The Influence of Generative Artificial Intelligence on Intellectual Property Regime: The Comparative Studies
อิทธิพลของปัญญาประดิษฐ์เชิงสร้างสรรค์ต่อทรัพย์สินทางปัญญา: การศึกษาเชิงเปรียบเทียบ

Tanakit Saezhu
ธนกิตต์ แซ่จู

International LL.B. Program in Business Law
Faculty of Law, Thammasat University, Pra Chan Road, Phra Nakorn, Bangkok, 10200
นักศึกษาในหลักสูตรนิติศาสตรบัณฑิต สาขากฎหมายธุรกิจ (หลักสูตรนานาชาติ)
คณะนิติศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ถนนพระจันทร์ เขตพระนคร กรุงเทพฯ 10200
Corresponding author E-mail: 12677.jimmy@gmail.com
(Received: February 17, 2025; Revised: March 10, 2025; Accepted: March 10, 2025)

Abstract

During this period, Generative Artificial Intelligence (AI) technologies have presented a new era of innovation across various industries, including intellectual property (IP) rights that are greatly affected. While AI helps promote some inventions and drive economic growth, it also presents significant challenges, particularly concerning copyright infringement. This research paper examines the multifaceted impact of AI, especially with intellectual property regimes: Copyright, Trademark, and Patent, highlighting its benefits and risks. For example, the AI user could not own the intellectual property rights of the AI-generated work. However, there is also a possible argument about whether or not the user using AI as a tool can own the work.

Furthermore, given the developing nature of AI technology, the paper emphasizes the urgent need for comprehensive regulation and control mechanisms to mitigate potential risks and ensure a balance between protecting intellectual property rights and economic and innovation development. The paper will conduct a comparative study of selected countries, analyzing their intellectual property law and regulations that could apply to Generative AI technology, including the United Kingdom, the United States of America, Thailand, China, and the European Union.

Keywords: Generative AI, ChatGPT, Stable Diffusion, Copyright, Trademark, Patent, Infringement

บทคัดย่อ

ในช่วงเวลานี้ เทคโนโลยีปัญญาประดิษฐ์เชิงสร้างสรรค์ (Generative AI) ได้เปิดศักราชใหม่ของนวัตกรรมในอุตสาหกรรมต่าง ๆ รวมถึงสิทธิในทรัพย์สินทางปัญญา (IP) ซึ่งได้รับผลกระทบอย่างมาก แม้ว่าปัญญาประดิษฐ์จะช่วยส่งเสริมการพัฒนาและขับเคลื่อนการเติบโตทางเศรษฐกิจ แต่มันก็ยังนำมาซึ่งความท้าทายสำคัญ โดยเฉพาะในประเด็นเกี่ยวกับการละเมิดลิขสิทธิ์

งานวิจัยนี้ศึกษาผลกระทบหลายมิติของปัญญาประดิษฐ์ต่อสิทธิในทรัพย์สินทางปัญญา โดยมุ่งเน้นไปที่ลิขสิทธิ์ (Copyright) เครื่องหมายการค้า (Trademark) และสิทธิบัตร (Patent) โดยเน้นทั้งประโยชน์และความเสี่ยง ตัวอย่างเช่น ผู้ใช้ปัญญาประดิษฐ์เชิงสร้างสรรค์ไม่สามารถเป็นเจ้าของสิทธิในทรัพย์สินทางปัญญาในผลงานที่ปัญญาประดิษฐ์สร้างขึ้นได้ อย่างไรก็ตาม ยังมีข้อถกเถียงเกี่ยวกับประเด็นที่ว่าการใช้ปัญญาประดิษฐ์เป็นเพียงเครื่องมือในการช่วยสร้างสรรค์ผลงาน ผู้ใช้ปัญญาประดิษฐ์เหล่านี้ยังสามารถมีสิทธิในผลงานหรือไม่

เนื่องจากเทคโนโลยีปัญญาประดิษฐ์ ยังคงพัฒนาอย่างต่อเนื่อง งานวิจัยนี้จึงเน้นย้ำถึงความจำเป็นเร่งด่วนของกฎระเบียบและกลไกควบคุมที่ครอบคลุม เพื่อลดความเสี่ยงที่อาจเกิดขึ้น และสร้างสมดุลระหว่างการคุ้มครองสิทธิในทรัพย์สินทางปัญญากับการพัฒนาเศรษฐกิจและนวัตกรรม

งานวิจัยนี้จะดำเนินการศึกษาเชิงเปรียบเทียบในบางประเทศ โดยวิเคราะห์กฎหมายและระเบียบเกี่ยวกับทรัพย์สินทางปัญญาที่สามารถนำมาใช้กับเทคโนโลยีปัญญาประดิษฐ์เชิงสร้างสรรค์ รวมถึงสหราชอาณาจักร สหรัฐอเมริกา ประเทศไทย สาธารณรัฐประชาชนจีน และสหภาพยุโรป

คำสำคัญ: ปัญญาประดิษฐ์เชิงสร้างสรรค์, แชตบอตปัญญาประดิษฐ์, การสร้างภาพโดยปัญญาประดิษฐ์, ลิขสิทธิ์, เครื่องหมายการค้า, สิทธิบัตร, การละเมิดทรัพย์สินทางปัญญา

I. Introduction

Artificial Intelligence (AI) has become a widely used technology in various industries. Consequently, AI become impactful as a disruption in a wide span of legal areas, including intellectual property, as one of the most area being affected. In this article, the effect of AI on Intellectual Property Law will be discussed. But before we delve deep into the legal issue, the author would like to put the spotlight of this section on the basic knowledge of AI that is necessary to understand the whole content of this article, starting from what AI is.

A. Definition and Characteristics of Artificial Intelligence

Artificial Intelligence or "AI" means the development of computer programs that are capable of simulating human intelligence.[1]

The term AI can also refer to any machine which exhibits characteristics associated with the human mind, such as learning and problem-solving. One important characteristic of AI is the ability to rationalize and take actions that have the chance of producing the best results.

AI systems are based on mathematics and computer science, and they use complex algorithms to solve problems, make decisions, and analyze data. At its most fundamental level, AI operates on an input-output system: the AI system receives and processes data (input). Then, create the response or action (output).[2]

B. Types of AI: Weak AI vs. Strong AI

AI systems are typically classified into two types: weak AI and strong AI. Weak AI, also known as Narrow AI, is the most common type of AI which is found in business and consumer application. It is designed to perform a narrow task, such as facial recognition or recommendation algorithms, within specific parameters and constraints. Strong AI, also known as General AI, is a type of artificial intelligence that may have intelligence equal to or greater than humans.

If we look deeper into the category of General AI, we can see that some AI use neural networks to learn information from massive amounts of data. Deep learning is a type of machine learning that employs multiple input and output layers to extract information from large amounts of data. Deep learning AI has become more popular, and a new type of AI has been developed, which has changed the course of technology and business around the world. Generative AI is a deep learning model that can take raw data and learn to generate statistically expected outcomes when prompted.

C. Impact of Generative AI on Intellectual Property (IP) Rights

At first, Generative AI was used for statistical analysis. However, it has now extended to the image, speech, text, and other data types. The most popular and

---

[1] 'Artificial intelligence noun - definition, pictures, pronunciation and usage notes' (*Oxford Advanced Learner's Dictionary at Oxfordlearnersdictionaries.com*) <https://www.oxfordlearnersdictionaries.com/definition/english/artificial-intelligence> accessed 3 June 2024.

