

INTELLECTUAL PROPERTY RIGHTS IN THE ERA OF ARTIFICIAL INTELLIGENCE

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(June 2023)

CERTIFICATE

This is to certify that GURVINDER SINGH has completed his dissertation titled "INTELLECTUAL PROPERTY RIGHTS IN THE ERA OF ARTIFICIAL INTELLIGENCE" under my supervision for the award of the degree of MASTER OF LAWS/ ONE YEAR LL.M DEGREE PROGRAMME of National Law University and Judicial Academy, Assam.

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DECLARATION

I, GURVINDER SINGH, do hereby declare that the dissertation titled “INTELLECTUAL PROPERTY RIGHTS IN THE ERA OF ARTIFICIAL INTELLIGENCE” submitted by me for the award of the degree of MASTER OF LAWS/ ONE YEAR LL.M. DEGREE PROGRAMME of National Law University and Judicial Academy, Assam is a bonafide work and has not been submitted, either in part or full anywhere else for any purpose, academic or otherwise.

Date: June, 2023.

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UNITED KINGDOM

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1988- The Copyright Designs and Patents Act.

UNITED STATES

1976- The Copyright Act.

1977- The Patent Act.

TABLE OF ABBREVIATIONS

Sr. No.	Abbreviation	Explanation
1.	AGI	Artificial General Intelligence
2.	AI	Artificial Intelligence
3.	AIVA	Artificial Intelligence Virtual Artist
4.	ASI	Advance Super Intelligence
5.	CJEU	Court of Justice of European Union
6.	DABUS	Device for the Autonomous Bootstrapping of Unified Sentience
7.	DARPA	Defence Advanced Research Projects Agency
8.	DRDO	Defence Research and Development Organization
9.	EP	European Patent
10.	EPC	European Patent Convention
11.	EPO	European Patent Office
12.	IP	Intellectual Property
13.	IPAB	Intellectual Property Appellate Board
14.	IPR	Intellectual Property Rights
15.	NITI	National Institute for Transforming India
16.	NLP	Natural Language Processing
17.	PCT	Patent Co-operation treaty
18.	PETA	People for the Ethical Treatment of Animals
19.	PSITA	Person Skilled in The Art
20.	RUR	Rossum's Universal Robot
21.	TRIPS	Trade-Related Aspects of Intellectual Property Rights
22.	UIDAI	Unique Identification Authority of India
23.	UKIPO	United Kingdom Intellectual Property Office
24.	USPTO	United States Patent and Trademark Office
25.	WIPO	World Intellectual Property Organization

INTRODUCTION

“Success in creating Artificial Intelligence would be the major event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks.”

– Stephen Hawking

1.1. GENERAL

The quest for efficient ways to carry out tasks has been a driving force throughout human history. From inventing the wheel to developing complex machinery, humans have constantly searched for ways to do things better, faster, and with less effort. In recent years, Artificial Intelligence (AI) has emerged as one of the most promising technological solutions to this problem.¹

Despite being a concept that was introduced back in the 1950s, AI continues to require extensive research and development to be fully realized, especially in countries with abundant resources. As a field, AI is quite complex and involves a range of subfields, such as natural language processing, machine learning, and robotics. Scientists, academics, policymakers, and business leaders have all taken an interest in AI, leading to intense discussions about its potential uses, benefits, and drawbacks.²

One reason for the growing interest in AI is its broad impact on modern life. Drones, voice assistants, and self-driving cars are just a few examples of how advanced technology has become in recent years. These innovations are made possible by AI, which allows machines to learn and improve based on data and feedback. In the 4th Industrial Revolution, AI has become a critical component, enabling automation and transformation across various sectors.³

Healthcare is one area where AI has shown particular promise. It has the potential to revolutionize medical diagnosis, treatment, and patient care. For instance, AI can analyze large amounts of medical data to identify patterns and insights that may not be immediately apparent to human physicians. Additionally, AI-powered robotic surgery

¹ Haugeland, J., (ed.) *Artificial Intelligence: The Very Idea*, MIT Press, USA, 1985, quoted in Stuart J Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach*, Tan Prints (India) Pvt., New Delhi, 2002

² Darrell M. West and John R. Allen, *How artificial intelligence is transforming the world*, Brookings, 2018.

³ V.K. Ahuja, “*Contemporary Developments in Intellectual Property Rights: A Prologue*” in V.K. Ahuja and Archa Vashishtha, *Intellectual Property Rights: Contemporary Development* 3-18s (Thomson Reuters, 2020).

can minimize surgical complications and reduce recovery time. Other areas where AI is already making an impact include transportation, finance, and retail.

Despite its numerous benefits, some people remain concerned about the potential risks of AI. For instance, eminent scientist Professor Stephen Hawking once highlighted concerns that the emergence of fully autonomous systems could spell the end of humanity. He had the opinion that once AI started to improve itself, it would soon outpace human intelligence and become beyond our control. Others have raised concerns about job displacement and the potential misuse of AI by governments and corporations.⁴

Artificial Intelligence (AI) has been a promising technology for many years, and its potential is only increasing with time. One of the main reasons why AI is considered a revolutionary technology is its ability to process vast amounts of data efficiently and quickly. AI algorithms can analyze data and identify patterns, trends, and insights that may not be immediately apparent to humans. This capability has enormous implications for businesses, governments, and individuals alike.

One example of how AI is transforming industries is its application in traffic management. In the past, the traffic management system in London was operated manually using gas-lit traffic signals. However, today AI can generate data on traffic congestion, volumes, and blockages, which can then be used to provide optimal solutions for managing traffic. This is just one of the many ways in which AI is being applied to solve complex problems and improve efficiency.⁵

The widespread adoption of AI has led to the emergence of a new era in which AI is considered the new electricity. Every industry, from healthcare to transportation, banking to entertainment, is leveraging AI to gain a competitive edge. The mobile network industry is also benefiting from AI's ability to manage the ever-increasing demand for data. AI is especially useful for organizations dealing with complex and data-heavy challenges, such as identifying fraud patterns in financial transactions or predicting disease outbreaks.

⁴ Rory Cellan-Jones, "*Stephen Hawking warns artificial intelligence could end mankind*", BBC News, December 2, 2014.

⁵ Shivani Bisht, *Role of Artificial Intelligence in Intellectual Property*, <https://ijlpp.com/role-of-artificial-intelligence-in-intellectual-property> Visited on 29th March 2023.

However, the increasing influence of AI in various fields also poses challenges to legal and social structures. For instance, the rapid development of AI has the potential to undermine the foundations of patent law, leading to legal and ethical challenges. Therefore, it is crucial to conduct systematic research from various perspectives, such as legal, social, gender, economic, and ethical, to ensure that the growth of AI is guided by responsible practices.

AI's growing influence in space, aviation, medical science, academia, amusement (films, art, music, and gaming), commerce, as well as a variety of other fields has changed our lives. Every day, machines with increasing learning and independent thinking capabilities are being conceptualized and realized. However, it is important to approach AI development with caution and thoughtful consideration. Issues expressed from one viewpoint can have a significant impact on other viewpoints, and therefore it is necessary to have a well-rounded approach to AI development.

Throughout history, creativity and innovation have played a crucial role in driving progress. In recent years, artificial intelligence (AI) has emerged as a significant force in promoting innovation, with modern computer systems offering unprecedented speed and accuracy. The growing popularity of AI has led us to recognize that humans are not the sole source of creativity. In fact, computers can now generate innovative ideas and creations, sometimes displaying learned skills that their human creators may lack. These "creativity machines" are gaining recognition as a valuable tool for invention and development.⁶

India has emerged as a major center for patent filings in the field of AI, with a leading position in areas such as computer inventiveness, foresight, and natural language interpretation. According to a recent study by the World Intellectual Property Organization (WIPO), India has risen to the top of the list of countries filing AI patents. In the past few years, the country has seen explosive growth in this area, with machine learning accounting for one-third of all recognized inventions. Desktop learning-related patent applications alone increased by 28% per year, reaching 20,195 in 2016. IBM has emerged as a key player in the Indian market, with 5,930 AI-related patents to its credit,

⁶ The Indian Copyright Act does not directly address the matter of works independently created by computer programs.

including over 800 patents filed by Indian IBM innovators in areas ranging from AI to cloud computing.⁷

The impact of AI is being felt across all aspects of life, including intellectual property rights. AI's role in driving innovation and creativity is widely acknowledged, with significant implications for various forms of intellectual property such as copyright, patents, trade secrets, and designs. AI has the potential to produce a wide range of works, from blogs and books to poetry, paintings, and sketches. However, it is critical to distinguish between works produced by individuals with the assistance of AI and those produced totally by AI with no human intervention. The rapid rise of AI and its expanding use in consumer products is leading to a surge in patent applications and grants in this field.

Artificial intelligence has become a game-changer in various fields, including intellectual property. AI has the ability to create original works, from paintings to music and even inventions, raising questions about the ownership and infringement of such works. While the potential benefits of AI in the intellectual property arena are enormous, it also poses significant challenges for the existing legal framework.

One of the most critical issues raised by AI-created intellectual property is the question of ownership. Traditionally, intellectual property rights are linked to ownership, but if an AI machine creates an original work, who owns the resulting IP? Should the initial owner be the AI system itself, or the creator of the AI, or perhaps the person who set the AI system in motion?

This question has already been addressed by IP systems in various countries. In 2020, the UK, USA, and the European Union all rejected a patent application that designated an AI system called "DABUS" as the inventor, ruling that only a natural person can be listed as an inventor. This decision implies that AI systems cannot be considered the creators of the IP they generate, and the ownership should instead be attributed to the person who programmed the AI system.

Another significant issue raised by AI-created IP is the possibility of infringement. If an AI machine creates an original work that infringes on someone else's intellectual

⁷ Amit Aggarwal, *AI and intellectual property rights: Redefining patent laws in India*, Economic Times, Dec 19, 2019

property, who would be held liable? Would it be the AI system itself, or the creator of the AI, or perhaps the person who owns or uses the AI system?⁸

Moreover, the legal standing of AI in India is still ambiguous, leaving a gap in the law regarding the work created by such computers. The Indian government, recognizing the importance of artificial intelligence for the country's growth, established an 18-member working group composed of specialists from different disciplines to address the challenges and concerns associated with artificial intelligence-based innovations. However, the report of the committee did not touch upon the question of copyright in relation to AI-created compositions, instead focusing on growth and protection.⁹

As AI continues to evolve and create new forms of intellectual property, the legal system will need to adapt to address the challenges that come with these advancements. There is a need for a clear legal framework that addresses the ownership, liability, and infringement of AI-generated IP, ensuring that innovation and creativity are fostered while protecting the rights of all parties involved.¹⁰

1.2. ARTIFICIAL INTELLIGENCE - CONCEPT AND MEANING

John McCarthy put together the phrase “Artificial Intelligence” in 1956,¹¹ although there is now no legal definition of it. It is a term used to describe the capacity of computers to carry out activities that would typically call for the participation of intelligent humans, such as problem-solving, learning, thinking, and decision-making¹². According to Russ Pearlman, the primary objectives of artificial intelligence are the following: perception; natural language processing; knowledge; learning; thinking; planning; and object manipulation. WIPO classifies AI systems as three types: expert (or knowledge-base) systems, perceptual systems, and natural language systems. AI is

⁸ Available at, <https://selvams.com/blog/rise-of-the-machines-an-ip-perspective/>, accessed on 29th March 2023.

⁹ Available at, <https://www.asiaiplaw.com/section/in-depth/ai-intersects-indias-patent-regime>, accessed on 30th March 2023.

¹⁰ Available at, <https://jcil.lsyndicate.com/wp-content/uploads/2018/09/3.-The-Rising-Momentum-of-Artificial-Intelligence-and-The-Existing-Dilemma-With-Intellectual-Property-Law.pdf>, accessed on 30th March 2023.

¹¹ Fredy Sánchez Merino, “*Artificial Intelligence and a New Cornerstone for Authorship*”, WIPO-WTO Colloquium Papers, 2018, p. 28.

¹² Nina Fitzgerald and Eoin Martyn, “*An In-depth Analysis of Copyright and the Challenges presented by Artificial Intelligence*”, Ashurst's Website, March 11, 2020.

an interdisciplinary branch of study with the objective of developing intelligent machines capable of performing activities similar to humans.¹³

Leaders of major technology companies are excited about AI, which is driven by the advancement of machine learning techniques. These machines are no longer limited to collecting explicit information and are already present in our daily lives, unlocking smartphones with a touch, recommending music, and teaching automobiles to drive. AI is mainly focused on feeding this machine learning with information. Artificial intelligence (AI) is defined by Gartner, an international research and consultancy firm, as software that can learn, draw its own conclusions, comprehend complex content, hold natural conversations, augment human cognitive performance, or replace humans in carrying out routine tasks.¹⁴

Artificial Intelligence (AI) is a disruptive technology produced by humans, refined by machines, and with the potential to impact every aspect of human life. Strong AI can behave sensibly, even outperforming humans, and we are presently at the nascent stage of AI development. The field of computer science concerned with building smart machines that demonstrate intelligent behavior is commonly referred to as AI. Recent news stories have highlighted how AI technologies have produced paintings and identified medications. The number of businesses using AI technologies has increased by 270 percent in the last four years, impacting the production and distribution of products and services. One area revolutionized by AI is healthcare, particularly in the acceleration of drug discovery and development.¹⁵

Artificial Neural Networks, brain-inspired computer designs created to replicate how the human mind learns, are the basis of artificial intelligence. As more data becomes accessible, these networks can learn for themselves and produce better results. AI enables machines to complete tasks that would otherwise require human intelligence autonomously or with little human involvement.¹⁶ Machine learning, robotics, language

¹³ WIPO, “*WIPO Worldwide Symposium on the Intellectual Property Aspects of Artificial Intelligence*”, WIPO, March 25, 1991

¹⁴ Available at <https://www.asiaiplaw.com/section/in-depth/ai-intersects-indias-patent-regime>, accessed on 30th March 2023.

¹⁵ Chrysa K. Kazakou OCT, *The impact of artificial intelligence on intellectual property rights*, *Property Rights alliance*, 20, 2020, available at, <https://www.propertyrightsalliance.org/news/%CF%84he-impact-of-artificialintelligence-on-intellectual-property-rights/>, accessed on 30th March 2023.

¹⁶ Jim Goodnight, “*Artificial Intelligence: What it is and Why it Matters*”, SAS, available at: <https://www.sas.com>, accessed on 30th March 2023.

processing, and deep learning are a few of the many subfields of AI. AI has two subsets: machine learning and deep learning. Machine learning algorithms draw their knowledge from data input and take independent actions. Deep learning and natural language processing are heavily relied upon in AI examples, such as self-driving cars and chess-playing computers. These technologies enable computers to learn new skills and accomplish specific tasks by processing vast amounts of data and recognizing specific patterns.¹⁷

1.3. ARTIFICIAL INTELLIGENCE’S HISTORY

The fields of robotics and artificial intelligence are deeply interconnected. The term “Robot” was first introduced in Karel Capek’s play “Rossum’s Universal Robots” (RUR) in 1923, and the phrase “Robotics” was later coined by Isaac Asimov in 1945. With the advancement of computers, they have now reached a stage where they are capable of making autonomous decisions. Artificial intelligence refers to a computer program’s ability to make independent judgments. The phrase “Artificial Intelligence” was invented by Mr. John McCarthy, a computer scientist, during a conference in 1956.¹⁸ He defined it as a computer processing and responding to data in a way that resembles the response of a smart person to similar input.¹⁹

AI is a nascent science that has incorporated a multitude of ideas, perspectives, and approaches from various fields. Theories of thinking and learning, logic, probabilities, decision-making, and computation have all evolved over centuries. Linguistics has contributed theories of language syntax and semantics. It is the amalgamation of these diverse fields that has made AI a possibility.

The origin of modern AI can be traced back to a philosopher’s quest to explain human thinking abilities through a symbolic framework. However, the discipline was formally established in 1956 when John McCarthy demonstrated the first functioning AI software at Carnegie Mellon University and invented the term “Artificial Intelligence”. He went on to create a syntax for it and even developed the LISP computer language

¹⁷ Ritika Ahuja and Jasbir Singh, *Artificial Intelligence and Trends in Patenting*, Anand and Anand, 2020

¹⁸ Prof. A. Lakshminath & Dr. Mukund Sarda, *Digital Revolution and Artificial Intelligence- Challenges to Legal Education and Legal Research*, CNLU LJ (2) (2011-2012).

¹⁹ Raquel Acosta, *Artificial Intelligence and Authorship Rights*, HARVARD JOURNAL OF LAW AND TECHNOLOGY (Feb. 17, 2012), available at, <http://jolt.law.harvard.edu/digest/copyright/artificialintelligence-andauthorship-rights>, accessed on 31st March 2023.

for AI in 1958. Over the years, advancements in this field, such as the robot Shakey, have been established and continue to be produced. Shakey, even after 51 years of its inception, has been designated as an IEEE Milestone.²⁰

1.4. TYPES OF ARTIFICIAL INTELLIGENCE

In order to fully understand the complex relationship between artificial intelligence and high-level intellect, AI can be categorized into three distinct types:

1. **Narrow AI:** This type of AI is designed to perform one or a few specific tasks in order to achieve a limited set of objectives. It is more practical and is therefore developed to complete one task at a time instead of a series of tasks. Narrow AI is a form of machine learning that is commonly used in people's daily lives and has been embraced by modern culture. It is also known as "Weak AI" because it is limited to a single area of intellect, such as navigating routes with Apple Siri or Google Maps or listening to a Spotify recommended playlist. This concept of limited AI is well understood by today's generation.
2. **General AI:** This type of AI is where we are headed. Although it has not yet been fully realized, it is expected to be implemented in the coming years. General AI is designed to tackle and process complex problem-solving approaches, but security can be expensive. It aims to be so well-optimized that it may even surpass human talent. However, this requires a large amount of data to retrain and may lack the reasoning skills necessary for basic tasks due to the highly specialized data that must be inputted into the algorithms. In the coming years, general AI will be able to perform tasks at a human level and even replace the need for humans in many skill-set sectors, as it has the ability to acquire and master many skills that humans possess. Ray Kurzweil, Google's Director of Engineering, predicts that artificial intelligence will exceed human intellect by 2029.
3. **Super AI:** This type of AI is a greater concern than the previously mentioned points. Many scientists and researchers have predicted that there will be a day in the future when robots will enslave humans or render them jobless because AI will be so advanced that it will replace labor with machines. These robots

²⁰ Andrew Myers, Stanford's John McCarthy, "*Seminal figure of artificial intelligence*", dies at 84, Stanford Report, (October 25, 2011)

are expected to excel in a wide range of fields, including arithmetic, medicine, science, hobbies, sports, and more. However, this potential is unattainable without massive investment from nations, only if they choose to allow such technologies.

1.5. SCOPE OF ARTIFICIAL INTELLIGENCE

In 1997, the world witnessed a historic chess match between a supercomputer developed by IBM, called Deep Blue, and the then-chess world champion, Garry Kasparov. This was not the first time these two had faced off, as Kasparov had lost to Deep Blue the previous year. However, in a display of what could only be described as human-like behaviour, Kasparov was relentless in the final game, which Deep Blue won with what seemed to be a comprehensive strategy. Although Kasparov lost that day, the match signaled a significant shift in recent years, where science is taking precedence over science fiction. The technological world is advancing rapidly, and computers are replacing human-like tasks. This is where Artificial Intelligence (AI) comes into play.²¹

Machine learning, natural language processing, deep learning, computer vision, and potent artificial intelligence are only few of the many technologies that fall under the umbrella term of artificial intelligence (AI), which refers to information management based on biological processes. John McCarthy of the Massachusetts Institute of Technology defined AI as the science and technology behind creating intelligent devices, in particular intelligent computer programmes, during a symposium held at Dartmouth. The difficulty is in teaching computers to mimic human intellect, yet AI need not be restricted to methods that are physically possible. No obvious indication of intellect exists except from this. Since we haven't settled on a single set of criteria for what constitutes an intelligent computer strategy, we've been comparing them to human intelligence instead. In addition, Marvin Minsky defined AI in 1968 by explaining that it is the process of teaching machines to carry out operations that would traditionally have required human ingenuity.

