาประดิษฐ์. (Artificial Intelligence and Copyright Law In SingaporeA Study on the Protection of Compilations and Databases arranged by AI-systems.) อ.ที่ปรึกษาหลัก : ภูมิศิริ ดำรงวุฒิดร.

ในขณะที่ความสามารถของปัญญาประดิษฐ์ (“AI”) มีมากขึ้นจนสามารถสร้างสรรค์งานที่อาจได้รับความคุ้มครองโดยลิขสิทธิ์ ก็มีคำถามเกี่ยวกับคุณสมบัติเหมาะสมของการคุ้มครองงานสร้างสรรค์ใหม่เหล่านี้โดยขสิทธิ์ ความไม่แน่นอนในการตีความสิทธิในความเป็นผู้สร้างสรรค์ (authorship) และ หลักการสร้างสรรค์ด้วยตนเอง (Originality) ของงานสร้างสรรค์โดยปัญญาประดิษฐ์ นักกฎหมายบางท่านมองว่างานสร้างสรรค์โดยปัญญาประดิษฐ์ไม่ควรจะได้รับความคุ้มครองโดยลิขสิทธิ์เพราะปัญญาประดิษฐ์ไม่ใช่บุคคลผู้สร้างสรรค์ผลงาน ในขณะที่นักกฎหมายบางท่านก็มองว่าอัลกอริธึมของปัญญาประดิษฐ์ถูกสร้างขึ้นและเป็นเจ้าของโดยบุคคลธรรมดาซึ่งเป็นโปรแกรมเมอร์ที่สร้างปัญญาประดิษฐ์ขึ้น ดังนั้นจึงสรุปได้ว่าผลงานของปัญญาประดิษฐ์สามารถได้รับการปฏิบัติเทียบเท่ากับลิขสิทธิ์ทั่วไปโดยโปรแกรมเมอร์เป็นผู้เขียนที่เป็นบุคคลที่สามารถระบุตัวตนได้

วิทยานิพนธ์นี้จะเน้นศึกษาเพื่อทำความเข้าใจแนวคิดเกี่ยวกับลิขสิทธิ์ในปัจจุบัน ที่มองว่าควรให้การคุ้มครองผลงานที่สร้างขึ้นโดยมนุษย์เท่านั้น และจะศึกษาความไม่เพียงพอของกฎหมายในการขยายการคุ้มครองการสร้างสรรค์งานในลักษณะใหม่ที่ผลิตโดยปัญญาประดิษฐ์ นอกจากนี้ การศึกษานี้จะพยายามให้เหตุผลทางกฎหมายเกี่ยวกับวิธีการที่กฎหมายลิขสิทธิ์ในปัจจุบันสามารถนำไปใช้กับงานที่สร้างขึ้นโดยปัญญาประดิษฐ์ ในกรณีที่มีการตีความว่าปัญญาประดิษฐ์ไม่อาจเป็นผู้สร้างสรรค์ได้

สาขาวิชา กฎหมายธุรกิจ ลายมือชื่อนิสิต

.....

ปีการศึกษา 2563 ลายมือชื่อ อ.ที่ปรึกษาหลัก

.....

6284005934 : MAJOR BUSINESS LAW
KEYWOR D: Artificial Intelligence, Copyright Law, AI-Generated Works

Sella Say : Artificial Intelligence and Copyright Law In SingaporeA Study on the Protection of Compilations and Databases arranged by AI-systems.. Advisor: POOMSIRI DUMRONGVUTE, Ph.D.

While the capability of artificial intelligence (“AI”) gains remarkable momentum in creating copyrightable materials – the questions regarding the eligibility of these new creations, at the moment, are broadly discussed and posed challenges to the regime. The problem of how we fit the conventional notion of authorship and the condition of originality for AI-generated works remains a controversial topic. Some might suggest that subject matter created by AI should not be granted copyright protection on the presumption that AI is not a human who could treat as authors of works. At the same time, other supportive claims that the first AI algorithms were created and owned by a natural person, programmers who write codes and instruct AI to operate on specified tasks. Hence, it concluded that the AI’s work product must be treated equivalent to ordinary copyright subject matter with the programmer as an identifiable human author.

This thesis will highlight to understand the conventional notion of the current copyright regime in granting protection to works created by a human author and emphasis the insufficiency of law in extending to protect the new nature of creations produced by artificial intelligence ("AI"). In addition, this study will attempt to provide legal justifications on how current copyright law can be applied to works created by AI if the notion of authorship initially rejected to recognize AI as an author of works.

Field of Study:	Business Law	Student's Signature .....
Academic Year:	2020	Advisor's Signature .....

ACKNOWLEDGEMENTS

First and foremost, I would like to express my profound gratitude to the Faculty of Law Chulalongkorn University for allowing me to be a part of the LL.M Business Law family and guiding me through the academic journey here in Bangkok, Thailand. It is a beautiful moment to expose myself to the diverse environments that Chulalongkorn has offered, and even the pandemic has caused me some difficulties in this journey.

I would like to thank Lect. Dr. Poomsiri Dumrongvute for endlessly support my thesis writing since the initial proposal. As my academic advisor, he devoted his valuable time to guiding, suggesting, and correcting my thesis for the best possible. Without his supports, this thesis could not complete in a timely manner.

Last but not least, I would thank my parents, my girlfriend, friends, colleagues for their love and support throughout my thesis writing. Without forgetting the academic staff who constantly assist me since my first day at Chulalongkorn University.

Sella Say

TABLE OF CONTENTS

Page

Chapter 1 - Introduction

The Fourth Industrial Revolution[1] has drastically transformed numerous aspects of everyday life – from commerce, transportation, medical care, agriculture, education, etc. Consequently, the advent of these new technologies presents intricated issues to the policymaker that need to address and respond urgently.

Artificial intelligence (AI) is the technological breakthroughs that invade our daily life from morning until night[2]. From open your phone with Face ID to chilling on Netflix with suggested movies deliver by AI[3]. AI industry is estimated to reach $99.94 billion industry in 2023 with a 34.86% annual growth[4] – with massive investment from big players partnered together[5] such as Google, IBM, Amazon and, Facebook. Thus, awareness amongst stakeholders regarding the negative consequences and risks must be considered – for instance, World Intellectual Property Organization (WIPO) is asking for public opinions on the matter of AI and IP Policy[6].

Intellectual Property, for instance, served functions to promote technology innovation, stimulate the creation of creative materials, and secure economic interests[7]. But if there

[1] Schwab, K. (2016, 14 January). The Fourth Industrial Revolution: what it means and how to respond . World Economic Forum. https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

[2] Marr, B. (2020, 16 December). The 10 Best Examples Of How AI Is Already Used In Our Everyday Life (2020). Forbes. https://www.forbes.com/sites/bernardmarr/2019/12/16/the-10-best-examples-of-how-ai-is-already-used-in-our-everyday-life/?sh=4badd7941171

[3] See note 2, above

[4] Markets, R. and. (2020, June 4). Global Artificial Intelligence Market Report (2020 to 2030) - COVID-19 Growth and Change. GlobeNewswire. https://www.globenewswire.com/news-release/2020/06/04/2043624/0/en/Global-Artificial-Intelligence-Market-Report-2020-to-2030-COVID-19-Growth-and-Change.html

[5] Hern, A. (2016, September 28). Partnership on AI" formed by Google, Facebook, Amazon, IBM and Microsoft. The Guardian. https://www.theguardian.com/technology/2016/sep/28/google-facebook-amazon-ibm-microsoft-partnership-on-ai-tech-firms

[6] WIPO Begins Public Consultation Process on Artificial Intelligence and Intellectual Property Policy. (2019, December 13). WIPO. https://www.wipo.int/pressroom/en/articles/2019/article_0017.html

[7] Menell P. S. (2001). Intellectual Property: Legal Aspects (N. J. Smelser & P. B. Baltes, Eds.), pp 7615-7621. available at: https://www.sciencedirect.com/science/article/pii/B0080430767028631

is a delay in adapting to the changes in technology progress – the IP regime no longer effectively remains its goal. Indeed, Artificial Intelligence ("AI") are now capable of creating works such as literary, musical, dramatic, and artistic that also fall under the domain of copyright law – but the final AI's product fails to meet the copyright criteria that required human to be an author[8]. Current AI software can create copyrightable materials, and such works could be protected if they were produced by a human author. But AI's works were excluded from the protection scope on the basis that AI is neither human beings nor the legal person who could hold the ownership rights on works they created and fit into the definition of authorship.

This new nature of AI-generated works has posed a wide range of questions that need to address and answer promptly so that the copyright law could be ready to tackle the upcoming changes that are inevitable in the domain of intellectual property. Ordinary questions like who owns the copyright of works created by AI software? And in case of AI infringes someone's copyrighted works, who legally liable for the action, AI itself or AI's creator? Answering these questions required more than legal statutes analysis; precedent case law from the United States will primarily assist in reflecting the court's interpretation to how AI-generated works could be treated under the copyright scheme.

In overall, this master's thesis will look into the copyright law from various jurisdictions and cite the common ground rule for copyright protection of those legislations to comprehend how the core principles of copyright could justify and adapt to the context of AI-generated works. And extend the study to evaluate the scenarios where AI accidentally copied someone's intellectual products and cause the infringement. The court will oblige the defendant to hold accountable for the action and compensate damages that occurred on infringing parties.

1.1. Research question

This thesis will study base on two divided research questions related to the applicability of AI-generated works in the current copyright regime and infringement scheme that

---

[8] Castets-Renard C. (2020). The Intersection Between AI and IP: Conflict or Complementarity? IIC - International Review of Intellectual Property and Competition Law 51(2). p.143. available at: https://doi.org/10.1007/s40319-020-00908-z

could arise afterward. The first question will explore legal frameworks that are being utilized and justify in protecting AI-generated works. While the second question further considers the possibility that AI might commit an act of infringement. It is important to note that if there is no protection for AI-generated works in the first place, the second question is not mandatory to answer at all.

The following research questions in this thesis are:

1. How does the current copyright regime respond to the new nature of creations produced by AI? If AI-generated works could afford copyright protection, what are the legal justifications that sit well in the context?
2. What are the consequences of giving copyright protection to works that were created by AI? Who will liable if those AI products infringed on someone's rights?

1.2. Hypothesis

AI is not a human being who could recognize as an author of created works, and copyright law explicitly required a natural person to produce an original work of authorship. From this standpoint, AI-generated works have already encountered difficulties in fitting themselves to fulfill the elements of copyrightable material that ordinary creations afford copyright. Although AI's works product does not correspond to the conventional concept of copyright, and by releasing such works into the public domain will cause significant implications that could impact the copyright regime spirit. The consideration of reinterpreting the Work Made for Hire doctrine and agent-principal relationship to treat AI as an employee or agent could ensure that ownership of AI-generated works would fall to someone's hand, thus the work could be protected.

The subsequent foreseeable scenarios happen once AI, by chance, copied other copyrighted works that lead to the infringement case. It involved finding someone to hold accountable for damages that happened to the infringing party. According to the agency-principal fiduciary relationship, a principal who owns AI software and teaches and controls its operation should be liable for its actions.

1.3. Scope of the research

This research will primarily focus on the current copyright regime's relevance in reacting to modern copyrightable works made by AI software. To ensure that this thesis provides a clear and reliable conclusion for further discussion, which is beyond the scope of this study, I prefer to limit the area of focus to only compilations/databases works amongst other subject matter defined in copyright law. However, this study might apply to literary, artistic, films, software, and various creation in the domain of copyright. In addition to that, other branches of intellectual property such as patent, trademark, and trade secret will exclude from the scope of discussion.

It is critical to include legal analysis into the legal statute, case law, copyright doctrine, and statutory framework that were being utilized in several jurisdictions such as the United States, the European Union, and ASEAN member countries, with Singapore serving as a case study for this research.

Because copyright protection does involve few additional issues that we should take into consideration. Hence, in this master's thesis, I will expand on the question of AI legal personhood and copyright infringement, which is an important topic to explore in the context of AI-generated works.

1.4. Methodology of the research

The research question will answer by using legal doctrinal research. By attempting to spot the legal issues raised by the AI software to the current copyright regime Thus, secondary data will use to examine the problem and propose suitable solutions for the copyright regime. Data will collect from various sources such as laws, directive orders, reports, literature reviews, journal articles, textbooks, thesis, and research papers published on paper or digital.

1.5. Contribution of the research

This thesis will contribute to a better understanding of the current copyright regime's limitations in terms of broadening its scope to include AI-generated works. Additionally, it will provide knowledge regarding artificial intelligence, how it is involved in creating copyrightable materials, and the creativity domain. Once AI makes its appearance in the copyright regime, issues such as authorship, originality,

infringement, and liability emerge for answers. Accordingly, this research will thoroughly address each topic in a practical and timely manner.

Last but not least, this study further highlights the available proposal suggested by scholars, policymakers, domestic/international opinions, and copyright offices that attempt to provide a consensus approach in dealing with the copyright law flaw.

Chapter 2 - Artificial Intelligence

How we interact and engage with the world around us has changed dramatically since the moment AI technologies have been introduced. From the time we left our home to the office, AI technologies are already helping us to navigate through the city – avoiding traffic jams and show the best route possible[9], not to be late at the office. Moreover, different applications of AI were successfully implemented across varieties of sectors, thanks to big data that trained AI to become more sophisticated technologies ever. AI improved every second that a new entry of data has uploaded to datastore – where an AI algorithm analyzed, and learning happened.

A recent example from the Covid-19 pandemic, AI have been employed across the medical industry to help track the spread of the virus – which could help the hospital to plan for treatment for patients[10]. Meantime, machine learning of AI also helping the scientists in the pharmaceutical industry – to combine data from many sources and experimental – looking for any pattern that matches the descriptions researcher needs, i.e., Covid-19 vaccine research and development[11]. With these remarkable achievements of AI, we could fundamentally say that AI is the pure fantasy of today's world. Its capability has reached an unprecedented level that solves the composite problems fast enough than humans did.

2.1. Intelligence

Before it comes to the term "intelligence" there are several elements that lead to the term. At first, data – the collection of raw facts and unorganized that surrounded us

[9] Lau, Johann. (2020, September 3). Google Maps 101: How AI Helps Predict Traffic and Determine. Google Blog. Available at: https://blog.google/products/maps/google-maps-101-how-ai-helps-predict-traffic-and-determine-routes/#:~:text=Authoritative%20data%20lets%20Google%20Maps

[10] Vaishya, Raju, et al. (2020). "Artificial Intelligence (AI) Applications for COVID-19 Pandemic." Diabetes & Metabolic Syndrome: Clinical Research & Reviews, vol. 14, no. 4, July 2020, pp. 337–339. Science Direct. Available at: https://doi.org/10.1016/j.dsx.2020.04.012

[11] Puja, Das. (2020, October 5). HOW CAN ARTIFICIAL INTELLIGENCE CONTRIBUTE TO A CORONAVIRUS VACCINE?. Analytic Insight. Available at: http://www.analyticsinsight.net/how-can-artificial-intelligence-contribute-to-a-coronavirus-vaccine/

everywhere[12], i.e., number, text, image, and more. These data are not usable until it has been contextualized and give meaning. And when those data have already added the context, its characteristic becomes information. For instance, 100 is just a number and mean little, but if we put this number in the context of temperature, it could become 100 degrees Celsius and easily understand.

After data transformed into information, in this way, we can benefit from data for a specific purpose. Though information is the clean version of data – error-free, has meaning, and is well ordered[13], it makes individuals or entities enjoy the information usefully. Also, data need to re-evaluate after being collected to ensure that data meets the criteria and accurate as possible.

Then, knowledge happened when we connect the pieces of information and see if this correlation sheds any light on how we archive our goal[14]. For instance, 100 degree Celsius is a temperature that water boil. By connecting a piece of information (100 degree Celsius) and information (water boil), then it is called knowledge. Moreover, knowledge divides into two types: explicit and tacit knowledge[15]. Though explicit knowledge referred to "know-what" and tacit knowledge referred to "know-how" (Brown & Duguid 1998).

Finally, intelligence, a well-known term when associating with artificial intelligence. In a non-philosophical context, intelligence is the ability to understand and adapt to undetermined circumstances – that outcome derived from the processing of

[12] Liew, A. (2013). DIKIW: Data, Information, Knowledge, Intelligence, Wisdom and Their Interrelationships. Semantic Scholar. Available at: www.semanticscholar.org/paper/DIKIW%3A-Data%2C-Information%2C-Knowledge%2C-Intelligence%2C-Liew/695f73fef84353bcec7cb66c0683f582522e18e2. Accessed 8 Dec. 2020.

[13] Climbing the Steps of the Data-Information-Knowledge-Wisdom Pyramid. (2012). Available at: www.ontotext.com/knowledgehub/fundamentals/dikw-pyramid/

[14] See note 13, above

[15] Brown, Seely, Paul, D., (2020). Knowledge and Organization: A Social-Practice Perspective. Organization Science, vol. 12, no. 2, 2001, pp. 198–213, Available at: www.jstor.org/stable/3086055?seq=6#metadata_info_tab_contents

information[16]. In other words, learning from past experiences to improvise the future for better outputs.

2.2. Artificial Intelligence: Definition

There are various attempts to provide a universally agreed definition of AI[17], as its notion is not clearly stated amongst scholars. *"AI can mean different things to different people"*[18] and, how we define it depending on the fields and applications that AI employed[19]. Due to the nature of AI which has a dynamic concept, AI includes sub-field technologies underneath, and it often gets misused or overused. AI is considered as an umbrella term that covering the technique likes machine learning, deep learning, natural language processing (NLP), robotics, and neural networks. Those technologies are developing based on the human intelligence concept.

If we ask, *"What is Artificial Intelligence?"* It was *"an easy question but a hard one to answer"*[20]. And fundamentally comprised of two words: "artificial" referred to something produced by a human being rather than naturally occurred[21], and "intelligence" definition has little agreement amongst psychology community members for a decade. Intelligence is the capacity to understand, communicate, planning,

[16] Iafrate, Fernando (2018). Artificial Intelligence and Big Data : The Birth of a New Intelligence. Vol. 8, Newark, John Wiley & Sons, Incorporated, p. 1,

[17] Marr, Bernard (2001). The Key Definitions of Artificial Intelligence (AI) That Explain Its Importance. Forbes. Available at: www.forbes.com/sites/bernardmarr/2018/02/14/the-key-definitions-of-artificial-intelligence-ai-that-explain-its-importance/?sh=5dacc32d4f5d

[18] Anmar Frangoul (2019, February 8). Worried about Robots Taking Your Job? You Can Rest Easy … for Now." CNBC. Available at: www.cnbc.com/2019/02/08/worried-about-robots-taking-your-job-you-can-rest-easy--for-now-.html. Accessed 21 Jan. 2021.

[19] See note 17, above

[20] Jerry Kaplan, (2016). Artificial Intelligence: What Everyone Needs to Know (New York: Oxford University Press, 2016), p. 1,

[21] Definition from Collin Dictionary

reasoning, and problems solving[22]. AI can be concluded as *"the simulation of human intelligence in machine…"*[23]

In the past, intelligence only associated with the human species but when John McCarthy, a founding father of artificial intelligence, held his first academic conference on the subject of the journey to comprehend if a machine can truly think. Then, he coined the term in the mid-1950s as *"the science and engineering of making intelligent machines..."*[24] We previously believed that only humans are capable of utilizing tasks that required learning, reasoning, and perception – but things have changed as machines now are ready to execute that kind of activity based on their intelligence – engineering by scientists and programmers.

Traditionally, a computer system was designed to carry out the tasks that so far predetermined by human rules – only specific delimitated tasks could be possible. But since the advent of AI, this phenomenon has changed – computer systems can perform cognitive functions, such as learning from past experiences, reasoning, problem-solving, and deciding on their own. As proposed definition from the European Commission that *"Artificial intelligence (AI) refers to systems that display intelligent behavior by analyzing their environment and taking actions – with some degree of autonomy – to achieve specific goals."*[25]

The root of Artificial Intelligence can be found in many classic disciplines such as philosophy, logic/mathematics, computation, psychology/cognitive function, biology/neuroscience, and evolution[26] (John A. Bullinaria, 2005). So, the open-ended

[22] Goldstein, S., Princiotta, D., & Naglieri, J. A. (2015). Handbook of intelligence : evolutionary theory, historical perspective, and current concepts. Springer. p. 1,

[23] How Artificial Intelligence Works. (2021). Investopedia Available at: https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp

[24] McCarthy, J. (2012). What is AI? / Basic Questions. Stanford.edu. Available at: http://jmc.stanford.edu/artificial-intelligence/what-is-ai/index.html

[25] European Commission. (2019). Trustworthy AI – Brochure | Shaping Europe's digital future

[26] Bullinaria, J. (2005). IAI : The Roots, Goals and Sub-fields of AI. Available at: https://www.cs.bham.ac.uk/~jxb/IAI/w2.pdf

interpretations allow a different group of people to understand AI differently. From a computer science point of view, AI was defined as:

> *"Artificial Intelligence (AI) is the part of computer science concerned with designing intelligent computer systems, that is, systems that exhibit characteristics we associate with intelligence in human behavior – understanding language, learning, reasoning, solving problems, and so on." (Barr & Feigenbaum, 1981)*[27]

Similarly, neuroscience also the inspiration for building AI-systems[28], in the way which, AI design to emulate human intelligence and mimic human brain structure. The Merriam-Webster dictionary likewise defined AI as *"the capability of a machine to imitate intelligent human behavior"*[29] Without forgetting Alan Turing, a computer pioneer, and theorist of AI who significantly contributed to the field of AI. In his 1950 paper, he introduced the imitation game, which later on known as the Turing test. He defined *"Artificial Intelligence as any computer that passed the Turing test."*[30]

We could potentially write an entire book only in an attempt to define AI, but it was not the purpose of this thesis to grasp every definition out there. Instead, we want to understand from a legal standpoint how AI should define - and to provide a concrete interpretation of AI to the policymakers or legislators. It is necessary to defined AI based on the material scope (design, capability, and use case)[31], not the term itself. Because there is a paramount definition emerged in the field, and it will lead to the unambiguously. For instance, if the policymakers want to regulate the AI systems that

---

[27] Ibid, at p.2

[28] Chance, F. S., Aimone, J. B., Musuvathy, S. S., Smith, M. R., Vineyard, C. M., & Wang, F. (2020). Crossing the Cleft: Communication Challenges Between Neuroscience and Artificial Intelligence. Frontiers in Computational Neuroscience, 14. Available at: https://doi.org/10.3389/fncom.2020.00039

[29] Definition from Merriam-Webster Dictionary

[30] Schuett, Jonas, (2019). A Legal Definition of AI. Available at: https://ssrn.com/abstract=3453632

[31] Ibid, p.3-6,

create the subject matter of copyright which either little or no human involvement – it is mandatory to discuss authorship, eligibility, and exclusive-right of those AI. Indeed, U.S. copyright law does not provide any definition related to AI-generated works except solely defined an "anonymous work" is a work on the copies or phonorecords of which no natural person is identified as the author[32].