[2] Abdaladze N, 'What Is Ai? A Complete Primer on Artificial Intelligence' (*Skillcrush*, 13 September 2023) <https://skillcrush.com/blog/what-is-artificial-intelligence/> accessed 3 June 2024.

commonly used Generative AI among people would be ChatGPT and Stable Diffusion. As the technology and AI ability grow, the risk regarding the use of AI also rises, especially regarding intellectual property (IP) rights. The reason is that Generative AI can access and take data from various sources and generate outputs that have references or are direct from the original source.[3]

This process raised the issue of copyright infringement. Scholars and even the court also decided that AI-generated work lacks creative expression from humans and should not be protected by copyright.[4] Thus, this paper will specifically study the concerns about IP rights with Generative AI, focusing particularly on copyright issues since the public is still concerned about the ownership and liability arising from Generative works. The ability of Generative AI to create new works based on existing data creates significant challenges for IP regime. Questions arise about whether the output of Generative AI can be deemed original and creative enough to meet the threshold for copyright protection and whether the use of copyrighted material by AI systems can be considered fair use.

Aside from copyright, the paper will also study the impact of Generative AI on trademarks and patents. The author will examine some examples of Generative AI that have been used in public, which generate text and images for the user. The author will analyze some foreign laws regarding intellectual property and suggest how Thailand could adapt to this new technology trend.

II. Generative AI and Intellectual Property Rights

As we already discussed, Generative AI could be thought of as a type of AI that poses the most challenges to the intellectual property regime. This section will explore those challenges widely before we move deeper into the subsequent sections.

A. Challenges in Copyright

As the nature of Generative AI is more advanced, it typically has its own internal decision-making algorithms that use a combination of experience and feedback to enhance itself. The calculation and generation of the work from the Generative AI are

[3] Cole Stryker and Eda Kavlakoglu, 'What Is Artificial Intelligence (AI)?' (*IBM*, 25 August 2023) <https://www.ibm.com/topics/artificial-intelligence> accessed 3 June 2024.

[4] Shuchi Mehta, 'Analysis of Doctrines: 'Sweat of the Brow' & 'Modicum of Creativity' Vis-a-Vis Originality in Copyright Law' (*IndiaLaw LLP*, 11 April 2023) <https://www.indialaw.in/blog/law/analysis-of-doctrines-sweat-of-brow-modicum-of-creativity-originality-in-copyright/> accessed 3 June 2024.

from the data which some of them are subject to intellectual property rights. The issue then arises when there are works that generate through these data. The ability to create new works based on existing data creates challenges for the intellectual property regime. This raises questions about how copyright, trademark, and patent laws should be applied to AI-generated works.[5] This paper will conduct a study and focus on the following points in each intellectual property rights

In the area of copyright law, the question emerges as to whether the output of Generative AI can be deemed original and creative, or meet the threshold for copyright protection. Furthermore, the source data used by these AI systems often contains copyrighted material, raising concerns about derivative works and fair use.

B. Challenges in Trademark and Patent

For trademarks, the use of Generative AI to create brand elements such as logos and slogans raises issues of originality, distinctiveness, and potential infringement on existing trademarks. There could be possible concern whether marks created from Generative AI could be registered?

Additionally, the patents have the challenge of assessing the inventiveness of AI-generated innovations. The question of inventorship also occurs as the traditional understanding of inventors being human individuals becomes involved with AI-generated inventions.

In the next section, the author will discuss Generative AI and copyright, then move on to the trademark and patent. In the end, the author will suggest how Thailand should adapt its intellectual property law to Generative AI technology.

III. Generative AI and Copyrights

In the area of Copyright Law, the question often arises as to whether or not the work is qualified for copyright protection. To be more precise, the questions usually are whether the work is a work of authorship and whether it is original. These questions also apply to AI-generated work. Although a clear consensus has not been reached, each jurisdiction has its own way of dealing with the copyrightability of AI-generated work or at least the principle that could be used to deal with the queries.

[5] Faye F. Wang, 'Copyright Protection for AI-Generated Works: Solutions to Further Challenges from Generative AI' (2023) 5 Amicus Curiae 89.

A. United States Copyright Law

Generally speaking, copyright law will only protect the work that was created by humans. The United States (US) copyright law requires human authorship for the work to be protected under copyright law. There must be some element of human creativity in order for the work to be copyrightable, for instance, in the *Zarya of the Dawn* copyright registration case.[6] The applicant submitted the book for copyright registration. However, the applicant used Generative AI to create the illustration. The copyright office has decided that the text, story, and arrangement of the book are protected by copyright since they came from human authorship.

On the other hand, the illustration from the Generative AI does not receive copyright protection. This is an example of the issue of using Generative AI combined with the work created by humans. The rationale in this case is similar to the Monkey-selfie copyright dispute.[7] Both cases emphasize the importance of the work of authorship by humans. However, the difference is that *Zarya of the Dawn* has both AI-generated parts and work from human authorship parts. It is clear that the monkey-selfie case is not copyrightable because it is not created by humans, but in *Zarya of the Dawn*, the applicant tries to argue that she has put effort and creativity on the work such as editing the image through photoshop.

Traditionally, the copyright interpretation only intends to protect the work created by humans. The US copyright law has scope that the work may only be registrable if it qualifies as an original work of authorship fixed in any tangible medium of expression.[8] The term original consists of two elements, which are independent creation by human authorship and sufficient creativity. In this case, the AI-generated work faced issues on both components. The work is not independently created by a human author, and the work lacks creativity.

B. Thai Copyright Law

For the Thai Copyright Act B.E. 2565, the law defines copyright as an exclusive right concerning the work created by the author. Thus, copyright is a protection granted to the creators of works resulting from original creative ideas using intellect, knowledge,

---

[6] 'Zarya of the Dawn Letter, 21 February 2023' (*copyright.gov*) <https://www.copyright.gov/docs/zarya-of-the-dawn.pdf> accessed 3 June 2024.

[7] *Naruto v. Slater* No. 16-15469 (9th Cir. 2018).

[8] *Urantia Found. v. Kristen Maaherra* 114 F.3d 955, 957–59 (9th Cir. 1997).

skills, and diligence.[9] Currently, there is no court decision regarding Copyright on AI-generated work yet.[10] Nonetheless, there is still a court decision confirming that a copyrighted work must originate from the creator's own original creativity, without copying or adapting from someone else's copyrighted work without permission.[11] Although it is not explicitly stated that the creator must be human, it is implied that the creation is of human origin.

Both Thai and US copyright laws apply traditional interpretations of copyright law, which protect the work created by human authorship.

Even so, the Thailand Department of Intellectual Property (DIP) has produced a podcast that questions the *Zarya of the Dawn* case.[12] The podcast raises the issue of whether the creator can use certain technologies to help create the work, such as Generative AI. Should we consider these types of work to be made by humans and protected by copyright law?

The author agrees with the DIP that it should be possible to consider Generative AI as a tool to help create the work. However, the author also thinks that the method to assess the threshold of using Generative AI as a tool is to evaluate the modicum of creativity and labor discretion.[13] These assessments help determine the originality of the work and check whether the creator contributes to the work enough and deserves copyright protection. For example, if the creator only uses the Generative AI to help rewrite and fix grammar for writing an article or the creator uses the Generative AI to help coloring the drawing, does this consider the work to have a sufficient amount of original authorship to qualify for copyright protection?

