Copyright Protection on AI-Generated Work : The Case Study of the US, UK, and Thailand Copyright Laws[*]

การคุ้มครองลิขสิทธิ์ในงานสร้างสรรค์โดยปัญญาประดิษฐ์: กรณีศึกษากฎหมายลิขสิทธิ์ประเทศสหรัฐอเมริกา สหราชอาณาจักร และประเทศไทย

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Abstract

With the advance of AI technology, artificial intelligent machines nowadays can originate creative works without human's involvement. Not as a tool of human like technologies in former age, can AI-generated work be protected under the current law regime in Thailand comparing to the US and UK?

Through the comparative study of the copyright laws in the three countries, though they are living under the same umbrella of international copyright legal framework, their copyright provisions are different in detail especially on the provisions related to authorship, originality, creativity, and copyright ownership. While Thailand clearly states in its provision that

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"author" requires to be human, the other two jurisdictions are silent on this part. This thus causes ambiguity in its interpretation and demonstrates their inadequacy in providing copyright protection to the work generated by AI.

To solve the problem, in the midst of proliferation of the use of AI in various industries, Thailand is in need to amend its copyright law to sufficiently protect AI-generated works. One of its options is the application of Fictional Human Author theory and Work Made for Hire doctrine. This is with note that such revision shall also be consistent with the objective of intellectual property law stated in TRIPS.

Keywords: AI, copyright, computer-generated work

บทคัดย่อ

ด้วยการพัฒนาเทคโนโลยีปัญญาประดิษฐ์อย่างไม่หยุดยั้ง ปัญญาประดิษฐ์และหุ่นยนต์ในปัจจุบันสามารถริเริ่มและสร้างสรรค์งานได้ด้วยตนเองโดยปราศจากการมีส่วนร่วมของมนุษย์ ก่อให้เกิดคำถามถึงการคุ้มครองลิขสิทธิ์ในงานสร้างสรรค์ดังกล่าวว่าสามารถได้รับการคุ้มครองหรือไม่เพียงใด ทั้งในประเทศไทย สหรัฐอเมริกาและอังกฤษ

จากการศึกษาวิจัยเปรียบเทียบพบว่า แม้ประเทศทั้งสามจะเป็นภาคีของข้อตกลงและอนุสัญญาเกี่ยวกับลิขสิทธิ์ระหว่างประเทศเช่นเดียวกัน แต่บทบัญญัติว่าด้วย ก) ผู้สร้างสรรค์ ข) การแสดงออกซึ่งความคิดริเริ่มสร้างสรรค์ และ ค) เจ้าของลิขสิทธิ์ ยังคงมีความแตกต่างกันออกไปในรายละเอียด ในขณะที่ประเทศไทยได้กำหนดให้ “ผู้สร้างสรรค์” ต้องเป็นบุคคล กฎหมายลิขสิทธิ์ในสหรัฐอเมริกาและอังกฤษไม่มีการกำหนดเงื่อนไขที่ชัดเจนเหมือนประเทศไทย ส่งผลให้เกิดปัญหาความไม่ชัดเจนในข้อกฎหมาย การตีความ และ ข้อจำกัดของกฎหมายลิขสิทธิ์ของทั้งสามประเทศในปัจจุบันที่ไม่สอดคล้องกับงานสร้างสรรค์สมัยใหม่ที่เกิดจากปัญญาประดิษฐ์ที่ก้าวหน้า