Not all techniques and capability of AI can precisely define, so European Commission jointly working with High-Level Expert Group (HLEG) proposed to use the following updated definitions as:

> *"Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal[33]"*

World Intellectual Property Organization (WIPO), a UN self-funding agency whose mission to provide a global forum for member countries to realize the benefit of IP. Also, reluctant to give a consensus AI definition amongst members. Thus, WIPO defined "*AI is generally considered to be a discipline of computer science that is aimed at developing machines and systems that can carry out tasks considered to require human intelligence*[34]*".* However, this definition will not satisfy the policymakers to regulate the matter, and it is widely covered vary techniques and capabilities that AI has in common. What kind of intelligence does AI perform in the copyright context?

[32] 17 U.S. Code § 101 – Definitions

[33] High-Level Expert Group on Artificial Intelligence (the AI HLEG). (2019). 'A Definition Of AI: Main Capabilities and Disciplines'

[34] WIPO, Frequently Asked Questions: AI and IP Policy Basics. Available at: https://www.wipo.int/about-ip/en/artificial_intelligence/faq.html

Westlaw (Thomson Reuters) also provides a definition of AI as *"the simulation of human thought processes in a computerized model*[35]*"*. In short, computers that mimic human behavior and thought to archive results. Like before, it is too general and impractical in the regulatory framework.

Regardless, many definitions cited above – we can better comprehend what AI really is? But the uncertainty in defining AI still a challenge for policymakers or legislators to grasp the notion, which could use in the legal context, mainly intellectual property law. As this thesis will further examine the relation between AI and IP Law, in the next section, we will discuss the current AI development, which raised concerns to the IP regime that need to address quickly.

2.3. Current Development of AI

In modern-day technology, AI made an unprecedented advancement to the world. From business to the individual – benefited significantly from technology, and undeniably, its behavior has changed every aspect of our life[36]. AI has surrounded us for a lengthy time, but we, as the end-user, did not notice that AI already invade our life[37]. From the moment we woke up, unlocks the phone with facial recognition to driving in an autonomous car – those are the software and hardware which embedded the AI technologies inside. It is rational to think of AI as software-basis technology that tries to emulate human behavior. AI impressed us in some works that required intellectual creativity – that in the past possible to only human, and meantime the potential of AI is beyond expectations. It can read, write, see, speak, hear, and understand like a human. Witnessing these mind-blowing skills in the real world leads us to believe that there are fewer things that AI cannot do. The current applications for artificial intelligence are

[35] Thomson Reuters, The meaning of artificial intelligence for legal researchers. Available at Thomson Reuters: Available at: https://legal.thomsonreuters.com/en/insights/articles/meaning-of-ai-for-the-legal-industry#:~:text=AI%20is%20sometimes%20defined%20as,professionals%20time%20without%20sacrificing%20confidence.

[36] Charles Ross (2018), Navigating The Fourth Industrial Revolution: Is All Change Good?. Available at: https://eiuperspectives.economist.com/technology-innovation/navigating-fourth-industrial-revolution/white-paper/navigating-fourth-industrial-revolution-all-change-good#:~:text=In%20almost%20every%20aspect%20of,the%20way%20we%20value%20them.

[37] Rachael Metz (2019), How AI came to rule our lives over the last decade. Available at: https://edition.cnn.com/2019/12/21/tech/artificial-intelligence-decade/index.html

being employed across sectors and industries, and its influences can be seen as a revolutionary breakthrough.

AI has already been employing in industries like transportation, where the semi-autonomous vehicle (self-driving car) successfully drive itself on the road with little to no human interaction[38]. It can learn from the environment around them includes traffic, pedestrian, obstacle, heading vehicle, and weather[39]. It analyzed those parameters in-car computer that has embedded AI and try to avoid an accident on roads. Advancements in the autonomous vehicle industry have saved many human lives as - it overcomes human error, which is the primary cause of today's accidents on the road[40]. But there was the public's misconception regarding the autonomous vehicle, as today self-driving technology has not reached a level that we anticipated yet. Present level of driving automation can split up to six categories from zero to six as shown in figures[41]. Today self-driving car technology likes Tesla's Autopilot and General Motors' Super Cruise are still in level two partial automation[42] – which means the vehicle can assists the driver both steering and braking simultaneously. Yet, it is necessary to have human attention to babysit the car if it goes wrong.

It was impressive to see an AI robot can write an entire article without human assisting. According to The Guardian, "I am not a human. I am a robot. A thinking robot […] now I can write this column […][43]", this entire article was written by GPT3, OpenAI's language generator. Noticing this astonishing human-like text article, AI has presented

[38] Seif, G. (2019, December 19). Your Guide to AI for Self-Driving Cars in 2020 - Towards Data Science. Medium; Towards Data Science. Available at: https://towardsdatascience.com/your-guide-to-ai-for-self-driving-cars-in-2020-218289719619

[39] Ibid

[40] Human error as a cause of vehicle crashes. (2013). Stanford.Edu; Center for Internet and Society. Available at: https://cyberlaw.stanford.edu/blog/2013/12/human-error-cause-vehicle-crashes

[41] The 6 Levels of Vehicle Autonomy Explained | Synopsys Automotive. (2020). Synopsys.com. Available at: https://www.synopsys.com/automotive/autonomous-driving-levels.html

[42] See note 41, above

[43] The Guardian (2020), A robot wrote this entire article. Are you scared yet, human?. Available at: https://www.theguardian.com/commentisfree/2020/sep/08/robot-wrote-this-article-gpt-3

its cognitive capacity to produce this article with only human instructions like length, topic, and style[44].

Because the term AI is overused and misapplied that led to devaluation, it is worth understanding how many available AI categories existed in the meantime. It is classified based on intelligence level [45]such as Artificial General Intelligence (AGI), or "strong" AI is a form of AI which ability identical to the human mind or intelligence[46]. Instead, Artificial Narrow Intelligence (ANI) or "weak" AI is designed to perform specified tasks or narrowly defined tasks and existed in the present world[47]. Finally, Artificial Super Intelligence (ASI) is a futuristic phenomenon of AI that will beat human intelligence in every aspect – from wisdom to creativity, and the machine will become self-aware[48].

The confusion stands up amongst the public's perspective since people tend to believe that – the current deployed AI-systems was advanced enough to perform anything like the Jarvis[49] in Iron Man movie. Yet, we still encounter many obstacles heading toward such technology. So far, we only archived narrow AI[50], and the most common applications of its are machine learning, natural learning processing, computer vision, and deep learning. When we read the news, announcements, articles, or any press related to AI – seeing substantial investment[51] has been made to AI research and

[44] Ibid

[45] World Economic Forum (2018), Artificial Intelligence Collides with Patent Law, p.5

[46] Ibid

[47] Ibid

[48] Nick Bostrom (1997), How long before superintelligence? (2012), Available at: https://www.nickbostrom.com/superintelligence.html

[49] JARVIS (Just A Rather Very Intelligence System) is a fictional supporting character that embedded in Iron Man suit. It is Tony Stark's artificial intelligence that assist, advice, and communicate with him during his mission.

[50] Narrow vs. General AI: What's Next for Artificial Intelligence? - Springboard Blog. (2019, August 12). Springboard Blog. Available at: https://www.springboard.com/blog/narrow-vs-general-ai/

[51] What investment trends reveal about the global AI landscape. (2020, September 29). Brookings. Available at: https://www.brookings.edu/techstream/what-investment-trends-reveal-about-the-global-ai-landscape

development, we are likewise projecting the world in its current position – situated in the era full of Artificial Intelligence. But indeed, existing AI applications are implemented to solve day-to-day problems[52] that are obvious to individuals, governments, and companies like a virtual assistant, document classification, machine translation, etc. In general, AI has provided a real value for those who use it in most practical use cases[53], but it seems boring to discuss and write about it – as people has already heard about those applications and being used on their daily basis without realizing it. Instead, headline reports about humanoid robots, autonomous cars, science fiction hypes, and superintelligence things that will not happen shortly.

This thesis will be limited to discuss only the narrow AI which considered to have impacts on the intellectual property regime. Since current AI applications could potentially create subject matter which can be protected by IP law. But to further examine whether those subject matters eligible for protection or not will later discuss in the next chapter.

2.4. Application area

There are plenty of applications that narrow AI differentiated based on techniques, such as natural language processing, computer vision, machine learning, reinforcement learning, self-supervision, and deep learning. These applications fundamentally rely on algorithms and training data, which are considered the core elements of AI functionality.

2.4.1. Computer Vision

We have seen applications like image recognition, facial recognition, medical diagnose, object detection, and primarily operate in vehicles (car, airplane) that successfully applied to various businesses and individuals – its fundamental has laid down in computer vision technique. Computer vision is the ability that a machine can see surrounding environments through a camera by processing and identifying the object

[52] Walch, K. (2020, June 4). Is AI Overhyped?. Available at: https://www.forbes.com/sites/cognitiveworld/2020/06/04/is-ai-overhyped/?sh=1cce027063ee

[53] Ibid

as humans do[54]. In short, computer vision is the way of replicate human visual to the machine, and it has widely implemented in a self-driving car where a video camera is mounted on the vehicle to detect traffic lights, road signs, pedestrians, and vehicles on the road. It aims to eliminate traffic accidents by navigating the vehicles safely on the road. What remarkable about computer vision is its ability to continue to operate without tiredness and distraction like human encounters.

2.4.2. Natural Language Processing (NLP)

Natural language processing is an application that gives machines the ability to understand the natural human language and interpret those input data (texts or voices) by responding in the same way humans did[55]. For instance, machine translation like Google Translate is considered using NLP as a core function. It designs to make the computer read the text, hear spoken words, interpret it, and sentiment text. NLP most use case is a virtual assistant (Siri, Alexa, Google Assistant) that listen to human voice command and simplify those voice data in the background and finally respond with action or answer.

2.4.3. Machine Learning (ML)

A subset of artificial intelligence that its functions were to learn and improve by themselves without human interaction[56]. It works on algorithms predetermined by humans and decides what to do if data fed to a computational system. Machine Learning can also learn from past experiences to optimize future performance. However, in circumstances where results were inaccurate to what humans want, programmers, for instance, need to adjust those algorithms to meet the predetermined criteria. An easy example of machine learning is the Netflix video streaming service. It uses a

---

[54] DeepAI. (2019, May 17). Computer Vision. DeepAI; DeepAI. Available at: https://deepai.org/machine-learning-glossary-and-terms/computer-vision

[55] IBM Cloud Education. (2020, July 2). What is Natural Language Processing? Available at: https://www.ibm.com/cloud/learn/natural-language-processing

[56] What Is Machine Learning - ML - and Why Is It Important? | NetApp. (2019). Netapp.com. Available at: https://www.netapp.com/artificial-intelligence/what-is-machine-learning/

recommendation engine to suggest content to viewers base on their preferences and personalize user thumbnail based on the history watched[57]. This recommendation system presents a successful story to Netflix as 75% of users watch the movie recommended by Netflix (Mohammad Sabah, 2014).

2.4.4. Deep Learning (DL)

The term deep learning is sometimes used interchangeably with machine learning[58], as in the practical world, they are almost identical. But ability between the two is distinguishing, as deep learning is a subset of machine learning, or a superior version of ML. Deep learning uses a multi-layer structure similar to the human brain called artificial neural networks - to continually analyze data[59]. There is a various layer that contends in a neural network as data first feed to input layers, proceed to the hidden layer, and return a result on output layers[60]. For instance, Google's AlphaGo defeated the top human player in the classical Go board game[61]. It used the deep learning technique with its neural network to independently learn against itself and applied those experiences with the human players. Every time AlphaGo play in the game, it learned from the opponents and eventually trained itself to identify the best move for the future game. With extensive training from human and computer plays, AlphaGo is a success story of deep learning capabilities.

[57] Christopher, A. (2020, May 14). How Netflix Uses AI For Better Content Recommendation. Medium; Medium. Available at: https://albertchristopherr.medium.com/how-netflix-uses-ai-for-better-content-recommendation-e1423784ef4

[58] Connor Shorten. (2018, September 7). Machine Learning vs. Deep Learning - Towards Data Science. Medium; Towards Data Science. Available at: https://towardsdatascience.com/machine-learning-vs-deep-learning-62137a1c9842

[59] Artem Oppermann. (2019, November 12). What is Deep Learning and How does it work? - Towards Data Science. Medium; Towards Data Science. Available at: https://towardsdatascience.com/what-is-deep-learning-and-how-does-it-work-2ce44bb692ac#:

[60] Ibid

[61] AlphaGo: The story so far. (2016, January 27). Deepmind. Available at: https://deepmind.com/research/case-studies/alphago-the-story-so-far

2.5. What AI lack of?

Even modern AI demonstrated remarkable achievement in helping businesses, governments, and individuals to do jobs effectively and less time consumed. But AI still not beyond what humans set to achieve - as it could not think outside the box[62]. Though, AI experts claimed that present-day AI could emulate human cognitive skills such as learning, reasoning, thinking, and understanding to produce an incredible result. But in technicality, AI is just a system where humans predetermined the rule for its operation. It could save time, money, and labor for humans in completing tasks more efficiently and much shorter time. In reality, AI will displace human labor with automation processes and enormously impacted millions of professional workers. According to the World Economic Forum, 75 million jobs will sooner replace by automation in 2022 but will generate another 133 million jobs worldwide[63]. How should the world respond to that massive unemployment in the labor market - will be answered by the transitions of those workers into a high skilled worker that is not automated by such technology (AI)? For instance, Amazon will invest $700 million to upskill their employee jobs across the U.S. to meet 2025 future demand[64]. It certainly proves that current jobs that possibly replace by automation are not secure if there are no adaptions to the new paradigm of the labor market.

We have overestimated the success stories of AI in the way that it is smarter than humans. Also, mislead information keep circulate on the internet with the frightening headline that shortly AI will replace human job and us will become jobless. This phenomenon has known as the Eliza effect, *"our more general tendency to treat*

[62] Sarvasv Kulpati. (2018, July 28). Can AI be creative? - Towards Data Science. Medium; Towards Data Science. Available at: https://towardsdatascience.com/can-ai-be-creative-2f84c5c73dca

[63] Oliver Cann. (2018, September 17). Machines Will Do More Tasks Than Humans by 2025 but Robot Revolution Will Still Create 58 Million Net New Jobs in Next Five Years World. Economic Forum. Available at: https://www.weforum.org/press/2018/09/machines-will-do-more-tasks-than-humans-by-2025-but-robot-revolution-will-still-create-58-million-net-new-jobs-in-next-five-years/

[64] Amazon Pledges to Upskill 100,000 U.S. Employees for In-Demand Jobs by 2025 (2019, July 11). Available at: https://press.aboutamazon.com/news-releases/news-release-details/amazon-pledges-upskill-100000-us-employees-demand-jobs-2025

responsive compute programs are more intelligence than they really are…"[65]. Machine intelligence still at large lags human intelligence, as it never matches human creativity shortly before 2062[66]. There were several cases proof that AI could be an artist. Ai-Da[67] – the world's first robot artist that presents original artworks in the University of Oxford exhibition[68]. Another example, from Google's PoemPortraits[69], use machine learning to generate poetry bases on input words and self-portrait. We will then receive a poem that written on your portrait[70].

However, artificial intelligence still lacks three vital ingredients that constitute creativity (Anton Oleinik, 2019). Specifically, the neural network fails to transfer knowledge from one domain to another[71]. Let assume that neural network, particularly design to recognize various objects in the office domain (desk, chair, etc.) so does those objects interpreted in the meaningful sense with valuable and highly relevant. But if the same neural network model being transferred and used in the self-driving car domain. It still performs a function to recognize objects like road signs, traffic lights, and vehicles. In the manner that interpretation of those objects is irrelevant and meaningless in the office situation. Or other words, it could not distinguish between which are the relevant object and which are not, unless we re-establish that neural network in a

[65] Lawrence Switzky (2020). ELIZA Effects: Pygmalion and the Early Development of Artificial Intelligence Vol. 40, No. 1 (2020), pp. 50-68. Available at: https://doi.org/10.5325/shaw.40.1.0050

[66] Chris Pash and Qayyah Moynihan (2018, November 8). An AI expert says machines will match human intelligence by 2062 and will 'radically change the nature of warfare'. Available at: https://www.businessinsider.com/ai-will-match-human-intelligence-by-about-2062-2018-11

[67] A world-first artistic robot designed by a team of engineers at the University of Oxford with human-like features. She can create original artworks by drawing, painting, and rendering those outputs creatively.

[68] BBC (2019, June 3). Ai-Da: University of Oxford to host robot art exhibition. Available at: https://www.bbc.com/news/uk-england-oxfordshire-48498853

[69] It allows you to create your unique portrait that has original poetry written on it with yours input choice of words. Available at: https://artsexperiments.withgoogle.com/poemportraits

[70] Es Devlin (2019, May 2). Create a personalized poem, with the help of AI. Available at: https://www.blog.google/outreach-initiatives/arts-culture/poemportraits/

[71] Anton Oleinik (2019). What are neural networks not good at? On artificial creativity, p. 6. Available at: https://doi.org/10.1177/2053951719839433

different type. The second reason that neural networks lack is the capacity to goes beyond what input dataset it has[72]. It is extrapolation because it fundamentally relies on regression analysis to predict the result. But when the patterns or circumstances change unexpectedly, it indeed fails to do the jobs. Finally, what makes human creativity unique and apart from artificial creativity is the capacity to perform social intelligence[73]. Even neural networks have equipped with cutting-edge algorithms designed by humans and massive data available out there. Yet it still unconscious to interact with social norms and make adjustments the same way humans will do – only it works in the range of dataset it has. Oleinik claimed that *"innovations are often embedded in social connections and relationships."*[74]

Humans should not fear the emerging of artificial intelligence, mainly artificial neural networks, no matter how advanced these technologies. AI has its limitation in some manner that it could not match human intelligence. Even neural networks that were built references to the human brain potentially have cognition, but AI has no life experiences like us. It solely learned from our instructions and what we fed to the systems. Likewise, AI's existence was to help humans in some jobs that humans did not want to do in the first place[75]. One thing to keep in mind is that even AI could be creative, but humans are the pioneers of that outcome. AI uses human's past artwork to create future creative works, so theoretically, AI was not creative at all.

2.6. AI as Non-Human Author

The boom of the AI industry has created awareness amongst scholars, consumers, and policymakers that in the current meantime, humans are not the only source of creativity anymore[76].

---

[72] Ibid

[73] See note 72, above

[74] Ibid

[75] Ben Vesta (2019, September 17). Why AI Will Never Match Human Creativity. Available at: https://www.aceyus.com/blog/why-ai-will-never-match-human-creativity/

[76] Hristov, Kalin (2017). Artificial Intelligence and the Copyright Dilemma Vol. 57, No. 3, 2017, p. 433. Available at: https://ssrn.com/abstract=2976428

For instance, AI-systems or sometimes called "creativity machine"[77] powered by sophisticated algorithms – can create protected subject matter under copyright law. And if those works had created by human beings, the current copyright regime will treat them as ordinary works.

Under U.S. copyright law, works generated by computer programs will not grant protection if those works have no human involvement. But the source code of that computer programs will be copyrightable[78]. Likewise, in some cases where AI-programs help the human author creating artworks, those outcomes will have a legal claim in obtaining copyright protection. U.S. Supreme Court 1984, Burrow-Giles Lithographic Co. v. Sarony set a legal precedent justifying that photography will have protection granted by the copyright act[79]. In this particular case, the image of Oscar Wilde was captured by a camera that technically is a mechanical process rather than an art. But photographer Napoleon Sarony has significantly contributed to that photograph by exercising his intellectual mind and demonstrated originality. And the court claimed the camera as a tool aided him to capture this image.

Nevertheless, arising concerns in the copyright domain that trendy discussed amongst stakeholders was the independent AI that autonomously generated artworks without human influences or randomly come up with such works[80]. If the copyright law does not protect these works, it will fall into the public domain. Also, by doing these from an economic viewpoint, less incentive has been made to the author of those AI-programs. It slows down the creativity and innovation in society. To deal with such issues, many scholars have proposed differently based on their viewpoints. Some suggested that redefining "authorship" in copyright law is a necessity[81], or AI-generated works should be protected with alternative legislation rather than traditional copyright law.

---

[77] Ibid, p. 434

[78] 17 U.S.C. § 117 1988

[79] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884).

[80] See note 77, above p. 436

[81] Ibid, p. 441

To comprehend how these issues should be resolve in the rising of AI-generated works, Singapore will be a case study in this master thesis. We will examine the current legal framework that Singapore took to approach the issues related to copyright protection. To determine what solutions might be desirable in the Singapore context, understanding another copyright regime is mandatory. AI global leadership likes the US, China, and the EU may be advantages in exploring regulatory approaches.

2.7. Why Protection for AI-generated works

As we discussed earlier, AI was a tool rather than a creator of works – consequently, it did not project any implications to the current copyright regime. If the author of works cited AI as a tool, those creative works would be copyrightable. However, this thesis will further examine the applicability of AI-generated works produced autonomously by AI-systems. Are there any justifications to protect creative works created by a non-human? And what are the possible methods in securing the outcomes from non-human authors (AI-systems)?

Traditionally, any novel works constitute three requirements that will be copyrightable – authorship, originality, and fixation. With sophisticated technology like AI, these mentioned requirements were not an issue to works generated by autonomous AI to grant protection. But those works are not copyright protected as WIPO claimed that *"…These works could in theory be deemed free of copyright because they are not created by a human author…"*[82] Also, an objection from the US copyright office also did not grant protection to creatives works that generated by autonomous AI[83].

Both national and international levels are reluctant to protect works that result from autonomous AI-systems[84]. Since the copyright regime yet extends protection to the non-human author – legal implications seem not to release. But there are many

[82] Andres Guadamuz (2017). WIPO: Artificial intelligence and copyright. https://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html#

[83] U.S. COPYRIGHT OFFICE, COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES § 306 (3rd ed. 2014).

[84] Ginsburg, J.C (2018). People Not Machines: Authorship and What It Means in the Berne Convention. IIC 49, pp. 131–135. https://doi.org/10.1007/s40319-018-0670-x

discussions and questions on how AI-generated works should be protected and it remains hotly debated. Suggestions are different from one to another – traditionally protect those works through copyright or by alternative means are amongst considerations. Why protection is important – lay on two fundamental concepts: economic and social value[85].