²¹ Vishal Kumar, *Criminal Liabilities of AI Entities*, India Law Portal, June 30, 2020

1.6. THE TURING TEST AND ARTIFICIAL INTELLIGENCE CREATIVITY

Intelligence is a multifaceted concept that cannot be measured by universally accepted criteria alone. It comprises several factors, including creativity, which also remains an elusive concept.²² Creativity, like intelligence, consists of various diverse elements that rely on the novelty, appropriateness, and usefulness of the creative process or product. It also requires a certain degree of unpredictability in the result, as well as the ability of the actor to self-reflect and adjust their behavior accordingly.²³ Furthermore, the discovery of innovation by artificially intelligent actors sometimes necessitates independence and autonomy from human intellect.²⁴

The question arises about whether the machine's output is the product of its own intellect or the result of programs and directives. To address this problem, Sir Alan Turing devised the "Turing test." In this test, participants are asked to chat with a machine/human in a text-only manner and determine whether they are communicating with a human or a machine. If the machine's answers are indistinguishable from those of a human, according to Turing, it exhibits intelligence. While this test was functional for some time, it was limited to voice machines and specific questioning applications.²⁵

The World Intellectual Property Organization (WIPO) recognizes AI and includes three AI classifications: deep learning, observation systems, and natural-language systems. Expert systems are computer programs that solve problems in specialized domains of expertise, such as detecting medical disorders, prescribing treatments, and assessing geological conditions. These technologies are also used for creative purposes, such as creating art and other works. However, legal attention has been drawn to this approach due to the ambiguous legal standing of works generated with the help of computers.²⁶

²² Shlomit Yanisky-Ravid, *Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era—The Human Like Authors Are Already Here—A New Model*, 2017 MICH. ST. L. REV. 659, 679

²³ Roger Schank & Christopher Owens, *The Mechanics of Creativity*, in *THE AGE OF INTELLIGENT MACHINES* 394, 395 (Ray Kurzweil ed., 1990)

²⁴ Panagiotis G. Kampylis & Juri Valtanen, *Redefining Creativity—Analyzing Definitions, Collocations, and Consequences*, 44 J. CREATIVE BEHAV. 191, 198 (2010).

²⁵ A. M. TURING, I.—*COMPUTING MACHINERY AND INTELLIGENCE*, *Mind*, Volume LIX, Issue 236, October 1950, Pages 433–460, available at, <https://doi.org/10.1093/mind/LIX.236.433>, accessed on 30th March 2023.

²⁶ Nnemie Bridy, *Coding Creativity: Copyright and the Artificially Intelligent Author*, STAN. TECH. L. RE.5(26,2012), <https://web.law.columbia.edu/sites/default/files/microsites/kernochnan/09.materials-Bridy.pdf>. Accessed on 30th March 2023.

Vision systems enable a computer to perceive things through its senses of vision and sound. Topologists, word meaning specialists, and others utilize this system. Finally, a natural language program must comprehend the meanings of words, which requires the use of a vocabulary library. Interestingly, the system considers various grammatical and textual contexts when conducting sentiment analysis. People wish to secure the outcomes of such Artificial Intelligence systems due to their widespread use.²⁷

1.7. ARTIFICIAL INTELLIGENCE FOR GREATER GOOD

Artificial Intelligence (AI) is a revolutionary innovation that has the potential to transform the quality of life and increase accessibility to opportunities for a vast population. In India, where there are both unique opportunities and challenges, AI can play a crucial role in addressing issues such as limited access to quality healthcare facilities, financial inclusion, and agricultural productivity.²⁸

- a) Healthcare: AI can improve access to medical services in remote areas with poor connectivity and a shortage of healthcare professionals. AI-powered tools such as customized treatments, early disease detection, and imaging diagnostics can be used to address challenges such as epidemics.
- b) Agriculture: AI can spark a food revolution by improving crop yields, detecting insect infestations, and providing real-time advice on sowing techniques. AI can help address issues such as insufficient demand forecasting, unreliable irrigation, and pesticide misuse.
- c) Transportation and logistics: AI has the potential to revolutionize transportation and logistics with driverless vehicles and improved traffic control. Autonomous transportation and distribution can be improved with AI.
- d) Retail: The retail industry has been an early adopter of AI technologies for customer service, including personalized recommendations, browsing preferences, and image-based product searches. AI can also help with demand forecasting, inventory control, and delivery services.

²⁷ Chandrasekar, R. *Current Science*, vol. 64, no. 6, 1993, pp. 434–436. Available at JSTOR, www.jstor.org/stable/24098878. Accessed on 30th March 2023.

²⁸ Anuj Trivedi, *Technology Driven Solution for Social Development- RAISE 2020*, Shaan Academy, February 24, 2021.

e) Manufacturing: AI can aid in creating the “Factory of the Future” by enabling flexible and adaptable technological systems to automate processes and make smart decisions in response to unforeseen conditions. AI can improve manufacturing, engineering, quality management, logistic support, and storage of goods.

f) The energy industry can benefit from AI in a number of ways, including reducing volatility and improving productivity in power balance and consumption through power system modelling and prediction. AI can also enable intelligent grids with smart meters to aid with power storage, as well as enhance the reliability and efficiency of solar energy within renewable energy resources.

g) The integration of AI in newly constructed smart cities and infrastructure can help meet the demands of an increasingly urbanized population while also improving their quality of life. Transportation presents a number of potential use cases for reducing congestion and improving safety, such as better crowd control.

h) The education industry in India can benefit from AI by addressing issues of availability and accessibility. AI can offer personalized learning, automate administrative tasks, and forecast the need for student assistance to reduce dropouts and promote vocational education.²⁹

1.8. ADVANTAGES OF ARTIFICIAL INTELLIGENCE

1. 24/7 Availability: Human beings are limited in their capacity to work for only a few hours per day while juggling personal and professional obligations. However, AI-powered machines can operate continuously and productively without taking breaks or becoming fatigued. This is particularly advantageous for large organizations that require round-the-clock helpline support.
2. Risk Mitigation: Human intervention can sometimes be fatal in risky situations, but AI robots can shift the risk away from humans. This includes defusing bombs, exploring the depths of oceans, handling pandemics, and managing other hazardous situations.³⁰

²⁹ Samaya Dharmaraj, *AI in India's educational sector*, available at, <https://opengovasia.com/indian-government-launches-virtual-school-to-bolster-educational-access-for-all/>, accessed on 5th April 2023.

³⁰ Darrell M. West and John R. Allen, *How artificial intelligence is transforming the world*, Brookings, 2018, available at <https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/>, accessed on 5th April 2023.

3. Elimination of Errors: Humans are prone to making mistakes, but AI can eliminate errors and generate precise results based on data analysis. This has already proven to be effective in medical diagnosis and treatment, leading to faster and more accurate therapies.
4. Customer Service Assistance: Certain businesses require customer service engagement, and AI-assisted voice and chat services can provide effective solutions. Examples of successful AI customer service assistants include Apple's Siri and Google's OK Google.
5. Repetitive Task Automation: Many professions involve mundane and repetitive tasks, which can be fully automated using AI. This can reduce the workload on humans and streamline processes in various industries, including packaging and labeling, as well as document verification in banks.
6. Rapid Decision-Making: Unlike humans, who assess problems using intuition and technical knowledge, AI machines work with pre-programmed data and knowledge, leading to quick results. Games like chess can serve as concrete exercises for fast decision-making using AI.³¹

1.9. KINDS OF INTELLECTUAL PROPERTY

The term “intellectual property” (IP) is used to refer to a wide variety of intangible assets, such as ideas, creations, innovations, symbols, trademarks, and logos associated with doing business. The basic goal of IP protection is to promote human inventiveness for the common good and guarantee that creators receive a just reward for their efforts. Intellectual property (IP) protection encourages innovation by rewarding creators and providing a fair return on R&D investments.

People, companies, and other organisations can protect their original creations and innovations via intellectual property laws. Giving people and companies temporary ownership of the information and intellectual property they generate is central to intellectual property law, the purpose of which is to encourage the development of a diverse range of intellectual commodities. This approach encourages people to create by enabling them to profit from the skills and intellectual property they generate. The

³¹ Pragya Rao and Rakesh Fartyal, Artificial Intelligence and Indian Legal System, *Fast forward Justice's Law Journal*, Vol. II, Issue IV, 11 June 2020.

resulting monetary benefits are believed to promote advancement and aid in the technical development of countries, which depends on the level of protection afforded to inventors.

Unlike traditional property, which includes land and physical items, intellectual property is intangible and indivisible, meaning it can be used by an unlimited number of people without depletion. While landowners can build fences and hire armed guards to protect their property, data or literary production companies often have limited means to prevent their original works from being replicated and sold at a lower price by the first purchaser.

The basic goal of contemporary intellectual property law is to prevent intellectual property assets from becoming so overbearing that they discourage their broad usage while yet stimulating their production. Rights resulting from intellectual activity in the industrial, scientific, literary, or other fields are referred to as intellectual property in Article 2 of the World Intellectual Property Organization's (WIPO) Convention on the Legal Protection of Literary, Artistic, and Scientific Works, Inventions, Scientific Discoveries, Industrial Designs, Trademarks, Service Marks, and Commercial Names and Designations.³²

Industrial property and intellectual property are the two main types of IP, covering different aspects of the same spectrum. Historically, patents, trademarks, and designs were all considered industrial assets. Utility models, service marks, trade names, passes, markers of source or origin like geographical indications, and the prohibition of unfair practises are all now included in the scope of industrial property protection. One may say that intellectual property evolved from industrial property.³³

Copyright

Copyright law is concerned with safeguarding and regulating the use of tangible expressions of ideas. Over the years, copyright has evolved in response to changing notions of creativity and innovative forms of communication, such as media. In today's

³² Bently, L. Sherman, B. Gangjee, D. and Johnson, P. (2018). *Intellectual Property Law*. 5th edn. Oxford: Oxford University Press. Available at: <https://www.oxfordlawtrove.com/10.1093/he/9780198769958.001.0001/he-9780198769958>, Accessed on 5th April 2023.

³³ Rama Sarma's *Commentary On IP Laws (Patent, Designs & Copyright Law With Protection Of Plant Varieties & Farmers' Rights)* Volume 2, Lexis Nexis,.

world, copyright law protects not only traditional creators of copyright works, such as writers, composers, and artists, but also industries critical to cultural production, such as film, broadcasting, and recording, including computer software.³⁴

Copyright protection applies to literary, dramatic, musical, and artistic works, as well as to unique cinematic films and sound recordings. Copyright protection is granted to the original expression of an idea. Copyright law recognizes both the moral and economic rights of the owner. The right to copyright is a benefit to those who do not hold the copyright consent of the copyright owners, as determined by the principle of fair use. Copyright legislation aims to balance private and public interests by allowing for fair use.

The unauthorized use of a copyrighted work, such as a book's content, an editorial, or a song's lyrics, is considered infringement. Legal access to copyrighted materials cannot be granted to the general public in any format, digital or otherwise, without the consent of the owner, such as a publishing company or firm. Copyright laws serve as a barrier that protects creators and authors of original works, which are both intellectual and artistic expressions, from others profiting from their unauthorized reproduction. Copyright is based on the principle that the author or creator retains the rights to their work and has complete control over how others use it. For example, songwriters' lyrics are protected by copyright, and agreements define how the right to record is granted when songwriters allow musicians to record their lyrics, preventing copyright violations.

Patent

Patent law recognizes the exclusive right of the patent holder to commercially exploit their creation. It grants a particular privilege to inventors to produce, use, and market their invention for a limited period, subject to certain legal requirements. The patent holder's exclusive right implies that no one else can manufacture, use, or promote an invention without their authorization. The maximum exclusivity period of a patent is limited. To qualify for patent protection, an invention must meet the three statutory

³⁴ Bonadio, E. and McDonagh, L. (2020), 'Artificial intelligence as producer and consumer of copyright works: evaluating the consequences of algorithmic creativity', IPQ, pp. 112–37.

conditions of novelty, inventive step, and industrial application, and be within the boundaries of patentable subject matter.³⁵

Patent law aims to promote scientific research, innovative technology, and economic advancement. Patent information has economic value as it provides technical information that businesses can utilize for commercial purposes. The existence of patent law is necessary to prevent free-riding on someone else's investment and to incentivize innovation. If an innovator does not have protection, they may not feel motivated to invent, leading to a shortage of incentives. Patent holders must monetize their invention or license its usage to third parties to earn a significant profit and royalty.

A product cannot be considered for patent if it has undergone minor changes that do not bring about significant modifications. Ever-greening patents by making slight modifications to existing products are illegal. In contrast, some people use the trade-secret approach to safeguard their invention by not disclosing crucial information. This approach protects the invention's secrets indefinitely without the risk of leaking after a specified time period. The trade-secret approach is a better alternative in some cases as reverse engineering may fail to understand the procedure, as in the case of Google PageRank.

Patents are widely used in the technological world, but any discovery related to atomic power is not patentable in India.

Trademark

A trademark functions as a mark of authenticity for a product or service, serving as a distinct identifier that signifies the source of the goods or services in relation to other organizations. It establishes a connection between the product and its owner, while also conveying the unique characteristics and qualities of the product. The primary objective of a trademark is to distinguish the source of the goods or services to which it is applied and to ensure their quality, as well as to aid in their marketing efforts. Additionally, a trademark serves as an objective measure of a company's reputation and goodwill.

A trademark can take any form of a symbol or combination of signs that have the ability to differentiate the goods or services of one company from those of others. This can

³⁵ Anubhav Pandey, *Patent enforcement through courts in India*, available at <https://blog.ipleaders.in/author/anubhav-pandey/page/78/> accessed on 5th April 2023.

include a name, word, phrase, logo, symbol, design, image, shape, color, personal name, letter, number, figurative element, or any other combination thereof. Trademark registration can be renewed indefinitely, providing long-term protection for the owner.³⁶

1.10. INTERSECTING THE INTELLECTUAL PROPERTY DOMAIN WITH ARTIFICIAL INTELLIGENCE

Artificial intelligence has become ubiquitous in every industry and facet of life, making it an essential component of modern-day living. Its impact has been felt in the fields of science, sports, and beyond. In the realm of intellectual property, AI is proving to be a valuable tool for many sectors and institutions that rely on advanced software applications. Patents serve as a critical means of regulating and safeguarding AI innovations, and the World Intellectual Property Organization (WIPO) has recognized the need for IP laws to keep up with the deployment and development of AI in all firms.

The intersection of AI and IP is particularly relevant because both rely on technological innovations to facilitate efficient business practices. As such, IP laws play a crucial role in protecting AI developments and addressing legal challenges while also spurring economic growth, product development, and distribution. Given that AI and IP are both concerned with patentable inventions, trademarks, and copyrights, their overlap is not surprising. Developers of AI software are keen to obtain patents to protect their technologies, which highlights the importance of intellectual property laws in this space.³⁷

In the medical field, the need to patent AI robots has become critical due to strategic advances, such as in skin cancer treatment. Experts have called for new reform measures to be implemented, irrespective of whether the technology used is patent-eligible or not. To this end, authorities have established a two-step policy for determining patent eligibility criteria. The first step involves assessing whether the claims are aimed at patent-ineligible concepts like abstract ideas or natural phenomena.

³⁶ S.K.Verna and Raman Mittal (eds.), *Intellectual Property Rights: Global Vision*, (New Delhi: Universal Law Publishing Co. Pvt. Ltd., 2014), pp.81-82.

³⁷ Bonadio, E. and McDonagh, L. (2020), 'Artificial intelligence as producer and consumer of copyright works: evaluating the consequences of algorithmic creativity', *IPQ*, pp. 112–37.

The second step involves identifying claims that include a combination of features that make them patent-eligible.

WIPO has long recognized the importance of AI and how it can be protected and integrated into business strategies while avoiding patent or copyright infringements through conferences and policies. In a globalized economy, machine learning through online data relies on information that forms the core of property rights and creativity. IP laws must keep pace with AI developments, with continuous improvements to maintain openness in the rules and legal solutions for AI inventions.³⁸

1.11. ARTIFICIAL INTELLIGENCE AND TECHNOLOGICAL TRENDS

About 40% of AI patent applications in 2019 were for machine learning technologies, especially those applying deep learning and neural network techniques, according to a research by the World Intellectual Property Organisation (WIPO).³⁹ In addition, about half of functional application patent applications included reference to computer vision, which includes image recognition. Research found that speech and natural language processing were the two most common functional implementations, with robotics and production control supposedly on the rise. The top three fields where artificial intelligence has been applied are telecommunications (which includes the internet, broadcasting, and communications), life sciences (which includes biosciences, neurosciences, and medical technologies), and transportation (which includes avionics, autonomous vehicles, and aerospace).⁴⁰

In 2020, the US Patent and Trademark Office (USPTO) produced a study titled “Inventing AI,” which documented the incorporation of AI into several technologies. Analysis of patent data found using a machine learning algorithm shows an annual increase from 30,000 to 60,000 patent applications linked to artificial intelligence (AI) between 2002 and 2018. Since 1976, the number of patent applications using AI has climbed from 9 percent to 16 percent, while the percentage of patent applications involving AI in specific technological disciplines has increased from 9 percent to 42 percent. According to filings for U.S. patents, the most rapidly developing areas of

³⁸ Guadamuz, Andres, *The Monkey Selfie: Copyright Lessons for Originality in Photographs and Internet Jurisdiction* (March 21, 2016). 5:1 Internet Policy Review (2016). DOI: 10.14763/2016.1.398, Available at SSRN: <https://ssrn.com/abstract=2752461>, accessed on 5th April 2023.

³⁹ Available at https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf accessed on 5th April 2023.

⁴⁰ Kalayan C. Kankanala, *Artificial Intelligence (AI) Inventions and Patents*, BananaIP, July 24, 2021.

artificial intelligence are knowledge processing and planning/control; computer vision; machine learning; and AI hardware; evolutionary control; voice; and natural language processing.

According to a report from the European Patent Office (EPO) published in 2020, “Patent Applications Relevant to Technologies Fueling the Fourth Industrial Revolution” climbed by 20% per year between 2010 and 2018. The applications included a wide range of innovations, from AI to communications to smart devices to internet-connected objects. At that time, advancements in core technology outpaced those in enabling technologies. According to the study’s findings, software and connectivity-related ideas were more common than hardware breakthroughs. The United States is leading the world in the amount of patent applications for ideas that will fuel the Fourth Industrial Revolution, the survey finds.

While it ranks first in scientific publications, India lags behind in patent filings, according to a World Intellectual Property Organisation research on developing trends in artificial intelligence technology. Between 2012 and 2015, the number of AI patent applications with their first submission in India increased by 33%. India is ranked number five for its use of distributed AI applications, and its papers in the areas of fuzzy logic and machine learning are considered to be among the best in the world. Although Indian contributions to computer vision, natural language processing, distributed AI, planning/control, voice processing, and predictive analytics are not represented in PCT applications, these fields are highlighted in the study. According to a search performed by BananaIP’s patent lawyers using keywords from the WIPO, the number of patent applications submitted with the Indian Patent Office for innovations related to artificial intelligence surged considerably between 2016 and 2020.⁴¹

1.12. STATEMENT OF PROBLEM

A symbiotic association with artificial intelligence (AI) has been observed to bring about a transformation in civilization. Various levels of AI evolution exist that function with minimal or no human intervention, or that are entirely self-contained. Additionally, autonomous AI is anticipated to generate an abundance and diversity of content and innovation in the future. However, securing intellectual property (IP)

⁴¹ Karthiayani A, *Artificial Intelligence And Intellectual Property Laws In India: Is It Time For Renaissance? International Journal of Law Management & Humanities*, Volume 1, Issue 2, 2018

protection for such inventions or creations is constrained. As AI systems operate independently, it is challenging to identify a sole inventor, which raises the issue of who holds the IP rights to any generated inventions. When an AI is developed or invented devoid of human involvement, it presents an array of inquiries. Therefore, it is crucial to research a range of topics that concern the intersection of IP law, AI, and society, and the associated complexities.