เพื่อแก้ไขประเด็นปัญหาดังกล่าว ด้วยแนวโน้มของการใช้เทคโนโลยีปัญญาประดิษฐ์ในภาคการผลิตของประเทศที่มีมากขึ้น ประเทศไทยมีความจำเป็นพึงปรับแก้กฎหมายลิขสิทธิ์เพื่อให้ครอบคลุมถึงการสร้างสรรค์งานที่เกิดจากปัญญาประดิษฐ์ โดยอาจใช้ทฤษฎีผู้สร้างสรรค์สมมุติประกอบเทียบเคียงกับหลักการเป็นเจ้าของลิขสิทธิ์ตามสัญญาจ้างประกอบการ พิจารณาแก้ไขหรือยกร่างกฎหมายใหม่เป็นการเฉพาะ ทั้งนี้ ภายใต้กรอบวัตถุประสงค์ของกฎหมายทรัพย์สินทางปัญญาดังปรากฏในมาตรา 7 ของข้อตกลงการคุ้มครองทรัพย์สินทางปัญญาที่เกี่ยวเนื่องกับการค้า (TRIPS)

คำสำคัญ: ปัญญาประดิษฐ์, ลิขสิทธิ์, งานสร้างสรรค์คอมพิวเตอร์

1. Introduction

1.1 Background and Rationale

Development and advance of new technology have from time to time caused challenges to revolution of laws and its enforcement. In the context of intellectual property ("IP"), commonly understood to connect deeply with mankind's "intellect", started from Paris Convention to Berne Convention ("Berne Convention"), together united in TRIPS (The Agreement on Trade-Related Aspects of Intellectual Property Rights), the correlation between industrial use and technology and innovation is inseparable. For long, intellectual property law has been used in handling with new technologies being developed to promote advantages mutually shared by producers (private) and users (public), literally recognized by TRIPS, it promotes international trade and economy under the World Trade Organization or WTO.

The intellectual property recognized by TRIPS includes copyright. The law aims to protect creation related to arts, being classified into a number of types including literary work. When technologies have rapidly been changed from analogs to digitals and now to artificial intelligence or AI, creation is no longer purely developed by human but can also be done by a machine or robot that has "brain", together with 1) computational power, 2) big data, and 3) algorithm, to create works. Unlike before, AI can now engage in self-directed learning. It can receive information from a multitude of sources and generate new ideas through the use of software just like human brain[1]. The software mimics the configuration of human neural networks which comprised of a number of switches which can work together to assess information. It receives sensory signals, audio, video, tactile and further, receives information from other devices and other computer networks. With trials and errors, AI learns from its experience. The original program code automatically adapts and rewrites itself to include new experiences from its discoveries like human baby. Once the database grows, because of this repeated process of rewriting, later creations can totally phase out its use of original program, a truly displaying intelligence[2].

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[1] Colin Davies, "An Evolutionary Step in Intellectual Property Rights – Artificial Intelligence and Intellectual Property," *Computer Law & Security Review* 27 (December 1, 2011): 604.

[2] Ibid., 604 and 613.

Today, we can see an AI, a "computer-implemented method of generating a poet personality including reading poems, ...generating analysis models, ...and storing the analysis models in a personality data structure", an invention under the US Patent No. 6,647,395, that was designed to be used as an automatic poetry generator[3] and an AI system that aids doctors in "diagnosis of illness and makes therapy recommendations" or "analyzes ultrasound images to aid doctors in the diagnosis of breast cancer"[4]. Far shifted from the original pattern of copyrighted works, how the copyright law can extend its scope of protection to the creation of AI without contribution of mankind? Who should by law own such automatically generated poems and recommendations/diagnosis?

As a developing country, Thailand's economic growth depends hugely on export and foreign direct investment ("FDI"). In 2017, Thailand had reached top 20 in ranking on FDI interest. Such success was shared by automobile, electronic, and textile industries.

Since 1970 when robotic manufacturing started to occupy automotive industry in the US and Japan, robots and AI machines nowadays are widespread across numerous industries including electronic sector. For automotive, in 2014, the sale volume of robots has been increased for 29 percent. Of the top four FDI in Thailand, the majority of the sale was made to China, followed by Japan, and the US. Though AI will be mainly used in automotive, it is expected that this will extend to other industries, including textile, around the world. Both automotive and textile industries are Thailand's major exports.