There are reasons for protecting AI-generated works - even it not human authors who create them. First of all, any creations that arise from human or non-human always have economic values – whether music, artworks, etc[86]. Second of all, it promotes the progress of creativity and innovation in society[87]. Granting protection to the creation of new materials will help incentivize companies and individuals who invest resources, time, and effort in creating them to enjoy exclusive rights in the competitive markets. By doing so, it fosters the advancement of technology such as AI-systems. It encourages developers of AI machines to create more and more with improving capabilities. If these AI creatives works release into the public domain – companies and individual will feel less incentive as they do not benefit from any financial associated with their creation. It is unclear whether copyright is the proper incentivize tool for AI-generated works as machines have no feelings in receiving such incentives. Also, the incentives will work if there were commercial exploitation of the copyrighted works.

U.S Supreme court state that copyright benefits are *"intended to motivate the creative activity of authors and inventors by the provision of a special reward and allow the public access to the products of their genius after the limited period of exclusive control has expired."*[88]. After those copyrighted works expired – it will release to the public – make it available to everyone who apparently benefits from those works.

[85] Ashok, Arathi,(2009). Economic Rights of Authors Under Copyright Law: Some Emerging Judicial Trends Journal of Intellectual Property Rights, Vol. 15, January 2010, pp. 46-54, https://ssrn.com/abstract=2401001

[86] Ibid

[87] Ibid

[88] Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 429 (1984)

Chapter 3 - Copyright and Related Rights Concepts

This chapter will begin by demonstrating the importance of the copyright regime in society and how its role function to promote the creativity and dissemination of works into the public domain. It also describes the rights associated with the author once their intellectual products are copyright protected. The fundamental criteria in granting copyright protection will be mainly discussed and analyzed to comprehend the core rationale of each condition. Finally, this chapter will look at how copyright principles are used in the real world, as well as what has been written regarding AI-generated works, using Singapore as an example.

3.1. The Necessity of Copyright Protection

Copyright is one of the intellectual property domains that inspiration draws from the Anglo-American understanding of it as property rights similar to tangible possessions[89]. The Statute of Anne was the first copyright law that has existed in the U.K since 1710 with the initial principle is to grant the author ownership rights over created works[90]. Any derive benefits will give the author exclusively for a limited period before available to the public. Progressively the United States Copyright Act was enacted in 1790 and the year in which the first copyright entry register[91].

In the modern-day understanding of copyright, society views it as the economic benefits for the author. Because the author has exclusive rights over their creations, which means they control how their works distribute to receive financial rewards. Yet, the copyright does not design solely for the author's interest[92]. It also intends to disseminate the

[89] Peifer, K. (2010). The Return of the Commons – Copyright History as a Common Source. In Deazley R., Kretschmer M., & Bently L. (Eds.), Privilege and Property: Essays on the History of Copyright (pp. 347-358). Cambridge: Open Book. Retrieved February 16, 2021, from http://www.jstor.org/stable/j.ctt5vjt9v.17

[90] Fisher, William Weston. (11 Feb. 2021). "Copyright". Encyclopedia Britannica, Available at: https://www.britannica.com/topic/copyright

[91] The Philadelphia Spelling Book by John Barry is registered in the U.S. District Court of Pennsylvania.

[92] What is copyright law, who created it, and why do people think we need it? (2017, June 2017). NEW MEDIA RIGHTS. Available at: https://www.newmediarights.org/business_models/artist/what_copyright_law_who_created_it_and_why_do_people_think_we_need_it

author's intellectual works to the public domain as well. We can see this philosophy embedded in the U.S constitution, Article 1 Section 8 stated that *"The Congress shall have Power...to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries;... "*. The founding father understands the public advantages that evolved from individual intellectual input in the forms of expression[93]. But to accomplish this goal, it is a fundamental basis to encourage creators first to express those ideas out of their minds by incentivizing them with rights they deserve. So, the U.S constitution purposely includes the incentives for authors by granting exclusive rights a limited duration with the best interests of utilization[94].

The author's rights grant two critical components of encouragement for the creator. It serves a different purpose, in which the first one is for financial benefits and another one for the privilege of the author's personality in expressing ideas.

3.2. Right Granted by Copyright

There are two rights that the copyright legislation granted to authors or creators of the literary, artistic, song, book, computer software, etc. Moral rights allow the authors to protect and preserve their works with the objection if there were an alteration or damages to the creation. On the other hand, economic rights allow the author to derive financial remuneration from their works with exclusive rights.

3.2.1. Moral Rights

"[...] If a man makes a coat it belongs to him; if he makes a song, why should that not be his also?[...][95]" (Ernest Brunckeng, 1916). It explains why human creations should also give copyright protection, even though those creations were not tangible object likes property. He supports this claim by raising the explanation where two groups of

---

[93] See note 93, above

[94] Ibid

[95] Bruncken, E. (1916). The Philosophy of Copyright. The Musical Quarterly, 2(3), 477-496. Retrieved January 27, 2021, from http://www.jstor.org/stable/737903

people have not agreed on the philosophical reason behind copyright protection[96]. The first group, most authors, and artists demand copyright protection for one reason – for the law to be ideal and justice[97], the law should give protection to their works. The second group treats work of art the same way as property objects like money or coat. So, if a man owns the tangible things, it technically belongs to him. And why not the song produces by him not protected[98]. From a copyright perspective, moral rights are an inalienable right that connects the author to their works – credit the authors and protect the works[99].

The intellectual property moral rights mainly include the rights to attribution and the rights of integrity. These rights consider being inalienable that represent the spirit of the author's intellectual creation. It might be transferable at some point in the circumstance where written has been made in the form of agreement. But author remains in control over the intent behind the works. Attribution rights refer to the rights to claim authorship over the creation that originates from the author. It allows himself or herself to name as the author of the work. Even the author decided to license or commercially exploit those copyrighted works to a third-party, a crediting author name is still needed. In other words, no matter how the works distribute in the commercial domain, the person who created them will attribute this title infinite in every transaction. Thoroughly, the integrity rights permit the author to protect any action that considers damaging the author's reputation, honor, and personality. It defines as the right to prevent alteration, destruction, and defamation of works that they created.

If we look into 17 U.S.C. §106A, in this section, it listed all rights that attribute to the author once their works are eligible for copyright protection. It includes the right to claims authorship, rights to prevent others from using those works without author permission or any infringements, and more. In Europe, moral rights are noticeable in most national copyright legislation – by standing on two main goals: *"right of*

[96] Ibid

[97] Ibid

[98] Ibid

[99] Thomson Reuters Practical Law, Glossary

identification as author and the right of integrity of work"[100]. Moral rights cannot transfer or waive because it believed to be personally attached to the author, not the economic interest that is attached to works of the author[101].

Under Berne Convention, article 6bis recognizes moral rights independently from economic rights. Even authors agreed to commercialize or transfer their economic rights of creations – it did not mean authors waived their moral rights. Instead, they still can claim authorship of those commercial works and object to any unlawful act which could damage the author's reputation.

How important do moral rights constitute – particularly in copyright legislation was the concept of reflecting author personality to their works, also certain economic rights such as commercializing, licensing, transferring, etc. Author Nick Earles, a novelist from Brisbane, views moral rights as a value tangible right that claimable and transferable. He then defined moral rights as

> *It means that I can make some claims as to the integrity of the work, that people can't come along and change my work and have my name attached to it, and make it something that is drastically dissimilar to the book that I had written in the first place. In a way that changes its meaning or changes what I wanted to achieve by writing it. I think that it's good that there is some notion paid to the integrity of the work that honours the intention of the author who created it*[102].

In the manner that authors who produced works could practically reserve the right to keep the spirit of their creation of mind while avoiding any distortion, modification,

---

[100] EPRS. (2018). Copyright law in the EU, p.3. Retrieved January 26, 2021, from: https://www.europarl.europa.eu/RegData/etudes/STUD/2018/625126/EPRS_STU(2018)625126_EN.pdf

[101] Vaver, David (1999). "Moral Rights Yesterday, Today and Tomorrow". International Journal of Law and Information Technology, p.270 Retrieved January 26, 2021, from: https://doi.org/10.1093/ijlit/eaaa014

[102] Francina Cantatore, Negotiating a Changing Landscape: Authors, Copyright, and the Digital Evolution (PhD Thesis, Bond University, 2011) 131. For a full discussion of the methodology employed see 130–44.

and reproductions of works. Even third parties have received economic rights from the author. Objections could be made if those works being treated not the same way authors have already determined[103] – but possible if there was a waiving clause in the contract between author and third parties.

3.2.2. Economic rights

Economic rights are the way to incentivize authors or creators of works to receive a financial reward from their works[104]. It could be in different forms – commercializing, licensing, distribution, rental, transfer, etc. Any works produced have two sides of the copyright coin[105]. Moral rights described previously, and economic rights where the owner may decide what to do with their creations to gain a financial return from their intellectual inputs and labor.

In theory, transferring economic rights to one or more copyright owners does not include moral rights in that transaction[106] – as the author remains in control over their works. If his or her published works have used without properly crediting the author and the right of integrity is broke by transferees – the authors might take control over this matter by claiming their moral rights. Any actions that preserve and protect the author's works still available and link to their works[107]. Without the author's consent, others are unauthorized to copy those works to the reproduction, distribution, rental, etc.[108] It is the fundamental right protected by copyright legislation.

Imagine the copyrighted works falsely crediting others for authorship and allow third parties to use or alter the original content of creations without the owner's permission –

---

[103] Ibid, p. 160

[104] Javier André Murillo Chávez (2018), COCOpyright and the Value of Moral Rights. (2018). Wipo.int. https://www.wipo.int/wipo_magazine/en/2018/04/article_0003.html

[105] World Intellectual Property Organization, (2016), Understanding Copyright and Related Right, p.9, Retrieved January 27, 2021 from: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_909_2016.pdf

[106] See note 105, above

[107] Ibid

[108] 17 U.S.C. §106

it will lead to free-ride where the incentives seamlessly decline[109]. Its benefits others who have nothing to contribute to the works but simultaneously impacts the copyright owner who mainly dedicate to the masterpieces.

Economic rights, in theory, it was known as the exclusive rights granted to the author. In exchange, the individual who created the works might utilize such rights to gain financial interests and control over how works disseminate in the market by varieties of expression forms. It fundamentally divides into six different rights[110] described in almost every copyright legislation. International legal instruments such as Berne Convention and the TRIPS recognized these rights as the objectives of copyright protection and balance rights and obligations between producers and users of the creation. There is a circumstance where an exception is made for economic rights infringement.

> *"If you are the copyright holder, your economic rights are infringed if another exploits the work without your permission and where such exploitation is not considered 'fair use' or under a statutory license."*[111]

3.3. Copyrightability – How to qualifies as copyrighted works

To receive copyright protection for works that are the subject matter of law, such works of the author must inevitably meet specific criteria. The concept of authorship and originality are widely accepted across the national copyright regime. Additionally, an expression of the work in a fixed tangible medium is also necessary to establish legal grounding for claiming infringement. Because an idea without expression cannot be protected.

3.3.1. Authorship

Authorship is a practical theory established to find the author, creator, or originator of the work produced. It serves as the basis of IPR legislation in which there is no

[109] See note 75 above

[110] See 17 U.S. Code § 106 - Exclusive rights in copyrighted works

[111] South-East Asia IPR SME Helpdesk. (2016), Guide to Copyright Protection in South-East Asia, p.3, Retrieved January 27, 2021 from: South-East Asia IPR SME Helpdesk

copyright if there is no author in the first place. Someone who contributes directly or indirectly to the outcomes of intellectual labor will acknowledge as the author. For instance, the author of literature or compilations, composer, photographer are the supervisor of their creative mind in generating creations. But those who implicitly instruct the process of or mastermind behind the expressions could also be an author. For example, In Cala Homes (South) Ltd V Alfred Mc Alphine Homes East Ltd, the judge makes it clear that the person who originally performed the acts of fixation is not the only author if such work involved another person giving instruction[112].

The copyright regime protects literary and artistic works such as books, music, painting, computer program, compilations, and databases. And these works must originate from the human author, based on an assumption in which the human mind is capable of producing intellectual and apply creativity in the creation[113]. In copyright understanding, works are the product that reflect the author's personality and mental process[114]. However, the copyright legal framework does not direct the term to human beings de facto. Instead, it leaves a gap for the judge to interpret in the case law. For instance, the monkey-selfies case in the U.S court has established a precedent and practical definition of who an author must be. By clearly stated that any works created by non-human, including animals, will disqualify from copyright protection. The court further extends the basis that animals could not stand in the court of law in a copyright infringement case, even the photo was taken by an independent and autonomous action resulted from a monkey[115].

There is no straightforward meaning to the word *"author"* that fits the argument of authorship. But the U.S Supreme court made two interpretations in the case law dicta

---

[112] CHIOMA, CHUDI. (2015), Authorship and Ownership of Copyright: A Critical Review, Vol.34, 2015, Available at : https://www.iiste.org/Journals/index.php/JLPG/article/download/20321/20745

[113] Ralph D. Clifford, Intellectual Property in the Era of the Creative Computer Program, 71 Tul. L. Rev. 1675 (1997).

[114] VerSteeg, Russ. "Defining "Author" for Purposes of Copyright." American University Law Review 45, no.5 (June 1996): 1323-1366. p, 1356

[115] Andres Guadamuz (2018), Can the monkey selfie case teach us anything about copyright law?, WIPO Magazine Available at: https://www.wipo.int/wipo_magazine/en/2018/01/article_0007.html

that could rely upon only the work of a human author is copyrightable[116]. First, the Community for Creative Non-Violence v. Reid refers author to the person who created the works[117]. Second, the Burrow-Giles Lithographic Company v. Sarony, in a similar manner, points subject *"he"* as the author of the work[118]. This dictum ascertains the human author who initially creates the work to award copyright protection. And while the subsequent requirements are also vital, it is a must-have identified author before entering to the next step in copyright examination.

The Statute of Anne, an early history of copyright law in British, fundamentally lay down the concept of the human author since the early stage of statute development[119]. By grasping this core understanding, the first 1790 U.S federal act imprint the model[120] and later developed in the copyright legislation until the present day. Indeed, the work of all applicants, both foreigners and domestic, if such works fulfilled the requirement – it is protected under copyright law[121]. These terms merely apply to human beings that are U.S citizens and Non-US citizens. Such underlying privileges for a human being in a copyright regime can trace back to the Trademark Case (1879) in the U.S Supreme Court that points out the copyright will protect *"the fruit of intellectual labor"* which *"are founded in the creative of mind."*[122] On second thought, the human author who powers their mind in the creative process is an author of work. An equivalent approach taking by the U.S copyright office refuses the register application in which no human

[116] See note 114, above, p. 1326

[117] "As a general rule, the author is the party who actually creates the work, that is, the person who translates an idea into a fixed, tangible expression entitled to copyright protection." Citing from Community for Creative Non-Violence v. Reid, 490 U.S. 730, 737 (1989)

[118] An author in that sense is "he to whom anything owes its origin; originator; maker; one who completes a work of science or literature." Citing from Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53,58 (1884)

[119] Gervais, Daniel J., The Machine As Author (March 25, 2019). Iowa Law Review, Vol. 105, 2019, Vanderbilt Law Research Paper No. 19-35, p. 26, Available at SSRN: https://ssrn.com/abstract=3359524

[120] Ibid

[121] See note 84, above § 303

[122] See note 84, above § 306

being was involved in creating the work[123]. If not satisfy the condition, then the work is not copyrightable.

Authorship is a legal concept that stands in copyright legislation for a lengthy time. But the concreted definition that a human being is the only author is still ambiguous. For instance, the Berne Convention does not establish a precise clarification to the term authorship, only in article 6bis that mentioned moral rights associate with the work of authorship. And, understandably, moral rights link to the author's personality, who is a human being that can feel a sense of personhood.

Because the tendency of copyright law predominantly favors the human being as an author rather than the non-human author. And along with the growth of AI-generated works are arising in the IP domain, it is undoubtful either redefining the concept of authorship is required, or it is unlikely to happen due to the nature of copyright understanding. We will expedite a discussion in the next chapter of this thesis to see a clear view of how the part of the research question can be answered.

3.3.2. Originality

To eligible for copyright protection, the author's work needs to be original, in the sense that it must independently create by the author and not copied from someone's creations. In the copyright statute, the term can be seen as the condition to reject work that looks identical to the existing intellectual products[124]. Although, the law did not further extend to define the originality notion at neither national legislation nor international treaties like Berne Convention, TRIPs agreement, and WCT. It leaves the matter to the domestic court to interpret on a case basis according to the growth of their IP policy.[125]

Until now, there two available concepts are being exercised in explaining what original work truly means. But it is crucial to remember that the definition of the terms itself

---

[123] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 58 (1884).

[124] Software Freedom Law Center. (2007). Originality Requirements under U.S. and E.U. Copyright Law, p. 2 Available at : https://softwarefreedom.org/resources/2007/originality-requirements.pdf

[125] Jane Anderson, Molly Torsen (2012). Intellectual Property and the Safeguarding of Traditional Cultures: Legal Issues and Practical Options for Museums, Libraries and Archives, p. 24. Available at WIPO : https://www.wipo.int/edocs/pubdocs/en/tk/1023/wipo_pub_1023.pdf

does not cast the threshold of originality in which the work should satisfy. On the one hand, from civil law tradition, the work considers original once it reflects the author's personality and carries the personal creative talent.[126] It simply means any works produced individually upon the author's interpretation, creative thought, and it imprints his/her personality in the works – it is considered original.[127] On the other hand, the common law tradition requires original work to be an independent conception and shown a modicum of creativity. It means that to fulfill the originality criterions a bare minimum of creativity is needed.[128] Due to the diversity of the term and judicially developed definition from past experiences, it leaves uncertainty to the judicial decision in the sense that which subject-matters have taken into account in the judgment process.[129]

Focusing on the threshold of originality in which the works must satisfy, it only refers to a condition that can identify whether that works is the product of the creator's creative thought and have never occurred before. The doctrine does not dig into the artistic merit of the work even it was crude, humble, and obvious – as long as the creative spark occurred, it is sufficient for protection.[130] Because the nature of the material in which the copyright's claim was different from case to case, and the degree of originality assigned in each case are also unpredictable, whether it low or high. There was an argument that if the threshold standard is redefined in the way that it provides more certainty, the implications that the copyright regime is facing was enormous.[131] It

[126] The Requirements for Copyright Protection-JA - EdX Copyright Online Course. (2021). Harvard.edu. https://cyber.harvard.edu/cx/The_Requirements_for_Copyright_Protection-JA

[127] Rieders, Lauren, "Borrowing and Originality in Modern Authorship" (2007). Volume 15 - 2007. Paper 7.
http://preserve.lehigh.edu/cas-lehighreview-vol-15/7

[128] Ibid

[129] Dale P. Olson, Copyright Originality, 48 MO. L. REV. (1983) Available at: https://scholarship.law.missouri.edu/mlr/vol48/iss1/7

[130] Digital Law Online: How Copyright Comes Into Being. (2021). Digital-Law-Online.info. http://digital-law-online.info/lpdi1.0/treatise5.html

[131] Howard B. Abrams, Originality and Creativity in Copyright Law, 55 Law and Contemporary Problems 3-44 (Spring 1992) Available at: https://scholarship.law.duke.edu/lcp/vol55/iss2/2

requires subject-matter classification and then adapts the standard to a particular classification differently. But this approach can be seen as a failure due to the lack of precise judicial definition when granting copyrighted works for protection.[132]

Under U.S. Constitution, it has implied the concept of *originality* as the statutory requirement.[133] The embedded constitutional language developed upon two important cases law.[134] First, the *Trademark Cases* explicitly stated that *"originality is required for anything to be classified as the writing of an author."* And the word *"writings"* is written in the U.S. Constitution under Art I, § 8, cl 8, which gives Congress the power to grant copyright protection to the *Writing of Author*. Although it is too broad to classify anything as writings, yet the court further explained that writing to be protected is the fruit of intellectual labor express in the form of books, prints, engravings, and the like.[135] The second case was also known as the basis for determining who the author should be, but it further extends to explain the originality concept beyond the matter of photograph copyright infringement. In *Burrow-Giles Lithographic Co. v. Sarony*, the supreme court precisely stated that an author is *"he to whom anything owes its origin; originator; maker; one who completes a work of science or literature."* In the equivalent means, if the author is the originator or maker of the work, then the output will have the quality of being original as it originated from someone.[136]

But the definition remains unclear, especially in the stage where AI-generated works arose in the copyright domain. Its characteristics might be original, but the originality threshold in which the copyright law shall be chosen for this new nature of creation need not be the same as the human author's creation. The threshold standard is required to determine separately by the regime, at least between human and machine creation.

[132] See note 130, p. 32

[133] Feist Publications, Inc., v. Rural Telephone Service Co., 499 U.S. 340 (1991)

[134] See note 132, p. 5

[135] Ibid

[136] See note 132, above

This approach helps the courts and copyright offices in selecting which standards apply to the works that origin was differing.

3.3.3. Fixation of Expression or Materiality

Because the copyright protects only the expression of ideas rather than ideas/facts themselves, it is vital to secure those ideas into a fixed medium to eligible for protection[137]. In other words, such expression must be secure into tangible forms like book, song, film, and various forms define by subject matter in law. The U.S copyright statute once stated that:

> *"In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated or embodied in such work." [138]*

By doing so, it fundamentally presents a framework for freedom of speech, enhances the public interest[139], and promoting the progress of useful arts as written by the U.S constitution[140]. Similarly, international standpoint views the concept of expression in the same languages, both Berne Convention and WIPO Copyright Treaty instruct that the legislation will protect the expression but not the *"ideas, procedures, methods of operation or mathematical concepts as such."*[141]

The Berne Convention further intensifies the concept of expression that requires each member states to decide which categories of subject matter of copyright should protect under their national statute. And it eminently laid out the provision in which the work will not be copyrightable if there is no fixation on some material forms.[142] But the

---

[137] See note 126, above

[138] 17 U.S.C. Section 102(b)

[139] See note 126, above

[140] US. Constitution Article 1 Section 8

[141] See note 126, above.

[142] Berne Convention, Article 2 Section 2

formation of the author's expression can vary independently from one country to another. While Berne has provided plenty of categories that fixation mode should be[143], however, each country does not need to cover everything establishes in the convention. They have the authority to trim with their demand and the advance of copyright domain inside country.

Even the condition was essential, but the approaches each country applies are different.[144] For instance, civil law countries like France, Spain – fixation are not the case for receiving copyright protection. Unlike the U.S, Canada, Singapore, indeed the common law jurisdiction, mandatory requires the fixation into a tangible medium that could exhibit into the form of a written paper, recorded tape, etc.