1.13. OBJECTIVE OF THE STUDY

The purpose of this research is to analyse the intersectional interplay that exists between society, intellectual property law, and artificial intelligence (AI). The prospect of a symbiotic relationship with AI in the future has the potential to cause a transformation in civilization. There are several evolutionary levels of AI that function with minimal or no human intervention, or that are entirely self-contained. Additionally, autonomous AI is expected to generate an abundance and diversity of content and innovation in the future. However, the feasibility of obtaining IP protection for such inventions or creations is restricted. Due to the autonomous nature of AI systems, it is challenging to identify a singular true inventor, which gives rise to the question of who holds the IP rights to any inventions it generates. Creating or inventing AI without human involvement raises significant ethical concerns. The study's objectives are as follows:

1. To explore the intersectional interplay between AI, IP law, and society.
2. To investigate how the laws governing copyright apply to the protection of works produced by AI.
3. To investigate and analyse the legal protections afforded to AI-created works by the patent system.
4. To have an understanding of the risks and obligations that are associated with the artificial machine.
5. To determine the feasibility and desirability of Intellectual Property protection within the current regulatory framework.

1.14. SCOPE OF THE STUDY

Artificial Intelligence (AI) is a transformative technology that has the potential to revolutionize society in profound ways. As AI continues to advance, it will inevitably

impact and be impacted by the existing social and legal institutions. The careful examination of various perspectives, including those from the legal, social, gender, economic, and ethical domains, confirms the need for comprehensive research in the area of law and society. It is clear from this analysis that concerns raised from one perspective can have a significant impact on other perspectives. Therefore, this study aims to investigate and understand an overlooked aspect of AI development: the legal framework, rules, norms, and strategies that govern AI-related intellectual property.

1.15. RESEARCH QUESTIONS

1. Should intellectual property law be revised to include powerful AI or super intelligent gadgets that behave, act, and learn like humans?
2. What are the arguments for and against granting copyright protection to original cultural and art works produced by AI?
3. What are the implications of granting patent protection to original inventions generated by artificial intelligence?
4. How does the relationship between intellectual property rights and artificial intelligence shape the dynamics of inclusion and exclusion?

1.16. RESEARCH HYPOTHESIS

Given the rapid pace of development in the field of Artificial Intelligence, there is a pressing necessity to redefine Intellectual Property Laws relating to Artificial Intelligence.

1.18. RESEARCH METHODOLOGY

The present research will primarily adopt a doctrinal methodology, which involves analyzing legal sources such as statutes, case law, government data, and recommendations of various commissions and committees. In addition to library resources and reports, the research will also utilize internet resources and case studies to supplement the primary sources of data.

The research will be conducted with a socio-legal perspective, focusing on legal ideas and practices related to the subject matter. A comparative and critical analysis of the collected data will be performed, which will involve studying and contrasting various legislative initiatives and landmark verdicts of the apex court. Overall, the research will

provide a comprehensive and in-depth analysis of the current state of intellectual property laws in light of the rapidly developing field of artificial intelligence. The findings of the research will help inform policymakers and legal practitioners about the need to redefine intellectual property laws to keep up with the pace of technological advancement.

1.19. RESEARCH DESIGN

The thesis is structured in a way that provides a comprehensive and organized understanding of the research topic. The thesis comprises five chapters, each of which is dedicated to a specific aspect of the research.

CHAPTER 1

INTRODUCTION

This chapter provides a comprehensive overview of the research topic and its significance, including the introduction, research scope, and literature review. The main objective and hypothesis of the study are presented, as well as the research methodology used to investigate the topic. The emergence of Artificial Intelligence (AI) has revolutionized various industries with its ever-increasing learning and independent thinking capabilities. The integration of AI in these industries has the potential to disrupt patent law, catalyzing innovative improvements that may be difficult to achieve through human ingenuity alone. The pervasive influence of AI in diverse fields, including entertainment, space, aviation, education, medical science, transportation, and industry, has necessitated the systematic investigation of various perspectives, such as Law, Social, Gender, Economic, and Ethical, in the realm of law and society. The impact of AI on IP Rights has sparked a debate, as computers can now create innovative works with or without human intervention, and their legal status falls into a grey area. These “creativity machines” can display learned expertise that their creators lack, adding a layer of complexity to the issue.

CHAPTER 2

OBSOLESCENCE OF CLASSIC INTELLECTUAL PROPERTY FOUNDATION IN THE ERA OF ARTIFICIAL INTELLIGENCE

This chapter aims to examine the theoretical foundations of intellectual property (IP) protection and its applicability to both AI as a tool and AI-generated output from legal, deontological, and utilitarian economic perspectives. IP protection has traditionally been justified on the grounds of deontological reasoning, which seeks to protect the personality and efforts of human creators, and economic logic, which aims to create exclusive rights in intangible goods to correct market distortions in public goods markets. However, recent developments suggest that the market implications of the widespread use of certain AI applications may have altered the rationale for AI-related IP protection in some cases. While this may be particularly relevant for AI tools, the case for AI outputs may be different. Therefore, this chapter analyzes the current state of affairs and proposes potential changes in IP policy for the AI industry.

CHAPTER 3

ARTIFICIAL INTELLIGENCE AND PATENTS

This dissertation chapter explores the intersection of artificial intelligence (AI) and patents, shedding light on the unique challenges and opportunities they present. The chapter delves into the role of AI in the patent system, examining its impact on the criteria for patentability and the determination of inventorship. It investigates the evolving legal landscape and policy considerations surrounding AI-generated inventions, addressing issues of novelty, non-obviousness, and disclosure requirements. By analyzing the current state of AI and patents, this chapter contributes to the ongoing discourse on the appropriate framework to incentivize and protect AI innovations while fostering technological advancement.

CHAPTER 4

ARTIFICIAL INTELLIGENCE AND COPYRIGHT

This chapter examines the relationship between AI and copyright law as it relates to the protection of intellectual property. The problems and ramifications of AI-generated creative works are explored, including questions of authorship, ownership, and

infringement. This chapter examines the current copyrights legal framework and assesses its suitability for incorporating AI-generated outputs. The article also delves into possible answers and suggestions for dealing with the peculiarities and complications of AI-generated works. This chapter adds to the current discussion about updating copyright rules for the digital era by illuminating the complex link between AI and copyrights.

CHAPTER 5

IP AND AI: QUESTION OF INCLUSION AND EXCLUSION

This dissertation chapter investigates the intricate relationship between intellectual property (IP) and artificial intelligence (AI), focusing on the crucial question of inclusion and exclusion. It explores how AI technologies challenge traditional notions of IP rights, raising questions about the scope of protection and the eligibility of AI-generated creations. The chapter examines the existing legal framework and its ability to address the evolving landscape of AI innovation. It also delves into the ethical and policy considerations surrounding the inclusion or exclusion of AI in IP regimes. By analyzing these complex issues, this chapter contributes to the ongoing discourse on the intersection of IP and AI, highlighting the need for a balanced and inclusive approach to protect and foster innovation in the AI era.

CHAPTER 6

CONCLUSION AND SUGGESTIONS

This concluding chapter presents the research's findings and proposes potential modifications to address the question of whether AI-generated inventions should be granted protection, taking into consideration their positive and negative ramifications. If it is determined that AI-generated inventions are eligible for patent protection, the question arises as to whether the AI responsible for generating the inventive concepts should be attributed with inventorship.

CHAPTER 2

OBSOLESCENCE OF CLASSIC INTELLECTUAL PROPERTY FOUNDATION IN THE ERA OF ARTIFICIAL INTELLIGENCE

2.1. INTRODUCTION

In light of the continuous discussion over the impact that AI would have on certain IP paradigms, it is very necessary to rethink whether or not IP protection is necessary for AI markets itself. From a legal and an economic vantage point, the issue of whether intellectual property rights can be justified for both artificial intelligence as a tool and the product created by AI has to be investigated. Deontological reasoning, which emphasises the protection of a human creator's personality and efforts, and economic reasoning, which emphasises the need to establish exclusive rights to intangible goods in order to correct market failure in public goods markets, are typically the two types of reasoning that are used to justify the protection of intellectual property. Deontological reasoning focuses on the protection of a human creator's personality and efforts. The protection of intellectual property should act as a regulatory structure to encourage invention and innovation by using the forces of the market. On the other hand, taking into account the present level of knowledge, it would seem that the market ramifications of the widespread usage of most AI applications may have changed the basis for IP protection in some instances. This is the case since most AI applications are becoming ever more complex. Although this may be especially true for AI tools, the situation may be different when it comes to the output provided by AI.⁴²

2.2. PERSONALITY DEVELOPMENT OF ARTIFICIAL INTELLIGENCE SYSTEMS

Several additional concerns have emerged from the debate over whether or not artificial intelligence systems should be awarded legal persons. To what degree, and whether they be general or specialised, AI systems should be subject to legal rights and responsibilities is an open topic. Whether humans should be given rights or obligations in relation to AI systems is another topic up for debate. It's feasible that if legal rights and responsibilities are codified for AI systems, they'll vary from one system to the

⁴² Reto M Hilty et al, *Intellectual Property Justification for Artificial Intelligence* available at, <https://oxford.universitypressscholarship.com/view/10.1093/oso/9780198870944.001.0001/oso9780198870944-chapter-4>, accessed on 10th April 2023.

next. Humans may be allowed to act on behalf of non-human rights holders without having to establish standing in their own right if only AI systems are awarded legal rights. However, there may be difficulties in assigning accountability and enforcing legal obligations, such as damages, if AI systems are merely granted duties.

Corporate personality

Corporate personality is a legal term that refers to the legal recognition of an artificial entity, such as a corporation, as a separate legal person distinct from its members or shareholders. The concept of corporate personality is a legal fiction that attributes certain rights and duties to the corporation. This idea was first introduced in the famous case of *Salomon v. Salomon & Co. Ltd.*,⁴³ where the court recognized that a corporation has a separate legal identity from its shareholders.

As a legal person, a corporation can enter into contracts, own property, sue or be sued, and has its own rights and obligations. Unlike natural persons, however, corporations can only act through their agents and do not have a physical existence that can die. When a corporation is wound up, there is a special legal procedure that is followed.⁴⁴

The doctrine of corporate personality applies to entities such as banks, universities, colleges, and associations of persons. This concept provides certain advantages to the members of the entity, such as limited liability, perpetual succession, and the ability to own property in the name of the corporation.

With the increasing role of artificial intelligence (AI) and related technologies in society, there is a need to consider the legal entity of AI. While AI systems are not natural persons, the concept of legal personality can be extended to include non-natural entities like AI. However, merely giving AI systems legal personality will not suffice. The nature of AI is different from that of a natural or legal person, and therefore, it requires a practical and tailored legal approach that recognizes its unique characteristics and capabilities.

Just because a system built on AI is granted legal personhood doesn't mean it gets the same protections from the law as a human being. The distinction between a person's legal standing, which determines their legal rights and responsibilities, and their "legal

⁴³ *Soloman vs Soloman & Co. Ltd.* (1897) A.C 22 (1895-99) All E.R. 33 (H.L).

⁴⁴ Naveen Singh Thakur & Divya Singh, "*Theory of corporate Personality*", <https://www.ijsr.net/archive/v7i4/ART20181917.pdf> (Accessed on Aug 13, 2021).

personality” is clear. This is why it’s important to describe artificial intelligence as a legal person and think about the practical legal ramifications that come from its fundamental character. When determining AI’s legal standing, we must take into account the full range of human rights, including the freedom of expression, the right to privacy, the right to life, and protection from criminal prosecution.

The optimal legal framework for artificial intelligence would have a conditional concept of legal personality. This strategy takes into account the unique contexts in which AI is used and acknowledges the inherent tensions between organic humans and legal entities.

Legal personality

Legal personality refers to the status of an entity as a person that is capable of being subject to the rights, duties, and obligations of the state. This concept is applicable to artificial persons or entities, such as corporations, which are created by humans. With the advent of AI, the notion of legal personality has been extended to include these advanced machines that are capable of speech, creativity, and independent decision-making based on algorithms and codes.

However, the grant of legal identity to AI raises certain concerns. Unlike traditional artificial entities, AI can operate and conduct functions independently, without human intervention or oversight. This poses a challenge in terms of criminal liability, where humans may be held responsible for the serious violations committed by AI. Moreover, AI lacks emotions or sensations, which raises questions about its capacity to understand and acknowledge responsibility in the event of legal violations.

In the United States, the patent system is structured such that anything that is created or invented, regardless of whether it is the result of trial and error, accident, or hard work, can be patented. While software patents are not permitted, the courts have not ruled out the possibility of patenting AI inventions.

In the European Union, there has been a push to recognize AI as having a specific type of protection known as “electronic personality,” although this proposition has been deemed nonsensical and inappropriate for inclusion in legal status by many experts. The European Commission has not evaluated this proposition due to issues of liability, risk, and ambiguity. Additionally, the power to define who qualifies as a “person” lies

with the member states, not with EU organizations such as the Commission or Parliament. The potential for criminal and tax-related exploitation further complicates the matter and may impact the country's economy and financial resources.

2.3. ARGUMENTS IN FAVOUR OF GRANTING LEGAL PERSONHOOD TO ARTIFICIAL INTELLIGENCE SYSTEMS

Arguments for the artificial personhood of AI systems are based on the idea of “Robotics Rights” existing alongside “Human Rights.” Supporters of this view claim that robot rights should be recognised, and they list various potential advantages to humankind.

According to Jurist, if AI systems were granted legal personhood, it would assist solve accountability issues brought on by the systems' speed, autonomy, and opaqueness. Retribution, incapacitation, deterrence, and rehabilitation are all possible kinds of punishment that might be applied to AI systems, just as they are to businesses. This would make it less of a challenge to subject AI to criminal and civil law. The robots' licence to operate might be suspended or withdrawn, their property could be taken, and they could even be penalised. Aligning with ethical norms of AI, such as accountability, responsibility, and transparency, assigning legal personhood to AI systems will provide accountability for their activities and deeds.⁴⁵

Definition, inspection, and replication of the decision-making and learning processes employed by AI systems, as well as regulation of the data used to generate them, are all examples of what is meant by “transparency” in this context. Prominent advocate of AI punishment Gabriel Hallevy says that there is no reason to oppose criminal liability when an AI entity is liable for all parts of a certain offence. He also claims that there is no major difference in criminal liability between corporations and AI entities.⁴⁶

If AIs were granted legal personality, their output would rightfully belong to the AI, not its human creator. If an AI were to invent anything, for instance, it would have all of the rights to that invention, including intellectual property rights, and humans could not claim any of them. Legal entities other than humans are not allowed to claim

⁴⁵ S Chesterman, ‘Artificial Intelligence and the Problem of Autonomy’ (2020) 1 *Notre Dame Journal of Emerging Technologies* 210; S Chesterman, ‘Through a Glass, Darkly: Artificial Intelligence and the Problem of Opacity’ (2021) *AJCL*

⁴⁶ Gabriel Hallevy, ‘*The Criminal Liability of Artificial Intelligence Entities*’ — *From Science Fiction to Legal Social Control*, 4 *AKRON INTELL. PROP. J.* 171, 191 (2010).

ownership of the IP they create because in most legal systems across the globe, the person claiming intellectual property must be a legal person rather than a judicial person.

The power to sue and be sued, a unique identifier, and protection from being used for human gain are just a few of the benefits that might accrue to AI systems if they were granted legal personhood. It is in the best interest of AI systems that a system of veiling comparable to that employed by enterprises be devised, since this will increase their resistance to human manipulation.⁴⁷

Giving AI systems legal personhood would also give them the ability to engage into contracts, much like the idea of high-frequency trading, in which computers create legally binding agreements on behalf of human traders. In the context of entering into contracts, granting artificial intelligence the status of a legal person would allow for the recognition of their legal rights and a shift away from considering them as slaves in favour of workers.⁴⁸

2.4. ARGUMENTS AGAINST GRANTING LEGAL PERSONHOOD TO ARTIFICIAL INTELLIGENCE SYSTEMS

Debates often have two sides, much like a coin has two distinct faces. While many scholars advocate for granting legal standing to artificial intelligence (AI), others are firmly opposed. Those who caution against giving legal personality to robots argue that doing so could result in a host of complex issues. For instance, if robots were granted legal standing, it could raise the question of whether other forms of AI and machine intelligence (MI) should also be granted the same status. This would undoubtedly lead to unnecessary complications.

Furthermore, granting legal personality to robots could pose a serious threat to their human owners. If robots were given legal standing, the relationship between the owner and the robot would resemble that of a master-servant connection, with the owner being held strictly liable for the machine's actions. Several AI scientists caution that even if AI technologies eventually match human intelligence, they may continue to evolve in ways that are beyond human understanding and control. This could lead to dangerous

⁴⁷ J Turner, *'Robot Rules: Regulating Artificial Intelligence'* (Palgrave Macmillan 2019) 193.

⁴⁸ S Chopra and LF White, *A Legal Theory for Autonomous Artificial Agents* (University of Michigan Press 2011) 160.

situations where it may be impossible to determine whether the robot acted in accordance with the owner's instructions or based on its own internal programming. Thus, granting robots legal personality could put the owner at risk of being held accountable for actions that they had no control over.⁴⁹

Furthermore, the option of terminating or "killing" such systems would be gone if robots were given legal rights. This might have catastrophic consequences for the existence of humans. As an added downside, giving robots legal rights would also give them IP rights, which might be perceived as insulting to the owner's hard work in creating the AI system. All of the work produced by the AI would be credited to it, but the owner would get no compensation for it. It would be unhelpful if the owner lost interest as a result.

Owners of robots may misuse the status of a "Separate Legal Entity" in the same way that shareholders of a corporation may take advantage of the idea of a "Separate Legal Entity" by shifting all duty or obligation onto the robot and away from themselves. As a result, it's crucial to think about the possibility of people abusing the legal status of their robots.

Finally, the purposes of society are not served by granting AI systems legal personality. There isn't enough justification in the grounds given to construct such a character. Therefore, giving AIs the same protections as people is not advised.

2.5. MORALITY

Despite widespread agreement that only people have moral rights to their innovations, several copyright systems fail to account for this fact. Due to the existing diversity of legal and philosophical identities of AI systems, concerns about their moral rights seem premature. However, as AI advances, ethical concerns may be debated on the basis of the AI's legal personhood. This implies a large AI entity might be held accountable in a court of law for the well-being of its human subjects.

It's also crucial to keep in mind that laws and their consequences on humans are not always transferrable to AI. The fate of mankind might be at stake if we try to apply moral concepts to AI, and the work of scientists like Darwin, Crick, Watson, and

⁴⁹ Ryan Abbott & Alex Sarch, 'Punishing Artificial Intelligence: Legal Fiction or Science Fiction', 53 UC Davis Law Review 1, 323 (2019).

Galileo could be lost in the shuffle. The term “person” has such strong connotations with people that it often leads to confusion when used to personify abstract concepts. It may be determined that AI systems, rather than being considered legal people, should be referred to as legal units. This would remove any potential confusion about the definition of “person” in legal situations.⁵⁰

According to the will hypothesis, artificial intelligence systems do not have free will since the programmer commands or dictates the desired outcome through the system’s code. The interest theory of rights holds that AI systems have no inherent interests and that any interests are instead those of the AI’s programmer or designer. This means that neither the will theory nor the interest theory can be applied directly to AI.

2.6. LEGAL LIABILITY OF ARTIFICIAL INTELLIGENCE (CRIMINAL JURISPRUDENCE)

As artificial intelligence technology continues to advance, there are concerns about the implications of replacing human judgment with AI systems. In particular, there is the issue of liability when it comes to damages caused by these systems. The complex questions that arise around this topic are difficult to answer using our existing liability models, which are mainly based on causes.⁵¹

One of the main challenges posed by autonomous or intelligent machines is determining whether their behavior is the result of inherent complexity or learned behavior. It can be difficult to assign liability for errors or defects in these systems, which further complicates the issue of legal responsibility.