C. United Kingdom and Commonwealth Copyright Law

In the United Kingdom (UK), copyright law has different interpretations. In case the work was created by a machine, the authorship is deemed to belong to the person

---

[9] 'บทที่ 2 ลิขสิทธิ์' <https://www.ipthailand.go.th/images/2562/Suppress/lesson2.pdf> accessed 12 June 2024.

[10] สกล หาญสุทธิวาริน์ทร์, 'งานที่สร้างโดย AI มีลิขสิทธิ์หรือไม่: สกล หาญสุทธิวาริน์ทร์' (*bangkokbiznews*, 20 September 2023) <https://www.bangkokbiznews.com/tech/innovation/1089551> accessed 12 June 2024.

[11] Thai Supreme Court Decision 1265/2563.

[12] กรมทรัพย์สินทางปัญญา, 'ผลงานที่ AI สร้างขึ้นมีลิขสิทธิ์ไหม? – Dip Podcast Ep1' (*Facebook*, 9 August 2023) <https://www.facebook.com/ipthailand/videos/713163807287076> accessed 3 June 2024.

[13] Shuchi Mehta, 'Analysis of Doctrines: 'Sweat of the Brow' & 'Modicum of Creativity' Vis-a-Vis Originality in Copyright Law' (*IndiaLaw LLP*, 11 April 2023) <https://www.indialaw.in/blog/law/analysis-of-doctrines-sweat-of-brow-modicum-of-creativity-originality-in-copyright/> accessed 3 June 2024.

who operated the machine and created the work under section 178 of the UK Copyright Designs and Patents Act 1998 (CDPA). However, it is still debatable whether this interpretation also covers AI-generated work.

There is a minor concern because the legislation does not distinguish between computer-generated and computer-assisted work. If AI-generated work is considered computed-generated work under section 178, the work will receive copyright protection without the need to consider creativity and human authorship. It does not matter whether the user uses AI to generate the whole work or only uses AI as an assistance tool and has an expression of ideas on his own. The UK copyright law intends to protect both types of work regardless of a modicum of creativity and contribution.

In the UK, AI-generated works are eligible for copyright protection, which differs distinctly from the US and Thai positions. Nevertheless, the House of Commons Science, Innovation and Technology Select Committee has advised that the current approach under the CDPA for "computer generated" works is unsuitable for AI. This is because AI technology not only assists in creating works but also independently produces them.[14]

Nonetheless, some scholars argue that AI-generated content should still be protected for technological innovation and economic development. In the United Kingdom, India, Hong Kong, South Africa, Ireland, and New Zealand, copyright law allows the person who organizes the process, including the algorithm, data feed, and training, to claim authorship of the computer-generated work created.[15] Generative AI output should be considered to be computer-generated work because building and training Generative AI is also considered to be a skilled and creative process.[16] The existing law in the UK and other countries also balances this protection by reducing the duration of protection, which is a period of 50 years after the work is made (section 12(7) of the CDPA).

D. European Union Copyright Law

On the European Union (EU) side, the EU AI Act was passed on March 13, 2024. The legislation addresses a wide range of artificial intelligence-related issues,

[14] Carlton Daniel, Joseph Grasser and James Collis, 'Copyright Protection for AI Works: UK vs Us' (*Global IP & Technology Law Blog*, 6 March 2024) <https://www.iptechblog.com/2023/07/copyright-protection-for-ai-works-uk-vs-us/> accessed 12 June 2024.

[15] Faye F. Wang, 'Copyright Protection for AI-Generated Works: Solutions to Further Challenges from Generative AI' (n 5) 92.

[16] Ibid. at 93.

including the scope of application, risk-based approach, AI system categories, prohibited AI practices, and general-purpose AI models.[17] The Act also addresses several regulations regarding copyright from AI use, such as the developer's need to comply with Article 53 of the Act. The service must follow transparency and copyright laws.[18] Recital 105 also needs the permission of the rightsholder to use copyrighted content for training and data mining purposes.[19]

The current EU AI Act addresses the procedure and responsibility for developers to avoid risk and danger to the public through the use of AI. However, the Act does not mention the subject of protecting AI output. In this case, the EU AI Act continues to follow existing copyright law, which is intended to safeguard creative work from human beings. As a result, AI-generated output is unlikely to get copyright protection because the criteria for originality rely on a natural person authoring the work.[20]

Nevertheless, there is discussion in parliament on how there should be some specific right to protect AI-generated output, such as applying the neighboring rights doctrine, because there is no human creation requirement to obtain protection, and there are some AI outputs that could get this type of rights like sui-generis databases.[21]

E. China Copyright Law

In China, the copyright law Third Amendment 2020 Article 3(8) grants copyright protection to computer software, but it does not extend or mention computer-generated work. However, there is a court decision that allows companies to have copyrights over AI-generated work.

---

[17] 'Artificial Intelligence (AI) act: Council gives final green light to the first worldwide rules on AI' <http://consilium.Tpa.eu/en/press/press-releases/2024/05/21/artificial-intelligence-ai-act-council-gives-final-green-light-to-the-first-worldwide-rules-on-ai/pdf> accessed 15 June 2024.

[18] 'Eu Ai Act: Shaping Copyright Compliance in the Age of Ai Innovation' (*KEA*, 2 April 2024) <https://keanet.eu/eu-ai-act-shaping-copyright-compliance-in-the-age-of-ai-innovation/> accessed 15 June 2024.

[19] 'Recital 105' (*EU Artificial Intelligence Act*) <https://artificialintelligenceact.eu/recital/105/> accessed 15 June 2024.

[20] Hugenholtz, P.B. and Quintais, J.P., 'Copyright and Artificial Creation: Does EU Copyright Law Protect AI-Assisted Output?' (2021) 52 International Review of Intellectual Property and Competition Law 1190–1216.

[21] Stephane Sejourne and European Parliament, 'Report on Intellectual Property Rights for the Development of Artificial Intelligence Technologies' (2020/2015(INI), Committee on Legal Affairs, Rapporteur, 2 October 2020) 8-9.

The reason is that there is enough labor and technical effort to train and build the Generative AI to create the article.[22]

In November 2023, the Beijing Internet Court issued a landmark ruling that affirmed copyright protection for AI-generated images. The court recognized the originality and intellectual effort invested by the creator, particularly when the generated content reflects the aesthetic choices and personal judgment of a natural person, demonstrating a certain degree of originality. Judge Zhu Ge also gives the opinion that AI-generated images should be protected by copyright to promote creativity and support Generative AI as a tool for creating works.[23]

The recent Chinese court ruling has a significant impact on AI artists and creators in China. It indicates that the courts may recognize the copyrightability of AI-generated works in appropriate cases, which could provide legal protection for their creations. This decision could encourage the creation of AI-generated works and provide a boost to the industry.[24]

This ruling is considered to differ from the current US approach to AI laws and it could benefit Chinese tech companies and the country's economy in the long run. While it might be a positive development for those involved in creating AI-generated content, there are concerns about the potential negative impacts of the court ruling. Some experts are worried about the global impact, particularly how it might affect international copyright norms and the balance between protecting creators and fostering innovation. The ruling led to fallout overseas, with debates on whether AI-generated images with human contribution should be copyright-protected.[25]

F. Conclusion

Currently, the consensus on copyright for AI-generated work is still difficult to establish since there are many different judicial views regarding Generative AI work. Generally, it is clear that AI cannot own copyright since it does not have a legal

---

[22] *Shenzhen Tencent Computer System Co Ltd v. Shanghai Yingxun Technology Co Ltd* (2019) Yue 0305 Min Chu No. 14010, Judgment decision on 24 December 2019 by Shenzhen Nanshan District People's Court.