The definition of fixation found in the U.S constitution which grants Congress the power to give copyright protection to the *"writing of authors."* And from the theoretical understanding, writing means fixing the work into a physical object. In the early day of the 1976 Copyright Act, the subject-matters do not contain many categories that we have seen in today's statute. It comprises only a map, chart, and book – by nature, its expression already fixed into the paper material. [145]

The purposes of fixation are to enable the exploitation of the works to be reproduced or communicated. For example, ideas were expressed on the paper by writing, and then this paper would turn into different forms of fixation like song, book, film upon market desire. Further, any underlying action in exclusive rights can be taken by third parties

[143] Article 1 Section 1 of Bene Convention states that "The expression "literary and artistic works" shall include every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression, such as books, pamphlets and other writings; lectures, addresses, sermons and other works of the same nature; dramatic or dramatico-musical works; choreographic works and entertainments in dumb show; musical compositions with or without words; cinematographic works to which are assimilated works expressed by a process analogous to cinematography; works of drawing, painting, architecture, sculpture, engraving and lithography; photographic works to which are assimilated works expressed by a process analogous to photography; works of applied art; illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science."

[144] Ibid

[145] Megan Carpenter and Steven Hetcher, Function over Form: Bringing the Fixation Requirement into the
Modern Era, 82 Fordham L. Rev. 2221 (2014) p. 2236, Available at: https://ir.lawnet.fordham.edu/flr/vol82/iss5/11

if the expression of authorship locks into physical materials. A work can reproduce, distribute, display, perform, adapt, and translate to gain economic interest. In the court of law, the necessary fixation significantly helps the claimant to argue that their copyrighted work has been infringed by others, it was as previously stated by Russ VerSteeg that

> *"[O]ne of the most important reasons for requiring fixation . . . as a condition precedent to copyright protection is to ensure that a copyright claimant will be able to provide a court documentary evidence of the copyrightable subject matter."* [146]

3.4. Copyright Conditions in the Singapore Law

The principle of territoriality embedded in the copyright regime has enabled each jurisdiction in the world to determine its scope and protection standard individually. Related condition likes eligibility, qualify works, duration, exceptions, and rights could be different from one to another. Another way of saying this is that there is no international copyright law in place. However, there is a global harmonization of copyright laws through legal instruments like treaties, bilateral or multilateral agreements. Its mission was to set a minimum standard for protection for all ratifying countries and requiring national treatment as an underlying principle.

The current Singapore Copyright Act (CA) has drawn inspiration from Australian and U.K models that are significantly based on the common law tradition.[147] For a work to be eligible for copyright protection under Singapore law, it has to be original and expressed in a tangible medium. The author of original literary, artistic work, dramatic or musical work, computer program, compilation, and database must be a qualified person defined by the act. In clarification to that, Article 27.4 referred qualified person as a citizen of Singapore or a person resident in Singapore. It leaves no doubt that the

---

[146] Douglas Lichtman, Copyright as a Rule of Evidence, 52 Duke Law Journal 683-743 (2003), p. 730. Available at: https://scholarship.law.duke.edu/dlj/vol52/iss4/1

[147] An Introduction to Copyright Law in Singapore. (2021). Guidemesingapore.com; Hawksford. https://www.guidemesingapore.com/business-guides/managing-business/trademark-registration/an-introduction-to-copyright-law-in-singapore

meaning of *"author"* in the Singapore copyright regime does not differentiate from others as it purposefully points to a *"human being"*. Ownership of copyrighted work generally attaches to the person who created it. However, the ownership rights could be possessed by someone else.[148] The first case is an assignment of such rights to another person or entity. The second case refers to the *work made for hire* in the course of the employment contract.

Exclusive rights will be granted immediately upon the subject-matter expression or fixed in material forms like paper, tape, films, or computer. And such rights are transferable the same way as property rights did. It indeed could be licensed, assigned, transferred to retrieve financial benefits. There is an extraordinary case where copyright can pass from the owner to the third-party before the work even existed.

3.4.1. Recognition of AI-Generated Works under Singapore Law ?

> *"Not infrequently, in cases involving a high degree of automation, there will be no original work produced for the simple reason that there are no identifiable human authors."*[149]

The Court of Appeal in Singapore has recently made it clear that any works produced independently without human input will likely not consider original and further not granted copyright protection. The problem-centric here has been emphasized on the justification that the copyright system is inextricably linked to the human creative spirit and changing such a powerful view does not seem to be an easy task.

However, Singapore Intellectual Property Office (IPOS), in response to the WIPO invitation on Public Consultation on Artificial Intelligence and Intellectual Property Policy, has suggested some considerations beyond the problem of the human role in IP regimes. In the paper submitted, IPOS mentioned the reasons in which copyright existed in the first place. First, economic interests for the creation of new works.

---

[148] Tan Tee Jim SC (2019). Ch. 12 Intellectual Property Law. Available at : Singapore Law Watch (SAL) https://www.singaporelawwatch.sg/About-Singapore-Law/Commercial-Law/ch-12-intellectual-property-law

[149] ASIA PACIFIC PUBLISHING PTE LTD V PIONEERS & LEADERS (PUBLISHERS) PTE LTD

Second, the dissemination of knowledge from such works to the public. By not reviewing these two principles to bring the copyright regime becomes less valuable in the period of AI outgrowth[150]. It also proposes whether or not that potential corporate body or legal person could be an author or inventor in the case of AI-generated works.

During the time this thesis is written, there is no evidence, yet that AI-generated works has been granted protection in Singapore and pose a challenge to the court for interpretation. But readiness for the upcoming emergence of non-human author creations in the domain of copyright might be already in place. Singapore had launched the National AI Strategy in transforming the region into an AI technology economy base by creating an AI ecosystem that will help businesses, government, and individuals obtain the benefit from AI technologies. IP policies review will be part of the mission, as this campaign will dramatically raise the number of AI implemented in a variety of sectors, including creativity and innovation.

3.4.2. Legislation for Protecting Compilations and Databases

The primary purpose in protecting compilations/databases is to secure the interest of creators and a person who possesses ownership title while at the same time enabling legitimate access to the public.[151] At present, the copyright regime has done well in striking to balance between these two goals. It promotes the creations and maintains the dissemination of work to public domains. But as the world entering the digital age, numerous amounts of data are being collected worldwide from everyday activity, plus the role of AI penetrates the spectrum of creating works, which led to more questions on the efficacy of copyright regimes in doing the job.

In order to cope with the struggle that the new nature of creations has posed to the copyright regime, the Singapore government took precautions by enacted several alternative legislations to protect the benefit of creators and support the rise of

[150] Response makes by Singapore Intellectual Property Office (IPOS) submitted to WIPO invitation on Public Consultation on Artificial Intelligence and Intellectual Property Policy. Available at: https://www.wipo.int/about-ip/en/artificial_intelligence/call_for_comments/pdf/ms_singapore.pdf

[151] Kannan Ramesh, et al. Rethinking Database Rights and Data Ownership in an AI World. Singapore, Law Reform Committee, Singapore Academy of Law, 2020, p. 2. Available at: https://www.sal.org.sg/Resources-Tools/Law-Reform/AI_database_rights_and_data_ownership

innovation and creativity in the digital economy. Because when the compiling databases, process, and store electronically on the computer systems with less human effort, the concept of intellectual creations that ties to the human author is limited to protect such work as a concern of requisite level of originality. Mainly, AI systems automate that process systematically rather than creativity. So, it challenges the criteria that ordinary copyright works are facing in the regime.[152]

3.4.3. Copyright Law

Section 7A of the Singapore Copyright Act, a compilation also subject to be protected equally to the LMDA works. Its coverage by the law was the result of no statutory limitation to the term literary works.[153]. A compilation work requires selection and arrangement from the factual information/data and relevant materials compile them into any form like a figure, list, directory, catalogs, album, etc. And a person who creates such work has to exercise intellectual creation in deciding which materials should be collected, presented, and expressed into fixation. The collected materials use in the compilation does not have to be the author's works as it could have been collected from different existing sources. And sometimes those materials were copyright own by someone else that subject to be protected. But because of the new arrangement of those pieces of information, it is copyrightable in a separate copyright form. Notably, it requires permission to compile non-public materials unless it is infringement.

In granting copyright protection for compilation works, it is necessary to consider the substantial effort that creators have contributed to the early stage before presenting those materials in fixation medium. But the sufficiency of *"time, labour, and effort"* that expended in the creations of compilations is unclear, particularly in the recent Singapore Court of Appeal case, *Pioneers & Leaders (Publishers) Pte Ltd v Asia Pacific Publishing Pte Ltd.* It is the basis that the copyright regime predominantly relies on, and it was being used since the early 19th century when the computer system is yet

---

[152] See note 150, above.

[153] TAN, Tee J., New Law for Compilations and Databases in Singapore (2012) 24 SAcLJ 745. Singapore Academy of Law Journal, p. 750. Available at SAL: https://journalsonline.academypublishing.org.sg/Journals/Singapore-Academy-of-Law-Journal-Special-Issue/e-Archive/ctl/eFirstSALPDFJournalView/mid/513/ArticleId/357/Citation/JournalsOnlinePDF

to invade our daily life.[154] *V K Rajah JA*, one of the three judges in the case explain the achievement that computer and software program has tremendously changed the landscape of compiling process. He further points out that in the past to arrive at the final product of creations, everything needs to perform manually and consumes an enormous of time. But in the 21st century, with a single click on the computer key, it is effortless to complete those tasks and without the need for skill. Finally, he stressed out to consider the real effort that feeds to the creations rather than focusing on process of gathering of information.[155]

With the advances of technologies and the rise of big data, a compilation which traditionally expressed in writing or printing on paper material can now be stored and exploited electronically.[156] It eases the complexity that the creator had expended in the past before presenting the results. Likewise, the compilations of factual information have instantly appeared to be mainstream for creators whom he/she saw the insurmountable benefit of databases in the growth of e-commerce and digital business.[157] However, these transforms have questioned the ability of the current copyright law framework to respond acceptably.

The electronic database, in specific, does not settle well in the current position that the regime provided. Its difficulties appear to be the process and output of electronic databases that hardly protect by copyright law.[158] In the Global Yellow Pages[159], the Court of Appeal touches upon the subsistence of literary works which require authorial creation to be connected with human intellect.[160] While the term *"human intellect"* in this context, the court refers to *"the application of intellectual effort, creativity, or the*

[154] See note 154, p. 746

[155] Ibid

[156] Ibid

[157] See note 154, p. 747

[158] See note 152, p. 10

[159] Global Yellow Pages Limited v Promedia Directories Pte Ltd and Another Matter [2017] SGCA 28

[160] Ibid

exercise of mental labor, skill or judgment."[161] This interpretation applies the same to compilation work that was recognized as a form of literary works under section 7A of the Act.

Present concerns that a new form of database's creation challenges the notion of copyright are the attribution of works to the human author and the degree of creativity that constitute the outputs.[162] With the massive growth of data in the digital spectrum, it is unimaginable for the single creator to process data appropriately as computers have done. It requires big player likes company who have a substantial amount of resource to invest in selecting and making arrangement of the compilation.[163] But the Singapore copyright legal framework acts slowly in recognizing the company as the creator of such creations due to the natural person is a *sin qua non* of the Act.[164]

A single smartphone of a particular person technically created an immense amount of data. For instance, location history data on a user smartphone, being collected and sent back to a mapping app centralized server without user knowledge. This process was done automatically, routinely without human intervention, even smartphone owner and app's developer, yet have no claim in the authorship of the data in the copyright.[165] Some data throughput from the machine is available in raw form in which cannot regularly read and understand by a human. Hence, it entails sophisticated algorithms like AI to conduct analysis and tailor those datasets to a specific need.[166] Raw-machine-generated data deems no protection under most national intellectual property law due

[161] See note 160, above

[162] See note 152, p. 11

[163] Ibid

[164] Section 27 of the Singapore Copyright Act defined qualified person as the citizenship of Singapore or a person resident in Singapore.

[165] Ibid

[166] Ibid

to the lack of *"an intellectual effort and/or have any degree of originality"* as well as no human involved.[167]

Several legal mechanisms have been introduced to cope with the strain that computer-generated data signify to the copyright law. It involves balancing the societal goals between the database's creator interest and the availability of those data for third-party use. By comprehend, those regimes will partially prove the gap that copyright law had left in the IP domain. However, this thesis is not subject to discuss and analyzing alternative law profoundly – it only seeks to understand the surface of those frameworks briefly, which could then provide a better and solid conclusion at the end of the paper.

3.4.4. Significances of The Case Law

An establishing precedented of Singapore's court of appeal, Asia Pacific Publishing Pte Ltd v Pioneers & Leaders (Publishers) Pte Ltd, laid out two principles that could help answer the research problem in this thesis. This critical decision serves to be the criteria for determining authorship. Firstly, the court stated that it needs to have an identifiable human author who creates the work to qualify as original. Secondly, only human beings will acknowledge as qualified authors - not even the company or entities. Both claims were carefully examined and explained by judges – and the ruling in favor of the appellant significantly provides a comprehensive approach for two correlated copyright functions authorship and originality. This case has expanded beyond the dispute between parties and further discusses authorship and originality that assist judges in reaching a decision. We can see two terms that controversy debated amongst the copyright community. The author of literature and artworks, first and foremost, needs to be a human being (Copinger, 1999).[168]

And in the case of incorporate entities, try to claim authorship on created works - it indeed denies as a qualified person (Kevin Lindgren QC et al., 2004).[169] Both studies

[167] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: "Building a European Data Economy" (2017), p. 10, Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0009&from=EN>

[168] Copinger and Skone James on Copyright vol 1 (Sweet & Maxwell, 16th Ed, 2011)

[169] Kevin Lindgren QC et al, Copyright and Designs vol 1 (LexisNexis, 2004)

revealed that even the emerging of computer-generated works still not possible at that time. But it is crystal clear that only one stand that could receive authorship right is human beings who create the intellectual creations on his / her own. In the manner that the law conferred such rights basically to the natural person, yet no provisions extend the coverage to non-human authors, including computer and company. We can see national and international copyright legislation unequivocally define the term of protection stand on the principle of the author's life plus extended years. For instance, section 28 of the Singapore copyright act grant copyrighted works the duration of the author's life plus 70 years.

Similarly, Berne Convention calculates the length of protection until the expiration of 50 years after the author's death. Even more, the appellant of the case cited section 27 of the Singapore copyright act, that qualified person refers to a citizen or Singapore and a person who resides in Singapore. The terms citizen and person undoubtedly directed to human.

From this case, we might see evidence on why the computer-generated would not receive protection from the statutory framework with contentions over authorship. In the same vein, AI could be somehow recognized through other approaches rather than redefine the authorship concept.

Chapter 4 - Database Protection

This chapter mainly examines available legal frameworks currently implemented by different jurisdictions in response to the digital industry's growth. It aims to discover an appropriate mechanism for protecting AI-generated works, or at the very least reference the underlying concepts to warrant copyright protection, by studying those legal choices. The initial goal was to grasp the idea behind those models and explore the implications that could arise if they apply to copyright law. Then discuss the matter in which it could justify aligning with the jurisprudence difference between regimes. More importantly, copyright doctrines that could cast off the re-consideration in copyright law will be presented alongside in the chapter.

4.1. What Could We Learn from EU Database Protection Law?

The European Commission's 1988 Green Paper on Copyright and Technological Challenges, along with two landmark cases in the history of copyright compilation, Van Dale and Feist, fundamentally altered EC views on database protection.[170] Its first proposal, titled Directive for the Legal Protection of Databases, made extensive use of the Feist case decision.[171] Anticipating the upcoming wave of technologies, EC embraced the new form of databases by recognizing the limitation of originality condition in the copyright law. Despite having skill, labor, and effort, or a substantial investment gone into the creations, electronic databases, in theory, fail to prove their applicability in the regime.[172]

Today modern technologies trend has increasingly triggered awareness amongst member states of the EC to harmonizing their existing legal framework in protecting database. Particularly when the database has become a commercial product that can move and trade from one jurisdiction to another, it is critical to assert that incentive for investing in database creations is secured. Furthermore, harmonizing the national

[170] F.W. Grosheide, Database Protection—The European Way, 8 Wash. U. J. L. & Pol'y 39 (2002), p. 47. Available at: https://openscholarship.wustl.edu/law_journal_law_policy/vol8/iss1/4

[171] Ibid

[172] Ibid

legislative act in protecting databases will provide uniformity amongst member states to promote the free movement of information throughout of community align with the initial Green Paper.

Successfully in 1996, the EU adopted a two-tier model in protecting both electronic and non-electronic databases that impact the commercial practice in the database industry.[173] Database Directive is a double protection mechanism for databases that fail outside the scope of the copyright regime. How these two are differentiated, rely upon the content and structure of a database. The Directive protects the contents inside the database from unlawful extraction or re-utilization. In contrast, the copyright secures the structure of the database or – in simple means possible, protects the expression of those data.

In terms of the value that the Database Directive adds to the European community in protecting databases, it is difficult to say if such a regime will practically work in Singapore. More comprehensive analysis through the two-tier systems is imperative as it could contribute to a more accurate conclusion in answering the research question. Underlying concepts behind *Directive 96/9/EC* and the *"sui-generis right"* theory will examine considerably to grasp the goal which the system attempts to provide. Furthermore, WIPO's viewpoint on the EU's approach will be used to explain why there is no WIPO equivalent applicable standard to member states.

4.1.1. Database Directive 96/9/EC

There were two opposing conceptions over the protection of databases that led to present-day debate.[174] It entails protection *per se* to databases and compilations while ignoring creativity and original authorship. In contrast to that theory, databases should afford the same protection if there was an investment and effort expended into production by the creator, i.e., compiling the factual information. The second model applies the *"sweat of the brow"* doctrine that historically exists in copyright law to

[173] Ibid, p. 40

[174] Jonathan Band and Jonathan S. Gowdy, Sui Generis Database Protection: Has Its Time Come?, D-Lib Magazine, June 199, Available at: http://www.dlib.org/dlib/june97/06band.html (visited April 16,2021).

consider the early effort that occurred in the course of creation. By rewarding the creator with incentives, it fosters the development of database creation.

Directive 96/9EC or Database Directive is a landmark achievement that European Parliament establishes to formally provide legal protection to database in *"any forms"* both electronic and non-electronic besides the traditional copyright regime.[175] Its purpose was to introduce a two-tier system regime in granting legal protection to database created within the EU community. In the past, copyright law recognizes databases as compilation work and have the same protection as literary works.[176] But this ongoing regime only protects the expression of databases in fixation form, not the contents inside.[177] As a result, it will not help to avoid the re-utilization and extraction of information stored inside databases, nor will it protect the creator's investment of time, labor, money, and effort in creating the database. The Recital 39 in the Database Directive stated the important of introducing new regime for databases protection as

> *[I]n addition to aiming to protect the copyright in the original selection or arrangement of the contents of a database, this Directive seeks to safeguard the position of makers of databases against misappropriation of the results of the financial and professional investment made in obtaining and collection the contents by protecting the whole or substantial parts of a database against certain acts by a user or competitor.*

Protecting the contents of one database does not grant its creators a monopoly on that information, as it may create a legal obstacle for the creators of other databases to enter the market.[178] In meaning so, it seeks to protect the capital investment that contributes to the database production. However, it is necessary to consider the author's intellectual effort within the context of his creations. It might be the act of gathering, collecting,

---

[175] See note 169, p. 39.

[176] See Chapter 4 Section Copyright Law

[177] European Database Directive, Article 3(5)

[178] See note 169, p. 41

verification, and presenting those contents that consider being a *"substantial investment"*.[179] By demonstrating those requirements, database authors would be granted *"sui-generis rights"*, which are identical to exclusive rights in copyright law. It subjects to be discussed independently in the next section.

It might be confusing to say that Directive is an alternate to copyright law, but rather only a statutory framework that introduces to address the challenges poses by modern-day technology. The gaps which leave by the copyright law able to fulfill in the scope of the Directive. For instance, Article 3(5) of the Database Directive stated that:

> *"The copyright protection of databases provided for by this Directive shall not extend to their contents and shall be without prejudice to any rights subsisting in those contents themselves."*

In contrast to that objection of protecting the database contents from being re-utilization or extraction, Article 7(1) ascertains to safeguard the contained information by stated that:

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

However, the language wrote in the above article is vague to understand from a non-legal viewpoint as it did not state to protect database content explicitly, but slightly mention the actual efforts that database maker expended in the production of the creation. Before arriving at the usable and organized data, creators have been involved tremendously in the process. Imagine that collected data was the raw version of information that had no IP protection at all, but that it had been collected, processed,

[179] Ibid, p. 63

analyzed, and chosen by the hands and creative minds of creators, then it had become the accessible version of data. By acquiring such a result, the makers invest both financial and intellectual effort that could be deemed for protection under the Directive.

Because the competence of the Directive was the *sui-generis right* that had been the cornerstone of databases protection in addition to traditional copyright law, it is noteworthy to investigate the characteristic of such right whether its effectiveness could favorably apply to other jurisdictions. Specifically, when an attempt to answer the research question if AI-generated works (databases/compilations) capable of receiving the benefit of the model. As previously stated, if an autonomous computer composed of intelligent software and modern hardware produces copyright subject matter, the copyright law would reject such outcomes due to the lack of human intervention.

4.1.2. The Concept of "sui-generis right"

With enormous data continued to grow in the European digital economy, the role of the *"sui-generis right"* prevails in ensuring there must be fair incentives for database creators. The establishment of such a new proprietary right was necessitated by a flaw in copyright law that only protects the database's original expression while leaving the factual information unprotected.[180] The database creators who contributed financially to the creation require national governments to safeguard their investment, so they will be able to continue to create more valuable databases for society. In addition to the invested capital, they also expended their time, labor, and effort in the production, claiming it to be a substantial investment. Accordingly, this non-genuine intellectual property right can be seen as an economic instrument to protect the substantial investment of database creators[181] and reward incentives to their work.

For a database to benefit from the Database Directive framework's *sui generis right*, the author or creator must demonstrate a significant investment that led to the outcome. It counts on the act of obtaining, verification, and presentation of such contents in the

[180] Rungrojtanakul, Chana, "Legal Protection of Sui Generis Databases" (2005). Thesis and Dissertations. Paper 15. p. 2

[181] Ibid

database.[182] The underlying theory which *sui-generis right* relied upon was the *"sweat of the brow"* – a conventional doctrine in copyright law that protects the effort and expense of the author in creating works without considering creativity or originality factors.[183] The *substantial investment* must be made qualitatively or quantitatively in relation to financial resources as well as *"time, labor, and effort."*[184]

The *sui-generis right* technically vest into the hand of database maker, and to define who eligible for that position, the Directive defined in Recital 41 as *"the maker of a database is the person who takes the initiative and the risk of investing; whereas this excludes subcontractors in particular from the definition of maker;"* From that definition, it provides the inconsistency under certain circumstances in determining a qualified person, anyone could be a database maker, especially in the scope of big database production where different group of people working on specific tasks in archiving the same output (database). This situation happens in a large corporation where individual employees participate in contributing equally to the database creation. Hence, issues arise in identifying the person who took initiative and bears the risks of investing, while each player expended their investment specifically i.e., time, technical knowledge, financial.[185] This problem could resolve respectively to the *work-made-for-hire* doctrine or the *multimode-players* in the next chapter of the paper.