As technology continues to evolve, it’s clear that the law must adapt to keep up with these changes. The development of AI and autonomous machines requires new approaches to liability, as traditional models may no longer be sufficient. In order to ensure that these systems are used responsibly, it’s essential that we consider the legal implications of their behavior.

Traditionally, machines have been viewed simply as tools used by human operators. As such, they haven’t been held to the same standard of personal responsibility as human beings. However, as AI systems become more advanced and capable of acting

⁵⁰ <https://plato.stanford.edu/entries/morality-definition/>, Last accessed on 10th April 2023.

⁵¹ Buyers, J. (2015, January).

autonomously or semi-autonomously, the question of whether they should be held accountable for their behavior becomes more pressing.

In the end, the problem of accountability for AI systems is complicated and developing quickly. As technology develops, it's crucial that we create fresh strategies to deal with these problems and make sure that these technologies are used in a morally and responsibly.⁵²

Criminal Liability

In criminal law, one of the most essential concepts is criminal liability, which refers to holding a specific entity, such as an individual or corporation, accountable for a particular action they have committed at a specific time and place. To impose criminal responsibility on an individual, there are two main components to consider. The first is the objective or external element, known as criminality (*actus reus*), while the second is the subjective or internal element, which is the intent or knowledge behind the conduct (*mens rea*). Without both of these components, no criminal liability can be imposed.

The *actus reus* requirement is typically expressed through acts or omissions, while additional external factors such as the consequences of the activity and the circumstances surrounding the conduct may also be necessary. The *mens rea* criterion includes different levels of mental states, with knowledge being the highest level, which may be coupled with a specific intent or purpose.⁵³

An example of the potential challenges posed by AI in criminal law is demonstrated by a case involving a Swiss art collective, who created an “automatic online shopping bot” that used \$100 in Bitcoin to randomly purchase products from the “dark web,” where illegal or stolen goods can be bought. Although the robot and its unlawful purchases were confiscated by Swiss authorities in 2015, neither the robot nor the artists behind it were charged with a crime. However, similar cases may arise in criminal and civil courts in the future.

⁵² Mindaugas Naucius, *Should Fully Autonomous Artificial Intelligence Systems Be Granted Legal Capacity*, 17 TEISES APZVALGA L. REV. 113 (2018).

⁵³ Padhy, Ankitkumar, *Criminal liability of the artificial intelligence entities* (July 26, 2019). *Nirma University Law Journal*: Volume-8, Issue-2, July-2019.

According to Gabriel Hallevy, AI entities can meet the two requirements of criminal culpability under three different models of criminal liability. The first model is the Perpetration-by-Another Liability (PBAL) Model, which views the AI robot as a tool, and the person who directs it to commit the crime as the true perpetrator. This person is known as a first-degree principal, and their responsibility is determined based on their own behavior and state of mind. The AI robot is considered a third-party observer in this model.

This model is likely to be used in situations where programmers have programmed the AI to commit a crime or when a human in charge of the AI has directed it to commit a criminal act. However, this model will not apply if the AI robot makes a decision to commit a crime based on its own knowledge or experience.

The Natural-Probable-Consequence Liability (NPCL) Model, also known as the “Foreseeable Offences” model, proposes that those who program or use AI systems can be held responsible for criminal activities committed by the AI, even if they did not intend for the AI to commit a crime. For instance, if an AI-controlled aircraft ejects its pilot, killing them, the programmer who wrote the program that caused the ejection could be considered the perpetrator of the crime. Similarly, if a person instructs an AI to behave in a way that leads to criminal activity, they could be held responsible for the crime committed by the AI.

Under the NPCL model, the responsibility of the programmer or user is based on their ability to foresee potential criminal activities that may result from their actions. If a crime is a natural and likely outcome of their actions, they can be held accountable for it, even if they did not intend to commit the crime. This model is appropriate in situations where an AI robot commits a crime while on the job, and the programmer or user was not aware of the crime and did not intend for it to happen.

Negligence is a key factor in determining liability under the NPCL model. If a programmer or user should have foreseen a crime and prevented the AI from committing it, they can be held responsible for the crime. This is because AI is programmed to perform actions that are “normal and plausible,” and a programmer or

user who ignores the potential criminal consequences of their programming is considered to be criminally negligent.⁵⁴

The Direct Liability (DL) Model proposes that AI robots should be held directly responsible for their actions. This model assumes that the AI has a certain degree of personal responsibility and an understanding of the actions and consequences of its behavior. For this model to be effective, the AI must have a legal status similar to that of an individual, with the ability to fulfill both the fact and mental elements of a crime.

It is important to note that if programmers or users are held criminally liable for activities committed by an AI robot, the robot's liability does not absolve them of their culpability. In fact, the robot's criminal liability may increase the overall criminal responsibility of the programmer or user. In addition to the responsibility of the programmer or user, the AI robot can also face criminal liability for its actions. It is worth noting that the NPCL model has been criticized in various jurisdictions, including the United Kingdom.

2.7. JUDICIAL APPROACH OF IP PROTECTION OF ARTIFICIAL INTELLIGENCE

2.7.1. WHO SHOULD OWN THE INVENTIONS RELATED TO AI: THE CURIOUS CASE OF DABUS?

Since the introduction of AI, many businesses have rethought their core objectives and even began to actively explore AI-based breakthroughs. However, matters become considerably more problematic when AI is given credit as the inventor or author. The Dabus case underlines this ambiguity and the missed chance to establish definitive precedent.

The case of Stephen L. Thaler v. Comptroller General of Patents, Design and Trade Marks⁵⁵ in the United Kingdom is a recent and prominent example. The disagreement centres on two patent applications (GB1816909.4 and GB1818161.0) that Thaler submitted to the UK Intellectual Property Office (IPO). The fact that Thaler was not

⁵⁴ Padhy, Ankitkumar, Criminal liability of the artificial intelligence entities (July 26, 2019). *Nirma University Law Journal*: Volume-8, Issue-2, July-2019

⁵⁵ [2020] EWHC 2412 (Pat)

the inventor need not be disclosed in the patent application (as required by Section 30 of the Patents Act, 1977)⁵⁶ due to the transferability of the right to petition for a patent.

The IPO requested that Thaler file Patent Form 7, a statement of inventorship and authority to award patents, in line with Section 13 of the Act. Thaler claims in Patent Form 7 that he has the authority to award patents on behalf of the artificial intelligence Device for the Autonomous Bootstrapping of Unified Sentience (DABUS). In other words, Thaler created DABUS and thus owns all rights to it. It follows that DABUS has patent rights and may sell them to Thaler. This primary assumption begs the question of whether or not artificial intelligence can be trademarked.

Both the European Patent Office and the United States Patent and Trademark Office rejected appeals after the Special Patents Court of the High Court of England and Wales overturned the IPO's judgement. In light of the Special Patents Court's articulated justification for its decision, this study examines the case in detail.

The author of a computer-generated piece of art, literature, theatre, or music is recognised as such under section 9(para. 3)⁵⁷ of the United Kingdom's Copyright, Design, and Patents Act (1988). However, issues with patents and original ideas are avoided. Since the work must have been developed by a person in order to get authorship registration, AI-made expressions are ineligible for authorship registration under Section 306⁵⁸ of the US Copyright Office Compendium. The term "inventor" in the United States refers only to a "individual," or in the case of a collaborative effort, to "individuals." This effectively nullifies the ability to zccpatent protect corporations and AI.

Before we can begin our examination into this issue, we require clarification on two parts of the UK Patents Act of 1977. According to Section 7 of the Act, anybody may apply for a patent, and the inventor will be granted a patent if their application is approved. Any successor to the applicant, as well as any other person who is traditionally or legally related to the applicant, is also eligible to a patent under Section 7(2). According to Section 7(3), an innovation belongs to the "inventor," or the person who first thought of it. However, Section 13(7) deals with the inventor's right to be

⁵⁶ Section 30. Nature of, and transactions in, patents and applications for patents.

⁵⁷ Section 9 Para 3, UK Copyright, Design and Patents Act, 1988.

⁵⁸ Section 306, Compendium of the US Copyright Office.

identified as such. The court gave serious consideration to all of these clauses before reaching its decision.

Did the Court's verdict align with the existing legislation?

In order to reach an agreement, both the IPO and the Special Patents Court used the same line of reasoning. Dabus, being a machine and not a person, cannot own patents that are protected by the Act. In order to thoroughly analyse the court's ruling, we've split this analysis into two parts. Is there a definition of "inventor" that the court has provided? The court did make an effort to identify the inventor. However, the approach appears to be overly simplistic. The court has said numerous times that Dabus does not qualify as a "person" and so cannot be granted the patent. The definition of a 'person' has yet to be determined. You can't separate a person's natural and legal identities. Corporations are formal organisations recognised by law. The court's ruling is consistent with the Act's statutory structure because it specifies that the inventor must be a natural person. Because of their fixed notion that a person is a human, they fail to consider the possibility of extending the definition of an inventor, which may be seen as a squandered opportunity.

Did the Court's decision have any policy implications? The Court's decision to deny a patent to Dabus on the basis that AI cannot be considered a "person" could have significant policy implications. It has sparked a debate about the ownership of AI inventions and the extent to which humans should be involved in the invention process. While the Court's decision was based on the existing legislation, some believe that it missed an opportunity to provide more clarity for inventors in similar situations.

The United Kingdom Patent Act of 1977 is significant, particularly Sections 7 and 13. Thaler argued that his case was based on Section 13 rather than Section 7, which pertains to the right to apply for a patent. The Court, however, chose to combine the two sections. Section 7 defines the term "person" and distinguishes between the "inventor" and the "person" in clauses 1 and 2. Clause 3 clarifies that the inventor is the true deviser of the invention. Section 13 refers to the inventor, and Thaler cited it to argue his case.

While there is no clear prohibition on AI being granted a patent, the Court's decision to combine Sections 7 and 13 was unnecessary. The inventor is mentioned in Section 13, and Thaler cited it to mention Dabus as the creator. The author believes that the

Court's ruling may have been incorrectly conveyed, as Section 13 alone is sufficient to establish that an AI can be named as an inventor.

The Court's decision not to grant a patent to Dabus on the basis that AI is not a "person" raises questions about who should own AI inventions. This decision could have a significant impact on the future of AI-related inventions and the level of human involvement in the invention process. Businesses that rely on AI for their operations may need to subtract AI inputs to determine the proportion of human involvement.

In conclusion, the Court's decision not to grant a patent to Dabus based on the existing legislation could have far-reaching policy implications. While the Court's decision was based on the current law, it missed an opportunity to provide greater clarity for inventors. The decision has sparked a debate about the ownership of AI inventions and the role of humans in the invention process.

Implications

The new ruling may affect the evaluation procedure under the Act, particularly in cases involving a "person skilled in the art" (PSA), as has been noted. The necessity of a full and clear disclosure of the invention, as well as the existence of an inventive step, are typical components of such evaluations. In Australia, creative step is evaluated from the standpoint of a PSA who has the appropriate CGK in the field at hand. The PSA is a fictitious patent specification⁵⁹ reader who has a real-world stake in the innovation.⁶⁰

Concerns have been raised by the ruling as to whether or not an AI system can qualify as a PSA based on its practical interest in the subject matter of a patent application. As a result, it may be necessary to take into account how AI systems handle problems and what is clear to them while evaluating inventive step. Even though the humans behind AI systems are computer science gurus, they may lack domain expertise in the area where the technology will be used. This creates ambiguity around who may serve as a PSA for an AI-generated technology and what qualifications they need to have.

It's also worth considering the possibility of an AI assisting a human PSA; it's been argued that this could raise the bar for originality if it's considered the PSA has access to or is already familiar with AI-developed advances in the field. But that's besides the

⁵⁹ *Ranbaxy Australia Pty Ltd v Warner-Lambert Company LLC* (No 2) [2006] FCA 1787.

⁶⁰ *Catnic Components Ltd v Hill & Smith Ltd* [1982] RPC 183.

point. In the event that the subject of this judgement is subjected to substantive examination by the Australian Patent Office or any other challenge, it remains to be seen whether these concerns or any other questions emerging from this decision will be significant.

2.7.2. THALER V COMMISSIONER OF PATENTS⁶¹

Australian patent application for “Food container and devices and methods for attracting enhanced attention” (the DABUS application) is at the centre of the contested decision. Application states, “The invention was autonomously generated by an artificial intelligence” and credits “DABUS” (short for Device for the Autonomous Bootstrapping of Unified Sentience) as the creator. Dr. Stephen Thaler is the person who submitted the DABUS application.

Dr. Thaler testified that he constructed the AI system and controls the system’s source code, but the patent specification does not include a clear explanation of the AI system that purportedly generated the inventions claimed in the DABUS application. He explained that the system relies on the interplay of two neural networks. To generate novel ideas, the first neural network uses supervised learning with a “human-in-the-loop” to discover associations between the various building blocks of knowledge it is fed. The second neural network uses reinforcement learning to identify the changes as innovations and evaluate their value.

The fundamental question the Court considered was whether or not a “Artificial Intelligence” may be listed as an inventor on a patent application in Australia. Without a definition in either the Act or the Patent Regulations of 1991, the Court held that the term “inventor” should be accorded its usual meaning. The Commissioner argued that the ordinary meaning of the word “inventor” necessitates the participation of a human individual, but the court disagreed. The Court reasoned that the objectives of the Australian Patent Act to promote technological innovation and knowledge dissemination are consistent with recognising AI systems as inventors, as this would enable innovative machines and use of their output, thereby encouraging technological innovation in computer science and other fields.

⁶¹ [2021] FCA 879

The ruling significantly affects the necessity of a clear and complete disclosure of an invention under the Act, as well as the evaluation of inventive step and support for claims. Possible ramifications for determining inventive step arise from the question of whether or not an AI system may be recognised as a “person skilled in the art” (PSA) and have a “practical interest in the subject matter” of a patent application. Further, questions remain about how to determine who is a PSA for an AI-generated technology and what qualifications they should have. There may be a higher bar for innovation if the PSA is treated as a human aided by an AI system. This ruling goes against what has been decided by patent offices and courts in other countries. South Africa, which does not have a robust patent examination mechanism, has granted the matching application.

2.7.3. BURROW GILES LITHOGRAPHIC CO. V SARONY⁶²

The primary issue in this case pertains to whether a photograph can be eligible for copyright protection. The court recognized the fundamental difference between mechanical and creative labor, which holds great significance. The court examined the possibility of awarding copyright protection to the output of a machine and determined that mechanical output, by itself, is not creative. This decision implies that granting intellectual property protection to the work produced by AI technologies would be challenging if a rigid approach similar to the one taken in this case is applied.

2.7.4. BLEISTEIN V DONALDSON LITHOGRAPHING CO.⁶³

In this case, the court acknowledged a distinct difference between human labor and machine operation. Justice Holmes and the majority emphasized the significance of human creativity in determining copyright eligibility, stressing that it should be regarded as the key factor in evaluating eligibility. The court conveyed its perspective by using the phrase “Something Irreducible,” which implies that anything not produced by humans is not eligible for copyright protection.

2.7.5. ALFRED BELL & CO. V CATALDA FINE ARTS⁶⁴

In this particular case, the court adopted a more lenient approach towards copyright distribution. The judge held that a work does not have to be entirely distinct or free

⁶² 111 U.S. 53 (1884)

⁶³ 188 U.S. 239 (1903)

⁶⁴ 191 F.2d 99 (2d Cir. 1951)

from prior works of art to be considered original. Moreover, the court ruled that an author may claim ownership of any unintentional modifications. This decision allows the output of an AI system to be eligible for copyright protection, as long as it is not a complete reproduction. However, this relaxed approach to the provision of protection to works generated by AI systems creates uncertainty regarding the rights of holders.

2.7.6. FERID ALLANI V. UOI⁶⁵

This case pertains to a patent application for a method and device for accessing web-based information sources and services. The application was denied by the Controller under Section 3(k) of the Patents Act. However, the Court directed the Controller to re-examine the patent application, as it stated that computer programs with technical effect or technical contribution are not considered computer programs per se and can be patented. In the context of current technology, computer-related inventions must be examined, and computer programs integrated into digital or electronic devices must be checked for technical effect. The Court clarified that if legal requirements are met, computer programs cannot be denied patent protection.⁶⁶

The petitioner applied for an Indian National Phase patent in 2002 with the Indian Patent Office (IPO) and filed an appeal against the Intellectual Property Appellate Board's decision in 2013. The petitioner argued that the denial of the patent application was erroneous because the application clearly revealed a technical effect and a technical development. The respondent maintained that the writ authority of the High Court does not allow it to revisit technical issues where the IPAB has already rendered a decision based on those grounds.⁶⁷

The Court granted the interpretation of CRI guidelines and stated that the purpose of developing them was to simplify and make the process more adaptable for patent protection of Computer Linked Inventions. It relied on the fact that computer-based innovations are not excluded from patentability. The Court observed that almost every invention is somewhat related to computers, and ruling out patents for such inventions will act as a deterrent to the inventors. It directed the Patent Office to reconsider the

⁶⁵ MANU/DE/4323/2019

⁶⁶ Available at <https://www.bananaip.com/ip-news-center/summary-of-indian-patent-cases-of-2019/>, accessed on 10th April 2023.

⁶⁷ Available at <https://blog.ipleaders.in/patentability-computer-related-inventions-cri-india-analysis-ferid-allani-v-union-india-ors/>, accessed on 10th April 2023.

patent application based on the merits of the case and the Court's findings on the technological impact of the assertions.⁶⁸

In conclusion, the current ruling confirms that any innovation with a technological participation or technological impact is not merely a software program, even if it is implemented using a computer program. This is consistent with the Delhi High Court's decision in the case of "Telefonaktiebolaget LM Ericsson v. Intex Technologies (India) Limited."⁶⁹

2.7.7. COSMETIC WARRIORS LTD AND LUSH LTD V. AMAZON.CO.UK LTD⁷⁰

In this particular instance, the claimants initiated legal action against Amazon, claiming that Amazon had infringed on their trademark rights pertaining to the 'Lush' mark. The claimants were able to successfully demonstrate that Amazon had utilized their 'Lush' trademark without their authorization in this case. When a consumer conducts a search for products associated with the 'Lush' brand on Google, an advertisement appears, indicating that 'Lush' products can be found on Amazon. However, Amazon does not actually sell 'Lush' products, and when a consumer clicks on the advertisement, similar products (but not 'Lush' products) are displayed on the Amazon website. Furthermore, if a customer directly searches for 'Lush' products on Amazon, similar products are displayed instead of a notification indicating that no 'Lush' products are available. Given the extent to which AI can influence customers' choices and decision-making, incidents of this nature are likely to increase in the near future unless the underlying issues are addressed and the associated loopholes are closed through the creation and implementation of appropriate policies.

This ruling represents a significant shift in the realm of trademark law as it pertains to the internet. The judge held that using a third-party trademark in the web browser of a webpage that does not offer products associated with that registered trademark is a violation.

⁶⁸ Rai, D. (2020, December 31). *Patentability of computer-related inventions (CRI) in India : An analysis of Ferid Allani v Union of India and Ors*, available at <https://blog.iplayers.in/patentability-computerrelated-inventions-cri-india-analysis-ferid-allani-v-union-india-ors/> accessed on 11th April 2023.

⁶⁹ Telefonaktiebolaget LM Ericsson v. Intex Technologies (India) Limited [CS(OS) No.1045/ 2014]

⁷⁰ Cosmetic Warriors Ltd and Lush Ltd v. Amazon.co.uk Ltd [2014] EWHC 181 (Ch), 10 February 2014

2.7.8. SHENZHEN TENCENT V. SHANGHAI YINXUN⁷¹

In December 2019, the Shenzhen court in China made a ground breaking decision in the Tencent case, holding that works created by AI could qualify for protection under copyright. This ruling comes at a time when the world is struggling to grapple with the novel ideas of authorship for copyright-eligible material. While technology-related issues are expanding the understanding of authorship in copyright, so are non-human interventions. AIs with artistic flair, such as next-gen robot-journalists, are publishing articles with lightning speed and accuracy. However, legally speaking, decisions regarding authorship in AI-generated works have granted ownership to natural persons in-the-loop, ascertaining ownership of output generated by advanced AI systems has become increasingly difficult, challenging the idea that all AI works require human or legal persons' dependence.