[23] *Li v. Liu* (2023) Jing 0491 Min Chu No. 11279.

[24] Loke Khoon Tan, James Lau, and Harrods Wong, 'Copyright Protection for AI-Generated Works: A Landmark Chinese Court Ruling' (*Asia IP*, 29 February 2024) <https://www.asiaiplaw.com/section/in-depth/copyright-protection-for-ai-generated-works-a-landmark-chinese-court-ruling> accessed 15 June 2024.

[25] Olivia Rafferty, 'Chinese Copyright Ruling on AI-Generated Images Leads to Fallout Overseas' (*World Trademark Review*, 15 December 2023) <https://www.worldtrademarkreview.com/article/chinese-copyright-ruling-ai-generated-images-leads-fallout-overseas> accessed 15 June 2024.

personality, but there are many opinions support the idea that AI-generated work should have copyright protection. For instance, without copyright protection, the work can be freely used and can directly compete with human-authored work in which users might use AI-generated work to evade copyright infringement liability.[26]

From the comparative study, the UK and China have different approaches to the US and Thai copyright, such that computer-generated work could have copyright protection. However, in practice, it is also challenging to determine the contribution to the creation of work. Therefore, there must be legal and technical measures to prepare the evidence and decide who makes the arrangements that create the work.

In the end, the issue of copyright on AI Generative work is very delicate. Each country's legislation has a different approach. In the author's opinion, we should adopt the UK and China approaches so that AI-generated work can be protected in some technological and economic aspects. However, there should also be a balance in the protection, such as the duration of protection. The author also suggests that there should be a test to determine the creativity and contribution to the AI-generated work. if there is insufficient labor, effort, or creativity, copyright protection should not be applied.

IV. Generative AI and Copyright Infringement Liability

As the technology of Generative AI progresses, the issue of infringement also arises from the usage of AI. Since the nature of Generative AI is a deep learning machine that is able to generate content based on the data that it learned, The AI could also create work from the content that is subject to copyright protection, which might be considered infringement by reproduction or adaptation without permission of the owner.

A. Liability of AI Developers vs. End-Users

When determining the potential infringement from Generative AI, the liability can be imposed on two sides. The creator of the Generative AI system or the end-users of the Generative AI systems.

The question arises whether the company that developed the Generative AI model will be held liable for the infringement created by their models, as the model itself is the tool that makes the infringing content. This is similar to the legal doctrine of

[26] Trapova A, Blogger KC and Hervey M, 'Copyright for AI-Generated Works: A Task for the Internal Market?' (*Kluwer Copyright Blog*, 14 June 2023) <https://copyrightblog.kluweriplaw.com/2023/02/08/copyright-for-ai-generated-works-a-task-for-the-internal-market/> accessed 15 June 2024.

contributory or vicarious liability, where the creator of the tool that enables infringement can be held liable for the infringement committed by the user. However, there is also an argument that the AI model is only a tool and the end-user is the one making the choice to use it to create infringing content, similar to how the creator of copying machine is not liable for infringement when the user makes unauthorized copies.

B. Case Studies of AI Developer on Copyright Infringements

This section will assess the possible liability of each Generative AI that the public could use. First would be the ChatGPT, the Generative AI chatbot developed by OpenAI.

1. ChatGPT

From the technical aspect, Data mining and general AI training is not considered to be an acts of copyright infringement. The reason is these types of actions are not used for expressive purposes, and the data is not redistributed to the public. Copyrights intend to protect the expression of ideas, but AI training only extracts data for functional purposes.[27] However, the answer will be different regarding Generative AI.

ChatGPT is a Generative AI that is trained on large datasets from the internet, and the data might be subject to copyright protection. ChatGPT can potentially use the work that is protected by copyright and create the output. The output created by ChatGPT could be considered as derivative work based on the dataset that ChatGPT has learned. In this case, the nature of text-Generative AI does not copy the data but creates the text based on the input or prompt that the user has made and created through an AI algorithm that already learns the structures of sentences, paragraphs, and text formats.[28]

In the case of fair use defense, we have to assess the transformative test to see whether the output changes the purpose and character of use, nature of the original work, amount and substantiality of the portion taken, and effect on the market.[29]

---

[27] Jenny Quang, 'Does training AI violate copyright law?' (2021) 36 Berkeley Technology Law Journal <https://btlj.org/wp-content/uploads/2023/02/0003-36-4Quang.pdf> accessed 4 June 2024.

[28] Helms S, Krieser, J and Will M, 'Copyright Chaos: Legal Implications of Generative AI' (*Bloomberg Law*) <https://www.bloomberglaw.com/external/document/XDDQ1PNK000000/copyrights-professional-perspective-copyright-chaos-legal-implic> accessed 4 June 2024.

[29] Stim R and law RSA at, 'Measuring Fair Use: The Four Factors' (*Stanford Copyright and Fair Use Center*, 25 November 2021) <https://fairuse.stanford.edu/overview/fair-use/four-factors/> accessed 4 June 2024 ; *Andy Warhol Foundation v. Goldsmith* 598 U.S 508 (2023).

In general, the output from ChatGPT is usually created from an extensive data set without using any particular protected work. It is most likely that output from the ChatGPT combines all of the data and material, which produces the output that fits all the transformative test factors. Nonetheless, the answer could be different if the output of ChatGPT targets any protected work. For example, if the ChatGPT creates the output of fanfiction from protected work, this type of output might not consider to be fair use and could be copyright infringement.

According to ChatGPT's terms of use, the user owns the input, and ChatGPT provides output rights to the user as long as they do not infringe applicable legislation or terms of use. The terms intend to let the user be solely responsible for both input and output content in terms of copyright management.[30] Although it is still debatable whether the output of ChatGPT is protected under copyright or not, the question still arises of who would be responsible for the copyright infringement by ChatGPT program: the developer or the end user? However, before answering this question, we will proceed to the Visual Generative AI that will conclude the liability section.

2. PixAI - Stable Diffusion

PixAI is one of the Visual Generative AI on the internet that uses a Stable Diffusion system. It is a text-to-image model that uses diffusion techniques to generate images based on text descriptions. The Stable Diffusion Process involves two main steps: First is Text Representation. It starts with a text prompt converted into a vector representation by the CLIP text encoder (Contrastive Language-Image Pretraining), leading to image generation. Second is Image Representation Refinement; this process refines the random noise into vector representation and creates a high-resolution image as a final product. This process allows Stable Diffusion to create pictures that strongly adhere to the input text prompts. The entire technical process in Stable Diffusion is extremely complicated.[31]

Still, the key takeaway from the Stable Diffusion model is that the CLIP text encoder did not search or use any specific image or files that match with the input. The image generated through the Stable Diffusion has a similar concept to ChatGPT in that they did not copy the preexisting image or data. They learn the pattern and data,

[30] 'Terms of use' (*OpenAI*) <https://openai.com/policies/terms-of-use/> accessed 4 June 2024.