Viewing Thailand as their production base and FDI destination, together with the promotion of Thailand's Eastern Economic Corridor and the implementation of Thailand 4.0 policy, Thailand will sooner or later be required to employ robots and AIs along their supply chain that will allow transfer of technologies and stock of knowledge that will benefit the locals. In the midst of proliferation of the use of artificial intelligence, can Thailand's

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[3] Annemarie Bridy, "Coding Creativity: Copyright and the Artificially Intelligent Author," *Stanford Technology Law Review* 5 (2012): 36-37.

[4] Colin Davies, *An Evolutionary Step in Intellectual Property Rights – Artificial Intelligence and Intellectual Property*, 604.

Copyright Act 1994 (B.E. 2537) sufficiently provide copyright protection to foreign investors which having gradually employed AI in their production?

1.2 Research Objectives and Expected Outcomes

1.2.1 To study and understand whether, under the current regime, the automatic works independently generated by AI can be subjected to copyright protection

1.2.2 To study and understand the conditions on the acquisition of copyright protection in Thailand comparing to the US's and UK's copyright laws

1.2.3 To study whether, under the current regime, a machine or AI can own copyright protection and evaluate any potential entities to possibly be assigned to own copyright

1.2.4 To evaluate and understand whether the copyright laws, especially in Thailand, are at present sufficient in providing protection to AI-generated work

1.2.5 To eventually provide constructive mean of recommendations to the government of Thailand whether the country shall amend or legislate a new law to apply with the case, and yet by upholding the original objective and function of the TRIPS as an international benchmark

1.3 Scope of the Research

The scope of this research is mainly on the study of copyright provisions in the Copyright Act B.E. 2537 of Thailand comparing to the Copyright Act 1976 of the US and the Copyright, Designs and Patents Act 1988 of United Kingdom ("CDPA"), specifically the provisions on the 1) scope of copyright protection, 2) types of copyrighted works, 3) conditions of copyright protection including the authorship, personality, originality, creativity, and 4) copyright ownership, and courts' interpretation on these conditions so far revealed in their judgments in order to answer the research question whether the current Thai copyright law is adequate in providing copyright protection to AI-generated works. To find a balance mean of constructive solutions given in the end, the provisions of TRIPS, particularly its Objective in Art. 7 will also be taken into consideration to ensure that the standard earlier set out by World Trade Organization can yet be remained.

1.4 Research Method

In consideration of all the literatures on copyright protection of AI/computer-generated works that the researcher has previously reviewed and the development of AI, questions are thus on the issues related to copyrightability, given that it must own originality and creativity, and authorship and copyright ownership. To analyze whether the works are protectable under the current regime, it is deemed appropriate to review the copyright laws of the US, UK, and Thailand in order to find their similarities that will lead to our discovery of the research question. To achieve the goal, a qualitative and documentary research of prior works available, including journals, articles, research reports, and papers published in proceedings will be the writer's main focus, together with legal provisions and court interpretation evidenced in precedents.

2. Research Outcomes

2.1 International Copyright Laws and the Standard of Copyright Protection

2.1.1 Copyrightability

Through the writer's analysis of the three copyright laws of the three different jurisdictions, the result shows that the statutory laws of the US[5], UK[6], and Thailand[7] all share some similarities and that require author's idea to be expressed, with note that the idea itself is never protected by the copyright acts. While Thailand is more flexible in terms of its way of expression, the US further requires all creative works to be fixed in a tangible medium similar to the literary, dramatic and musical works in the UK's CDPA.

To express author's idea, the laws further requires that the work must be originated by the author (originality requirement) without copying from other sources and satisfy the minimal degree of creativity (creativity requirement). Though the condition of creativity is not explicitly stated in all the three countries' copyright acts, competent courts have repeatedly ruled

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[5] *US Copyright Act of 1976*, Sections 101 and 102.

[6] *UK Copyright, Designs and Patents Act of 1988*, Sections 1, 3, 4, 9, and 178.