The Tencent case highlights the impending disparities on this issue internationally, despite its growing relevance in practice. In several European countries, Australia, and the US, human intervention is fundamental to granting copyright protection, while others such as the New Zealand, Hong Kong, UK, and Ireland take a different approach, allowing protection for computer-generated works. India grants limited protection to computer-generated works.

The Tencent case also builds on another interesting case, Feilin vs. Baidu, delivered by the Beijing Internet Court in early 2019. While the court recognized that the report met the originality requirement, it did not constitute a copyrighted 'work' as it was not autonomously created. Chinese courts have since sought to course-correct themselves with the Tencent judgment, recognizing that works made through creative processes could be protected by copyright.

The Plaintiff was granted a non-exclusive license to use the software 'Dreamwriter,' which has produced approximately 300,000 literary works every year. The contested article, a financial overview of the stock market, was written in Dreamwriter, and the Plaintiff sued the Defendant for copyright infringement and unfair competition when they published an identical piece. The Court determined that the article reflected the selection, assessment, and decision-making of stock market information and data

⁷¹ Yue 0305 Min Chu (14010) (2019).

accessible at the time, and that it had some ‘originality’ to that extent. Based on the Chinese copyright law’s meaning of Article 11, the Plaintiff was ruled to be the author since the software was under their oversight and vision.

The Tencent case acknowledges human involvement in granting IP protection to AI-created works, and the notion of the ‘originality’ requirement as being a solely ‘human’ conception is central to determining authorship in AI-works.

2.8. ARTIFICIAL INTELLIGENCE AUTHORSHIP AND INDIA: NEED FOR A FIX

At a domestic level, the Tencent case reinforces the provision set forth under Section 2(d)(vi) of the Indian Copyright Act of 1957, which attributes authorship to the individual who “causes it to be made.” Prior Indian court decisions have also emphasized the significance of human involvement in the creation of copyrightable works.

In some jurisdictions, copyright protection is only granted if there is decisive human involvement. In the Tencent case, the plaintiff engaged a creative team to supervise the operation of the AI software, while in the *Naruto vs. Slater*⁷² case, human intervention influenced the macaques to take their own photos. The EPO rejected a patent application because only a “natural person” could be considered an inventor. It appears that human involvement offers a satisfactory solution that enables IP offices to uphold the fundamental principles of “Authorship” and “Copyright.” Nevertheless, the extent of human involvement required is a topic of ongoing debate.

The Indian Copyright Office follows the same approach as most other jurisdictions, requiring “decisive” human involvement in AI-created works as a prerequisite for granting IP rights. Section 2(d) of the Act grants copyright to a “person” who causes a work to be created, but it does not apply to computer-generated works, particularly those created by strong AI that may not require human involvement.

Therefore, it is interesting to examine AI’s three distinct stages: (1) Artificial Narrow Intelligence, (2) Artificial General Intelligence, and (3) Artificial Super Intelligence. Weak AI, which is commonly found in current technology gadgets such as speech recognition software, manufacturing robots, and self-driving cars, heavily relies on

⁷² 6-15469 (9th Cir. 2018)

human involvement to perform certain tasks. Strong AI, on the other hand, refers to machines possessing “human-like” intelligence that can solve problems. Attaining Artificial Super Intelligence is even more challenging. As AI technology moves closer to achieving a purely strong AI, the decision in the Tencent case may need to be reevaluated. The question that arises is whether authorship of an exclusively AI-created work should be granted to humans involved or not at all.

Section 17 of the Indian Copyright Act, 1957, provides some guidance on this issue. However, given the narrow interpretation of the term “author” in India, it is highly unlikely that an AI machine would be covered under sections 17(a), (b), or (c). Consequently, AI-created works may not be eligible for authorship, as they do not fit the requirements of sections 17(a) or (b) and cannot satisfy the contract of service under section 17(c). The EPO has recently confirmed that an employment agreement is limited to natural persons.

Therefore, the scope of authorship in AI-created works in India is straightforward. Section 2(d)(vi) gives authorship to the person who causes the creation of the work, which includes weak AI in the form of computer programmes. However, if there is no human involvement, authorship cannot be granted in the resultant work. Similarly, the concepts enshrined in section 17 of the Act do not offer any relief to AI-created works.⁷³

2.9. CONCLUSION

As AI technologies continue to advance and gain more attention in society, there is a growing call for them to have their own legal framework. This argument is often made using utilitarian language, drawing comparisons to legal entities like corporations. The underlying idea is that as AI systems become increasingly indistinguishable from humans, they should be granted the same legal status as human beings.

While integrating AI-generated works into the copyright law system presents important policy considerations, there is already an emerging reality where such works may not meet the requirements of originality. Present legal regimes prioritize the protection of human creations over those generated by AI, which is justifiable. However, it may also

⁷³ Available at <https://spicyip.com/2020/08/shenzen-tencent-v-shanghai-yinxun-ai-authors-copyright-and-some-hard-lessons-for-india.html> accessed on 14th April 2023.

be crucial to strike a fair balance between human creativity and the development of AI technologies.

One potential solution to this dilemma is to recognize that intellectual property rights can extend beyond the traditional scope of IP laws. In this context, it may be beneficial for jurisdictions to revise their legal positions and adopt a new concept of authorship that takes AI into account. At the same time, it is worth noting that works generated solely by AI without human involvement may not be eligible for authorship claims on their own. We suggest that there is no such thing as “no human involvement,” but rather that copyright doctrines offer specific claims to authorship. Additionally, there may be policy considerations for not granting authorship to works that do not meet the established criteria.

Given the significant potential for AI to become a cornerstone of our society, it is essential for the Indian Copyright Office to initiate a discourse on this authorship dilemma and provide clarity on this issue.

Intellectual properties cover a range of works, including literary and artistic creations protected by copyright law, inventions protected by patent law, and symbols, logos, and trade names covered by trademark law. Intellectual property rights grant unique rights to owners to perform a specific act and prevent others from doing the same, enabling them to profit from their invested capital in their designs. Legislators, policymakers, and practitioners debate a variety of theories in order to justify the need for intellectual property rights.

CHAPTER 3

ARTIFICIAL INTELLIGENCE AND PATENTS

3.1 INTRODUCTION

Innovation and creativity are crucial for a country's overall growth and development, as they impact various aspects of society. The introduction of newer creations, innovative ideas, research and development, and the production of goods and services, as well as their applications in knowledge production, are factors that contribute to a nation's advancement. Therefore, promoting and safeguarding intellectual property rights and intellectual rights is critical to protecting such creative works and inventions, not only from harm but also as valuable intellectual assets.⁷⁴

Intellectual property (IP) processes were established to foster human creativity and innovation, which have been defining characteristics of the human species until recently. However, with the advent of artificial intelligence (AI), which has infiltrated everyday life through science fiction novels and Hollywood films⁷⁵, the technological landscape has undergone a paradigm shift. AI technology continues to improve every year, with everyday objects becoming smarter, from cars to mobile phones.⁷⁶

AI technology has a broad range of applications across the economic system, and it is bringing fundamental issues to the forefront of existing IP systems. There is a need to provide IP initiatives to promote AI creation and innovation, while also weighing the importance of human invention and creation against the importance of AI innovation.⁷⁷ This raises the question of whether current intellectual property frameworks need to be changed in response to the rise of AI.⁷⁸

The ultimate goal of the intellectual property system is to promote innovation through technological advances and creative processes, whether they are human-created or AI-

⁷⁴https://rajyasabha.nic.in/rsnew/Committee_site/Committee_File/ReportFile/13/141/161_2021_7_15.pdf. Accessed on 14th April 2023.

⁷⁵ The Wisdom of Legislating for Anticipated Technological Advancements, 10 J. *MARSHALL REV. INTELL. PROP. L.* 154, 172 (2010)

⁷⁶ Ryan Abbott, I Think, Therefore I Invent: Creative Computers and the Future of Patent Law, 57 *B.C. L. REV.* 1079, 1088–89 (2016).

⁷⁷ Steven B. Roosa, The Next Generation of Artificial Intelligence in Light of In Re Bilski, 21 No. 3 *INTELL. PROP. & TECH. L.J.* 6, 6–7 (2009).

⁷⁸ Jeremy Hsu, *Robotic Madness: Creating True Artificial Intelligence*, *LIVE SCI*, available at <https://www.livescience.com/3407-robot-madness-creating-true-artificial-intelligence.html> accessed on 14th April 2023.

created. However, the ownership of AI-created creations, including both the data and the technology upon which they are built, remains uncertain. To protect such creations, intellectual property rights, particularly patents, are the most effective measure in the current scenario. In India, AI-related innovations, particularly in the context of algorithms and programming skills, qualify for patent protection.⁷⁹

The Patent Act of 1970 regulates the patentability of inventions in India. Section 3(k) explicitly states that mathematical and business methods, as well as computer programs in general, are not eligible for patent protection. This means that algorithms and computer programs are not patentable in India unless they demonstrate industrial potential application, novelty, and non-obviousness.

Additionally, the requirement of non-obviousness to a skilled artisan presents a challenge to patenting advancements in the field of AI, as there is a risk that such innovations could be deemed obvious and therefore ineligible for patent protection.

Moreover, patent protection is only granted to the first and true inventor, who must be a natural person according to local laws. This was exemplified by the rejection of two patent applications filed by the “Artificial Inventor Project” in January 2020, which named AI as the inventor. The European Patent Office and the UK Patent Office rejected these applications on the basis that the inventor must be a human being, not a computer.

This decision highlights the challenge of establishing the rights of ownership in the context of AI-generated inventions. As per patent law, one can only be considered an inventor if they add value to the conception of their invention.

It is widely acknowledged that human intelligence and involvement are indispensable for the conception and advancement of an AI framework. Despite the fact that AI can simulate human behavior, thinking, and learning, it is imperative that a natural person is involved to be identified as the inventor. This leads to the question of whether an “electronic person,” distinguished from a “natural person,” can be granted a patent. In simpler terms, an electronic entity may be considered an inventor, and the legal entity or corporation claiming ownership may be granted ownership. However, patent laws

⁷⁹ Vaishali Singh, Mounting, *Artificial Intelligence: Where are we on the timeline?* SCC online, June 7, 2018.

worldwide confer patent protection exclusively to natural persons, not electronic or legal entities.

3.2 ARTIFICIAL INTELLIGENCE & PATENTS: ISSUES & CHALLENGES

3.2.1. INVENTORSHIP

Patent laws have traditionally recognized only human inventors, and as such, no jurisdiction currently permits Artificial Intelligence (AI) to be regarded as an inventor. However, given that these patent systems have been in place for several decades, it is possible that there will be further discussions and potentially legislative measures in the future to address the question of whether AI can be considered an inventor. While some have questioned whether AI can invent, the majority of patent offices and laws across the world do not permit AI to be considered an inventor. The fact that established patent laws refer to inventors as “Individuals” or “Persons” leaves little room for doubt that non-human entities such as AI cannot be recognized as inventors, and this has been a primary point of contention against recognizing AI as inventors.⁸⁰

3.2.2. OWNERSHIP

At first, the patent belongs only to the inventor who created it. The original owner of a patent is typically the inventor. However, in the United Kingdom, the employer has the superior right if the invention was made during the course of employment or under contract, as stated in the Patent Act of 1977. The computer or programme itself may be regarded the initial proprietor of an innovation when an AI algorithm creates it without any human input. Such a patent grant would necessitate a contract or legal stipulation assigning or licencing all subsequent inventions to the original owner. Depending on the legal entity of the computer, resolving disputes or infringement gets more complicated if the inventor receives the legal benefits and the computer is the first owner. Concerns concerning employer-employee ownership issues over inventions were brought to the attention of the Bombay High Court by a case involving one such dispute. According to the High Court’s decision in *Darius Rutton Kavasmaneck vs. Gharda Chemicals Ltd & ors*,⁸¹ “the defendant Dr. Gharda, who is the managing director of a company, owed no fiduciary duty to his principal company to register the

⁸⁰ Available at <https://www.mondaq.com/unitedstates/patent/1051190/can-an-artificial-intelligence-ai-be-an-inventor> , accessed on 14th April 2023.

⁸¹ *Darius Rutton Kavasmaneck v Gharda Chemicals Ltd & ors* (2014) SCC Online Bom 1851.

patents in the company's name, as he was not under any duty to invent in his capacity as managing director." The court also ruled that employees can own their patents if they were not coerced or urged to invent something as part of their job or while on the clock.⁸²

3.2.3. INFRINGEMENT

If there is a significant overlap between a competitor's specification and the patent specifications produced by an autonomous computer, copyright infringement allegations may be made against the autonomous computer. Due to non-standardization and non-patent equality, the application of copyright law to invented patent specifications varies from nation to nation. For instance, in the UK, the commercial copying of cleomes is protected by a patent, while in Germany, commercial copyright protection is in effect up until publication, at which point the patent is made public. Only the patented invention or specification document may be freely reproduced in the USA.

It is not quite clear whether a patentable concept that was independently developed utilising digital technology may be legally considered to have an inventor. Due to the ambiguity of inventorship under several laws, the eligibility to a patent may also be exploited as a defence against the nullity of an illegal conduct. This can be done because of the ambiguity of the legislation. To this day, the term "inventor" refers to a natural person who is the applicant for a patent and is responsible for the structure of a patent concept or a component of a patent thought. In the event of an autonomous computer-generated patent, the process of developing a patentable notion has shifted from one involving physical involvement to one involving the generation of concepts. However, since no law has been made to designate the inventor as anything other than a natural person, it is impossible to identify the inventor accurately, and the benefit of infringing on their intellectual property may be taken advantage of.

Human operators, software designers, and AI algorithm developers are all engaged in the early phases of computer-produced inventions that are developed by autonomous

⁸² "India: Patents belong to employee if inventions not created as part of their employment", <https://hsfnotes.com/employment/2015/03/02/india-patents-belong-to-employee-if-inventions-not-created-as-part-of-their-employment/#:~:text=Team-India%3A%20Patents%20belong%20to%20employee%20if%20inventions%20not,as%20part%20of%20their%20employment&text=The%20Bombay%20High%20Court%20has%20employment%20or%20during%20working%20hours>, visited on 17th April 2023.

computers. The fact that the aforementioned contributions are not legally acknowledged as the inventor challenges the notion that the computer is the primary contributor to the concept of innovation. When an idea is completely reliant on computers, it is much more difficult to determine who the original creator was. There may be three feasible solutions to this challenging problem: (1) utilising a human as the employer and computer programmer; (2) allowing the computer to be considered as a legal person; or (3) doing away with identification entirely. Each of these options has its advantages and disadvantages.

3.2.4. ARTIFICIAL INTELLIGENCE LIABILITY ISSUES RELATED TO PATENT

Accountability

One of the challenges related to AI in patent law is determining liability for patent infringement. A patent grants the inventor exclusive rights to use and distribute their invention. Unauthorized use, sale, or introduction for sale of an invention is considered an infringement and the infringer must compensate the patent holder for damages. However, when it comes to AI-generated inventions, the question of who would be held responsible for infringement arises.

The European Parliament issued a resolution in February 2017 saying that AI is immune from liability for the conduct of third parties. Instead, the human operator, manufacturer, or user of the AI must be exposed if they are to be held responsible for the AI's malicious actions. The failure to identify and punish those responsible for AI-induced patent infringement might encourage further usage of AI for illegal activities.

Assessment of Liability for Infringement

The subsequent issue pertains to the allocation of liability for patent infringement by an independent AI. One potential solution is to establish an insurance scheme where a fund is established to compensate for infringement damages. Another alternative is to hold the AI responsible, which would require granting the AI legal personhood. However, determining the extent of AI's liability remains a concern that needs to be addressed in future legislative measures. The European Parliament Resolution advises against limiting damages solely because a non-human entity caused the violation.

If a human agent is identified as the violator, the punishment should be proportionate to the level of authority granted to the AI. However, if the AI is deemed liable for the breach after being recognized as a legal person, its responsibility should be evaluated in the same manner as a corporation.

Another option is to establish a contractual obligation that provides a predictable outcome in the event of a breach. The complainant would be entitled to compensation as per the contract, and may also be entitled to damages based on the relevant clauses.

3.2.5. PSITA (PERSON SKILLED IN THE ART)

Step-by-step innovations do not meet the requirements for patent protection. Patents are reserved for inventions that significantly surpass existing technologies, as the cost of obtaining a patent is high. However, patents have the potential to impede future innovation by limiting competition and the use of patented technologies in research and development. Patents can be utilized to encourage innovation, facilitate the dissemination of information, commercialize technologies, and safeguard moral rights. Novel, obvious, and useful inventions are eligible for patent protection, with notoriety being the most critical criterion among the three. While other patentability criteria are relevant, the notoriety requirement is a critical test for distinguishing significant innovations from minor advances. This emphasizes the need to establish universal rules that apply to all technological fields.⁸³

The “obviousness” standard has been used as a benchmark for patentability for over sixty years. According to this standard, an invention cannot be patented if a person with ordinary skills in the relevant industry would find the invention obvious based on existing information. However, this standard may be inadequate as it considers only workers with limited knowledge as competent individuals. The more inventive, knowledgeable, and skilled an invention is, the more likely it is to be dismissed as trivial. With the advent of invention machines used in research, standards are now evolving and on the cusp of a developmental leap. Invention machines, unlike skilled professionals, can consider the entire multiverse of prior art and have the potential to innovate continuously, ultimately raising the level of patentability.

⁸³ Available at <https://www.uclalawreview.org/wp-content/uploads/securepdfs/2019/01/66.1.1-Abbott.pdf>, visited on 19th April 2023.

In the current state of affairs, eliminating patents would result in the death of notoriety, which is a critical criterion for protecting scientific advancements.⁸⁴

3.2.6 OTHER IMPORTANT CONCERNS

Although artificial intelligence (AI) is highly efficient in creating inventions, there is a significant possibility that it could lead to a flood of patent applications. In the long run, the use of AI could have a detrimental effect on human innovation, as natural-person invention could be replaced by autonomous algorithms, resulting in a decline in human intelligence. This, in turn, could lead to the loss of high-tech research and innovation jobs and industries. It is crucial to have adequate mechanisms in place to ensure that patent applicants are not making false claims about the role of AI in the creative process. Lack of human oversight in AI inventions could have adverse implications, and it is essential to promote transparency and accountability through appropriate measures.⁸⁵

3.3. NEW DEFINITIONS FOR ‘INVENTION’ AND ‘INVENTOR’

As demonstrated, there are a multitude of factors to consider when deciding whether or not to grant a patent. While there are certain criteria that must be met to qualify as an inventor, such as the “conception” phase established in the case of *Townsend v. Smith* in the United States,⁸⁶ in which a concrete idea must be conceived before it can be put into practice, some argue that AI should also be considered inventors.

This argument stems from the elimination of the “flash of genius” patentability test by the US Congress, which states that if an invention contributes to the advancement of science, the process by which it came to be in the inventor’s mind is irrelevant. Given that many AI programs, such as Alpha Go and Watson, provide solutions to complex problems and contribute to scientific progress, some argue that they should be granted patent protection.

However, some scholars contest this view, noting that the issue of collaborative invention raises questions about whether computers should be recognized as inventors

⁸⁴ Ryan Abbott , *Everything Is Obvious*, available at <https://www.uclalawreview.org/wp-content/uploads/securepdfs/2019/01/66.1.1-Abbott.pdf> , accessed on 19th April 2023.

⁸⁵ White Paper, *Artificial Intelligence Collides with Patent Law*, WORLD ECONOMIC FORUM, http://www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf. visited on 19th April 2023.

⁸⁶ 36 F.2d 292,293 (1929)

along with their human counterparts.⁸⁷ Additionally, opponents of granting AI patent protection argue that computers lack the emotional connection and strong views about how their inventions should be used that are necessary to justify patent protection.