[31] Lee S, 'Stable Diffusion Explained and Visualized for Everyone' (*Medium*, 10 November 2023) <https://medium.com/polo-club-of-data-science/stable-diffusion-explained-for-everyone-77b53f4f1c4> accessed 4 June 2024.

which create the algorithm that allows them to create output that looks like the prompt's description.[32] The process of diffusion renders the output with a random image that is unrecognizable on which image it is used. The system is designed to construct and deconstruct the data from original sources and produce the result.[33]

In conclusion, both ChatGPT and the Stable Diffusion system itself did not copy any data or images; the Generative AI learns and trains through the large dataset and creates the output. Therefore, the act from the Generative AI system did not consider as copying, and the claim on copyright infringement and fair use defense doesn't need to be considered.[34] Therefore, in the author's view, the developer should not be held liable for copyright infringement since the technology behind these AIs is designed not to actually copy and produce similar work.

The development and function of Generative AI are designed to use the dataset only for training purposes and create an output that does not copy any data specifically. Thus, there should be no liability on the developer of Generative AI. However, the answer will be different regarding the end-user.

C. End-User Liability: The Role of Prompts and Output Management

In practice, the End-user is the one who is personally involved with alleged copyright infringement created by the Generative AI. Users are the ones who write and design the prompt, review the sample of output, select the final output, and determine the purpose of the work. The user is the person who makes all the important decisions when creating output that might be subject to copyright infringement.

To consider the liability of the end user, we will assume that the user is a human author who uses Generative AI to create work. The user has used AI as a tool to create creative work based on user prompts and order. Although the user creates work through Generative AI use much less creativity and effort than traditional artists, the process of making work is similar in that both sides have to determine what the image should look like, what composition and style should be used, how the final work should

[32] Michael D. Murray, 'Generative AI Art: Copyright Infringement and Fair Use' (2023) 26 SMU Sci & Tech L Rev 295.

[33] Suraj Patil et al., 'Stable Diffusion with Diffusers' (*HUGGING FACE*, 22 August 2022) <https://perma.cc/CK5L-AEP5> accessed 4 June 2024.

[34] Zirpoli, Christopher T., 'Generative Artificial Intelligence and Copyright Law' (*congress.gov*) <https://crsreports.congress.gov/product/pdf/LSB/LSB10922> accessed 10 June 2024.

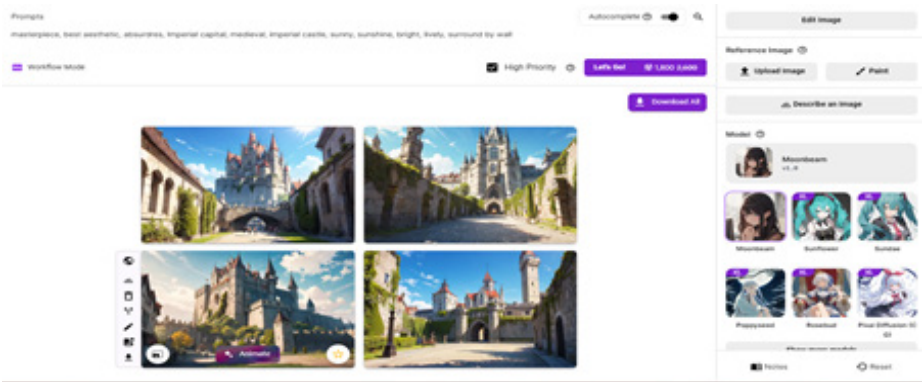
look and finalize the work that satisfied with their need.[35] These processes of thinking and work creation establish the ground claim for using Generative AI as a tool.

1. Fair Use Test in Visual Generative AI: Examples and Analysis

As we have mentioned above, the nature of Stable Diffusion does not copy the existing work. In practice, it is almost impossible to generate output that replicates the original work. However, it will be different if the user intends to use Generative AI for replicate purposes.

When the user uses Visual Generative AI such as PixAI, it uses Stable Diffusion. The user has to put a prompt on what type of image the user wants and what style and composition. Suppose the image is created based only on the prompt and model (pre-trained base model checkpoint, which is a large dataset with images that do not have specific images and references when creating output). In that case, the image is created by a Stable Diffusion system that does not use any specific image for reference.

Example 1



Additionally, there are other functions that the user would like to use because using the prompt to generate the image alone does not perfectly create the work that the user wants. The work creation is often very randomized, and the outcome cannot be predicted. In this paper, we will discuss two functions that are widely used among users, which are reference images and the LoRA model.

In general, if the user uses a reference image that does not have copyright protection, such as the user using personal sketch image. The Stable Diffusion system could use both prompt and reference images to produce the work that the user wants.

[35] Kirmer S, 'Art and Ai' (*Medium*, 17 February 2024) <https://medium.com/@s.kirmer/art-and-ai-c5f5352d8ced> accessed 10 June 2024.

Example 2

AI generated image

Sketch image

When the user uses a reference image function, it could create a high possibility for the Generative AI to produce work that almost replicates the original work. One of the elements to prove whether the act from the user copies another copyrighted work is a substantial similarity test from the US Copyright Law. In this case, we must assess the work's extrinsic and intrinsic tests.[36]

The extrinsic test compares the similarity between two works and focuses only on the protective element of the work.[37] On the other hand, the Intrinsic test is a subjective evaluation of the overall look and feel of the works from the perspective of an ordinary, reasonable observer.[38] In practice, the court will assess both tests and filter out the unprotected element first. If there remain similarities, the court moves to the intrinsic test.

If we apply substantial similarity to the work created by reference image through Stable Diffusion, we have to filter out what elements are not protected. As mentioned above the style, genre, and element that is common for the work is not protected under doctrine of Scènes à Faire. The **Example 2** that the author has provided is the work generated through the author's sketch image. There is no concern about

[36] *Williams v. Crichton* 84 F.3d 581, 588 (2d Cir. 1996).

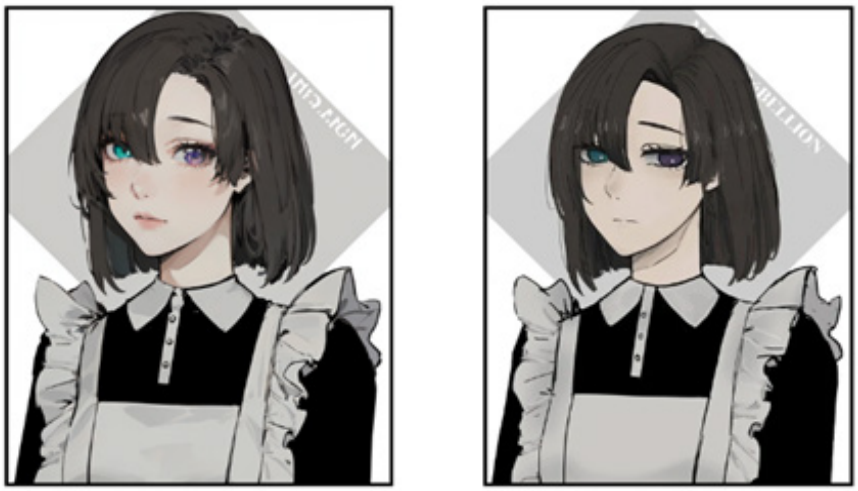
[37] *Cavalier v. Random House, Inc.* 297 F.3d 815, 822 (9th Cir. 2002).

[38] *Funky Films, Inc. v. Time Warner Entertainment Co.* 462 F.3d 1072, 1077 (9th Cir. 2006).

copyright infringement for **Example 2** since it is a case where the user uses personal work or unprotected work for reference.