[7] *พระราชบัญญัติลิขสิทธิ์ 2537*, มาตรา 4, 6, 7, และ 8.

in their precedents of such condition. Speaking of this "minimal degree of creativity", courts in the three countries have interpreted the term to be different. In the US, according to *Baltimore Orioles, Inc. v. Major League Baseball Players Association*[8] and *United States v. Steffens; United States v. Wittemann; United States v. Johnson*[9], the court ruled that the work must "embodies from modest amount of *intellectual labor*" but a mere contribution of labor (sweat of the brow) can never gain copyright protection without "the *creative* powers of the mind, the *intellectual production, of thought, and of conception"*, noted in *Feist Publications, Inc. v. Rural Telephone Service Co.*[10] Of the same notion, these were presented in the UK court, in *Interlego AG v Tyco Industries Inc.*, as the "skill, labor, and judgment"[11]; while the Supreme Court in Thailand put these as the "effort, knowledge, and intellect" contributed by author (Supreme Court Decision No. 15717/2557).

As all Thai laws are originally legislated in its local language, the Thai meaning of "creative" is likely embraced with a positive sense of creation of which foreigners may misinterpret its meaning when English translation omitted to possibly communicate this hidden connotation. As such, Thai court has constituted another condition of copyrightability and that the work must not be illegal. This is in addition to the fact that the work created by author must fall under any of the types defined in the codes. It is also interesting to the writer that the UK law is even one step ahead of the others to recognize computer-generated works in its Sec. 9 of the CDPA.

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[8] Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 16-17.

[9] Andrew Wu, "From Video Games to Artificially Intelligence: Assigning Copyright Ownership to Works Generated by Increasing Sophisticated Computer Programs," *AIPLA Quarterly Journal* 25 (1997), 157-159.

[10] Arthur Miller, "Copyright Protection for Computer Programs, Database, and Computer-Generated Works: Is Anything New Since CONTU?," *Harvard Law Review* 106 (March, 1993), 1040-1041.

[11] ดารพุธ ศรีธรรมวุฒิ, "*งานอันมีลิขสิทธิ์ที่เกี่ยวข้องกับสัตว์*," (วิทยานิพนธ์ปริญญามหาบัณฑิต คณะนิติศาสตร์ มหาวิทยาลัยกรุงเทพ, 2557), 68, DSpace, http://dspace.bu.ac.th/jspui/bitstream/123456789/1818/3/daraput.srit.pdf, สืบค้นเมื่อ 20 มิถุนายน 2563.

2.1.2 Authorship & Copyright Ownership

By comparing all the three countries' copyright laws[12], this research also found that they all stand on the same position provided that the author shall be the owner of the copyrighted work. With this regard, only UK and Thailand have clearly declared the definition of "author" in their provisions given that it is the person who actually creates creative/copyrighted work, known as the author-in-fact versus the author-in-law who is possibly entitled the copyright by virtue of the work made for hire doctrine ("WMFH"). In the US, this "author" was later clarified in the Supreme Court decision to have the same meaning[13].

Important to note, among the three, Thailand is the only one country which states in its provision that "author" must be a person, and that is further explained in the Thai Civil and Commercial Code ("CCC") as either a natural person (by born, Sec. 15) or juristic person (by registration, Sec. 65). Even that, by reading all the provisions in the UK copyright laws, i.e. Secs. 153 and 154, of the repeated terms "citizen, nationality, domicile, and resident", it can be understood that the law was originated for human and by human and it would make more sense that authorship (as well as ownership) of the computer-generated work would be vested on a person who undertakes arrangement rather than a computer with no personality to be entitled to copyright protection as stated in Secs. 9 and 178 of the CDPA.