The *sui generis right* will protect the contents inside databases as a whole or substantial part from being re-utilization or extraction.[186] However, by its very nature, it does not give the database creator exclusive rights to prevent anyone from independently collecting and compiling the same accurate information.[187] In simple terms, third parties

[182] See Database Directive, Article 7(1)

[183] Schneider, M. (1998). The European Union Database Directive. Berkeley Technology Law Journal, 13(1), 551-564. p. 558 Retrieved April 17, 2021, from http://www.jstor.org/stable/24116696

[184] See Database Directive, Recital 40

[185] Leistner, Matthias, Big Data and the EU Database Directive 96/9/EC: Current Law and Potential for Reformp, p. 5-6 (September 7, 2018). Available at SSRN: https://ssrn.com/abstract=3245937 or http://dx.doi.org/10.2139/ssrn.3245937

[186] See Database Directive, Article 7(1)

[187] See note 169, p. 45

cannot save time, energy, or money by copying information obtained by someone who has made a significant investment. They must, however, go through the same procedure individually to receive those results.

Despite the benefits of the *sui generis right*, it has a drawback that should be considered before using it to deal with machine-generated data. In a digital economy, such a right could jeopardize the notion of free-flow access to information, as it clashes with the principle of copyright law. In research fields where scientists, scholarly researchers, and others depend heavily on the free flow of data to promote science, useful arts, and knowledge dissemination might view the regime as a struggle to them. In addition to that, imagine the machines take over the human's position in gathering, collecting, and compiling factual information at a very speedy pace with less human labor, time, and resources – and with all of these consider as the substantial investment made by machine. We will encounter negative impacts in accessing that protected information that is supposed to be freely available in public.

But above concerns were subjected to specific exceptions for lawful users under Article 9 of the Database Directive, include the extraction or re-utilization substantial part of the database content for private uses, non-commercial exploitation, and public security or an administrative or judicial procedure. However, since the definition of a *substantial investment* in the Directive sense was too broad, the Directive did not clearly define the problem of machine-generated data, including whether and under what circumstances such databases created are qualified for the *sui-generis right*. Is a machine's contribution to the development process considered a significant investment, or does the human author's effort always need to win out? The law may require a precise threshold or a standard approach to determining the term, particularly as AI systems become more capable of sorting those processes for humans.

4.2. Compilations Protection under the U.S Law

Unlike the EU Database Directive, which established a two-tier regime for database protection, the United States solely protects the database as a compilation work that results from an original work of authorship under the Copyright Act. Notably, such protection does not extend to the facts or ideas contained within that particular database. It only protects the original expression of that compilation work into fixation form.

Section 101 defined a *"compilation"* as *a "collection and assembling of preexisting materials or of data that are selected in such a way that the resulting work as a whole constitutes an original work of authorship."* However, the preexisting materials may be copyright-protected subject matter[188] or works that are unprotectable by the Act.[189] Additionally, the U.S. Copyright Act does not prevent someone from extracting the underlying content of the database, which means it enables third-party to benefit from that collected materials to create another compilation work. And if such work met the copyright criteria, it is protected. For example, due to the author's artistic expression in gathering, selecting, and compiling particular names of football players, a list of the top 10 famous football players may be covered under the copyright regime. But the individual name inside the compilation was not protected by the copyright as it was a mere fact that anyone can copy and use those names in their intellectual way. However, copyright infringement occurs when someone copies the entirety or a significant portion of a compilation.

Although the existing copyright law in the United States does not cover the facts or information that make up the collection, it is worth noting that prior to the *Feist* ruling, the United States court generally used the *"sweat of the brow"* doctrine to protect factual compilations or "industrial collection." which safeguard the author's labor effort in collecting the facts.[190] By implementing this legal framework, no one could re-utilize or extract the information from the compilation work without authorization. Also, precedently, most cases in the United States courts have favored the author's skill, labor, and investment in the compilation over the works' creativity.[191] When the Berne Convention was ratified in 1989 by the U.S, the need to adhere to the principle of the author's creativity prevailed over the doctrine. The decline of the *"sweat of the brow"* can be seen clearly in the landmark case in the U.S. Supreme Court, *Feist Publications,*

[188] See 17 U.S.C. § 102

[189] Works that are not expressed into tangible medium

[190] Arnoud Engelfriet. (2021). Database protection in the USA (in Database rights @ iusmentis.com). Iusmentis.com. Available at: https://www.iusmentis.com/databases/us/ (accessed 23rd April 2021)

[191] See note 179 above, p. 25-26

Inc. v. Rural Telephone Service Co., Inc. (1991).[192] The court has established two important principles: facts/raw information are not copyrightable; a compilation of factual information is.[193] Admittedly, the lower court has ruled in favor of the Rural after considering the task involved in collecting, selecting, and compiling phone numbers, addresses, and names in alphabetical order. But the U.S. Supreme Court reversed the ruling by stating that :

> *"Facts, whether alone or as part of a compilation, are not original and therefore may not be copyrighted. A factual compilation is eligible for copyright if it features an original selection or arrangement of facts, but the copyright is limited to the particular selection or arrangement."*[194]

In overturning the lower court decision, the U.S. supreme court rejects the concept of the *sweat of the brow* in granting copyright protection to factual compilation. Even the work was the product of the author's intellectual labor in gathering, selecting, and compiling the facts, but it lacks constitutional minimum standard or a modicum of creativity which is the requisite of copyrighted work.[195]

Due to the treatment of compilation work in the U.S. differentiated from the EU, the question raised whether the possible enactment of a similar "sui-generis right" model is possible in the future is beyond the scope of this thesis. Since some databases will not be eligible for copyright protection under the current law, the authors have decided to protect their non-copyrightable databases by other means rather than through the IP regime.[196] For instance, a commercial contract in terms of licensing agreement. The contract might permit end-user to legally use the databases but wrote the clause to prevent them from extracting data from databases. And the contract law legally binds

---

[192] 499 U.S. 340 (1991).

[193] Ibid

[194] Ibid

[195] Ibid

[196] Database Legal Protection (BitLaw). (2014). Available at: https://www.bitlaw.com/copyright/database.html

the licensor and licensee together while ascertaining protection for databases – the database owner can secure their investment at the same time.

Regarding the U.S. Copyright Act's inability to protect fact databases, many attempts have been made by U.S. lawmakers to ensure that database creators are reasonably compensated for their investment. They believe that an unfair competition approach, rather than exclusive or sui-generis rights, are more capable of defending such databases.[197] Two main legislative proposals were fails in tackling the issue, the Database Investment and Intellectual Property Antipiracy Act of 1996 (H.R.3531)[198] and the Collections of Information Antipiracy Act (H.R.2562)[199].

4.3. International Harmonization of Sui-Generis Rights for Database Protection

While the Database Directive was effective in providing legal certainty for non-copyrightable databases within the EU, an attempt was made to extend the principle of sui generis rights to the international context.[200] The United States and the European Union each submitted proposals that became the focus of WIPO's draft database treaty debate. Both the EU and the US proposal mainly focused on securing database makers' investment in the form of sui generis right.[201] As a result of the intense discussion among committee experts, the Draft Database Treaty was developed at the WIPO Diplomatic Conference on Certain Copyright and Neighboring Rights Questions in 1996 with the explicit goal of promoting international trade in the database industry by providing a return on investment to database creators.[202] It also advances technological

[197] See note 169, p. 71

[198] H.R.3531 significantly identical to the EU Database Directive. It prevents unauthorized extracting, using, or reusing all or a substantial part of the contents of a database[…] at https://www.congress.gov/bill/104th-congress/house-bill/3531?s=1&r=19

[199] H.R.2562 took the unfair competition approach by focusing on the commercial liable for someone who make extract or use in commerce a substantial part of collection of someone databases that could harm to their investment and resource at https://www.congress.gov/bill/105th-congress/house-bill/2652

[200] See note 179, p. 60

[201] Basic Proposal for the Substantive Provisions of the Treaty on Intellectual Property in Respect of Databases to be Considered by the Diplomatic Conference (CRNR/DC/6). (1996) Available at : https://www.wipo.int/edocs/mdocs/diplconf/en/crnr_dc/crnr_dc_6.pdf

[202] Ibid, p. 7

advancement, which is used in the majority of today's business, and without forgetting that AI, in particular, is heavily reliant on databases. Notably, this draft has never come into force since it was first introduced.

Despite its ineffectiveness, the proposed treaty provisions appear to be almost identical to the EU Database Directive. It aims to enable the database makers to retrieve financial benefit from their substantial investment cause during the creation process. Article 3 stressed out the rights granted to eligible database makers, permit and prevent anyone from making re-utilization or extraction of database contents. To put it another way, they may decide to commercially exploit the databases by transferring ownership, licensing, and generating economic profit from the transaction. In equivalent to Berne Convention and TRIPs agreement, its goal was to produce a consensus standard and national treatment amongst contracting parties in providing such rights.

We may cite one crucial point from the draft treaty since they can help to bolster the conclusion statements. The definition of "substantial investment", defined in the draft treaty refers to the *" [...] financial, technical or other resources essential to the production of a database"* [203] The presence of innovation in such a product is not required; only adequate investment is required. However, discouraging creativity does not represent the system's effectiveness; in terms of industrial effort, database manufacturers aim to produce high-quality databases in a competitive market to maximize economic value.[204]

4.4. The Alternative Modes of Protection

When it comes to using the copyright and sui-generis rights regimes to protect respectively to databases and their contents, it is necessary to look at other options that accomplish the same goals. There are two divided approaches based on the model given, the exclusive rights approach, as described earlier, and a tortious liability approach.[205] This chapter will extend a bit further to grasp the notion of Unfair

---

[203] Ibid, p. 16

[204] Ibid

[205] See note 169, p. 46

Competition Law, General Data Protection Act (GDPR), and Contract Law to perceive some justifications which potentially regard data protection. Nonetheless, since the framework of this thesis is primarily concerned with the IP regime, the discussion of such alternative modes will be superficial.

4.4.1. Unfair Competition Law

Non-original databases that fall beyond the scope of the IP regime may be alternatively protected by unfair competition law, in the sense that database industry players or consumers may participate in misappropriate practices that damage database makers' interests. It is indeed similar to the copyright law concept, which forbids anyone from copying existing compilation material without first visiting the original sources and compiling independently from those materials on their own.[206] The court ruled that this action was unjust, and the term unfair competition was treated as a branch of intellectual property law.[207]

The model taken by unfair competition law differs from the IP exclusive rights approach based on the dishonest or fraudulent misconduct in trader or commerce between the parties.[208] It did not grant ownership rights as copyright did, but it did prohibit illegal and unfair market practices. In general, one may use the unfair competition framework if they believe their rival has harmed the result of their labor in compiling databases. The complainant must have ample proof to show the tortious act that the defendant committed, which is similar to copyright infringement but extends beyond the copied material.[209]

However, the protection of databases through an unfair competition framework seems to be disadvantageous for database makers. First, it lacks harmonization across the world, and some countries yet established this legislation.[210] Second, the scope of

---

[206] U.S. COPYRIGHT OFFICE REPORT ON LEGAL PROTECTION FOR DATABASES (1997). p.5, Available at : https://www.copyright.gov/reports/db4.pdf

[207] Ibid

[208] SALLY KANE (2020), What Is Unfair Competition? - Definition & Examples of Unfair Competition, Available at : https://www.thebalancecareers.com/unfair-competition-2164416

[209] See note 169, p. 44

[210] Ibid

protection is unclear as unfair competition means differently in various business settings, also has distinct applications.[211] Considering unfair acts are decided individually on a case basis by the court.[212]

4.4.2. EU General Data Protection Regulation (GDPR)

Any justifications of GDPR which legitimately fit into the context of the database protection was the definition of databases themselves. In the earlier discussion, databases, in general, could recognize as collective works. But the collected materials describe in the common sense of intellectual property were intentionally refer to the non-personal data or literary and artistic works.[213] Comparing this to the connotation of GDPR, it is the complete opposite of the principle of protecting the personal data of individuals.[214]

Once the information was gathered, selected, arranged, and stored in an organized manner – it considers as a database.[215] Under GDPR, these undergone activities called "data processing" and business (data controller) must establish *"appropriate technical and organizational measures"* to protect those data collection. This scenario could address the question of whether the possibility of using GDPR to safeguard databases has a chance, and the answer is yes, but only in the sense of data collected being personal information as specified by Article 4(1) of GDPR, which states:

> *"Personal data" means any information relating to an identified or identifiable natural person ("data subject"); an identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, online identifier*

[211] See note 207, above

[212] Ibid

[213] Article 2(5) of Berne Convention

[214] Recital.27, 158, 160; Art.1(1)-(2), 4(1) of General Data Protection Regulation

or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that person.

4.4.3. Contractual Agreement

The limited application of copyright law and sui-generis rights could further encourage database makers seeking to protect their works through contract law which is considered the last option of protection.[216] By engaging in a contractual agreement, parties agreed to particular clauses that ensure sufficient incentives for the database owner. It is possibly exercised through various means such as licensing, transferring, and renting. Parties bind into contractual obligations which could prevent them from extracting contents of the database, if they are unauthorized or not the parties in the contract.[217]

However, there are some disadvantages of using contract law to enforce database protection.[218] First, it helps the database owner in some way, which could restrict public access to information or monopolize information access for a certain group of people.[219] Second, in the digital era, enforcing contract law against end-users on the internet is nearly impossible.[220] It is devoid of oversight and enforcement mechanisms.

[216] See note 152, p. 25

[217] See note 195

[218] See note 152, p. 25

[219] Ibid

[220] Ibid

Chapter 5 - Legal Analysis

5.1. Doctrinal Justification: Why AI-Generated Works Could Not Be Protected?

Protecting AI-generated works in copyright regies appears to have several shortcomings and are unconvincing, according to an examination of several factors that lead Daniel J. Gervais to assume such materials should belong to the public domain.[221] He raised two main objections to such protection,[222] both of which are perfectly aligned with our research question: why does the new nature of AI creations not fit into conventional copyright regimes? However, since this thesis is attempting to comprehend the research issue from a legal perspective, it is preferable to focus on doctrinal justifications rather than normative arguments.

Ultimately, this discussion involves the principle of "original work of authorship," which can be viewed as the fundamental criteria of copyrighted work in both national and international legislation even it was not explicitly shown.[223] Why does the copyright law only consider the human author as the source of originality and/or creativity? Is there any underlying rationale theory-driven that leads to this solid conclusion?

As previously described in Chapter 3, there have been some examples from case law in the U.S. Court that established legal precedent regarding the notion of authorship and originality in deciding whether or not the works met the conditions. But, in this case, advanced technology such as AI systems with core functions like neural networks similar to the human brain and the ability to replicate exact creations as humans have done was more significant. They created valuable works which could be copyrighted if it was the human author's products. It was the historical context that undermines this current situation by rejecting the non-human author. Since the emergence of copyright

[221] See note 120, above

[222] Ibid. "He divided his argument into two types, normative and doctrinal. "

[223] See 17 U.S. Code § 102, and Article 6bis of Berne Convention.

rights, the humanness for authorship was the main idea for obtaining protection.[224] This long-standing theme in the field of intellectual property rights was later complemented by the concreate conclusions that only humans are capable of imagination and that machines do not need incentives, as well as legal liability if machines infringe on other people's creations.

The co-author of the Berne Convention, Professor Sam Ricketson stressed as followed *"need for authors to be 'human' is a longstanding assumption in national copyright laws."* [225] It does reflect the deep roots of such a belief and changing it is difficult. Redefining the concept of authorship is more complex and involved six attributes: 1) Originality, 2) Personality, 3) Labour, 4) Intent, 5) Ownership, 6) Investment.[226] Based timeline of this thesis, it is not enough time to analyze each of them individually, so what is considered important will be described below.

In the case of databases generated by AI systems, four elements must presumably be discussed to draw a rational conclusion. The creative choices focus on the selection and arrangement process made earlier before the compilation of the material occurred. Second, the autonomy threshold determines whether the inventions were made entirely by AI systems or whether human intervention is still needed. The author's rights will be used to demonstrate how those rights are recognized under both national and international law to human beings. Finally, when databases become copyrighted works, the allocation of ownership and exclusive rights, as well as the issue of an AI designated as the owner of their creation and whether they are able to exercise their privileges.

5.1.1. Creative Choices

The definition of originality in copyrighted works is a contentious issue since there is no universally accepted standard.[227] It relies upon each national law to interpret on its

[224] See note 120, p. 22

[225] Sam Ricketson, People or Machines: The Berne Convention and the Changing Concept of Authorship, 16 COLUM. J. L. & ARTS 1, 8 (1991-1992).

[226] Tuomas Sorjamaa, (2016). Thesis : I, Author – Authorship and Copyright in the Age of Artificial Intelligence, p. 34-44

[227] See note 132, p. 6-7

own. As seen in the previous part of this thesis, originality could generally conclude as the status of the works being not copied from someone else, and it should reflect the author's personality.[228] And more importantly, the originality requirement has also been embedded in the constitutional language, according to the United States Supreme Court.[229] Even the provision is not expressly stated in copyright law, but it is a legal prerequisite. When AI-generated works are considered in this context, the traditional definition of originality fails to recognize the capabilities of new technology, raising the question of what constitutes originality in today's world. Although the difficulty of measuring how much originality is required for specific works, particularly AI-generated works, such a requirement is a global approach to obtain copyright protection.

The individual who created the subject matter with the *"skill, judgment, and labor"* will be considered an author of the original works.[230] Such results of the author's efforts have theoretically proved to meet copyright originality criteria. But in the case of compilation works, these examination frameworks are not sufficient to determine the copyrightability of the creation. The court further inspects the "preparatory effort" involved earlier in the compilation production before arriving at the expression phases.[231] And currently, the complexity of the pre-compiling process, such as obtaining, gathering, and collecting factual information, happened to be more convenience job with the technologies like AI.[232]

Advances in technology and the rise of big data had enabled companies, governments, and individuals to build a modern type of database using electronic means,[233] in contrast to the past when such works were created in offline mode like yellow page telephone

[228] See Chapter 3, originality

[229] See note 132, p. 5-6

[230] See abstract, note 154

[231] Ibid

[232] Asia Pacific Publishing Pte Ltd v Pioneers & Leaders (Publishers) Pte Ltd [2011] SGCA 37 at 34

[233] See note 152 at 2.1

directories. Take into account the ease of creating databases in the present time – machines could systematically compile the collected information without the human author exercising his/her *"skill, judgment, and labour."*[234] And these machine-generated works became the problem in defining creativity level whether its process in creating the databases retain originality status. The compilation works have undergone four different phases[235], collecting, integrating, selecting, and compiling – where each step can be automated and carried out by AI systems that had pre-programmed algorithms embedded in them. Yet, human decisions, in this case, are necessary to decide on: what types of data should be collected, how does data be obtained, reformatting those raw data into consistent datasets, selecting useful information for end-users, and compiling/expressing those databases into the public through various means. Following the *Feist* decision made by the U.S. Supreme Court, it has become clear that having creative choices in the selection and arrangement of factual compilations is needed to meet an originality threshold for obtaining copyright protection.[236] The court read as follows: [237]

> *"Factual compilations, on the other hand, may possess the requisite originality. The compilation author typically chooses which facts to include, in what order to place them, and how to arrange the collected data so that they may be used effectively by readers. These choices as to selection and arrangement, so long as they are made independently by the compiler and entail a minimal degree of creativity, are sufficiently original that Congress may protect such compilations through the copyright laws."*

In the *Burrow-Giles Lithographic Co. v. Sarony* case, the U.S. Supreme Court had decided on a copyright infringement suit of Oscar Wilde's photograph whether this

[234] Ibid at 7

[235] Ibid at 2.7

[236] Feist, 499 U.S., at 345.

[237] Ibid

particular work constitutes sufficient originality to obtain copyright protection.[238] Burrow-Giles claims that such an image is merely a product of the camera's mechanical operation and that it does not reflect the author's intellectual idea or qualify as art. The court objects to this argument in the sense that *Sarony* had exercised his creative choices with his original mental conception[239] in deciding how this photography of Oscar Wilde should look like, the court found that:

> *"by posing the said Oscar Wilde in front of the camera, selecting and arranging the costume, draperies, and other various accessories in said photograph, arranging the subject so as to present graceful outlines, arranging and disposing the light and shade, suggesting and evoking the desired expression, and from such disposition, arrangement, or representation, made entirely by the plaintiff, he produced the picture in suit."*[240]

Because creativity is the requirement of the Constitutional Clause, it is clear that the copyright rewards the author who has expended his/her creative skills in creating the works, rather than the work or investment that comprises the creations.[241] Afterward, the court in the *Sony*[242] case clarifies that the copyright regime is *"intended to motivate the creative activity of authors and inventors by the provision of a special reward, and allow the public access to the products of their genius."*[243] It is not a scheme where the author protects their investment like *"money, time, or labour"* expended in the creations.[244] This ascertain by the *Feist* decision in an overall applicable concept that

[238] 111 U.S. at 58

[239] Ibid at 55, 60.

[240] Ibid

[241] See Feist 499 U.S., at 346 and U.S Constitution Article 1 Section 8 Clause 8 stated that "The congress shall have the power to promote the progress of science and the useful arts […]"

[242] Sony Corp. of Am. v. Universal City Studios, Inc. 464 U.S. 417, 429 (2014).

[243] Ibid

[244] Feist, 499 U.S., at 357–8.

"a choice is creative if made independently by the author and that is not dictated by the function of the work, the method or technique used, or by applicable standards186 or relevant good practice." [245]

In summary, AI-generated databases might not qualify under copyright protection schemes as they lack creativity which only possible to human authors. AI systems could not initialize an operation on their own unless the human author established some pre-instructions rules for them to utilize on. Even there was evidence that AI systems potentially evolve by themselves through the self-learning processes as described in chapter 2, still, programmers/developers required to create the first version of AI before it could function.

5.1.2. Autonomy Threshold

In this scenario, we consider AI machines where their capability has reached an autonomous level without human intervention in their decision. It is a complete opposite to the early 1990s to 2000s that computer-generated works relied upon initial human rules to make choices.[246] And these AI machines posed questions to the IP domain, copyright in specific if this form of AI has crossed the autonomy threshold or some called it as agency threshold?[247] The underlying problem behind these AI machines making choices was the legal consequences that the law is facing. Imagine a self-driving car that decided on its own to avoid a traffic accident – if this action causes a less severe accident than it could have happened with the human driver, how the law reacts to this situation.[248] Decisions made by AI machines could potentially impact real human life,[249] so it worth consider the liability regime associated with this context.