For **Example 3**, it is the case where the user uses copyrighted work for the reference image.[39]

Example 3



As shown in **Example 3**, the AI-generated work is very similar to the original work. Although the doctrine of Scènes à Faire will provide an exemption for genre, style, and type of work, in this case, the maid character in this picture is an original character created by the artist that is protected under copyright since it is not considered as genre or style but the character itself.[40] The AI-generated work does not change or alter the character's appearance at all. The only difference is that the AI-generated work has more vivid detail and color. For the intrinsic test, it still depends on the discretion of

[39] The Author has asked for permission to use the image for explanation in this paper from the artist herself, Ms. Saowapa Thammaratana.

[40] Under US copyright law, the character must have sufficient uniqueness and distinctiveness in order to be protected under copyright law ; in this case, we shall assume that the character in the example met the requirement for explanation purposes. Richard Stim A, 'Protecting Fictional Characters under U.S. Copyright Law' (*www.nolo.com*, 16 April 2019) <https://www.nolo.com/legal-encyclopedia/protecting-fictional-characters-under-copyright-law.html> accessed 10 June 2024.

the court and reasonable person. The author analyzes that using a copyrighted work to generate an image with this extended similarity could be considered an unauthorized act of copying based on a substantial similarity test.[41]

Moving on to the following function, the LoRA model (fine-tuning pertain model technique that applies tiny changes to standard checkpoint models). The LoRA model is different from the regular model in that it allows the user to create an independent or open-source model that the public can use. Some LoRA models are useful and do not have any risk of copyright infringement, such as detail enhancement and perfect hand models that solve the issues of AI-generated art having trouble generating hands.[42]

Nonetheless, the real problem with the LoRa model is that some users have trained and created the LoRA model to develop and generate the existing fictional character or even a natural person.[43] If the user uses this type of LoRA model to create a fictional character that is subject to copyright protection, then it could be considered to be an act of an unauthorized copy. Still, we also have to assess the substantial similarity test.

For this paper, the author will use Furina, the fictional character from a popular online game called Genshin impact, as an example.[44] (The author will not use any reference image function and only use Furina LoRA model)

[41] Under US copyright law, the work must be registered with the US copyright office in order for the right owner to file a copyright lawsuit against the infringer. In this case, the author only uses this image as an example for explanation; we shall assume that the work met the requirement to file a copyright lawsuit to mainly focus on a substantially similar test. 'First Steps in a Copyright Infringement Lawsuit' (*Justia*, 18 October 2023) <https://www.justia.com/intellectual-property/copyright/infringement/first-steps-in-a-copyright-infringement-case/> accessed 10 June 2024.

[42] Example of the LoRA model, 'Perfect hand model' <https://pixai.art/model/1622080903277692835>.

[43] Example of natural person model, 'Taylor Swift' <https://pixai.art/model/tags/Taylor%20Swift?lang=en>.

[44] Character information <https://genshin.hoyoverse.com/en/character/Fontaine?char=6>, Hoyoverse, the developer of the Genshin impact game, allows non-commercial use for the re-creation of the fictional character. Therefore, the character is allowed to be used as an example in this paper. <https://www.hoyolab.com/article/143107>

Example 4

AI generated image **Official image**

While the AI-generated work could not entirely replicate the character as there are still slight defects and differences, the author believes that most reasonable people will understand and believe that this character is substantially similar to the official character in both extrinsic and intrinsic tests. The reason is that the character itself is not subject to the doctrine of Scènes à Faire, and the AI-generated work attempted to replicate the character through the model that was specially trained to create this character.

As previously mentioned above, suppose we assume that the user could use Generative AI as a tool and have authorship over the work; the user can be liable for the act of copying, which leads to copyright infringement if the user is trying to achieve the output that is substantially similar to the copyrighted work by using the function that we have discussed. Additionally, the purpose of use for AI-generated work is also a factor in determining the fair use defense. For example, if the work is intended for parody or criticism, it could be subject to fair use defense.[45] However, if the purpose and function of the work are similar to the original work, then the fair use defense is not applicable.[46]

---

[45] Nathania Bates, 'Copyright Law: Parody and the 'heart' of the fair use privilege (Campbell v. Acuff-Rose Music, Inc., 114 S. Ct. 1164 (1994)' (1996) 2 University of Florida Journal of Law and Public Policy <https://scholarship.law.ufl.edu/cgi/viewcontent.cgi?article=1104&context=jlpp> accessed 10 June 2024.

[46] *Dr Seuss Enters., v. ComicMix LLC* 983 E3d 443 (9th Cir. 2020).

D. Contributory and Vicarious Liability on the Developers

The concept of copyright protection and infringement can indeed be viewed as two sides of the same coin. When one is eligible for copyright protection, they must also be aware of their potential as an infringer. This dual nature emphasizes the responsibilities and risks that come with the creation and use of creative works. However, the situation becomes more complex with AI-generated content. If AI-generated works cannot acquire copyright protection due to the lack of human authorship, this does not automatically exempt the creators or users of AI from potential infringement liability.

The liability for copyright infringement in the context of AI can fall on multiple parties. It is questionable whether developers could be seen as contributory or vicarious infringers if their tools are used to produce infringing content, particularly if they fail to implement adequate safeguards against misuse. Conversely, end-users who input prompts and select outputs may bear direct liability if their actions result in the creation of works that violate existing copyrights.

To answer the question, the developer in this case should not be held liable for contributory or vicarious liability for several reasons. Firstly, they do not know the content that end users use to generate infringing work. The technology design of Generative AI is to create the work based on the dataset that is not predictable by the developer.[47] The work generated by the user also does not need approval or review from the developer, which makes it more difficult for the developer to know about infringement.

Secondly, the developer does not encourage the user to use Generative AI for infringement purposes. Moreover, the creator also does not have financial benefit from the infringing work from the user either.[48]

Thirdly, the developer should not be held liable for the user's conduct if the Generative AI can be used for substantial non-infringing purposes.[49] Generative AI can be used for infringement and noninfringement based on user prompts and control. We should not interpret Generative AI as an infringement tool but as an innovation that can be used for non-infringing activities that benefit the economy and society.

---

[47] Angell N, 'Style, Copyright, and Generative AI Part 2: Vicarious Liability' (*Creative Commons*, 8 November 2023) <https://creativecommons.org/2023/03/24/style-copyright-and-generative-ai-part-2-vicarious-liability/> accessed 10 June 2024.

[48] *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.* 545 U.S. 913, 937 (2005).

[49] *Sony Corp. of Am. v. Universal City Studios, Inc.* 464 U.S. 417, 437 (1984).

On the other hand, there could be an argument that what happens if the developer knows that there is copyright-protected content in the training data without exclusion measures, or is the developer opening the platform considered an act of facilitating?

In this case, they could arguably be liable under both theories. The developer can be liable under contributory liability if there is proof that the developer knew or should have known about the infringement with enough material contribution. If we use the example in the PixAI case, the platform has a browse engine that allows the user to find and search the model they want to use, including the character subject to copyright protection. These facts mean that PixAI made a material contribution by providing sites and facilities for users to commit direct infringement.

Moreover, if the developer also benefits financially from the infringing use of their AI and has control over its application, they could also face vicarious liability.

In conclusion, AI developers could potentially be liable for contributory or vicarious infringement if they knowingly include copyrighted material in training datasets and fail to take adequate measures to prevent resulting infringements. The degree of their liability would depend on their knowledge, the material contribution to infringing acts, their ability to supervise, and the financial benefits gained from the AI's infringing outputs.