2.2 AI-Generated Work: A Question on Copyright Protection under the Current Legal Regime

In spite of the fact that many scholars, due to the writer's study of the former works and literatures, yet believe that non-human author such as AI can be included under the same "authorship" basing on their argument of silent expression in laws (especially in the US), this research sees otherwise given that the law shall be understood by using logical interpretation rather than literal interpretation that can possibly extend its scope. Without taking

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[12] *US Copyright Act of 1976*, Section 201; *UK Copyright, Designs and Patents Act of 1988*, Sections 9(1), 11, 153 and 154; *พระราชบัญญัติลิขสิทธิ์ 2537*, มาตรา 4.

[13] Shlomit Yanisky-Ravid, "Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era—The Human-Like Authors Are Already Here—A New Model," *Michigan State Law Review* 4 (2017), 688-690.

the gist and objective of the law, legal context, and its history as a supplementary means of interpretation into account, such interpretation can be broad enough to include animals and AI in its copyright protection with a simple conclusion that AI machine is the author of the work.

In this context, in the midst of proliferation of the use of automated AI in various industries, the new challenge is now presented in another form. Neither the work solely generated by AI can be called "derivatives" nor a fruit of "machine-assisted" production, AI can now individually generate copyrightable works without human's (neither programmer nor user) contribution, or with their contribution but not to the minimum originality requirement that would grant them copyright by law. The question is then how the copyright laws of the three jurisdictions can be applied with the case.

Likely, if we rely on bits and pieces of a language used in American judicial opinions of the past century, it can more or less exhibit the court's notion that the "author" must be only human author. For instance, in *Burrow-Giles to Goldstein v. California, and in Alfred Bell & Co. v. Catalda Fine Arts, Inc.*, the use of specific terms, e.g. "he to whom anything owes its origin; originator; maker; one who completes a work of science or literature", or "any physical rendering of the fruits of creative intellectual or aesthetic labor", or "author contributes something more than a merely trivial variation, something recognizably his own"[14], possibly explain at least the courts' implication of applying copyright provisions with "human". Besides, in the *Urantia Foundation v. Maaherra*, the Ninth Circuit regarded "authorship" in the copyright as the creation which comprised of "some element of human creativity" and "not [the] creations of divine beings that the copyright laws were intended to protect" such that a book can be copyrightable[15].

In line with the above cases, in *Bleistein v. Donaldson Lithographing Co.*, Justice Holmes has offered a conception of authorship grounded on the inherent uniqueness of human personality, stated that "the copy is the personal reaction of an individual upon nature. Personality always contains

[14] Colin Davies, *An Evolutionary Step in Intellectual Property Rights – Artificial Intelligence and Intellectual Property*, 611.

[15] Ibid., 608.

something unique… something irreducible, which is one man's alone. That something he may copyright"[16].

While the US Supreme Court once explained that "the author is the party who actually creates work", it should be understood that the fact upon the case is in no way relevant to artificial intelligence. It therefore should not be assumed that AI is ever meant by the US court and the US law to secure copyright protection. In fact, the Supreme Court used to state in a decision that "in most cases, a computer requires a significant amount of input from a *human user*"[17].

In the UK, though the country has included Sec. 9(3)—copyright on computer-generated work in its copyright provisions, the unique nature of AI-generated work yet poses some questions on the originality (including creativity) requirement whether this should be of human or computer. According to this, Prof. Guadamuz believes that Sec. 9(3) is an exception to the general requirement of originality and creativity. With note that the House of Lords used to touch upon this issue, even indirectly, on their attempt to identity the author of computer-generated work. Lord Beaverbrook, in their discussion about the Act, commented that "the person by whom the arrangements necessary for the creation of a computer-generated work are undertaken *will not himself have made any personal, creative effort*". Other scholars, including Emily Dorotheou, are yet of different opinions arguing that the person who undertakes an arrangement needs to meet the originality requirement in order to gain copyright protection[18].

Despite of the ongoing debate on its interpretation, it should also be noted that the Whitford Committee in their draft of Sec. 9(3) once discussed that "*the author of the final output can be no one other than person(s) who devised the instructions and originate the data used to control and condition*

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[16] Annemarie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, 12-13.