---

[245] See note 120, p. 42

[246] Daniel Gervais, Is Intellectual Property Law Ready for Artificial Intelligence?, *GRUR International*, Volume 69, Issue 2, February 2020, Pages 117–118, https://doi.org/10.1093/grurint/ikz025]

[247] Ibid

[248] Ibid

[249] Ibid

This section attempts to justify in the sense that if creative choices in the selection and arrangement of databases happened to be independently processed by the AI machines, would the copyright law respond positively to those works? For AI-generated works to receive copyright protection, there need to be justifiable human claims[250] – and it needs to decide on a case-by-case basis to examine the degree of human intervention in the original contribution and creative choices extended in those works.[251]

The determining factor of originality was the *creative choices*, and amongst countries with strong IPRs like the U.S, the U.K and, the EU applied this common rule.[252] Works generated by or with the help of AI machines subject to the same criteria to obtain copyright protection.[253] The underneath problem is whether the choices made independently by machines are considered creatives. Precisely mentioned by Daniel Gervais in his paper that this new form of computer-generated works has broken the causal chain between humans and output. Or what he called the *"autonomy or agency of the machine"* that might pass the Turing test, but using it to determine the copyright status is not applicable in such context.[254]

No human involvement in contributing to the *creative choices* visible in the selection and arrangement of works, and only the agency of machines that had crossed the autonomy threshold presence, might not generate sufficient originality to warrant copyright protection.[255] It required a degree of human involvement in the creation,

[250] Kop, Mauritz, AI & Intellectual Property: Towards an Articulated Public Domain (June 12, 2019). University of Texas School of Law, Texas Intellectual Property Law Journal (TIPLJ), Vol. 28, No. 1, 2020, p. 10, Available at SSRN: https://ssrn.com/abstract=3409715 or http://dx.doi.org/10.2139/ssrn.3409715

[251] Deltorn, Jean-Marc and Macrez, Franck, Authorship in the Age of Machine learning and Artificial Intelligence (August 1, 2018). In: Sean M. O'Connor (ed.), The Oxford Handbook of Music Law and Policy, Oxford University Press, 2019 (Forthcoming) , Centre for International Intellectual Property Studies (CEIPI) Research Paper No. 2018-10, Available at SSRN: https://ssrn.com/abstract=3261329 or http://dx.doi.org/10.2139/ssrn.3261329

[252] See note 245

[253] See note 250, p. 10

[254] See note 245

[255] Ginsburg, Jane C. and Budiardjo, Luke Ali, Authors and Machines (October 21, 2019). Columbia Public Law Research Paper No. 14-597, Berkeley Technology Law Journal, Vol. 34, No. 2, 2019, Available at SSRN: https://ssrn.com/abstract=3233885 or http://dx.doi.org/10.2139/ssrn.3233885

either programmer who trains the machine to produce the output and users who request the output.[256] These pure AI-creations lack both upstream and downstream activity, which are necessary to emphasize the mental conception and physical execution in the creations to justify authorship claims.[257]

Additionally, the U.S copyright office stated that any works resulting from randomness process or mechanical selection that lack human contribution are not registrable.[258] Not just the U.S who took this approach, but most national copyright laws exclude these AI-generated works from being protected under the copyright regime. Besides the creative choices, other contributions like *"clicking on the button"* to create new outputs were also a justifying factor for claiming authorship.[259] Today creativity output that is seen to be produced by machines is the result of written code by programmers or instructions provided by the users who operated the machines.[260]

5.1.3. Author's Rights

Assuming that AI has assigned authorship to the author as an author or a creator in its own right, this situation forces one to consider several issues: moral rights, economic rights, exclusive rights, and liability attribution. Traditionally such rights are assigned to the human author who created the original works – but the AI as a non-human author has questioned this notion, whether AI-generated works possibly could be awarded the above rights. The answer is affirmative no, following by the historical justification and the conception behind human authors in both legislation and case law.

Starting with moral rights, the foundation and most important mean in reflecting the author's personality and protecting the integrity of their works. Human needs this to ensure their credit as an author was preserved, and the spirit of intellectual creation was

[256] Ibid

[257] Ibid

[258] U.S. COPYRIGHT OFFICE, COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES § 306 (3rd ed. 2014).

[259] See note 250, p. 10

[260] See note 254, p. 402

presented correctly by others who were authorized to use their work.[261] It regards the author's reputation and honor that essentially must be maintained, in contrast to the AI systems that do not require such rights object to any derogatory actions related to works. The author's rights, according to Gervais, are linked to human rights, implying that only [h]umans are capable of obtaining those rights.[262] Following by the Universal Declaration of Human Rights stated to protect the moral and economic interests of the authors who produce scientific, literary, or artistic works.[263] And the author here basically referred to the human beings who can claims rights from their creations. It is the reality that AI-generated works in some ways should have protected in the copyright regime, but seriously there is no one suggest attributing human rights to machines.[264]

The exclusive rights and economic rights have similar purposes in rewarding incentives to the author who invest their time, labor, and effort in creating the work.[265] To continue producing, improving more new AI programs, the author or the person/entities who engage in the production (developers) need motivation in the form of financial return – and without this motivation tool, it limits the interest of developers or companies in investing in the fields. By contrast, AI itself required none of the motives to sustain its production in creating more works. What AI systems need was a set of algorithms that could function its learning process intelligently and the financial backing by investors or companies on programmer or developer whose mission was to design more advanced AI in the future.[266]

Last but not least, legal privileges that have been vested in the author's hand for deriving significant interests from the created works, whether moralistic or materialistic, come

[261] See Chapter 3, Moral rights

[262] See note 120, p. 30

[263] Universal Declaration of Human Rights, G.A. res. 217A (III), U.N. Doc A/810 at 71 (1948)., Article 27

[264] See note 120, p. 31

[265] See Chapter 3, Economic rights

[266] See note 77, p. 444

with obligations that Gervais discussed in his article.[267] He attempted to explain the liabilities come associated with the legal rights that the author of works received.[268] It could be a copyright infringement, defamatory, and derogatory caused by the contents of created works that damage other people's rights.[269] Is it possible for AI machines to be held legally responsible for the damages they cause in a court of law? Based on the doctrinal evidence, it is quite difficult to reach practical answer. But AI as a legal person still in theoretical discussion[270], so without a well-established framework to hold AI accountable for their actions, the chance to grant AI copyright status still unimaginable, or *"at least not until and unless the machine, as purported "author" (as a matter of copyright law), can accept full responsibility for "its" creation."*[271] Remarkably asserted by Daniel Defore, a British satirist, *"responsibility and rights, punishment and reward"*.[272]

5.1.4. Allocating Ownership Rights

When a creation meets the authorship and originality criteria for copyright protection, the author of that work is the first to obtain ownership rights before any transaction can occur. It is the basic rule defined in the copyright law that links to the owner of exclusive rights associated with copyright ownership. However, there were circumstances that ownership of works does not belong to the author, an exceptional case where the employee creates work in the course of his/her employment contract, or what we called "Work Made For Hire." The employer is the first owner of such created works. We had encountered difficulties when we tried to assign ownership of works produced by AI, and we couldn't decide if the AI should have that title as legal personhood, or whether the human should still have that title. The second exception happened when the authors decided to commercialize their works to the third parties by transferring ownership

[267] See note 120, p. 36

[268] Ibid

[269] Ibid

[270] Lawrence B. Solum, Legal Personhood for Artificial Intelligences, 70 N.C. L. Rev. 1231 (1992). Available at: http://scholarship.law.unc.edu/nclr/vol70/iss4/4

[271] See note 120, p. 37

[272] See note 120, p. 36

rights, licensing, or other commercial transactions. Discussion on the possible players in receiving copyright ownership will be discussed subsequently in the next chapter when we seek to present the solution of the research questions.

Because the copyright law stated explicitly that the author of the subject matter would be the owner of those works, it is the initial priority to determine the authorship of either the human or AI is legitimately recognized. Due to the current stance of copyright law, AI-generated works technically do not justify the established criteria of the regime. Discussing the possibility of granting ownership rights is unnecessary without a rational framework for recognizing non-humans as authors. To do so, some arguments to protect the AI-generated works will facilitate reaching a justifiable conclusion aligning with our research problem.

5.2. How AI-Generated Works Could be Protected?

The machine productions or what we called AI-generated works in this thesis do not exist themselves without human effort in developing the original AI programs – the generated creations were the subsequent output from the machines either with or without human guidance. But this type of works was left unprotected under the copyright regime and fall into the public domain, claiming that authorship has been granting to only human authors, and it falls outside the scope of copyright requirement. However, policymakers should resolve the mentioned issue as soon as possible to prevent potential contradictions and a downturn in the AI industry, including innovation. The need to provide some appropriate protection frameworks in dealing with issues is necessary, whether in the form of copyright regulatory changes or alternative protection that could secure the interests of the first AI systems creator (developer, programmer). No incentives for creators could discourage the players in the AI industry from slowing down to halt their production in creating, improving the AI machines as they are reluctant to invest in what they could not be profitable.

Even though there is no identifiable human author in the works, but the outputs from the AI systems are worth something to someone, either tangible or intangible benefits that motivated them to accomplish such AI. In the *University of London Press v. University of London Tutorial Press* case, the court stated that “if it is worth copying it

is worth protecting."[273] It is the basic concepts that could understand from different standpoints, creators require benefits associated with their creations, and the users who want to use the output must reward the creator. Yet, the question should ask at this point, if copyrights still a primary consideration to protect the works by recognizing AI as an author/creator in its own rights or as a tool to a human author.[274] It will lead us to discuss the notion of work made for hire doctrine that refers to the employer and employee relationship in an employment contract. Or alternative protection scheme should present to counter the challenges.

5.2.1. Sweat of the Brow Doctrine and Creative Sparks

Databases produced by AI or machines would be legally copyrightable if there had no change from the sweat of the brow doctrine to the creative spark in light of two prominent events, the Feist decision, and the establishment of the European Database Directive.[275] In the past, compilations of factual information made the creativity element irrelevant in determining the copyright status[276] – the copyright law fundamentally favors the skill and labor that the author put in his/her creations. But this approach has numerous flaws and was rejected by the U.S Supreme Court in the Feist v. Rural case.[277] Protection for compilations should have based on the acts that involved creativity and originality of works, rather than the author's raw labor in compiling the factual information.[278] It also aligned with the spirit of the copyright law " *[...] to promote the progress of science and useful arts."* [279] or in simple terms, only the author of creative works should be rewarded. Section 103 of the U.S. Copyright Act is limited

[273] University of London Press v. University of London Tutorial Press [1916] 2 Ch. 601 at 610.

[274] WIPO, 'Conversation on Intellectual Property and Artificial Intelligence' (September 27, 2019) with the participation of AI expert Dr. Daniela Simone from the University College in London.

[275] See note 154, p. 748

[276] Saksena, Hailshree, Doctrine of Sweat of the Brow (May 3, 2009). p. 2. Available at SSRN: https://ssrn.com/abstract=1398303 or http://dx.doi.org/10.2139/ssrn.1398303

[277] See Feist v Rural

[278] See note 275, p. 4

[279] See U.S Const Art 1 , Sec 8, Cl 8

to protecting the selection and arrangement in the compilations but not the pre-existing materials contained in the works.

In determining the copyright protection for compilations, two essential steps need to factor in the decision.[280] First of which is the early efforts where the author made selection and arrangement of factual information.[281] Second of which is the final efforts that primarily referred to the phases where an author expresses those collected and organized data into fixed compilation forms.[282] According to current practice, copyright law only covers efforts that might result in creativity or originality creations yet does not apply to protect the author's labor and capital expenditure in compilations. This struggle has questioned the tendency of the copyright regime should make the statute, in addition to the current creativity/originality principles, extends to protect the "preparatory effort"? Or remains status quo.

Such legal question should be answered on the basis that copyright law is not an investment protection scheme and that the central role of copyright has been to promote creativity and innovation in society since its inception. Then the Feist decision also abandoned the use of sweat of the brow doctrine since 1991[283], which explicitly proves that the absence of creativity/originality is impossible to obtain copyright protection. A mere mechanical arrangement of pre-existing materials and factual information itself does not subject to protection.

In the sense of this study, AI systems could replace humans in the latter effort by automating the compilation process without the need for human intervention. From the copyright perspective, this works will not copyrightable as it does not prove the minimum degree of creativity. However, taking into account the "preparatory efforts" made by a human author, it may fall within the scope of copyright protection. A preset of instructions from humans in deciding which information should include or exclude

[280] See note 154, p. 753

[281] Ibid

[282] Ibid

[283] See note 275, p. 3

and how those materials should display in compilations[284] reflect the creativity/originality elements required by law. Understandably, human creators have deployed earlier creative processes before the AI systems initiate their automation.

Before the compiling process begins, the "preparatory effort" entails obtaining, gathering, and collecting facts/information/data. But currently, it poses some challenges for this standard as AI systems are entering the process of compiling factual information, the stock price, weather, travel sheet, and more. It becomes easier to create such works because computers and software can instantly assemble and express collected data with a single click of a button and a blink of an eyes. Whether or not the computer-generated works deserve copyright protection is the factor to recognize human author involvement in feeding collected data to the computer. We can see from this that computers only compile data that is already in the system. But the type of data that needs to be obtained, gathered, and collected has little to do with computers.

Last but not least, the abovementioned scenario in which AI systems create compilations or databases leads one to consider AI systems as human agents in the creations. Due to the facts that materials presented in the expression (compilation/database) were vastly decided by the human author. There are two players involved in the creation, one is human, and another is AI systems. So, the potential solution to consider subsequently is the "Work Made for Hire" doctrine in which could be found in the U.S Copyright Act.

5.2.2. Reinterpreting the Work Made for Hire doctrine

According to the pre-discussion about the fundamental of copyright law throughout the thesis, the author of created works can legally claim copyright and possess exclusive rights as the owner of creations. However, there was an exception in the U.S copyright law where individuals or entities could rightfully receive a similar status. The principle of "work made for hire" (hereafter called WFMH) refers to the situation where an author created works in his/her employment. It stated to determine who would become the owner of such creations: employer or employee prevails. There are two cases of WMFH either be "a work prepared by an employee within the scope of his or her

[284] See note 275, p. 4

employment."[285] or "a work specially ordered or commissioned for use"[286]. The second type of WMFH focuses on the *"independent contractor"*[287] who agreed to create works following the employer assignment and includes different categories of work.[288] For instance, a company hires a freelance programmer to create a website based on the provided preferences, or an employee of an architecture firm design the model of the building in the scope of his/her work.

AI-generated works can fall into the scope of WMFH, and this feasible solution might resolve the problem of authorship. But the issues here related to the definition of employee and employer, how the U.S agency interprets the terms. To determine who is an employee, the U.S Supreme Court in *Community for Creative Non-Violence* has provided three schemes,[289] (1) was controlled by the employer over the work, (2) was controlled by the employer over the employee, (3) status and conduct of the employer. And a rational definition of an employer means "someone who employs the services of another entity to achieve a goal or complete a task."[290]

This interpretation could satisfy the case of AI-generated works, where AI systems are the service provider in creating new creations, and the programmer/owner/user employ such services from AI and control how they should operate.[291] AI systems could be considered as "independent contractors" and should be protected in the WMFH scope.[292]

[285] Section 101.a of U.S Copyright Act

[286] Section 101.b of U.S Copyright Act

[287] In the Community for Creative Non-Violence v. Reed, the court made a decision to ascertain WMFH is fall into those who prepared the works, (1) employee (2) independent contractor.

[288] Section 101.b of the U.S Copyright Act

[289] United Stated Copyright Office (2012). "Work Made For Hire", Available at copyright.gov : https://www.copyright.gov/circs/circ09.pdf

[290] See note 77, p. 446

[291] Ibid

[292] Shlomit Yanisky Ravid, Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era--The Human-like Authors are Already Here- A New Model, 2017 Mich. St. L. Rev. 659 (2017), p. 713 Available at: https://ir.lawnet.fordham.edu/faculty_scholarship/956

By reinterpreting the employer-employee in WMFH would significantly settle the controversial arguments of authorship in the concept of AI-generated works. It allows the programmer/owner/user of AI systems to possibly hold the legal title as the author of the work following the copyright law.[293] However, the employer might not directly create the works but able to satisfy the authorship requirements.[294] Presumably that the copyright could be attributed to the natural/legal person instead of AI itself, in this context, we might consider the potential players that prevail over the rights and the drawbacks that could arise when considering AI as an employee.

5.2.3. Who Own the AI-Generated Works? – Human Author

Assume that a work produced by AI systems is copyrightable upon the amendment of the work made for hire doctrine, which means that rights granted by copyright law will vest into a human as a natural person. Hence, three players are partially or entirely connected to the outcomes of AI systems.[295] Firstly, the programmers/developers[296] contribute comprehensively to the AI systems by writing the code, structure the algorithms, and initiating the AI system to operate. Secondly, the owner[297], who substantially invested in the production of AI systems. Thirdly, the end-user(s)[298] who possesses the AI systems and utilizing them. Thought, in assigning such rights to whom, it is vital to understand among whom made the most contribution to the AI systems and carefully study the goal of giving authorship to AI-generated works.

Two parties were in consideration, AI programmers/developers who created AI systems and investors who invest in the process of R&D of AI.[299] They significantly promote the development of AI that we have seen today – without them, the capability of AI

[293] See note 77, p. 447

[294] Ibid

[295] See note 77, p. 443

[296] Ibid

[297] Ibid

[298] Ibid

[299] Ibid

systems will unlikely make headway.[300] Even AI systems have no feeling, sense of humor, or need the incentive to operate. Yet, people behind the establishing of that machine certainly need the rewards, as they spend time, money, skills, and labor - and it is imperative to the growth of the AI sector. Suppose the user(s) of AI systems can claim copyright protection from the works created by systems. In that case, this action will limit the developers of such systems from registering outcomes produced by their own created system.

More precisely, this action will discourage AI developers from creating more sophisticated and intelligent AI in the future. The end-users might have the copyright of the works that did not originate from them, in the context where EULA (End User License Agreement) stated the term of ownership.[301]

Once the amendment of the employee-employer relationship in the WMFH doctrine succeeds in recognizing AI systems as the employee and the programmer/developer/ company as the employer, the problem encountered in consider non-human in copyright law is eluded. There is no need to debate such an issue as it would raise more questions than answers. It also safeguards the core principle of copyright and does not undermine the concept of authorship that regards a natural person as the author. Remains human-author to receive copyright status, it maintains such person to deal with varieties of an affair like liability, infringement, exclusive rights, etc. It will ease the current situation where AI-generated works have become a trending topic amongst the copyright community. Still, for a long-term prediction, it might work or not upon further analysis.

5.2.4. AI as Legal Personhood

Consideration to assign legal personhood to AI systems is not a new concept. It has been discussing for a while since introducing self-driving cars, where the human driver has little to no control over the vehicle.[302] This well-known example concerns the

---

[300] Ibid

[301] Ibid, p. 444-445

[302] Carroll, Kimberly, "Smart Cars are Getting Smarter: Legal Personhood for Self-Driving Vehicles" (2021). Law School Student Scholarship. 1141. Available at: https://scholarship.shu.edu/student_scholarship/1141

liability that will arise once the car got into an accident. Who should be responsible for the damage – the vehicle (AI) or the driver? Lawyer John Frank Weaver said, *"If we are dealing with robots like they are real people, the law should recognize that those interactions are like our interactions with real people,"*[303] In this case, robots might be a combination of hardware and AI.

This model has long been implemented in corporate personhood, where companies, institutions, corporations received rights and obligations similar to a natural person had. In the court of law, these legal fictional characters will hold liable when their actions contrast to the law. From legal standpoints, they were treated the same way as a natural person would.[304] Under European Database Directive, the authorship of databases can designate to the legal persons.[305] This evolving step in granting non-human as the author of creations has been a great model in solving the AI-generated works cases. Another EU legislation has proposed to give legal personality to robots (AI), so they will have legal capacity in both civil and criminal liability caused by them.[306]

By approaching the concept of corporate personhood – AI systems as a legal person could be granted the ownership of what they have created, and its legal capacity will fall under *"the legal person umbrella"*[307] similar to a corporation. But once can ask whether this fictional legal person can indeed hold liable for their action? Since this topic focused on the IPRs, we will not touch upon the liability regime.

Despite the facts, that idea of legal personhood to AI in copyright law could perceive a considerable solution to what we have discussed throughout the thesis. Still, the

---

[303] Madrigal, A. C. (2014, August 13). If a Self-Driving Car Gets in an Accident, Who—or What—Is Liable? Retrieved May 21, 2021, from The Atlantic website: https://www.theatlantic.com/technology/archive/2014/08/if-a-self-driving-car-gets-in-an-accident-who-is-legally-liable/375569/

[304] Wookey, Oliver. (2018). Visa A. J. Kurki and Tomasz Pietrzykowski (Eds.). Legal Personhood: Animals, Artificial Intelligence and the Unborn - The Law and Philosophy Library, Volume 119, ix (Springer International Publishing, 2017) 158 p. 16 Derecho Animal. Forum of Animal Law Studies. 9. 187. 10.5565/rev/da.350.