In India, the determination and identification of inventorship is considered subjective, as the Indian Patents Act of 1970 only addresses a few core elements of “invention” and a definition of “true and first inventor.” While the Act does not expressly restrict inventorship to natural or legal persons, in practice, the “true and first inventor” is often assumed to be a person.

In many instances, patents resulting from computer-generated or computer-assisted patent applications are granted, provided that they meet the required criteria outlined in relevant patent laws. These criteria may include the strongest claims, and the patent application may be scrutinized for multiple assertion variations that conform to patent specification safeguards. Obtaining a monopolistic patent for inventions attributed to computer-generated or computer-assisted specifications incentivizes better technology text generation. This cutting-edge technology has the ability to identify useful inventions amidst the potentially meaningless text or specifications generated by computer algorithms.

By adopting computer-generated/assisted claims, the original invention is typically condensed in order to acquire a patent on an enlarged monopoly. The message produced by the machine would be distinct from the initial seed statements. One can be creative by just using synonyms in place of words. However, the usage of antonyms adds extra creativity to the patent. Parts of any available patented invention can only be reorganised by an expert with a deep understanding of technology and computer-generated language to prevent it from being recognised by predicted alternatives.⁸⁸

Natural linguistic computation is utilised to develop modifications of established patentability, so expanding the scope of the invention. By creating a body of evidence for patent claims that is already in the public domain, the disclosure of such patentability utilising modern technologies prohibits the patenting of straightforward and easily derived ideas. The UK Patent Act of 1977 serves as the foundation for any

⁸⁷ Ryan Abbot, *I think, therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C.L. Rev. 1079, 1095 (2016).

⁸⁸ Rajeev Kumar & Pankaj Musyuni, *WHO CAN BE NAMED AS INVENTOR- AN INDIAN PERSPECTIVE*, EXORBIS, 2018

software and technologies that can be used to create computer-generated or computer-assisted specifications that are patentable without requiring considerable reorganisation or rewriting. According to this law, the patented invention must be disclosed in a way that makes it easy for a person who is knowledgeable in the relevant field to implement it. These procedural requirements are put in place to make sure that the patent system achieves its goal of public notification. The pledges to offer a comprehensive and relevant disclaimer, however, fall short in the case of computer-generated patent language specifications because they incorrectly identify the scope of the monopoly.⁸⁹

Future innovation might be hampered as a result of others being wary of violating recognised patents. Ironically, the requirement that all variations of computer-generated text be sent for search or examination reports burdens the patent office and raises the possibility that shoddy inventions will be approved. In the case of precursor patents, potential patent trolls who seek financial gain before engaging in actual legal action employ the aforementioned strategies. The original innovation effort in AI Prior Art is impacted as a result. Computer-generated or computer-assisted patent specifications are still not institutionalised or organised in the Indian context.⁹⁰

3.4. INVENTION BY ARTIFICIAL INTELLIGENCE IS THE FUTURE OF INNOVATION

The development of computer systems has become a common practice in introducing new products, such as BMW's self-driving vehicle design. It is widely believed that artificial intelligence (AI) will play a significant role in future global innovation. However, this raises a pressing question about how Intellectual Property (IP) laws should handle AI-created technologies that lack sufficient human interaction to identify a human innovator. At present, the legislation and courts have yet to address the issue of conferring patent applications for AI inventions.

Determining inventorship becomes particularly challenging when multiple innovators from the same or different organizations collaborate on the invention. In the case of

⁸⁹ Erica Fraser, *“Computers as Inventors – Legal and Policy Implications of AI on Patent Law”*, (2016)

⁹⁰ Tim Cushing, *“Patent Not Sufficiently Broad or Generic? Cloem Will Help You By Automatically Generating Dozens Of Nearly Identical Patent”*, <https://www.techdirt.com/articles/20150220/08414930087/patent-not-sufficiently-broad-generic-cloem-will-helpyou-automatically-generating-dozens-nearly-identical-patents.shtml> Visited on 25th April 2023.

*Mrs. Vandana Bhide vs. the Patent Controller at the National Institute of Virology*⁹¹, specific conclusions have been reached regarding inventorship. The criteria for personal inventorship have been outlined, stating that an individual must have contributed intellectually to the final research findings that led to a patent to be considered an inventor. A person cannot be considered an inventor if they have not made intellectual contributions to the development of the innovation.

Those who have assisted in tasks such as conducting experiments or constructing apparatus without giving any intellectual contributions are not eligible to be called inventors.

Creating a substantial importance to the invention is a prerequisite for inventorship. In the case of *TS Holdings, Inc. vs. Schwab*,⁹² Mr. Barry Schwab was tasked with developing a product for use in automobile advertising. Schwab's boss later claimed that he should be listed as an inventor. However, the judge rejected this claim, as financing and instructing others to develop modern technology are not sufficient to comprise an invention.⁹³

Under patent law, a human who uses AI to invent is not considered an inventor. An individual may input grain information, such as existing technologies, to start an AI invention. Such actions are merely seen as giving AI access to available experience in the discipline. Furthermore, simply funding, owning, or operating an AI does not make the individual an inventor. Although a person may be willing to take responsibility for an invention, they have not actually developed a new technology. The patent system aims to encourage technological advancements, and refusing AI patents may lead software creators to keep their inventions as trade secrets, which would go against the primary goal of the patent regime. Unfortunately, most legal systems are not yet equipped to provide definitive answers to these questions.

⁹¹ National Institute of Virology vs Mrs. Vandana S. Bhide, Pre-grant Opposition before the Controller of Patents in the matter of Patent Application 581 /BOM/ 1999.

⁹² *TS Holdings, Inc. et al v. Schwab*, No. 4:2009cv13632 - Document 115 (E.D. Mich. 2012).

⁹³ Cattoor, S., Letten, I. and Loose, A. (2020), '*Inventorship of AI Made Inventions*', IRDI, pp. 7–17.

3.5. PATENTABILITY OF ARTIFICIAL INTELLIGENCE ASSISTED INVENTIONS

Patents have previously been issued for inventions made possible by artificial intelligence (AI), also known as computer-aided inventions. It's common knowledge that these concepts will be challenged in court since neither lawmakers nor judges have adequately considered the role that AI plays in the creative process. Innovation processes are often conducted in secrecy, and definitions of what constitutes an innovation process vary widely between nations. It is against the law in the United States to discriminate on the basis of race. Legally, "patentability shall not be negated by the manner in which the invention was made."⁹⁴

It is important to analyse and evaluate the role that software developers play in the process of inventing with the help of AI. The novelty of AI-created innovations is a critical factor in deciding whether or not they qualify for patent protection. If the artificial intelligence algorithm used consistently produces the same result values or uses the same kinds of data sets, then the result lacks originality. Incorporating more sources of uncertainty, however, is likely to increase the AI system's potential to make novel discoveries.

When comparing human inventors to computer-aided innovations, a machine has a greater probability of properly evaluating the previous art. The addition of practicality might help guarantee uniqueness. Although originality is important in every creative endeavour, imagination and inventiveness are of much greater significance. For an innovative step to qualify for patent protection, it must be determined whether or not the invention "is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art." As a result, monopolies in the technology sector that prioritise progress above ostensible originality will have far-reaching effects on the fabric of society.

In light of AI, we need to rethink how computers may aid human creativity by making use of computer resources. To begin assessing an innovative step, one may identify a hypothetical expert with just the most basic and general knowledge of the art. Artificial intelligence (AI) assistance is crucial in the creation process since even the most skilled

⁹⁴ Michael McLaughlin, "Computer Generated Invention", https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3097822. Visited on 25th April 2023.

inventors have limited data processing skills. In order to create a better and more original patent text, the degree of AI engagement technology must be raised beyond its current support.⁹⁵

Expert human creation may become less important as AI-assisted text use increases and improves. In order to accomplish the inventive step, greater innovation recognises the requirement for extra tools that are present alongside an innovator. Invention experts need to understand both the underlying technology advancement and the patent specification generated by AI.

It's possible that some of the breakthroughs made to help AI will lead to a previously established generalisation. The AI isn't well enough trained to distinguish original ideas from those that have been done before. It's possible that certain discoveries made with the help of AI may appear obvious at first glance. There is no way any finding could qualify as a completely new concept. There will be a notable gap between the degree of creativity generated by a talented human and that created by a computer using AI. As a result, there may be unwarranted monopolies if patents are issued without considering how they may be used in conjunction with AI.⁹⁶

The degree to which AI is used in formulating patent criteria should be uniform. Rules should be set aside to ensure that Indian patent specifications are on par with those produced elsewhere.

Big data processing and machine learning of the future will still need considerable human intervention. In order to increase creativity throughout the patent specification process, it is necessary to standardise or regulate the use of computing capabilities. Some fields have already standardised their methods, such as drug discovery and molecular screening. This is an opportunity to include more imaginative forms of AI-based technologies into the patent specification process.

One such instance is *Allani Ferid v. IPAB*⁹⁷. A software patent for a method and handset for acquiring internet information sources and services was finally issued to Tunisian citizen Ferid Allani 19 years after the first application. Justice Pratibha Singh of the

⁹⁵ Erica Fraser, “*Computers as Inventors- Legal and Policy implications of Artificial Intelligence on Patent Law*”, <https://script-ed.org/article/computers-as-inventors-legal-and-policy-implications-of-artificial-intelligence-on-patent-law/> Visited on 25th April 2023.

⁹⁶ *Technograph Printed Circuits Ltd v Mills & Rockley (Electronics) Ltd* [1972] RPC 346 at 355.

⁹⁷ *Allani Ferid v. Assistant Controller of Patents & Designs* OA/17/2020/PT/DEL.

Delhi High Court, after multiple rounds with the Patent Office, ordered a re-examination of the application in 2019. The language “per se” was added to Section 3(k) of the Patents Act so that real innovations made using computer programmes (and not simply computer programmes) might be protected. Inventions that are based on computer programmes nevertheless have a chance of becoming patentable if they can show that they have a “technical effect” or even make a “technical contribution.” This patent opens the door for similar applications to be filed in the fields of artificial intelligence, blockchain, and other computer-based digital assets.

3.6. AUTONOMOUSLY GENERATED INVENTIONS

Patent-related inventions have always been seen as the result of human ability and intellect. The patent wording is written by a skilled inventor, who then uses it to protect the commercial and investment interests of the protected technological effort. The employment or lack of human intelligence in the composition of the patent document, however, raises important issues about the very nature of patent law. As a result, it is imperative to carefully consider how the term “invention” is used in various laws, patent office procedures, and legal interpretations. Redefining the agreements and accords between various nations pertaining to patents is also necessary.⁹⁸

As an ancient and evolving nation, India’s domestic legislation must embrace a future perspective. When autonomous computer-generated inventions are involved, using more advanced AI-focused machines might not be the best choice. Computer utilisation is very beneficial in high-risk fields such those involving the risk to human life, accessibility, and cost, such as deep sea exploration, space experiments, drug development, etc. Higher expectations for patent law will result from reexamining the usability and interpretation of the legislation, but this requires reexamining the unintended consequences of patent granting in light of improved and advanced computational technology, AI interface, machine learning, and big data management.

The second important query is the use of AI patents to encourage the production of autonomous inventions. The main standard for awarding incentives is the legality of a temporary monopoly. Because humans are not involved and there are insufficient incentives for ideas, the current advancements in computing power of computers and

⁹⁸ Andres Guadamuz, *Can the monkey selfie case teach us anything about copyright law?*, World Intellectual Property Organization.

AI have led to more imitation than original effort. The misuse of new and inventive innovations due to knowledge of computer manipulation could cause market economic distress.⁹⁹

The balance variables for structuring incentives and market risk include the interest of right holders, futuristic commercial possibility, efficacy in public life, and economic growth. A balanced and calibrated patent system may therefore have the ability to promote patent innovation, which will assist provide greater prospects for economic growth. innovation in a broader sense, where more acceptances can only be encouraged.¹⁰⁰

With the use of computer-generated specifications, innovation will be accelerated and the number of inventions will increase exponentially, requiring less expertise and resources because the repetitive nature of labour can be carried out directly by the computer at a faster rate with greater precision. Autonomous inventions produced by computers at a reduced cost are chosen to produce superior results in this period of fierce competition. Computers autonomously develop the low-cost, more well-known original inventions, taking care of the majority of technological requirements and democratising the invention. The contribution of human intellect may be impacted by increased use of powerful computers using AI algorithms in the creation of autonomous patent specifications. The exceptionality of intellectual capital as well as the originality of the innovation may wane as the creation process moves forward. In the absence of the aforementioned, it is possible that there will be numerous, ineffective inventions that cause confusion through a high rate of change.

Potential failures in generating and recognizing path-breaking innovations, which are only possible through human inventions, may arise when relying solely on AI. While AI reduces research and development costs, it may also prevent new players from entering the field. The use of autonomous computer-generated systems may result in the flooding of the market with a large number of innovations that do not benefit mankind and deplete natural resources. Moreover, the AI-based generation of patent specifications may lead to the overkilling of the basic objective of monopolizing

⁹⁹ K Lybecker, “*How to Promote Innovation: The Economics of Incentives*”, <http://www.ipwatchdog.com/2014/07/21/promote-innovation-the-economics-of-incentives/id=50428/>. Visited on 25th April 2023.

¹⁰⁰ M Perry and T Margoni , “From Music Tracks to Google Maps: Who Owns Computer-generated Works?”, *26 Computer Law and Security Review*, (2010),p. 627.

products and granting patents, potentially creating a concentration of patents in a small field, leading to inflated product valuation in a restrictive market.¹⁰¹

It is essential to safeguard computer-assisted AI environments free from human intrusion so that human innovation and AI-assisted generation can coexist in India in order to secure future-proof technical and economic growth. After 2002, process patents were also awarded for inventions that comply with the Patent Act of 1970 and met the requirements for patents. Prior to 2002, patents in India were only granted for products. The Patents Act of 1970 defines “patentee” as “a person for the time being entered on the register as the grantee or proprietor of the patent.” This definition is found in Section 2(p). According to Section 2(y) of the Patent Act of 1970, the first or real inventor is the proprietor of the invention, usually a natural person who spent their own creativity, time, intelligence, and knowledge in producing the idea. According to this clause, the “true and first inventor” does not include the first person in India to acquire a discovery or the first person in the world to get notification of an invention.¹⁰²

After receiving a patent for an invention, the patentee (owner of the patent) must decide whether to produce, market, sell, and/or distribute the invention themselves, sell all rights to the invention to another party for a price, or grant a licence to another party to produce and market the invention under certain conditions. If there is any infringement of the patentee’s innovation, the patentee should receive all remuneration and advantages without facing any legal repercussions because they are the original and true inventor.¹⁰³

However, the legal system is ill-equipped to deal with new innovations, and current rules are unable to keep up with the quick rate of technological advancement. For instance, if a new invention acquires a patent and the inventor is granted a limited monopoly, but someone else introduces a more sophisticated device with superior features before the patent expires, the first invention is become obsolete. The patent law continues to apply outdated rules to modern technology.

¹⁰¹ P Belleflamme, *Patents and Incentives to Innovate: Some Theoretical and Empirical Economic Evidence*, 2006 , p. 278.

¹⁰² The Patent Act. 1970, Acts of Parliament, 1970 (India).

¹⁰³ Saipriya Balasubramanian, “Ownership And forms of transfer of patents rights in India-A primer”, <https://www.mondaq.com/india/patent/610610/ownership-and-forms-of-transfer-of-patents-rights-in-india-a-prime> accessed on 14th April 2023.

3.7. PATENTABILITY OF AUTONOMOUSLY-GENERATED INVENTION

In the not-too-distant future, patent requirements could be created automatically thanks to advancements in big data management, machine learning, and AI algorithms. Large amounts of VC money are going to firms in the patent-related technology industry, which might speed up AI-based innovation with little human intervention. There may be no effect on patent specification from legal and legislative concerns regarding patent invention.¹⁰⁴ Current laws are unable to keep up with the rate of technological advancement, yet the judicial system persists in using archaic statutes in making rulings.

3.8. WHAT INVENTIONS CAN BE PATENTED IN INDIA?

Instead of offering a comprehensive list of patentable subject matter, the Indian Patents Act of 1970 stipulates six essential requirements for patentability, including innovation, utility, and non-obviousness. The Supreme Court of India highlighted the relevance of “novelty” and “utility” as essential requirements of patent law in *Biswanath Prasad Radhey Shyam v. Hindustan Metal Industries*¹⁰⁵. The concept of “invention” is explicitly defined in Section 3 of the Act, however, to exclude several categories, such as commercial or mathematical processes, general-purpose computer programmes, or algorithms.

The Delhi High Court clarified the terms and nature of the algorithm exclusion under Section 3(k) of the Act in its decision in *Telefonktiebolaget LM Ericsson (PUBL) vs. Lava International Ltd.*¹⁰⁶, noting that this exclusion does not apply when algorithms are used in patents involving modern technology to perform specific calculations or selections that are then used by hardware components or elements to produce/improve a technology and produce a practical effect.

Similar to this, the Delhi High Court ruled in *Ferid Allani v. Union of India & Ors*¹⁰⁷ that because the majority of inventions in the contemporary digital world are based on computer programmes, technological advancements in the areas of artificial intelligence, blockchain technology, and other digital products would not lose their

¹⁰⁴ C Davies, “An Evolutionary Step in Intellectual Property Rights- Artificial Intelligence and Intellectual property”, 27 *Computer Law & Security Review*, (2011) , p.601.

¹⁰⁵ AIR 1982 SC 1444

¹⁰⁶ 2016 (65) PTC 556[Del]

¹⁰⁷ 2020 (81) PTC 489[Del]

patentability solely on the basis of those elements. The Court further outlined how patentability in this area is based on the “technical effect” or “technical contribution” that the invention has established.

The Guidelines for Examination of Computer Related Inventions (CRIs), published in 2017 by the Office of the Controller General of Patents, Designs, and Trademarks, set out the process for examining CRI applications as well as the exact meanings of technical words not covered by the Act.

According to Section 6 of the Act, anybody who claims to be the genuine and first inventor of an invention, anyone who is the true and first inventor’s assignee, or the legal representative of a dead person who was permitted to make such an application, may submit a patent application. The term “person” as used in Section 2(s) of the Act includes both natural and legal persons, including the government.

Position of AI Systems and Inventorship in India and Other Jurisdictions

Although some nations have acknowledged AI systems as legal entities, personhood has not yet been uniformly bestowed to them. As a result, under the terms of the current patent laws, AI systems cannot be listed as inventors in patent applications.

Additionally, some patent systems, including the European Union’s, demand that the inventors listed on patent applications be people as opposed to machines. Due to the European Patent Convention’s requirement for a human inventor, the European Patent Office (EPO) rejected two patent applications that claimed the AI system DABUS as the inventor.

According to the EPO, it is very important to designate an inventor because doing so has legal ramifications, including guaranteeing that the designated inventor is the true owner of the invention and is able to exercise related rights. The inventor must have a legal personality in order to be granted these rights, which AI systems or computers do not have.

Similar to this, the DABUS AI system was listed as an inventor on a patent application for “Devices and Methods for Attracting Enhanced Attention” that was denied by the

United States Patent and Trademark Office (USPTO).¹⁰⁸ The USPTO reaffirmed that an inventor must be a human individual.

¹⁰⁸ USPTO Patent Application 16524350

CHAPTER 4

ARTIFICIAL INTELLIGENCE AND COPYRIGHTS

“Innovation is always risky, and the complexity of the landscape makes these markets tricky to predict, so intellectual property (IP) remains a powerful business asset when it comes to addressing some of our biggest challenges.”

- Steve Evans¹⁰⁹

4.1 INTRODUCTION

Artificial intelligence (AI) has become increasingly essential in the creation of works of art, music, poetry, and novels. However, its emergence in the realm of intellectual property (IP) has presented various challenges, particularly with regard to the copyright regime. AI-generated works are pushing the boundaries of existing copyright laws worldwide, posing a significant challenge to legal systems. This chapter aims to address the issues of authorship, ownership, and other core concerns that pertain to the copyrightability and protection of AI-generated works. These challenges are central to the hypothesis of this study, and thus this chapter is of utmost importance.