[17] Shlomit Yanisky-Ravid, *Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era—The Human-Like Authors Are Already Here—A New Model*, 696-698.

[18] Emily Dorotheou, "Reap the Benefits and Avoid the Legal Uncertainty: Who Owns the Creations of Artificial Intelligence?," *Computer and Telecommunications Law Review* 4 (May 29, 2015), 86-87.

a computer to produce a particular result". It then makes sense that the UK copyright law related to authorship in this context of computer would be in hands of a person who makes an arrangement and to exclude moral right from protection as it is closely related to the personal nature of creative effort[19].

In Thailand, the provisions are quite clear to show that AI can likely never fulfil the requirement of copyrightability without personality. Even the work created by AI can easily fall under any one of the nine types of copyrighted work (Sec. 6), this research also found it difficult to prove that its work would meet the condition of originality and creativity. Can we say that AI device spends "effort, knowledge, and intellect" as stated by the Supreme Court which deserves reward of copyright protection in return? Reading together with Sec. 8 on the point of attachment, of the repeated terms "national and domicile", it is moreover hard to believe that the Thai legislators ever expected to apply copyright with AI author.

This research found it unreasonable to include AI and its generated work under the Thai current regime as the copyright system is, at present, unable to holistically serve the new technology of artificial intelligence. According to Prof. Thatchai Supphaphonsiri, to be copyrightable, apart from the fact that the work must be able to fulfill the conditions of copyrightability and is not protected under other laws (i.e. patent), the entire copyright system must be in support and facilitate its protection[20]. Though the AI-generated work can likely be categorized under "any other work in the literary, scientific or artistic field..." subject to Sec. 6 par. 1, the work by nature is argued to be incompatible with the overall copyright system given that it does not fit with several provisions that are initially set to serve human author.

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[19] Andres Guadamuz, "Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works," *Intellectual Property Quarterly* 2 (2017), 176-177.

[20] ธัชชัย ศุภผลศิริ, *กฎหมายลิขสิทธิ์*, พิมพ์ครั้งที่ 3, (กรุงเทพฯ: นิติธรรม, 2544), 102-103.

3. Conclusions and Recommendations

3.1 The Grant of Copyright Protection: Recent Studies and Proposals of Scholars

In consideration of different proposals recently have made by different scholars, among multi players surrounded the creation of AI-generated work, some proposed that its copyright ownership should be in hands of artificial intelligence, backed by the fact that many jurisdictions are silent to explicitly define the term author[21], others proposed that the original programmer[22] or user/operator[23] are supposed to be entitled to its copyright given that they are the most relevant persons on the generation of work by AI. This research found ones have their problems in its legitimacy and their arguments are likely unpersuasive.

By law, in order to grant copyright to a party, such author must clearly meet the requirements of authorship and originality (of which includes creativity) as previously discussed. Without human's intervention, neither the original programmer nor user/operator can fulfill these requirements. It is hard to argue of what extent they spend their "effort, knowledge and intellect" or "skill, labor, and judgment" (as stated by the UK court) in the work, and to argue that the output is in fact originated by them so as to deserve incentive or reward in return.

Because of that, Perraya and Margonia, and Ralph, believe we should leave its copyright to none, proposing that it should fall into public domain and consider it as an orphan work[24]. Though this sounds very much logical that without law, a springboard should not then be put to jump to whatever conclusion that the law does not aim for, comparing to the *Naruto v. Slater* in the US of the photo snapped by a money, however without copyright, there would be lesser incentive for developer/owner of AI machine to continue generating new works.

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[21] Colin Davies, *An Evolutionary Step in Intellectual Property Rights – Artificial Intelligence and Intellectual Property*, 609-617.

[22] Ibid., 614-615.

[23] Ibid., 610.

[24] Ibid., 612.