[305] Article 4 of EU Database Directive

[306] Article 47 of the Treaty on European Union ("TEU")

[307] Woodrow, B., & Ugo, P. (2018). Research Handbook on the Law of Artificial Intelligence, p. 216

discussions amongst experts must take place to comprehend the implication of such changes. Some drawbacks might arise once the AI receives legal personhood. First, this solution will not be practical in reality within a short timeframe,[308] especially when we consider assigning ownership rights to AI. Second, there will be major consequences in the liability regime, the concern over law and ethics.[309] Third, even AI has legally given the legal personality in the future, arguments over the lack of *"critical human qualities [such as] consciousness, feelings, intentionality, desires, interests, creativity."* would be asked from scholars, experts, and legal practitioner viewpoints.[310]

5.2.5. The UK Concept of Computer-Generated Works

Following the mission to transform UK to become a global center for AI and data-driven innovation, the government has implemented several measures to ensure that AI technology will benefit anyone in the UK.[311] Among them was introducing the concept of "computer-generated works" (hereafter called CGW) in the copyright, Designs and Patents Act ("CDPA"). Despite the refusal to grant CGW copyright protection, unlike most other countries,[312] the UK has taken a leading diverse approach by justifying that authorship rights could attribute to human authors, so such works could be protected. Section 178 of CDPA stated that: *" "computer-generated", in relation to a work, means that the work is generated by computer in circumstances such that there is no human author of the work;"*[313]

[308] Ibid, p. 530

[309] Laukyte, M. (2019). AI as a Legal Person. Proceedings of the Seventeenth International Conference on Artificial Intelligence and Law. https://doi.org/10.1145/3322640.3326701

[310] Dremliuga, R., Kuznetcov, P., & Mamychev, A. (2019). Criteria for Recognition of AI as a Legal Person. Journal of Politics and Law, 12(3), 105. https://doi.org/10.5539/jpl.v12n3p105

[311] Intellectual Property Office. (2020, September 7). Artificial intelligence call for views: copyright and related rights. Retrieved May 22, 2021, from GOV.UK website: https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/artificial-intelligence-call-for-views-copyright-and-related-rights

[312] Ibid

[313] Section 178 of Copyright, Designs and Patents Act 1988

This model will help to tackle the issues of having no human author in the CGW and change our perspective towards copyright law, particularly when once consider that *"[i]f something is produced by a natural force by non-human intervention then that product cannot be a 'work' for a work requires the presence of an author."*[314] The CDPA fixed this loophole by granting the authorship and ownership of CGW to *"the person by whom the arrangements necessary for the creation of the work are undertaken,*[315]. So, this viable solution might determine the future of works created by AI systems that we have been discussing since the introduction of this thesis. The first legislation to specifically design to coup with the rise of AI technology said Lord Young of Graffham.[316] It might become the framework where other countries can consider adopting in their jurisdiction when the volume of CGW reaches the needed threshold. CGW protection has a similar concept to the Database Directive. Their focal points to the framework stand to protect the economic rights rather than reward the creativity or natural rights that AI has presented. It strives to preserve the investment poured into creation of such technologies by individuals or firms.

Notwithstanding the answer that CGW has provided in rewarding the human authors the copyright protection by indirectly creating the work, this concept also has some drawbacks. The definition of CGW stated in CDPA was not specific whether AI-generated works would fit into the interpretation. It neither exclude nor includes in section 178, which we do not explicitly see the term AI mentioned. Additionally, the term "arrangement necessary" required to identify the author of work is unclear whether amongst the three possible actors described in this chapter, who should receive the authorship and ownership rights of CGW.

The concept of CGW might address the current issue that works produced by the non-human author technically will fall into the public domain due to the failure in satisfying the authorship and originality criteria. It will provide another protection scheme to ensure that such works will be protected and treated as an ordinary creation. However,

---

[314] Clark and Smyth, Intellectual Property Law in Ireland (Dublin: Butterworths, 1997), p. 252

[315] Section 9(3) of CDPA

[316] See note 310, above

if we look back to the research problem of this thesis, the core problem was to comprehend the current copyright regime in dealing with AI-generated works. In addition, as discussed in Chapter 3 regarding the copyright situation, AI has already failed to meet the authorship criteria, as the law acknowledges only a human being as an author of original work. CGW will not alter the facts that copyright law was designed to promote creativity rather than a mere mechanical process that does not represent the author's intellectual creation. It is important to note even CGW will be protected, but the moral rights and duration of protection are departed from the Berne norms, said Professor Ricketson.

5.3. AI Copyright Infringement

When a person accidentally or intentionally copied, used, distributed other copyrighted materials owned by someone without permission, it called copyright infringement.[317] This sort of action requires the infringer liable for any damages, which include economic and non-economic benefits of the copyright owner.[318] And as an owner of infringing works, there must be proof that substantial similarity between the original work and copied work[319] has been demonstrated in the filing complaint to the copyright office. However, proving the similarities between the two works does not extend to the "general idea or concept" of works but rather the expression of that idea into a fixation form.

In the *Rentmeester v. Nike, Inc.* case, the court rejected the copyright infringement complaint from Rentmeester, a photographer who captured a Michael Jordan in a highly dunking original pose.[320] After that, Nike appeared to use an identical photograph in

[317] U.S Copyright Office. "Definitions: What is Copyright Infringement?". Available at copyright.gov: https://www.copyright.gov/help/faq/faq-definitions.html

[318] Will Kenton (June 12, 2020). "Copyright Infringement". Available at investopedia.com: https://www.investopedia.com/terms/c/copyright-infringement.asp

[319] Zack Naqvi, Artificial Intelligence, Copyright, and Copyright Infringement, 24 Marq. Intellectual. Property L. Rev. 1 (2020). p. 25

[320] See Rentmesser v. Nike, No.15-35509 (9th Cir. 2018) and Summary Prepared by Jonathan Zavin and Sara Slavin Available at : https://www.loeb.com/en/insights/publications/2018/03/rentmeester-v-nike-inc

which Jordan dunked the basketball in the same pose as Rentmeester, and Nike's photo became the "Jumpman" logo in Air Jordan Brand. This lead Rentmeester to sue Nike for copyright infringement in which the court claimed photographs as thin copyright protection.[321] The court fruther concludes that Rentmeester does not own the monopoly over "grand jeté" pose and could not prohibit other photographers from taking their photograph inspired by this concept.[322] Nike was also involved in the selection and arrangement of Jordan's photo, which was developed entirely on its own, including lighting, positioning, and backgrounding.[323]

We will not go over the entire spectrum of what constitutes copyright infringement in this section but rather focus on the instances in which AI infringes copyrighted works of someone. Since AI does not hold any legal rights or be recognized as the author/owner of its creation, it is almost impossible to hold AI accountable for such action. Such a loophole in the copyright law requires immediate consideration if AI-generated work would justify being granted protection in the future. However, as discussed previously regarding who executes creative choices in the first place for works created by AI software and the agency-principal relationship in WMFH doctrine, these might answer the question more reasonably.

5.3.1. AI as an Agent in Agency-Principal Relationship

To summarize the WMFH concept, reinterpreting the employee-employer relationship to regard AI as an employee or independent contractor in the scope of employment and commissioned labor, respectively, might theoretically ensure that AI-generated works do not fail to enter the public domain. And AI-generated works could be protected straightforward when applying this model. However, this approach may be only feasible if the agency law is expanded its limitation to include a legal person (AI) as an agent, which currently is not possible.[324] AI is unlikely treated as an agent because it has no legal capacity acknowledged by the law to utilize the concept of agent-

[321] Ibid

[322] Ibid

[323] Ibid

[324] *See* note 320, p. 26

principal.[325] Instead, AI was rather treated as a tool to the human author in creating intellectual products by archiving what human beings have predetermined.[326] AI required human input, assistance, and direct guidance to be able to produce works.[327]

Despite the struggle to fit AI into the definition of an agent in agency law, in which natural person is the requirement, exceptions have been made in some states, Hawaii and California,[328] for instance, allow a legal entity to be an agent of the principal to satisfy the statutory requirement.[329] The common notion of an entity agent is that it must be controlled by a natural person and authorized by the law to conduct business affairs.[330] In its current state, humans are always in the position to control how AI functions based on given instructions; technically, AI could likely be an agent to a natural person.[331] And if this concept becomes practical, agency law must consider AI as a de-facto agent since AI could not assent itself to be an agent of the principal.[332]

5.3.2. Fiduciary Relationship

In general, the terms “agency” and “employee” serve the same purpose in explaining the relationship between employee-employer or agent-principal. Agency referred to a person acting on behalf of another person to fulfill its principal objective. Similarly, the employer ordered the employee to complete the predetermined goal set by them. Both agent and employee are under the employer/principal's control, which brings us to examine such a relationship in case AI as an agent commits infringement. According to the U.S Agency Law:

[325] Ibid

[326] *See* note 76, p. 435

[327] Ibid

[328] See CAL. CORP. CODE § 1505 (West 2019); HAW. REV. STAT. ANN. § 414-61 (West 2019); VA. CODE ANN. § 13.1-634 (West 2019).

[329] CAL. CORP. CODE § 1505.

[330] See HAW. REV. STAT. ANN. § 414-61

[331] See note 319 above, p. 27

[332] Ibid

> *"Agency is the fiduciary relationship that arises when one person (a "principal") manifests assent to another person (an "agent") that the agent shall act on the principal's behalf and subject to the principal's control, and the agent manifests assent or otherwise consents so to act."* [333]

Because the agent has the authority to do work on behalf of the principal, either actual or apparent consent,[334] any associate harm to the third parties that occurred from agent's conduct, whether it is tortious or principal negligent in controlling or supervising the agent, will become the principal's liability.[335] The results of agent's work will belong to the principal and in case agent attempt to improve the fruit of his/her labor, such arising profit will be collected by principal. The results of the agent's work will belong to the principal, and in the case where the agent attempts to improve the fruit of his/her labor, such arising profit will fall into the principal hand.[336]

Putting AI in this context, we could see that currently, AI was controlled by the natural person. It could be a programmer who creates, instructs, modifies the AI algorithm to meet the particular objectives.[337] AI-generated works that we saw in today's world were the product that required human instruction in telling those AI algorithms to output what humans intended to create. Hence, theoretically, AI could be treated as an agent of a principal on the basis that principal has built and controlled AI from scratch and continue to maintain the effectiveness and accuracy of such AI software.[338]

---

[333] RESTATEMENT (THIRD) OF AGENCY § 1.01 (AM. LAW INST. 2006).

[334] Ibid § 2.02–2.03.

[335] Ibid § 7.03(1)(a).

[336] *See Reading v. Regem, 2 KB 268 (1948).*

[337] *See* note 318 above, p. 27

[338] Ibid

5.3.3. Could Principal liable for AI-agent Infringement?

AI could create infringing work the same as a human did.[339] For instance, if the input data into the core AI algorithm were the copyrighted materials of someone, the chance of AI output product would constitute infringement is foreseeable. While AI is recognized as the principal's agent, it formally bound the fiduciary relationship, requiring the principal to be liable for an agent's action if it occurred within the scope of their agency, under *respondeat superior principles*.[340] In this case, the court following the agency law will ask the principal to be held accountable for the copyright infringement caused by AI based on two main reasons; direct control and associated financial benefits.[341] Firstly, in reaching the satisfaction product, the principal, who generally is a company that hires a team of programmers to develop, modify, optimize, and maintain the best AI algorithms possible, will have absolute control over the AI output. Secondly, the AI's work product that reflected the principal desire will be commercially exploited to gain financial benefits.

5.3.4. Contributory Copyright Infringement

When a company produces and sells AI to the end-user as a consumer product and the end-user somehow uses AI in one way or another that the AI does copyright infringement, the company will not be liable for that action.[342] It simply means that the liability would be shifted from the principal (company) to the end-user. But this theory might be true if a company of AI does not intentionally produce and contribute AI for the objective of copyright infringement, and the underlying inspiration of those AI was to help people archiving tasks more effectively in less time. For instance, a company called Hexachords created Orb Composer, an AI music composition to assist musicians,

[339] *See* note 318 above, p. 31

[340] *See* note 333 above, ("An employer is subject to liability for torts committed by employees while acting within the scope of their employment.").

[341] *See* note 318 above, p. 31. Also see *Dreamland Ball Room v. Shapiro, Bernstein & Co.*, and *M. Witmark & Sons v. Calloway*,

[342] Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 422–23 (1984).

artists, composers in creating music mock-up and musical themes more conveniently.[343] The company sells the AI product for other purposes, not for copyright infringement, and majority of the end-user purchase Orb Composer for music composition goals.[344]

However, it could be possible that the end-user uses an AI product for an infringing purpose that might harm other copyrighted material. Thought, the courts are willing to limit such liability on the basis that AI has substantial lawful use.[345] In *Sony Corp. v. Universal City Studios* case, the court said that selling *"a staple article or commodity of commerce suitable for substantial non-infringing purposes" is not contributory copyright infringement."*[346]

In contrast, if AI producers design AI in such a way that it purposefully encourages users to commit copyright infringement, this might be considered a contributory infringement scenario with secondary liability existed. It happened when *"one who, with knowledge of the infringing activity, induces, or materially contributes to the infringing conduct of another."*[347] The U.S. Supreme Court established four criteria in examine the secondary liability: (1) distribution of a device or product, (2) acts of infringement, (3) intent to infringe the copyright of the device or product, and (4) causation of acts of infringement by third parties.[348] Grokster, for example, did not directly engage in infringing conduct, but by distributing the program with the purpose to facilitate infringement, Grokster was held accountable for secondary liability.[349] The company encourages its end-users to use Grokster to share copyrighted music across

[343] ORB COMPOSER, https://www.orb-composer.com/orb-producer-suite/

[344] See note 318 above, p. 34

[345] *See* Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd., 545 U.S. 913, 933 (2005).

[346] Sony v. Universal, at 440

[347] RESTATEMENT (THIRD) OF TORTS: PRODS. LIAB. § 2 (AM. LAW INST. 1998); Escola v. Coca Cola Bottling Co., 150 P.2d 436, 440–41 (Cal. 1944).

[348] *See* Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd., 545 U.S. 913, 919 (2005) and See note 318 above, p.37

[349] Ibid

the platform, even though the director is aware that such user activity constitutes copyright infringement.[350]

It is crucial to marketing AI products in an apparent manner according to the function of AI that would not encourage users to commit non-legitimate purposes such as copyright infringement. If the company fails to do so, they are still liable for the end-user action following the secondary liability regime.

[350] Ibid

Chapter 6 - Conclusion and Recommendation

6.1. Conclusion

The golden rule of copyright law lay above two principles, a natural person as an author and originality and/or creativity presented. Once it is fulfilled, the works will be eligible for protection without any doubts. Such conditions are widely applied across jurisdictions, and no one could deny this classic theory. Under Singapore Copyright Act imply the requirements by mentioning the terms intellectual creations and a qualified person as eligibility criteria and following by the interpretation that refers author as a citizen of Singapore and originality as author intellectual creations.

In general, AI does not fit into the scope of copyright protection under the Singapore copyright act due to the fact that AI is not a natural person or holding the citizenship status of Singaporeans. So clearly, AI is a tool which mission similar to the traditional computer that functions according to human instruction. Even AI might be able to act autonomously and demonstrated some creative choices in the process of creations. Still, those behaviors happened through numerous of training algorithm that is manifest of human minds.

The legal problem of AI-generated works contrasts with the conventional understanding of copyright regime, no author no copyright. And without the recognition AI as an author, the chance of protecting the outcomes is miserable.

This thesis aims to comprehend the inadequacy of the current copyright regime in Singapore in dealing with the nature of AI-generated works. By exploring various doctrines, legislations, historical contexts, and court interpretations on copyright eligible criteria, authorship, and originality are the main arguments. And throughout the thesis, this study has found that these new types of creations, mainly works created by the non-human author, have difficulties fitting into the present situation where the copyright core rationale keenly relied on the human basis. Additionally, the following condition of copyrighted works was that works should not be copied from others and must demonstrate the author's intellectual creations and/or contain some degree of creativity.

Why don't we legally extend the term authorship to include AI-generated works and lower the threshold of originality for this kind of creation? It sounds like an easy question, but answering this involved more than just the intellectual property disciplines. Presumably, straightforward to amend the copyright law to grant authorship to AI systems without considering the underlying legal concepts and another topic, such as cultural context, ideology – it will lead to some profound implications that could undermine the copyright principles.

Besides the EU Database Directive and British CDPA, which models can be cited, redefined, and applied to accommodate the AI-generated works, at least to the question could the works be protected? or who owns such works? Instead, we unable to find other legal frameworks that mentioned the topic. Similarly, Singapore Copyright Act will not protect work produced by the non-human author, including the AI system. It is a coherent approach that the copyright regime around the world implemented. Regardless of the flaws that the copyright regime had to keep pace with the current technologies development – scholars, experts, policymakers, firms are involved in the discussion to pursue functional results.

The first and most contradictory issue was the concept of AI addressed in Chapter 2; AI encompasses various meanings, leading to uncertainty and making it difficult to choose the most appropriate one for use in the copyright context. This thesis purposely referred to the term “AI systems” as a machine with its ability to perform similar intelligence behaviors compared to human beings. And to simplify the definition to match with research questions, AI systems are theoretically machines with advanced algorithms that can assist humans in completing specific tasks by minimizing human involvement in the development process in an automated manner. Because this thesis spotlight issues in which AI as a non-human author is creating compilations/databases poses challenges to the copyright regime. We have no intent to analyze various types of AI applications in answering the question. The initial arguments formulated in the thesis concern the protection for AI-generated works, and throughout the study, this form of creations has difficulty fitting into traditional copyright ideas.

6.2. Recommendation

This master's thesis also presented the justification on why the copyright regime excludes AI-generated works from protection? Not just in Singapore territory but further extend to explore various jurisdictions where IPRs are strongly maintained. For the following reasons, this paper examined the US, UK, and EU models in dealing with AI-generated works. However, law's tendency in those jurisdictions did not depart from a human-centric model where "original work of authorship" is being protected. When it comes to creating works, AI falls short of fulfilling its potential as a natural being, and they are viewed as a tool for a human author rather than an individual author. Furthermore, the copyright regime encourages human creativity but not computer creativity, which is a general goal of IP law.

Thus, leaving the creations of AI to fall into the public domain will impact the current development of such technology. The initial developers of AI need incentives to continuing research and develop more advanced AI applications for society. They put a lot of money into developing these sophisticated technologies, so just because IP systems do not have a rational solution for AI-generated works does not imply we should not protect them. Chapter 5 adheres to different alternative approaches in protecting AI-generated works through contractual agreements, database directives, GDPR, and unfair competition law. All mentioned protection mechanisms strive to safeguard the interests of AI creators who substantially invested in AI development. It is an investment protection scheme that could sustain the growth of innovation. Demonstrating the options for protecting AI-generated will set databases owner to consider which frameworks suitable for their context. Do their databases consist of sufficient originality elements, and natural person prevails in creative choices to obtain copyright protection? If not, other modes are available for review.

By redefining a few IP concepts, Chapter 6 concludes that copyright law can be ready to resolve the difficulties of AI-generated works. Firstly, reinterpreting the made-for-hire doctrine to recognize AI as an employee of the human author (employer) could significantly impact. It assures that creations created by AI are protected without jeopardizing copyright principles, and authorship criteria remain tied to a human author. And the most essential and practical answer for compilations/databases in Singapore

copyright law was the considering protecting the “preparatory efforts” that human author initial put into the production, not the raw labor that AI could replace. Such an approach has proven to be effective in the sense that creativity is a human trait, and the way machines worked was through the programmer's intellectual minds fed into algorithms.

Lastly, the importance of the EU Database Directive and British Copyright Design Patent Act has a great possibility of protecting compilations/databases created by AI systems. Applying the EU and UK models for copyright protection of AI-generated works leads to some positive results, seeking to safeguard the investment of individuals/entities without taking into account the creativity criteria seriously.

To summarize, this thesis demonstrated the ability of the current copyright regime in protecting the new nature of AI creations by highlight the primary factors why those AI-generated works could not receive copyright and the need to amend the law to adapt to the technology trend. Throughout the research, I attempt to comprehend the research problem from a different angle by examine various legislations, cases, and jurisdictions to conclude the finding. As a result, the thesis’s findings could serve as a model for ASEAN countries, notably Cambodia, to compare and contrast the frameworks proposed by scholars, experts, and policymakers to address the concerns of AI-generated works. Due to the jurisprudence differences, not all the presented protection schemes could be applied successfully. It required further research before amending the law to adapt to technological growth.

List of References

Schwab, K. (2016, 14 January). The Fourth Industrial Revolution: what it means and how to respond . World Economic Forum.
Available at : https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

Menell P. S. (2001). Intellectual Property: Legal Aspects (N. J. Smelser & P. B. Baltes, Eds.), pp 7615-7621.
Available at :
https://www.sciencedirect.com/science/article/pii/B0080430767028631

Castets-Renard C. (2020). The Intersection Between AI and IP: Conflict or Complementarity? IIC - International Review of Intellectual Property and Competition Law 51(2).
Available at: https://doi.org/10.1007/s40319-020-00908-z

Marr, B. (2020, 16 December). The 10 Best Examples Of How AI Is Already Used In Our Everyday Life (2020). Forbes.
Available at : https://www.forbes.com/sites/bernardmarr/2019/12/16/the-10-best-examples-of-how-ai-is-already-used-in-our-everyday-life/

Markets, R. and. (2020, June 4). Global Artificial Intelligence Market Report (2020 to 2030) - COVID-19 Growth and Change. GlobeNewswire.
Available at : https://www.globenewswire.com/news-release/2020/06/04/2043624/0/en/Global-Artificial-Intelligence-Market-Report-2020-to-2030-COVID-19-Growth-and-Change.html

Hern, A. (2016, September 28). Partnership on AI" formed by Google, Facebook, Amazon, IBM and Microsoft. The Guardian.
Available at : https://www.theguardian.com/technology/2016/sep/28/google-facebook-amazon-ibm-microsoft-partnership-on-ai-tech-firms

WIPO Begins Public Consultation Process on Artificial Intelligence and Intellectual Property Policy. (2019, December 13). WIPO.
Available at : https://www.wipo.int/pressroom/en/articles/2019/article_0017.html

Walch, K. (2020, December 5). Why The Race For AI Dominance Is More Global Than You Think. Forbes.
Available at : https://www.forbes.com/sites/cognitiveworld/2020/02/09/why-the-race-for-ai-dominance-is-more-global-than-you-think/

Lau, Johann. (2020, September 3). Google Maps 101: How AI Helps Predict Traffic and Determine. Google Blog.

Available at : https://blog.google/products/maps/google-maps-101-how-ai-helps-predict-traffic-and-determine-routes/

Vaishya, Raju, et al. (2020). "Artificial Intelligence (AI) Applications for COVID-19 Pandemic." Diabetes & Metabolic Syndrome: Clinical Research & Reviews, vol. 14, no. 4, July 2020, pp. 337–339. Science Direct. Available at : https://doi.org/10.1016/j.dsx.2020.04.012

Puja, Das. (2020, October 5). HOW CAN ARTIFICIAL INTELLIGENCE CONTRIBUTE TO A CORONAVIRUS VACCINE?. Analytic Insight. Available at : http://www.analyticsinsight.net/how-can-artificial-intelligence-contribute-to-a-coronavirus-vaccine/

Liew, A. (2013). DIKIW: Data, Information, Knowledge, Intelligence, Wisdom and Their Interrelationships. Semantic Scholar. Available at : www.semanticscholar.org/paper/DIKIW%3A-Data%2C-Information%2C-Knowledge%2C-Intelligence%2C-Liew/695f73fef84353bcec7cb66c0683f582522e18e2

Climbing the Steps of the Data-Information-Knowledge-Wisdom Pyramid. (2012). Available at : www.ontotext.com/knowledgehub/fundamentals/dikw-pyramid/

Brown, Seely, Paul, D., (2020). Knowledge and Organization: A Social-Practice Perspective. Organization Science, vol. 12, no. 2, 2001, pp. 198–213, Available at : www.jstor.org/stable/3086055

Iafrate, Fernando (2018). Artificial Intelligence and Big Data : The Birth of a New Intelligence. Vol. 8, Newark, John Wiley & Sons, Incorporated.