V. Generative AI and Trademark

Normally, the function and purpose of a trademark are to create an identity and brand that can identify the sources of a product or service, thereby ensuring full protection under trademark law. Registration is crucial for protecting brand identity and securing the business's intellectual property rights. However, Generative AI technology raises new questions about trademark law. Specifically, it brings into question whether marks created by Generative AI can be registered as trademarks.

Since Generative AI can create images and art much easier than before, it is possible for entrepreneurs to use Generative AI to design logos and symbols for their products or services. From the copyright perspective, most jurisdictions do not grant copyright protection for AI-generated work. However, the nature and purpose of trademark and copyright are different. Copyright is intended to protect and grant exclusive rights to the creator who contributes creativity, effort, and labor to the work. Meanwhile, trademarks are used to protect the brand for commercial and customer interest.[50]

[50] Amit Singh, 'Importance of Copyright and Trademark in Business' 2 Journal of Legal Research and Juridical Sciences <https://jlrjs.com/wp-content/uploads/2023/03/78.-Amit-Singh.pdf> accessed 19 June 2024.

A. US Trademark Law

In US trademark law (Lanham Act), the registration qualifications are assessed on the use of the trademark or intent to use the trademark. There is no requirement for a trademark to have human authorship, unlike a copyright. The two basic requirements for a mark to be registrable are its use in commerce and its distinctiveness. There are some prohibitions on what makes marks not registrable, such as confusingly similar, generic terms, and primarily geographically descriptive. Therefore, the Lanham Act focuses on the use of marks in commerce and their distinctiveness rather than on authorship.[51]

Although there are possible concerns that the trademark generated by AI could potentially be similar to the existing trademark or use the existing trademark in the data training, if we look at the principle of trademark rights, the intention of a trademark is to avoid confusion about source, origin, or sponsorship of goods or services. As long as the output of Generative AI satisfies all the requirements under the Lanham Act, it should be registered for trademark protection.[52]

B. Thai Trademark Law

In Thai trademark law, the law does not have requirements for human authorship. The main requirement for the mark to be registrable is specified in section 6 of the Trademark Act B.E 2559, which are:

1. Be distinctive.
2. Not be prohibited under this Act.
3. Not be the same as or similar to a trademark registered by another person.

[51] 'Lanham Act' (*Legal Information Institute*) <https://www.law.cornell.edu/wex/lanham_act#:~:text=The% 20Act%20provides%20for%20a,mark%20is%20likely%20to%20occur> accessed 19 June 2024.

[52] 'AI and IP: Examining Legal Rights over AI-Generated Output' (*Moses & Singer LLP*) <https://www.mosessinger.com/publications/ai-and-ip-examining-legal-rights-over-ai-generated-output> accessed 19 June 2024.

Based on the Act, there is no prohibition regarding using AI to create trademarks either. The concept of trademark law between Thailand and the US is similar in that it intends to identify the sources of goods and services rather than protect the creator's rights like copyright law.[53]

Additionally, there could be possible concerns about the term owner of the trademark. Both the Lanham Act and the Thai Trademark Act require the owner to own the trademark in order to get registration. The question arises of what the owner means in this context.

In this case, the owner in a trademark context does not mean copyright ownership, but it is classified as a right to use the mark. The term owner in trademark law has to assess whether such a person has the right to use the trademark. In cases where the trademark was generated from AI, we have to look at the term of use of the Generative AI service. Suppose it allows the user to own and use the output. Then, it could be considered that the user is the owner of the trademark.

Currently, there are no court cases or decisions regarding using Generative AI to create trademarks and whether it is registrable. Nonetheless, if we look at the purpose and rationale of the law, the copyright and trademark purposes are different. Thus, the author views that even if the mark is created from Generative AI, as long as it satisfies all the requirements under trademark law, it should be registerable under trademark law regardless of copyright protection.[54]

VI. Generative AI and Patent

Patent is an intellectual property right that grants protection for an invention or a design, ensuring that the inventor has exclusive rights to use, produce, and sell their invention for a specified period.

The question arises whether an invention can be protected under patent law when Generative AI plays a significant role in the creation process. Traditional patent law has been built on the premise that inventors are human individuals who apply their creativity, knowledge, and skills to develop new inventions. However, when AI systems

---

[53] Thai Trademark Act (No. 3) B.E. 2559, Section 6.

[54] From an inquiry with the Department of Intellectual Property, the official has confirmed that a trademark generated from AI is allowed to be registered as long as it meets the requirements under the Trademark Act.

contribute to or even independently create inventions, it challenges the understanding of inventorship. Determining the inventiveness of AI-generated innovations and assigning inventorship in such cases pose significant legal questions.

A. Generative AI as Inventor

Currently, there are cases where Generative AI named DABUS has applied for patents under many jurisdictions. The AI was developed by Stephen Thaler, and the creator claims that DABUS can create new inventions by learning from algorithms and data without human intervention.[55]

The issue is separate between two cases: Should AI be considered the property of the developer or have the status of an inventor of the inventions made by itself?

There was a debate on whether AI should have legal rights as an electronic person. In this case, we have to classify the category of AI to answer this problem. Firstly, both narrow and general AI should only be classified as the developer's property. The reason is these types of AI do not have Autonomy and Volition, which means thinking independently, making decisions independently, and forming intentions independently. If the creator cannot do these things, the AI should merely be considered the owner's property and have no other legal status.[56] Since Generative AI falls under the category of general AI, it should not have a legal personality to have status as an inventor.

For Instance, In the US case *Thaler v. Hirshfeld*, the court rejected the application for recognizing Generative AI as an inventor. This decision is grounded in the legal interpretation that inventor status is exclusively reserved for individual human beings. The court concluded that AI systems cannot hold or exercise the exclusive rights granted by a patent, nor can they personally derive benefits from such rights. Thus, the status of an inventor, according to the court, cannot be extended to non-human entities like AI.[57]

Additionally, In the United Kingdom, the court has ruled that AI cannot possess legal personality as an inventor under patent law. This decision emphasizes the requirement that an inventor must be a human being. Meanwhile, the owner or operator of an AI system can apply for a patent for innovations generated by AI.[58]

---

[55] Ryan Abbott, 'The Artificial Inventor Project' (*WIPO*, 11 December 2019) <https://www.wipo.int/wipo_magazine/en/2019/06/article_0002.html> accessed 21 June 2024.

[56] ภูมินทร์ บุตรอินทร์, 'กฎหมายกับปัญญาประดิษฐ์' (2561) 47(3) วารสารนิติศาสตร์ มหาวิทยาลัยธรรมศาสตร์ 491-511.

[57] *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238 (E.D. Va. 2021).

[58] *Thaler v. Comptroller General of Patents Trade Marks and Designs* (2021) EWCA Civ 1374.