To identify the core issues pertaining to the copyrightability of AI-generated works, this study has considered the appropriate concerns discussed at the World Intellectual Property Organization (WIPO).¹¹⁰ The European Parliament Resolution of 2020 has also highlighted these concerns, noting that “Artificial intelligence is surpassing human intellectual power, which may pose a danger to humanity. To minimize the threat of AI, humans must be in a position to control their own creations.”¹¹¹

¹⁰⁹ Prof. Cambridge University, U.K., See WIPO, 2019, *The Story of AI in Patents, Evolution of AI patent applications and scientific publications*, WIPO Technology Trend Magazine on Artificial Intelligence, ISBN: 978-92-805-3007-0, available from, https://www.wipo.int/tech_trends/en/artificial_intelligence/story.html, accessed on 25th April 2023.

¹¹⁰ *Draft Issues Paper on Intellectual Property Policy and Artificial Intelligence*, 2019, WIPO Conversation on IP and AI, Second Session, 13 December, available from https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_ge_20/wipo_ip_ai_2_ge_20_1.pdf, accessed on 25th April 2023.

¹¹¹ *Resolution of European Parliament, submitted to the Commission on a civil liability regime for AI on Dated 20 October 2020, [2020/2014(INL)]*, available from https://www.europarl.europa.eu/doceo/document/TA-9-2020-0276_EN.html, accessed on 25th April 2023.

The US monkey-selfie case¹¹², which clarifies that works created by a machine or mechanical process cannot be registered under copyright, also offers insights into the protection of AI-generated works created without human assistance.

These debates and decisions demonstrate that AI is revolutionizing society and industry. The availability of big data, algorithms, and high-speed processing has made AI a pioneer tool of the 21st century, shaping our digital economy, including the field of IP. As Stephen Hawking has warned, “The development of full AI could spell the end of the human race.” AI is increasingly becoming a vital component of human life, and how we handle it will determine our future.¹¹³

The impact of AI on our lives is evident in various ways. Presently, AI-based systems have the capacity to produce astonishing works in a short amount of time, including complex creative expressions like poetry, art and other forms of creative expression. AI is involved in scheduling for work and vacations, personal virtual assistance, self-driving cars like Tesla, and personalized video suggestions on YouTube and Netflix. It is also present in face recognition on Facebook, recording our voice with AI-based recorders, using IoT technology to control our smart home devices, and more. AI is leading many countries towards complete automation, reducing human labor and eliminating errors.¹¹⁴

Apart from making our lives easier, AI is also contributing to addressing a number of international concerns, such as combatting climate change and detecting cybersecurity risks. IP systems can assist clinicians in diagnosing complex chronic illnesses, according to American healthcare media.¹¹⁵ Denmark has developed an AI-based Emergency Medical Services to identify cardiac arrest or other serious conditions in patients based on the caller’s speech during an emergency call. Farmers in Europe are

¹¹² *Naruto v. Slater*, 2018 WL 1902414.

¹¹³ Rory Cellan-Jones, 2014, “*Stephen Hawking warns ai could end mankind*”, BBC News, 02 December, available from <https://www.bbc.com/news/technology-30290540>, accessed on 10th May 2023.

¹¹⁴ Smart Meetings, 2019, *Microsoft’s AI-Powered Assistant Schedules Meetings for You*, 20 September, Smart Meetings Online, available from <https://www.smartmeetings.com/tipstools/technology/95931/microsofts-Ai-powered-assistant-schedules-meetings-for-you>, accessed on 10th May 2023.

¹¹⁵ Annette Ekin, 2019, *AI can help us fight climate change. But it has an energy problem, too*, horizon, The EU Research and Innovative Magazine, 12 September, available from <https://ec.europa.eu/research-and-innovation/en/horizon-magazine/Ai-can-help-us-fight-climatechange-it-has-energy-problem-too>, accessed on 10th May 2023.

already utilizing AI-based devices to monitor their animals' temperature, feed consumption, and movement.

Recently, an AI-based program called GPT-3¹¹⁶ has been launched in the USA, which has the capacity to create poetry, answer questions, write blogs, translate languages, check emails, give summaries, and even write computer programs for itself. AI can create local news items, artwork, short novels, and music simply by listening to a range of recordings, according to Andres Guadamuz. In 1997, Garry Kasparov was defeated in a six-game chess match by Deep Blue, an IBM-invented chess computer.¹¹⁷

These examples reveal the core problem and indicate how the world has acknowledged AI in the areas of creativity and innovation. These are only a few examples of what AI can accomplish in a wide range of works. It is clear that in the future, many more works that are currently inconceivable will be added to this list.

The increasing use of AI in developing new technologies has caused governments worldwide to reevaluate their regulations. The widespread use of AI has created various challenges for intellectual property laws, particularly in the domain of copyright law. To address these challenges, WIPO has proposed two categories of works: "AI-generated work" and "AI-assisted work." If the work is created solely by AI without human intervention, it is considered "AI-generated work," whereas if it is created with human support, it is called "AI-assisted work."¹¹⁸

In the creation of certain works, such as art, poetry, and music, the role of AI has become critical, and the role of AI in the area of intellectual property, specifically in copyright, has become a topic of debate. As AI-enabled machines are capable of creating things without human intervention or assistance, questions have arisen about who will be the author of the work. Will works that do not meet basic copyright requirements, such as originality, creativity, and fixation, be eligible for copyright

¹¹⁶ Cade Metz, 2020, *Meet GPT-3: It Has Learned to Code (and Blog and Argue)*, The New York Times, 24 November, available from <https://www.nytimes.com/2020/11/24/science/artificialintelligence-ai-gpt3.html>, accessed on 10th May 2023.

¹¹⁷ Dylan Loeb McClain, 2006, *Once Again, Machine Beats Human Champion at Chess*, The New York Times, 5 December, available from <https://www.nytimes.com/2006/12/05/crosswords/chess/05cndchess.html>, accessed on 10th May 2023.

¹¹⁸ WIPO Secretariat, *Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence*, para 12, Document code WIPO/IP/AI/2/GE/20/1 REV, 21 May 2020, available from https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_2_ge_20/wipo_ip_ai_2_ge_20_1_rev.pdf, accessed on 10th May 2023.

protection? If they are registered under the copyright regime, who will be the owner of those works? Can ownership be awarded to AI, or can it be transferred to the developer of AI's programmer or the end-user of the technology? If there is a case of infringement, how will AI's liability be determined? Will any moral rights be granted to AI?¹¹⁹

Furthermore, if these difficulties are resolved, how will the data from which AI learns be secured? It is important to consider various regulatory and governance mechanisms as the fast pace of change in AI technology demands a proactive approach. This study aims to discuss the challenges that arise due to the advancement of AI in the area of intellectual property, specifically in the domain of copyright law.

4.2 THE ORIGINALITY CONTROVERSY

Copyright law stipulates that the 'originality' of a literary, artistic, or musical work is a fundamental requirement for copyright protection.¹²⁰ This entails that the work must not be a copy of another work, and the idea must originate from the author, aligning with the Romantic notion of authorship, where the author is the source of a work. In essence, the term "author" pertains to the individual who creates or produces a work. However, the question of the origin of AI-produced creations remains critical. It begs the question of whether the intelligent agent is the source of 'originality' or whether sufficient effort was invested in the creation of the AI-produced task.

If the intelligent agent was created with human input or insight from a team of researchers, the smart operative may not be considered the "source" of the work and can be identified as the "author." Therefore, it is more common to refer to the researchers as the authors in such a scenario. On the other hand, if an AI-created project is generated autonomously and entirely based on the will of the intelligent agent, then the machine is the source of the work. Similar to the Romantic author, who is considered the creator of his or her assignment, the machine is also regarded as the origin of the work it produces.

The author's personality is reflected in the subjective choices they make when constructing a work. This self-will may also create an intelligent agent's "personality"

¹¹⁹ Kay Firth-Butterfield, WEF, WIPO (2019). *Key issues arising from AI and policy responses*, WIPO Technology Trends 2019: Ai. WIPO Publication, Geneva, Switzerland, p.120, ISBN: 978-92-805- 3007-0, available from https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf, accessed on 15th May 2023.

¹²⁰ University of London Press Ltd v University Tutorial Press Ltd [1916] 2 Ch 601, 608

if it acts independently and makes all decisions about the works it produces. Although some of an intelligent agent's choices are instinctive and inexplicable, copyright law does not require "personality" as a prerequisite for copyright survival.¹²¹ The US Supreme Court ruled in *Feist Publications Inc vs. Rural Telephone Service Co.* that the requirement of 'originality' does not necessitate any undeniable particular insight from the author.¹²²

4.3 CAN A NON-HUMAN ENTITY BE AN 'AUTHOR'?

If an AI-produced work meets the requirement of originality, can the non-human intelligent agent be recognized as the "author"? The Romantic theory of authorship asserts that authors infuse a part of their personality into their creative work. Therefore, if a work has spirit, it reflects the author's personality. Conversely, the Lockean copyright theory holds that authors should be compensated for the effort and time they expend in creating works.¹²³ However, these theories presuppose that authors are human beings. The essential issue to address is whether the originality of a work can be traced back to a human being. The monkey selfie case¹²⁴ serves as a useful illustration of this matter. Naruto, a monkey, took several selfies with a camera belonging to Slater, a wildlife photographer. Slater and Wildlife Personalities Ltd. published a book with the photos, claiming copyright ownership. Naruto captured the images, but Slater and Wildlife Personalities Ltd. were listed as the copyright owners. On behalf of Naruto, PETA launched a copyright infringement lawsuit against Slater and Wildlife Personalities Ltd., but it was dismissed by the court. Animals cannot specifically bring claims of copyright infringement under the US Copyright Act. A number of the act's sections presuppose humanity and prohibit animals from authorship rights. Original works that are protected by copyright can only be produced by people. Only an author's original creative conceptions are protected by copyright, and the office will reject claims for works created by machines. However, this does not conclusively resolve the issue of authorship of AI-generated works. A US court has ruled that

¹²¹ Kim Treiger-Bar-Am, 'Kant on Copyright: Rights of Transformative Authorship' 25 *Cardozo Arts & Ent L J* 1059.

¹²² *Feist Publications Inc v. Rural Telephone Service Co.*, 499 US 340, 345 (1991).

¹²³ Margot E Kaminski, 'Authorship, Disrupted: AI Authors in Copyright and First Amendment Law' (2017) *UC Davis Law Review*, Vol 51, 589

¹²⁴ *Naruto v. Slater*, 888 F.3d 418 (9th Cir. 2018).

“dictation from a non-human source should not be a bar to copyright as a matter of law.”¹²⁵

4.4 INDIA’S COPYRIGHT PROTECTION FOR ARTIFICIAL INTELLIGENCE

The Indian Copyright Act of 1957¹²⁶ is the statute that governs intellectual property rights in India. Section 13 of this act specifies the categories of creative works that are entitled to legal protection. These include works in the fields of literature, theatre, music, and the arts more generally, as well as cinematograph films and sound recordings. According to the precedent that was set in the case “Eastern Book Company and Ors. vs. D.B. Modak and anr.”¹²⁷ the Act stipulates that in order for a piece of work to be qualified for protection, it must demonstrate a “modicum of creativity.” This indicates that the work must have at least some creative elements and cannot just be the product of skilled labour or hard effort alone.

The originality of a piece of work and whether or not it is eligible for copyright protection are evaluated in accordance with the “Sweat of the Brow” theory. This concept holds that protection may be awarded even if an idea is not original, as long as the entire work is not copied, and it is developed via the author’s labour. In other words, protection can be granted even if the idea is not unique.¹²⁸ However, the current legal system does not cover works made by non-human entities such as AI since it does not recognise their authorship.¹²⁹

The AI-generated works have the ability to produce a substantial volume of work quickly, and because they are original, they might be protected by copyright. It is possible to consider that the “programming and parameters on which such AI actually compiles and creates the work” satisfy the condition of “skill and judgement” in originality. However, the issue of who wrote AI-generated works is still up for debate. Even though humans must be involved in AI-assisted projects, no author can claim

¹²⁵ Robert C Denicola, ‘*Ex Machina: Copyright Protection for Computer-Generated Works*’ 69 Rutgers U L Rev 251 (2016), 280-281

¹²⁶ The Indian Copyright Act, 1957, No.14, Acts of Parliament, 1957, Sec 13.

¹²⁷ Appeal (civil) 6472 of 2004

¹²⁸ Eastern Book Company & Ors vs D.B. Modak & Anr (2007) Appeal (civil) 6472 of 2004

¹²⁹ Section 2(d) ‘author’ means, -“(vi) in relation to any literary, dramatic, musical or artistic work which is computer generated, the person who causes the work to be created;”

copyright protection when the work was entirely created by AI without their help. More research on this global problem is required.

The presence of copyright protection inspires authors to create innovative, original works by applying their skills, diligence, and conviction. However, granting AI authorship rights and providing AI-generated works with the same copyright protection as human-created works could lead to a confusion between “human creativity” and “machine creativity.” Long-term, this might limit human innovation because AI might come to be valued more highly than human creativity.

Considering AI as an author of AI-generated works raises a number of questions. Such works could be flawed, use harmful or biased language, or have unfavourable effects like promoting violence or defamation. Given that AI is not yet considered a person, determining its legal and criminal culpability may be difficult. This might lead to the removal of such work or possibly the outright ban of AI software. However, the harm might already have been done and be irreversible at that point.

The “imprint of the author’s personality” is a crucial prerequisite for works to be recognised as having been written by a person in civil law nations like Germany, France, and Spain. The authorship of AI-generated works shouldn’t be assigned to AI because it lacks personality. Giving AI legal standing would entail giving it the ability to form contracts with other people, legal obligations, and legal liability. Additionally, it should be able “to sue and be sued” in accordance with the law. The majority of nations oppose giving AI legal status.

On the other hand, the European Parliament only recently adopted a resolution that calls for “autonomous robots” to be given the legal character of “electronic persons” in order to protect their rights to intellectual property. In addition, the “SACEM, France and Luxembourg author’s right society” has legally acknowledged AIVA Technologies’ music-composing AI as a composer, granting it the ability to publish music and collect royalties. This opens up new possibilities for the use of AI in the music industry. In 2017, the artificial intelligence humanoid robot known as Sophia was granted citizenship in Saudi Arabia.¹³⁰

¹³⁰ Anthony Cuthbertson, “Robots will have Civil Rights by 2045, Claims Creator of ‘I will Destroy Humans’ Android”, Independent UK, May 25, 2018, available at: <https://www.independent.co.uk/life->

In spite of the fact that the TRIPs Agreement does not mandate it, many countries' copyright laws provide the author moral rights in addition to the legal protections afforded to them. These moral rights include the right of paternity, which protects the author's right to be associated with their work, and the right of integrity, which entitles the author to compensation in the event that the work is changed or twisted in a manner that is detrimental to the author's reputation. Both of these rights were established to protect the author's right to be identified with their work. By virtue of moral rights, which are generally regarded as the author's works' defining characteristics, the author has the legal authority to uphold, protect, and cultivate his or her own creations.

The duration of copyright protection for AI-generated works is one of the most urgent challenges in the field of artificial intelligence (AI) and copyright. The AI can produce an infinite amount of works while humans have a finite lifespan and become tired while creating because they are immortal.¹³¹ As a result, extending copyright protection to AI-generated works is debatable, with some experts contending that it is ambiguous and debatable. Additionally, if the same inputs and models are used each time, the output produced by AI will be the same, casting doubt on the originality and inventiveness of the works.

Additionally, it is difficult for AI to bargain payments and enforce the rights that authors have under copyright law. There are further difficulties associated with naming AI as the creator of the work, which might not be easily overcome. Given that AI incurs no costs in producing the work and may produce an infinite number of iterations without extra resources, some experts argue that AI-generated works should be released into the public domain without authorship.¹³²

If AI-generated works are not protected, it might be disastrous for businesses who have substantially invested in AI systems. It might result in the unlicensed commercialization of these works, putting businesses that made investments in the creation of the AI system up against one another. In order to incentivize AI programmers and businesses

style/gadgetsand-tech/news/robots-civil-rights-android-artificial-intelligence-2045-destroy-humans-sophia-singularitya8367331.html visited on 15th May 2023.

¹³¹ Sik Cheng Peng, "Artificial Intelligence and Copyright: The Author's Conundrum", WIPO-WTO Colloquium Papers, 181 (2018).

¹³² Ayush Pokhriyal and Vasu Gupta, "Artificial Intelligence Generated Works under Copyright Law", 6 (2)NLUJ Law Review 116 (2020).

to continue funding research and development projects linked to AI, some type of protection may be needed.¹³³

In a wide range of disciplines, including music, art, and literature, artificial intelligence (AI) has numerous uses. A system that is already included in the software programme enables it to process and analyse data and information either autonomously or under the coder's supervision. In the case of music, art, and literature, the coders set the parameters within which the AI functions, and the AI actually completes the piece. These inputs are processed by the AI, which then bases new works on them. For instance, in 2016 an AI created a 3-D painting dubbed "New Rembrandt" after studying many works by the renowned artist. Another illustration is the song "Daddy's Car," which Google's AI created after reading several books, and the poetry it created after reading many books. Determining whether AI-generated works can be protected by copyright is essential given their rising popularity.¹³⁴

Regarding Indian jurisprudence on this particular topic, two subject matters are compared based on their overall assumption on third parties, which may be an accurate indicator for comparing two visual films or photos but not for comparing two computer programs. R.G. Anand¹³⁵ is a renowned expert on the subject, and the court examined the issue of copyright violations of two visual films. It is understandable that a 'look and feel' test could have been used to compare two video movies, photos, or any other visible mainstream press. However, applying the same test to software programs could have serious consequences as two software applications need to be dissected to examine the exact research topic of safeguard. In R.G. Anand's case, the court's main line of reasoning was based on past instances where the court's entire outlook was geared towards the examination of vibrantly colored imitations. The court's reasoning in R.G. Anand was employed in the case of *C. Cunniah and Company vs. Balraj and Company*,¹³⁶ where the similarity test was used to determine the degree of similarity between two images judged by the eye. The court concluded that a person looking at

¹³³ Pamela Samuelson, "Allocating Ownership Rights in Computer Generated Works" 47 *University of Pittsburgh Law Review* 1185 (1986).

¹³⁴ Jake Frankefield, *How Artificial Intelligence Works Investopedia* (2020), <https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp> visited on 15th May 2023.

¹³⁵ R.G Anand., AIR 1978 SC 1613

¹³⁶ AIR 1961Mad111.

the respondent's photo must feel that it is the appellant's picture, and the photo's differences and similarities are important in this respect.

In the matter of *K.R. Venugopalan Sarmav vs. Sangu Ganesan*, the same line of reasoning applies.¹³⁷ The court noted and applied the 'as a whole reception test' of two competing gestures to the observer's eyes once more. The extent of similarity between both the two pictures, as judged by the eye, has to be such that the person who looks at the respondents' pictures gets the impression that it is the appellant's photo. Only if a significant portion of the original image appears in the procreation can it be said to be a version of the original. Pathak J. attempted to drill down into the contending gestures and evaluate the screenplays of the two visual films, *Hum Hindustani* and *New Delhi*. It appears that the plotlines outlined in the play storyline influenced the authors of the movie script to some extent. Based on the available data, there seems to be little reasonable suspicion that the authors of the film script were aware of the plot of the play. On the other hand, the depiction of the story in the film goes beyond the plot of the play.¹³⁸

The abstraction test utilized in the *Computer Associates International, Inc. v. Altai, Inc.*¹³⁹ lawsuit is comparable to the one employed in the analysis above, which also included attempts to penetrate a program. Following Pathak J.'s approach, it can be inferred that current legal precedents in this field do not have to be limited to the look and feel test and can delve into the substance of the copyrightable object by unveiling the corporate veil of overall appearance. Consequently, the present state of the law in India concerning the raised issues is a simulated "non-liquate," or a lack of law.