To certain point, developer/owner of AI machine probably invest substantial amount of time and money in the creation of AI that later generates creative works. Breaking their hope to gain copyright may more or less suspend their improvement of AI capability. Negative consequences can then be lesser research and development on AI and the declination of innovation. Certainly, this is not that pleasurable for a developing country like Thailand to see the decreasing number of FDI and eventually the decline of works entering public domain. People should not be trained to be a free rider.

3.2 The Mixture of WMFH Doctrine and Fictional Human Author ("FHA") Theory as a New Proposed Solution

Accordingly, this brought to the writer's conclusion of the mixture concepts of WMFH doctrine and FHA theory as a new solution to be proposed.

Though this "work made for hire" is somehow already existed in all the countries' laws[25], it yet bears a loophole given that the current practice is applicable only when the two-side parties are all legal entities, either natural or juristic person, recognized by the civil code. None of these include AI.

To fix this, the FHA theory of Timothy Butler must then be brought to use. Once presuming the existence of the fictional human author—AI, the WMFH can then play its role to assign copyright to an appropriate person, equalizing to the employer-employee relationship, and that should be the owner and user, the author-in-law, of the AI machine to fulfil the objective of having the copyright.

"Behind every robot there must be a good person", said the National Commission on New Technology Uses of Copyrighted Works (CONTU)[26]. The writer is on his agreement with such saying and found it practical even today though this may be in a different context that the authorship shall not vest in hands of humans as AI is no longer a tool. Speaking of this, any cost and contribution in today's creation of copyrighted work, particularly the AI-generated ones, are the effort and expenditure in controlling, maintaining and preserving the AI system to function uninterruptedly and such cost is very

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[25] *US Copyright Act of 1976*, Sections 101 and 201; *UK Copyright, Designs and Patents Act of 1988*, Section 11; *พระราชบัญญัติลิขสิทธิ์ 2537*, มาตรา 9 และ 10.

[26] Arthur Miller, *Copyright Protection for Computer Programs, Database, and Computer-Generated Works: Is Anything New Since CONTU?*, 1045-1046.

most likely bound by the owner and user of the AI system who takes financial risk of buying and hiring AI machine, supplies it with energy and materials and uses it to create works. Inevitably, they can possibly expect to market or commercialize the final products and get their return on investment. Not just merely to promote the continuation of creations, by allowing AI to be an author and granting owner and user of the AI system a copyright ownership, this new proposed model will likely encourage further investment in AI industry and will also promote the goals of intellectual property law. It is justified by the law and economic points of view.

To do so, this research suggests that law makers, especially in Thailand, should take the UK approach of removing the moral right provisions associated with AI from its protection as AI is now a fictional human author. In addition, as the copyright law in Thailand was originally and systematically drafted to be used with human, new legislation of law on copyright and AI is more preferable than revising and/or adding into any existing provisions. Looking at its universally, this proposed solution is also in line with the current practice of the US's Copyright Office that used to grant copyright registration for the computer-generated works and listed their programmers as the copyright owner but listed the authors as machines[27]. Above-all, the proposal was very likely to be consistent with the objectives stated in TRIPS, Art. 7 of which stated that "The protection and enforcement of intellectual property rights *should contribute to the promotion of technological innovation and to the transfer and dissemination of technology*, to the *mutual advantage of producers and users*…", the standard historistically and mutually accepted by both developing and developed countries in providing a balance mean of having the IP law.

Moreover, it is important to note that it is not the intention of this research to draft a module law of copyright protection on AI -generated work, nor to find an absolute answer whether AI-generated work shall be protected under the Copyright Acts. As the development of AI is yet on going, this research is merely aimed to be a stepping stone for future researches in this field of IP and for law makers to take into consideration.

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[27] Andrew Wu, *From Video Games to Artificially Intelligence: Assigning Copyright Ownership to Works Generated by Increasing Sophisticated Computer Programs*, 154-155 and 160-162.

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