On the other hand, In Australia, the court has ruled differently, stating that AI can be designated as an inventor. The main reason is that the law in Australia does not define inventor terms as limited to natural persons. However, despite this recognition of AI's inventive status, a human individual must still hold the application for a patent and the grantee's patent rights. Thus, while Australia acknowledges the creative contributions of AI, it maintains that the legal and procedural aspects of patent rights are strictly reserved for human applicants.[59]

For the Thai Patent Act B.E. 2542, the law mentions that an individual eligible to apply for a patent must be of Thai nationality, a juristic person with a main office in Thailand, or another nationality, as specified in section 14. Since AI does not have the status of a person with nationality and does not qualify as a juristic person, it cannot be considered an inventor under the Patent Act.[60]

In summary, the author believes that AI should not have the status of an inventor eligible for patent rights for the following reasons:

1. AI cannot exercise a patent holder's rights by the law's objectives without human intervention or control.

2. AI is not the entity that invests effort, knowledge, and expenses in creating inventions and thus should not be rewarded based on economic rationale.

3. Granting patents to AI does not incentivize research and innovation development.

B. Invention from Generative AI

The inventions created by AI should be entitled to patent protection if they meet the patent criteria under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), such as novelty, inventive steps, and industrial applications.[61]

In this case, the owner of the AI should be entitled to be an inventor if the owner develops the AI with diligence and effort. However, if the owner or user of Generative AI is not the developer who built the AI, they should not receive the benefits of patent protection.

---

[59] *Thaler v. Commissioner of Patents* [2021] FCA 879.

[60] Thai Patent Act (No.3) B.E. 2542, Section 14.

[61] WTO TRIPS Agreement, Section 5, Article 27.

It should be noted that disclosing the technical characteristics and proving the level of inventiveness for inventions created from AI systems is not as easy as inventions created by humans, which poses a challenge in assessing the patent qualification criteria.

In the US case, the United States Patent and Trademark Office (USPTO) provided Inventorship Guidance for AI-assisted Inventions to the public, outlining how the USPTO will assess inventorship concerns as AI systems become more involved in the invention creation process. According to the guidance, while AI-assisted inventions are not automatically unpatentable, the inventorship assessment should prioritize human contributions, as patents are intended to incentivize and reward human innovation. Patent protection can be sought for inventions where a natural person makes a significant contribution to the invention.[62]

In addition, the Intellectual Property Task Force Chairs have reached a consensus among experts in various industries that:[63]

- Inventions facilitated by AI should be eligible for patent protection. Since humans bear responsibility for these inventions, they should be entitled to patent protection to drive innovation.

- Clear guidance is necessary to determine which "individual" qualifies as the inventor. When AI is involved in the invention process, guidelines are needed to define what constitutes a human's inventive contribution in borderline cases.

- AI is a "tool" In the eyes of the law, AI's role in innovation is that of an advanced tool that is not capable of independent conception and thus cannot qualify as an "inventor" in its own right.

Under the Thai Patent Act B.E. 2542, if an innovation created by AI meets all the criteria according to patent law and does not fall under the exceptions for protection, such as being a scientific and mathematical rule, theory, or a data system for computer operations, it can be patented according to the procedures specified by the law.[64]

---

[62] 'Inventorship Guidance for AI-Assisted Inventions' (*The Federal Register*) <https://www.federalregister.gov/documents/2024/02/13/2024-02623/inventorship-guidance-for-ai-assisted-inventions> accessed 21 June 2024.

[63] Iancu and Elluru, 'When Ai Helps Generate Inventions, Who Is the Inventor?' (*CSIS*) <https://www.csis.org/analysis/when-ai-helps-generate-inventions-who-inventor> accessed 21 June 2024.

[64] Thai Patent Act (No.3) B.E. 2542, Section 5 and 9.

In the end, while Generative AI systems, such as DABUS, have demonstrated the capability to create inventions, traditional patent laws are fundamentally built on the notion of human inventorship. The evolving landscape of AI and intellectual property will necessitate continuous dialogue and adaptation to balance technological advancements with legal principles.

VII. Suggestion on How Thailand Should Adapt Its Legislation on Generative AI Technology

Since the advancement of Generative AI technology poses challenges for intellectual property regimes worldwide. Thailand also needs to adapt its IP laws to address the unique issues arising from AI-generated content. The author will provide some suggestions for Thailand's intellectual property law, particularly in relation to copyright, trademark, and patent.

A. Copyright Act Suggestion

Currently, Thai copyright law does not explicitly address the issue of AI-generated work. The Author suggests that section 4 of the copyright act should be amended by adding the definition of artificial intelligence and AI-generated work. The Author believes that adding a defined term will help define the work and apply the law to the new AI technology.

Additionally, the Author views that section 6 of the copyright should also be amended by adding the AI-generated work to fall under copyright work. AI-generated work should have copyright protection in some circumstances. As we observe from multiple jurisdictions, works created with the assistance of AI should be copyrighted if humans are involved in the creative extension that requires sufficient creativity. Applicants for copyright must disclose when the creator's work includes content generated by AI. This aligns with the theory of motivation and balance between the creator and societal benefits, providing protection while primarily considering the public's interest and creating a balance for the creator's benefits.

B. Copyright Infringement Suggestion

Under Thai copyright law, the act of reproduction has a similar concept to the act of copying under US copyright law. The user is liable under direct infringement if it can be proven that the user used copyrighted material to create work that is considered to imitate the original work, which fits with the definition under the Thai Copyright Act B.E. 2565.[65]

[65] Thai Copyright Act (No.5) B.E. 2565, Section 4 and 27.

There are still issues regarding the developer's liability since Thai law does not have a concept of vicarious and contributory liability. Moreover, secondary infringement under the Thai Copyright Act is not applicable in this case because the context and technology behind Generative AI do not fit the conditions under the law.[66]

Even under criminal law and tort law, it is still possible for the developer to be liable as a joint actor or facilitator.[67] Thai copyright law should implement a new and proper mechanism to deal with the infringement arising from AI technology that has conditions similar to vicarious and contributory liability under US law.

C. Trademark Suggestion

The DIP permits the registration of trademarks for AI-generated work, provided that these trademarks comply with existing trademark regulations. However, this raises concerns regarding the clarity of ownership. It is important that the entity or individual utilizing AI to create a trademark possesses the legal right to do so. Applicants for trademark registration must demonstrate their legal entitlement to use the mark. This could be evidenced through adherence to the terms of use of the AI platform employed in the creation process.

D. Patent Suggestion

For AI-generated inventions, the Thai Patent Act B.E. 2542 should maintain the principle that only human beings can be recognized as inventors. However, the contributions of AI in the invention process should be acknowledged, and the human who directed and supervised the AI should be listed as the inventor. Furthermore, the law should require transparency in AI use, which should be mandated through detailed disclosure requirements when filing for patents. This would involve explaining the role of AI in the invention process and specifying the contributions of both the AI and the human inventor.

E. Conclusion

The arrival of Generative AI marks an important moment in the evolution of technology and intellectual property regimes. The comparative study has revealed significant disparities in how countries approach the protection and regulation of AI-generated works. While countries like the United Kingdom and China have taken more inclusive stances, allowing some level of protection for AI-generated content, others like

[66] Ibid, Section 31.

[67] Thai Penal Code, Section 86. ; Thai Civil and Commercial Code, Section 432.

the United States and Thailand adhere strictly to traditional interpretations of human authorship.

The core challenge lies in balancing the promotion of innovation and economic growth with the protection of intellectual property rights. As Generative AI continues to evolve, it becomes crucial for legal frameworks to adapt, ensuring that creators are adequately protected and incentivized.

As Thailand and other nations navigate the complexities of integrating Generative AI into their intellectual property regimes, there must be a balance that promotes innovation without compromising the foundational principles of intellectual property law. Thailand must ensure that its intellectual property laws remain relevant and adaptable in the face of AI advancements.