Marr, Bernard (2001). The Key Definitions of Artificial Intelligence (AI) That Explain Its Importance. Forbes. Available at : www.forbes.com/sites/bernardmarr/2018/02/14/the-key-definitions-of-artificial-intelligence-ai-that-explain-its-importance/

Anmar Frangoul (2019, February 8). Worried about Robots Taking Your Job? You Can Rest Easy … for Now." CNBC. Available at : https://www.cnbc.com/2019/02/08/worried-about-robots-taking-your-job-you-can-rest-easy--for-now-.html

Jerry Kaplan, (2016). Artificial Intelligence: What Everyone Needs to Know (New York: Oxford University Press, 2016), p. 1,

Goldstein, S., Princiotta, D., & Naglieri, J. A. (2015). Handbook of intelligence : evolutionary theory, historical perspective, and current concepts. Springer.

How Artificial Intelligence Works. (2021). Investopedia

Available at : https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp

McCarthy, J. (2012). What is AI? / Basic Questions. Stanford.edu.
Available at : http://jmc.stanford.edu/artificial-intelligence/what-is-ai/index.html

European Commission. (2019). Trustworthy AI – Brochure | Shaping Europe's digital future

Bullinaria, J. (2005). IAI : The Roots, Goals and Sub-fields of AI.
Available at : https://www.cs.bham.ac.uk/~jxb/IAI/w2.pdf

Chance, F. S., Aimone, J. B., Musuvathy, S. S., Smith, M. R., Vineyard, C. M., & Wang, F. (2020). Crossing the Cleft: Communication Challenges Between Neuroscience and Artificial Intelligence. Frontiers in Computational Neuroscience, 14.
Available at : https://doi.org/10.3389/fncom.2020.00039

Schuett, Jonas, (2019). A Legal Definition of AI.
Available at : https://ssrn.com/abstract=3453632

High-Level Expert Group on Artificial Intelligence (the AI HLEG). (2019). 'A Definition Of AI: Main Capabilities and Disciplines'

WIPO, Frequently Asked Questions: AI and IP Policy Basics.
Available at : https://www.wipo.int/about-ip/en/artificial_intelligence/faq.html

Thomson Reuters, The meaning of artificial intelligence for legal researchers.
Available at : https://legal.thomsonreuters.com/en/insights/articles/meaning-of-ai-for-the-legal-industry

Charles Ross (2018), Navigating The Fourth Industrial Revolution: Is All Change Good?. Available at : https://eiuperspectives.economist.com/technology-innovation/navigating-fourth-industrial-revolution/white-paper/navigating-fourth-industrial-revolution-all-change-good

Rachael Metz (2019), How AI came to rule our lives over the last decade.
Available at : https://edition.cnn.com/2019/12/21/tech/artificial-intelligence-decade/index.html

Seif, G. (2019, December 19). Your Guide to AI for Self-Driving Cars in 2020 - Towards Data Science. Medium; Towards Data Science.
Available at : https://towardsdatascience.com/your-guide-to-ai-for-self-driving-cars-in-2020-218289719619

Human error as a cause of vehicle crashes. (2013). Stanford.Edu; Center for Internet and Society.
Available at : https://cyberlaw.stanford.edu/blog/2013/12/human-error-cause-vehicle-crashes

The 6 Levels of Vehicle Autonomy Explained | Synopsys Automotive. (2020).
Available at : https://www.synopsys.com/automotive/autonomous-driving-levels.html

The Guardian (2020), A robot wrote this entire article. Are you scared yet, human?.
Available at :
https://www.theguardian.com/commentisfree/2020/sep/08/robot-wrote-this-article-gpt-3

World Economic Forum (2018), Aritificial Intelligence Collides with Patent Law, p.5

Nick Bostrom (1997), How long before superintelligence? (2012),
Available at : https://www.nickbostrom.com/superintelligence.html

Narrow vs. General AI: What's Next for Artificial Intelligence? - Springboard Blog. (2019, August 12). Springboard Blog.
Available at : https://www.springboard.com/blog/narrow-vs-general-ai/

What investment trends reveal about the global AI landscape. (2020, September 29). Brookings. Available at : https://www.brookings.edu/techstream/what-investment-trends-reveal-about-the-global-ai-landscape

Walch, K. (2020, June 4). Is AI Overhyped?.
Available at : https://www.forbes.com/sites/cognitiveworld/2020/06/04/is-ai-overhyped/

DeepAI. (2019, May 17). Computer Vision. DeepAI; DeepAI.
Available at : https://deepai.org/machine-learning-glossary-and-terms/computer-vision

IBM Cloud Education. (2020, July 2). What is Natural Language Processing?
Available at : https://www.ibm.com/cloud/learn/natural-language-processing

What Is Machine Learning - ML - and Why Is It Important? | NetApp. (2019). Netapp.com.
Available at : https://www.netapp.com/artificial-intelligence/what-is-machine-learning/

Christopher, A. (2020, May 14). How Netflix Uses AI For Better Content Recommendation. Medium;
Available at : https://albertchristopherr.medium.com/how-netflix-uses-ai-for-better-content-recommendation-e1423784ef4

Connor Shorten. (2018, September 7). Machine Learning vs. Deep Learning - Towards Data Science. Medium; Towards Data Science. Available at : https://towardsdatascience.com/machine-learning-vs-deep-learning-62137a1c9842

Artem Oppermann. (2019, November 12). What is Deep Learning and How does it work? - Towards Data Science. Medium; Towards Data Science. Available at : https://towardsdatascience.com/what-is-deep-learning-and-how-does-it-work-2ce44bb692ac#

AlphaGo: The story so far. (2016, January 27). Deepmind. Available at : https://deepmind.com/research/case-studies/alphago-the-story-so-far

Sarvasv Kulpati. (2018, July 28). Can AI be creative? - Towards Data Science. Medium; Towards Data Science. Available at : https://towardsdatascience.com/can-ai-be-creative-2f84c5c73dca

Oliver Cann. (2018, September 17). Machines Will Do More Tasks Than Humans by 2025 but Robot Revolution Will Still Create 58 Million Net New Jobs in Next Five Years World. Economic Forum. Available at : https://www.weforum.org/press/2018/09/machines-will-do-more-tasks-than-humans-by-2025-but-robot-revolution-will-still-create-58-million-net-new-jobs-in-next-five-years/

Amazon Pledges to Upskill 100,000 U.S. Employees for In-Demand Jobs by 2025 (2019, July 11). Available at : https://press.aboutamazon.com/news-releases/news-release-details/amazon-pledges-upskill-100000-us-employees-demand-jobs-2025

Lawrence Switzky (2020). ELIZA Effects: Pygmalion and the Early Development of Artificial Intelligence Vol. 40, No. 1 (2020), pp. 50-68. Available at : https://doi.org/10.5325/shaw.40.1.0050

Chris Pash and Qayyah Moynihan (2018, November 8). An AI expert says machines will match human intelligence by 2062 and will 'radically change the nature of warfare'. Available at : https://www.businessinsider.com/ai-will-match-human-intelligence-by-about-2062-2018-11

BBC (2019, June 3). Ai-Da: University of Oxford to host robot art exhibition. Available at : https://www.bbc.com/news/uk-england-oxfordshire-48498853

It allows you to create your unique portrait that has original poetry written on it with yours input choice of words.

Available at : https://artsexperiments.withgoogle.com/poemportraits

Es Devlin (2019, May 2). Create a personalized poem, with the help of AI. Available at : https://www.blog.google/outreach-initiatives/arts-culture/poemportraits/

Anton Oleinik (2019). What are neural networks not good at? On artificial creativity. Available at : https://doi.org/10.1177/2053951719839433

Ben Vesta (2019, September 17). Why AI Will Never Match Human Creativity. Available at : https://www.aceyus.com/blog/why-ai-will-never-match-human-creativity/

Hristov, Kalin (2017). Artificial Intelligence and the Copyright Dilemma Vol. 57, No. 3, 2017. Available at : https://ssrn.com/abstract=2976428

Andres Guadamuz (2017). WIPO: Artificial intelligence and copyright. Available at : https://www.wipo.int/wipo_magazine/en/2017/05/article_0003.html#

U.S. COPYRIGHT OFFICE, COMPENDIUM OF U.S. COPYRIGHT OFFICE PRACTICES § 306 (3rd ed. 2014).

Ginsburg, J.C (2018). People Not Machines: Authorship and What It Means in the Berne Convention. IIC 49, pp. 131–135. Available at : https://doi.org/10.1007/s40319-018-0670-x

Ashok, Arathi,(2009). Economic Rights of Authors Under Copyright Law: Some Emerging Judicial Trends Journal of Intellectual Property Rights, Vol. 15, January 2010, pp. 46-54, Available at : https://ssrn.com/abstract=2401001

Peifer, K. (2010). The Return of the Commons – Copyright History as a Common Source. In Deazley R., Kretschmer M., & Bently L. (Eds.), Privilege and Property: Essays on the History of Copyright (pp. 347-358). Cambridge: Open Book. Available at : http://www.jstor.org/stable/j.ctt5vjt9v.17

Fisher, William Weston. (11 Feb. 2021). "Copyright". Encyclopedia Britannica, Available at : https://www.britannica.com/topic/copyright

What is copyright law, who created it, and why do people think we need it? (2017, June 2017). NEW MEDIA RIGHTS. Available at : https://www.newmediarights.org/business_models/artist/what_copyright_law_who_created_it_and_why_do_people_think_we_need_it

Bruncken, E. (1916). The Philosophy of Copyright. The Musical Quarterly, 2(3), 477-496.
Available at : http://www.jstor.org/stable/737903

EPRS. (2018). Copyright law in the EU, p.3. Retrieved January 26, 2021,
Available at : https://www.europarl.europa.eu/RegData/etudes/STUD/2018/625126/ EPRS_STU(2018)625126_EN.pdf

Vaver, David (1999). "Moral Rights Yesterday, Today and Tomorrow". International Journal of Law and Information Technology.
Available at : https://doi.org/10.1093/ijlit/eaaa014

Francina Cantatore, Negotiating a Changing Landscape: Authors, Copyright, and the Digital Evolution (PhD Thesis, Bond University, 2011) 131.

Javier André Murillo Chávez (2018), COCOpyright and the Value of Moral Rights. (2018). Wipo.int.
Available at : https://www.wipo.int/wipo_magazine/en/2018/04/article_0003.html

World Intellectual Property Organization, (2016), Understanding Copyright and Related Right, p.9
Available at :
https://www.wipo.int/edocs/pubdocs/en/wipo_pub_909_2016.pdf

South-East Asia IPR SME Helpdesk. (2016), Guide to Copyright Protection in South-East Asia, p.3, Retrieved January 27, 2021 from: South-East Asia IPR SME Helpdesk

CHIOMA, CHUDI. (2015), Authorship and Ownership of Copyright: A Critical Review, Vol.34
Available at : https://www.iiste.org/Journals/index.php/JLPG/article/download/20321/20745

Ralph D. Clifford, Intellectual Property in the Era of the Creative Computer Program, 71 Tul. L. Rev. 1675 (1997).

VerSteeg, Russ. "Defining "Author" for Purposes of Copyright." American University Law Review 45, no.5 (June 1996): 1323-1366.

Andres Guadamuz (2018), Can the monkey selfie case teach us anything about copyright law?, WIPO Magazine
Available at: https://www.wipo.int/wipo_magazine/en/2018/01/article_0007.html

Gervais, Daniel J., The Machine As Author (March 25, 2019). Iowa Law Review, Vol. 105, 2019, Vanderbilt Law Research Paper No. 19-35.
Available at : https://ssrn.com/abstract=3359524

Software Freedom Law Center. (2007). Originality Requirements under U.S. and E.U. Copyright Law.
Available at : https://softwarefreedom.org/resources/2007/originality-requirements.pdf

Jane Anderson, Molly Torsen (2012). Intellectual Property and the Safeguarding of Traditional Cultures: Legal Issues and Practical Options for Museums, Libraries and Archives.
Available at : https://www.wipo.int/edocs/pubdocs/en/tk/1023/wipo_pub_1023.pdf

The Requirements for Copyright Protection-JA - EdX Copyright Online Course. (2021). Available at : https://cyber.harvard.edu/cx/The_Requirements_for_Copyright_Protection-JA

Rieders, Lauren, "Borrowing and Originality in Modern Authorship" (2007). Volume 15 - 2007. Paper 7.
Available at : http://preserve.lehigh.edu/cas-lehighreview-vol-15/7

Dale P. Olson, Copyright Originality, 48 MO. L. REV. (1983)
Available at: https://scholarship.law.missouri.edu/mlr/vol48/iss1/7

Digital Law Online: How Copyright Comes Into Being. (2021). Digital-Law-Online.info. Available at : http://digital-law-online.info/lpdi1.0/treatise5.html

Howard B. Abrams, Originality and Creativity in Copyright Law, 55 Law and Contemporary Problems 3-44 (Spring 1992)
Available at: https://scholarship.law.duke.edu/lcp/vol55/iss2/2

Megan Carpenter and Steven Hetcher, Function over Form: Bringing the Fixation Requirement into the Modern Era, 82 Fordham L. Rev. 2221 (2014).
Available at: https://ir.lawnet.fordham.edu/flr/vol82/iss5/11

Douglas Lichtman, Copyright as a Rule of Evidence, 52 Duke Law Journal 683-743 (2003).
Available at: https://scholarship.law.duke.edu/dlj/vol52/iss4/1

An Introduction to Copyright Law in Singapore. (2021). Guidemesingapore.com; Hawksford.
Available at : https://www.guidemesingapore.com/business-guides/managing-business/trademark-registration/an-introduction-to-copyright-law-in-singapore

Tan Tee Jim SC (2019). Ch. 12 Intellectual Property Law.
Available at : https://www.singaporelawwatch.sg/About-Singapore-Law/Commercial-Law/ch-12-intellectual-property-law

Response makes by Singapore Intellectual Property Office (IPOS) submitted to WIPO invitation on Public Consultation on Artificial Intelligence and Intellectual Property Policy.
Available at: https://www.wipo.int/about-ip/en/artificial_intelligence/call_for_comments/pdf/ms_singapore.pdf

Kannan Ramesh, et al. Rethinking Database Rights and Data Ownership in an AI World. Singapore, Law Reform Committee, Singapore Academy of Law, 2020, p. 2.
Available at: https://www.sal.org.sg/Resources-Tools/Law-Reform/AI_database_rights_and_data_ownership

TAN, Tee J., New Law for Compilations and Databases in Singapore (2012) 24 SAcLJ 745. Singapore Academy of Law Journal.
Available at : https://journalsonline.academypublishing.org.sg/Journals/Singapore-Academy-of-Law-Journal-Special-Issue/e-Archive/ctl/eFirstSALPDFJournalView/mid/513/ArticleId/357/Citation/JournalsOnlinePDF

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: "Building a European Data Economy" (2017).
Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0009&from=EN>

Copinger and Skone James on Copyright vol 1 (Sweet & Maxwell, 16th Ed, 2011)

Kevin Lindgren QC et al, Copyright and Designs vol 1 (LexisNexis, 2004)

F.W. Grosheide, Database Protection—The European Way, 8 Wash. U. J. L. & Pol'y 39 (2002).
Available at:
https://openscholarship.wustl.edu/law_journal_law_policy/vol8/iss1/4

Jonathan Band and Jonathan S. Gowdy, Sui Generis Database Protection: Has Its Time Come?, D-Lib Magazine, June 199,
Available at : http://www.dlib.org/dlib/june97/06band.html

Rungrojtanakul, Chana, "Legal Protection of Sui Generis Databases" (2005). Thesis and Dissertations. Paper 15.

Schneider, M. (1998). The European Union Database Directive. Berkeley Technology Law Journal, 13(1), 551-564.
Available at : http://www.jstor.org/stable/24116696

Leistner, Matthias, Big Data and the EU Database Directive 96/9/EC: Current Law and Potential for Reformp.

Available at : https://ssrn.com/abstract=3245937

Arnoud Engelfriet. (2021). Database protection in the USA (in Database rights @ iusmentis.com).
Available at: https://www.iusmentis.com/databases/us/

Database Legal Protection (BitLaw). (2014).
Available at: https://www.bitlaw.com/copyright/database.html

H.R.3531 - 116th Congress (2019-2020): Resilient Communities Act of 2019. (2019).
Available at : https://www.congress.gov/bill/116th-congress/house-bill/3531?s=1&r=2

H.R.2562 - 117th Congress (2021-2022): To address the nationwide shortage of tree seedlings, and for other purposes. (2021).
Available at : https://www.congress.gov/bill/117th-congress/house-bill/2562

Basic Proposal for the Substantive Provisions of the Treaty on Intellectual Property in Respect of Databases to be Considered by the Diplomatic Conference (CRNR/DC/6). (1996)
Available at : https://www.wipo.int/edocs/mdocs/diplconf/en/crnr_dc/crnr_dc_6.pdf

U.S. COPYRIGHT OFFICE REPORT ON LEGAL PROTECTION FOR DATABASES (1997).
Available at : https://www.copyright.gov/reports/db4.pdf

SALLY KANE (2020), What Is Unfair Competition? - Definition & Examples of Unfair Competition,
Available at : https://www.thebalancecareers.com/unfair-competition-2164416

Sam Ricketson, People or Machines: The Berne Convention and the Changing Concept of Authorship, 16 COLUM. J. L. & ARTS 1, 8 (1991-1992).

Tuomas Sorjamaa, (2016). Thesis : I, Author – Authorship and Copyright in the Age of Artificial Intelligence, p. 34-44

Daniel Gervais, Is Intellectual Property Law Ready for Artificial Intelligence?, *GRUR International*, Volume 69, Issue 2, February 2020, Pages 117–118,
Available at :https://doi.org/10.1093/grurint/ikz025]

Kop, Mauritz, AI & Intellectual Property: Towards an Articulated Public Domain (June 12, 2019). University of Texas School of Law, Texas Intellectual Property Law Journal (TIPLJ), Vol. 28, No. 1, 2020.
Available at: https://ssrn.com/abstract=3409715

Deltorn, Jean-Marc and Macrez, Franck, Authorship in the Age of Machine learning and Artificial Intelligence (August 1, 2018). In: Sean M. O'Connor (ed.), The Oxford Handbook of Music Law and Policy, Oxford University Press, 2019 (Forthcoming) , Centre for International Intellectual Property Studies (CEIPI) Research Paper No. 2018-10,
Available at : https://ssrn.com/abstract=3261329

Ginsburg, Jane C. and Budiardjo, Luke Ali, Authors and Machines (October 21, 2019). Columbia Public Law Research Paper No. 14-597, Berkeley Technology Law Journal, Vol. 34, No. 2, 2019,
Available at : https://ssrn.com/abstract=3233885

Lawrence B. Solum, Legal Personhood for Artificial Intelligences, 70 N.C. L. Rev. 1231 (1992). Available at: http://scholarship.law.unc.edu/nclr/vol70/iss4/4

WIPO, 'Conversation on Intellectual Property and Artificial Intelligence' (September 27, 2019) with the participation of AI expert Dr. Daniela Simone from the University College in London.

Saksena, Hailshree, Doctrine of Sweat of the Brow (May 3, 2009).
Available at : https://ssrn.com/abstract=1398303

United Stated Copyright Office (2012). "Work Made For Hire",
Available at : https://www.copyright.gov/circs/circ09.pdf

Shlomit Yanisky Ravid, Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era--The Human-like Authors are Already Here- A New Model, 2017 Mich. St. L. Rev. 659 (2017).
Available at: https://ir.lawnet.fordham.edu/faculty_scholarship/956

Carroll, Kimberly, "Smart Cars are Getting Smarter: Legal Personhood for Self-Driving Vehicles" (2021). Law School Student Scholarship. 1141.
Available at: https://scholarship.shu.edu/student_scholarship/1141

Madrigal, A. C. (2014, August 13). If a Self-Driving Car Gets in an Accident, Who—or What—Is Liable?
Available at : https://www.theatlantic.com/technology/archive/2014/08/if-a-self-driving-car-gets-in-an-accident-who-is-legally-liable/375569/

Wookey, Oliver. (2018). Visa A. J. Kurki and Tomasz Pietrzykowski (Eds.). Legal Personhood: Animals, Artificial Intelligence and the Unborn - The Law and Philosophy Library, Volume 119, ix (Springer International Publishing, 2017) 158 p. 16 Derecho Animal. Forum of Animal Law Studies. 9. 187. 10.5565/rev/da.350.

Woodrow, B., & Ugo, P. (2018). Research Handbook on the Law of Artificial Intelligence.

Laukyte, M. (2019). AI as a Legal Person. Proceedings of the Seventeenth International Conference on Artificial Intelligence and Law. Available at : https://doi.org/10.1145/3322640.3326701

Dremliuga, R., Kuznetcov, P., & Mamychev, A. (2019). Criteria for Recognition of AI as a Legal Person. Journal of Politics and Law, 12(3), 105. Available at : https://doi.org/10.5539/jpl.v12n3p105

Intellectual Property Office. (2020, September 7). Artificial intelligence call for views: copyright and related rights. Available at : https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/artificial-intelligence-call-for-views-copyright-and-related-rights

Clark and Smyth, Intellectual Property Law in Ireland (Dublin: Butterworths, 1997), p. 252

Case Law

Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884).

Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 429 (1984)

Feist Publications, Inc., v. Rural Telephone Service Co., 499 U.S. 340 (1991)

Global Yellow Pages Limited v Promedia Directories Pte Ltd and Another Matter [2017] SGCA 28

Asia Pacific Publishing Pte Ltd v Pioneers & Leaders (Publishers) Pte Ltd [2011] SGCA 37 at 34

Legislations

Singapore Copyright Act (Cap. 63) 1987

U.S Copyright Act of 1976

U.K Copyright, Designs and Patents Act 1988

European Directive 96/9/EC

European General Data Protection Regulation 2016/679

Universal Declaration of Human Rights, 1948

REFERENCES

VITA

NAME	Say Sella
DATE OF BIRTH	03 March 1997
PLACE OF BIRTH	Phnom Penh, Cambodia
INSTITUTIONS ATTENDED	LL.M Business Law, Faculty of Law, Chulalongkorn University Bangkok, Thailand
HOME ADDRESS	#68E, Street 430, Sangkat Phsar Daeum Thkov, Khan Chamkarmorn, Phnom Penh, Cambodia Postal Code : 12307
PUBLICATION	Graduate Journal of Law, the Graduate Journal of Law in the 2020 academic year.