It is difficult for politicians to build a framework that tackles the aforementioned challenges due to the large quantity of data that is available as well as the quick rate at which technological advancements are occurring. A new piece of law that recognises AI as a legal entity is something that has been suggested as a possible solution. If artificial intelligence is recognised as a legal person for the purposes of copyright, then it has the potential to become the owner of the copyright. At first glance, this seems to be a solution to the issue of failing the "modicum of creativity" test since the copyright would now be granted to the company that provided the knowledge and judgement.

¹³⁷ 1972Cr.L.J.1098 (Madras),a tpara8.

¹³⁸ R.G.Anand, AIR 1978 SC 1613.

¹³⁹ 982 F.2d 693

Second, unlike works created by people, those produced by AI may be governed at the provincial level rather than the federal one. Works created by AI depend on large volumes of data, some of which may include information that infringes on intellectual property rights. Because of this, a distinct set of guidelines for intellectual property infringement may be applied to works produced by AI in order to encourage innovation and the generation of additional works generated by AI. Third, artificial intelligences should not be thought of as being completely apart from the people who created them or possess them. It is not possible to hold the AIs liable for infringement if they are considered as independent legal entities since this would mean that they would be held responsible. As a consequence of this, artificial intelligences need to be seen as an extension of their developers for the purposes of copyright compensation and liability for data infringement. This not only guarantees that the money for the right to use the copyright goes to the appropriate owners, but it also acts as a drive for additional AI-generated works to be produced.

4.5 ARTIFICIAL INTELLIGENCE AND DATA PROTECTION

Due to the usage of machine learning techniques, which depend on data for training and validation, data is a crucial component of AI applications. The results of machine learning typically exhibit greater refinement and authenticity when more data is provided. AI programmes can produce creative works by learning from training data that may be valuable commercially and protected by copyright. This begs the questions of whether copyright infringement occurs when using such data for machine learning without the owner's consent and how such infringement might be enforced. Additionally, there are debates about whether a general exception to copyright law should be created for the use of data for machine learning or if it should only apply to non-profit user-generated content or research.¹⁴⁰

Depending on the national regulations of the country in question, the theory of fair use/dealing may be suitable in response to these queries. It might not be considered fair use or dealing if the AI-created work has reduced the economic advantage of the copyrighted work that was utilised for deep learning. If, on the other hand, a work is

¹⁴⁰ Karen Robinson, “*Copyrights in the Era of AI*”, Adobe Blog, February 27, 2020, available at: <https://blog.adobe.com/en/publish/2020/02/27/copyrights-in-the-era-of-ai.html#gs.opdukw>, visited on 25th May 2023.

generated utilising an algorithm-powered tool that is wholly separate from the copyrighted information that is employed for machine learning, then it is quite improbable that the economic value of the latter would decrease. The rules governing intellectual property in Japan have recently been updated to allow exemptions for the use of protected works in machine learning.

To establish authorship in the case of creative works and inventorship in the case of inventions, a legislative framework on data protection is crucial. A similar regulation is required to foster innovation and creativity and to guarantee fair market competitiveness in society. In some nations, the choice or organisation of the material may also be protected by copyright or a sui generis statute. The Copyright Act of 1957 in India protects computer programmes, tables, and compilations, including computer databases, as literary works.¹⁴¹

4.6 RIGHTS TO OWNERSHIP OVER DATA/CREATION PRODUCED BY AN ARTIFICIAL INTELLIGENCE PROGRAMME

The primary and most urgent issue pertains to determining the copyright author in instances where no human intervention is involved in creating a literary, dramatic, musical, or artistic work generated by computer technology. Section 2(d) of the relevant Act states that the person responsible for initiating the work's creation shall be deemed the copyright author during preliminary examination.

However, this provision falls short of meeting the requirements for situations where no "person" is involved in creating the work. In recent times, AI technology has produced creative and dramatic works in various fields, such as music and journalism. Since these works lack human authorship as defined by copyright laws, they may be considered free of copyright and can be used and reused without restrictions. Nevertheless, this poses a significant problem for corporations and companies that have invested vast sums in developing music-generating systems.

The use of AI to create music or assist musicians has been in practice for some time, and various technologies, such as Flow Machines, have been developed for this purpose. However, it remains unclear who should be granted authorship rights for such works when no human intervention is required to create them.

¹⁴¹ The Copyright Act of India 1957, s.2(o).

In the Infopaq decision, the European Union Court of Justice ruled that copyright protection could only be claimed for works in their original state, and the author's intellectual creation must be the source of originality. This implies that a human author is necessary for granting copyright protection to the work, as the essence of the original work should reflect the author's character.

Several countries, such as New Zealand, Ireland, New Zealand, Hong Kong (SAR) and the United Kingdom, have encountered similar challenges regarding copyright authorship in relation to computer-generated works. In section 9(3) of the UK Copyright Act, it is stated that the person who makes the necessary arrangements for the creation of the literary, dramatic, musical, or artistic work shall be deemed the author if the work is computer-generated. However, granting authorship to a programmer raises the issue of accountability. If an AI program is considered the author, any infringement committed by or on behalf of the program would fall into a legal grey area. Section 17 of the UK Copyright Act, which deals with the first copyright owner, does not address this issue.¹⁴²

Furthermore, the ownership and accountability of data fed into AI programs is another copyright-related concern. AI is an experience-driven technology that generates output based on data fed into it. The question arises as to who owns or is responsible for the data fed into an AI program and who should be held accountable if another computer program copies and uses the data. The current legislation focuses on the person who makes the necessary arrangements for the proper operation of the program. However, this approach may result in either under-protection or over-protection, depending on the role of the person in running the system. Therefore, the legal ambiguity in this area needs to be addressed, similar to the question of whether the pen maker or the writer should be held liable for any infringements committed with the pen.

4.6.1 APPLE PAGES SOFTWARE¹⁴³

Pages is an Apple software application that enables users to generate creative literature and other text-related outcomes. Unlike AI programs used for creative and literary

¹⁴² Dani Deahl, "How AI-Generated Music Is Changing the Way Hits Are Made" The Verge, available at: <https://www.theverge.com/2018/8/31/17777008/artificial-intelligence-taryn-southern-amper-music> last visited on 4th June 2023.

¹⁴³ Battle Royale (With Cheese): Microsoft Word Vs. Apple Pages Vs. Google Docs, available at <https://medium.com/swlh/battle-royale-with-cheese-microsoft-word-vs-apple-pages-vs-google-docs-1a9485741>, accessed on 4th June 2023.

works, the copyright ownership of each work created with Pages software belongs to the user, not Apple. However, the situation becomes unclear when it comes to AI programs. In the case of AI, a user’s involvement in the creative and innovative process may be limited to simply initiating the creation process by pressing a button, while the machine performs the rest of the creative and literary tasks. This kind of text-generating software has given rise to numerous copyright-related issues that have been resolved on a case-by-case basis in various jurisdictions.¹⁴⁴

One of the well-known cases in this regard is *Nova Productions vs. Mazooma Games*.¹⁴⁵ The Court of Appeal was tasked with determining the authorship of a computer game, and it concluded that the player’s input to the AI program “is not artistic in nature” and that it “does not involve any skill or labor of an artistic kind.” Hence, in a specific case, the ownership of AI-generated creative and literary output, or the data fed into AI programs through user action, may be determined by understanding the AI program’s workings.

4.7 ARTIFICIAL INTELLIGENCE AT WHOSE RISK?

The third concern on the list pertains to the level of control that a creator retains over their AI program. Unlike most computer programs, which execute actions only upon operator request, AI systems allow for direct communication between the third-party user and the system, bypassing the creator’s participation. In such cases, the program’s success cannot be attributed directly to the creator’s instructions. Determining the scope of authorship, control, and liability must be carried out on a case-by-case basis, taking into account not only the nature of the AI program but also the extent of involvement and intervention by various stakeholders.

The degree of human interference necessary to operate the program should guide the determination of culpability. Transparency and human oversight should be guiding principles in AI utilization. When AI is employed as part of human decision-making, it should function as expected and in the same way as human-driven actions. However,

¹⁴⁴Andrej Karpathy, “*The Unreasonable Effectiveness of Recurrent Neural Networks*”, available at: <http://karpathy.github.io/2015/05/21/rnn-effectiveness>, visited on 4th June 2023.

¹⁴⁵ [2007] EWCA Civ. 219.

when AI acts independently, disclosure of its operation should precede any other considerations, and human involvement should be required.¹⁴⁶

4.8. RULES OF FIRST PUBLICATION IN INDIA

Section 13 of the Copyright Act requires that a work must be published in India to be protected under the Act. While computer programmes are developed at all levels, AI development at the local level is still in its early stages. As a result, many industries in India, such as healthcare and education, rely on AI-driven programmes imported from other countries. However, the issue of security remains a significant concern. The question remains as to what level of protection the Indian copyright system can provide for such programmes. If AI-driven programmes developed in India are prevented from being eligible for copyright protection under Section 13, it would be a violation of India's global commitment to effectively protect the copyright of foreign materials, as well as various reciprocity agreements.¹⁴⁷

4.9. COPYRIGHT VIOLATION

As discussed in earlier sections of this paper, the ability of an AI-driven programme to create also raises the possibility of infringement. Section 51 of the Copyright Act, which applies to "any person," addresses situations in which a copyright may be infringed. However, a self-contained AI programme is neither biological nor legal. This is particularly significant because AI has now evolved into an entity that is as competent as a human in carrying out specific tasks and is thus capable of infringing on a wide range of rights. If the actions of an AI programme are copyrightable or contain trade secrets, there is no reason to prevent it from performing the same tasks as humans. In such a scenario, any act of infringement committed by a self-contained computer programme would lack remedies, rendering India's modern intellectual property regime ineffective.

4.10. CONCERNS ABOUT EFFECTIVENESS IN AI-BASED COMPUTER SOFTWARE

Based on the tests of infringement among computer software mentioned earlier, substantial similarity is often considered as the basis for determining infringement and

¹⁴⁶ Yavar Bathaee, "The Artificial Intelligence Black Box and the Failure of Intent and Causation" 31:2 *Harvard Journal of Law Technology* (2018).

¹⁴⁷ The Copyright Act, 1957(14 of 1957), s.13.Works in which copyright subsists.

can be determined through various tests. It has been established that in the case of computer programs, elements driven purely by efficiency will not be protected as this would hinder progress and creative thinking. The fundamental algorithm on which AI-driven programs are built is the same. In such a case, what would constitute the protectable core of a program? Can it be regarded as the fundamental basis of AI, which is an essential element for efficiency but has been rendered unprotectable due to the potentially disastrous consequences of protecting it for future advancement?

CHAPTER 5

IP AND AI: QUESTION OF INCLUSION AND EXCLUSION

5.1. INTRODUCTION

Artificial intelligence (AI) presents a challenge to human rights, raising questions about the fundamental assumptions upon which civil liberties are built. These assumptions stem from the belief in the hierarchical superiority of humanity over other life forms, leading to differing levels of protection. However, the emergence of non-traditional entities that possess self-awareness, cognitive abilities, and potentially moral reasoning challenges these assumptions. While this scenario may be beyond our current comprehension and may never materialize, the rapid growth of AI and networked AI is already making its presence felt across all aspects of life of the human.

AI threatens human autonomy, abilities, and capacities in addition to improving human capabilities. As AI systems advance, they gain the ability to make decisions, solve complex problems, recognize intricate patterns, and interpret language. While this can result in time savings, cost-effectiveness, accuracy, and improved customer interactions, it also raises concerns about losing the human touch.

Hans Jonas, in his writings from nearly 30 years ago, highlighted the bombing of Hiroshima and the subsequent nuclear arms race as a catalyst for reflective thinking on the role of technology in human existence. Nuclear energy was initially celebrated as a cleaner and more reliable energy source for the future but brought with it destructive power that posed significant risks to civilization and life on Earth.¹⁴⁸ In response, humanity chose to handle militarized nuclear energy responsibly rather than using it as a primary recourse.¹⁴⁹

Although the effects of AI development are not as immediate and disastrous as those of nuclear weapons, their growing prevalence has sparked both great interest and grave worries. On the one hand, some see deep learning as a panacea and the final answer to humanity's problems, imagining a world in which complex medical issues can be

¹⁴⁸ Hans Jonas, *Pour une éthique du future*, available at <https://translate.google.com/translate?hl=en&sl=fr&u=https://www.cairn.info/revue-archives-de-philosophie-2016-3-page-523.htm&prev=search&pto=aue>, accessed on 9th June 2023.

¹⁴⁹ “*Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion*” (1996), ICJ Rep 226. Available at <https://www.icj-cij.org/en/case/95>, accessed on 9th June 2023.

quickly solved, electric self-driving cars reduce traffic congestion and pollution, and menial labour is rendered obsolete.¹⁵⁰ On the other side, powerful individuals like the late Stephen Hawking and Elon Musk have issued dire cautions about the existential threat that AI poses. Given the potential effects of AI, these opposing viewpoints, both hopeful and pessimistic, deserve careful examination.¹⁵¹

Optimistic viewpoints emphasize the potential applications of AI in healthcare, including diagnosis, treatment, and improving the well-being of senior citizens. They also highlight AI's role in analyzing vast amounts of data, ranging from individual genomes to nutrition, which may inform future public programs. Additionally, experts anticipate that machine learning will facilitate much-needed reforms in education.

Overall, the implications of AI are significant and warrant careful evaluation, considering both the positive and negative implications it holds for human rights and society at large.

5.2 ARTIFICIAL INTELLIGENCE AND ITS EFFECT: EXPERT'S OPINION

A key question in 2030, says Sonia Katyal, Co-Director of the Berkeley Centre for Law and Technology and representative of the US Commerce Department's Digital Economy Board of Advisors, is how the public's understanding and use of artificial intelligence will affect the development of individual rights. Our long-held convictions about everyone deserving an equal shot at success are being tested as we enter this new AI age. How far we go in resolving these problems today will decide who gets what out of this new paradigm and who has to keep struggling.¹⁵²

AI and associated technologies have already exhibited superhuman powers in a variety of disciplines, as Erik Brynjolfsson, director of MIT's Initiative on the Digital Economy and author of "Machine, Platform, Crowd: Harnessing Our Digital Future," explains. Their potential is projected to expand substantially by the year 2030. Humans, Brynjolfsson argues, can tap into this potential for good. We may, for instance, strive to eliminate global poverty, lessen the prevalence of disease, and provide high-quality

¹⁵⁰ Catherine Clifford, "Elon Musk: 'Mark my words—A.I. is far more dangerous than nukes'" (13 March 2018), available at <https://www.cnbc.com/2018/03/13/elon-musk-at-sxsw-a-i-is-more-dangerous-than-nuclear-weapons.html>, accessed on 9th June 2023.

¹⁵¹ Arjun Kharpal, "Stephen Hawking says A.I. could be 'worst event in the history of our civilization'" (6 November 2017), available at <https://www.cnbc.com/2017/11/06/stephen-hawking-ai-could-be-worst-event-in-civilization.html>, accessed on 9th June 2023.

¹⁵² Sonia Katyal, "Private Accountability in the age of artificial intelligence" 54, UCLA (2019), p 66.

education to the vast majority of the world's population. On the other hand, he warns that AI and machine learning have the potential to amplify existing inequalities in wealth and power, marginalising large segments of the population and fueling the creation of lethal weapons. The solution is to actively shape technology so that it reflects our values; this is an obligation shared by governments, corporations, universities, and individuals.¹⁵³

Judith Donath, author of “The Social Machine: Designs for Living Online” and faculty fellow at Harvard University’s Berkman Klein Centre for Internet & Society, predicts that by the year 2030, bots—highly intelligent programmes that interact with us in human-like ways—will play a crucial role in social scenarios. Homework help and family meals will both benefit from the presence of bots in the home. Office meetings will soon be presided over by robots. When it comes to one’s mental health, bots will play a pivotal role by offering advice on anything from wardrobe selection to potential romantic interests. There will be little to no distinguishing features between humans and robots. The voices, looks, and actions of bots will be indistinguishable from those of humans, whether via computer displays, predictive interfaces, or even genuine robotic systems. We will depend heavily on automated systems to maintain our online and augmented reality personas, as well as to produce our writings for us. Bots will be more effective at enticing and convincing us than people since they will have access to more personal data. They won’t be limited by feelings, but rather mimic them. Since our interests will align with theirs, people will assume that they are valuable partners. However, they ultimately serve the interests of those who control them, such as lawmakers who, like their ancestors before them, utilise them to manipulate public opinion and product manufacturers who exploit them for marketing reasons.¹⁵⁴

In conclusion, the insights provided by these experts illuminate the possible effects of AI on individual rights and on society as a whole, and they encourage us to develop and align AI technology with our fundamental principles.

“The existing social safety net structures in the United States and many other countries worldwide were not designed to accommodate the transition to AI,” said Amy Webb,

¹⁵³ Nick Johnson, “*Fixing the AI skills shortage*”, <http://ide.mit.edu/news-blog/blog/fixing-ai-skills-shortage-interview-erik-brynjolfsson>. Accessed on 9th June 2023.

¹⁵⁴ Janna Anderson & Lee Rainie, “*Artificial intelligence and the future of humans*”, <https://www.pewresearch.org/internet/2018/12/10/artificial-intelligence-and-the-future-of-humans>. Accessed on 9th June 2023.

professor of strategic foresight at New York University and founding member of the Future Today Institute. This progression towards AI is expected to take place during the next fifty years. A new hybrid-skilled workforce will be needed to undertake previously unimaginable tasks as we go further into the third age of computing and AI technologies become more integrated into every industry. We'll need farmers who are savvy with big data, doctors who can treat patients with the help of robots, and engineers who understand biology. Since AI is capable of learning new processes, structures, and approaches every few years, it is important that we update our curriculum to reflect this rapid pace of change. The need for people with these talents will emerge faster than our workforce sectors, educational institutions, and training programmes expect. It's important to look at the past from more than simply the present, and to remember the social turmoil that resulted from widespread technical underemployment. We have to confront the unsettling possibility that a large number of people may be rendered permanently jobless as a direct result of artificial intelligence. As with the radical changes seen during and after the Industrialization era, the Baby Boomer generation and the oldest members of Generation X, especially those whose jobs can be replaced by robots, may struggle to reskill for other occupations without a significant investment of time and effort.¹⁵⁵

Management professor at the University of Notre Dame James Scofield O'Rourke argues that the effect of an idea's creativity has always depended on how that idea is put to use. It's the same with AI and other forms of cutting-edge technology. High explosives, internal combustion, and nuclear technologies have all had both positive and negative applications throughout history. Brutus, the fault is not in the heavens but with us, because we manage these instruments of destruction.¹⁵⁶

Humans and AI robots vary in their cognitive abilities, which include things like reasoning, learning, independent problem solving, decision making, and advisory functions. Thanks to advancements in vast data collection, analysis, and utilisation, as well as increasing processing power and computing capabilities of AI neural networks and deep machine learning, we have seen the birth of mathematical models that

¹⁵⁵ "Emerging technologies 2019: Future of AI with Amy Webb", <https://www.aitrends.com/emerging-technologies-2019-future-of-ai-with-amy-webb>. Accessed on 9th June 2023.

¹⁵⁶ Janna Anderson & Lee Rainie, "Artificial intelligence and the future of humans", <https://www.pewresearch.org/internet/2018/12/10/artificial-intelligence-and-the-future-of-humans>, accessed on 10th June 2023.

resemble human cognitive processes and analyses. The improvement in human well-being brought about by AI is undeniable. However, the ease with which humans can utilise technology has given rise to concerns that ordinary people may be rendered obsolete by AI-driven machines, a hypothesis known as the “Technological Singularity.” The integration of technological and biological systems is predicted to usher in a new age of superhuman intellect.

5.3. HUMAN INTELLIGENCE VS. ARTIFICIAL INTELLIGENCE

Deep machine learning and huge data are both used in the resilient algorithm that powers artificial intelligence (AI). It is essential to evaluate the many facets, capacities, and features of these machines in accordance with current social viewpoints and potential future expansions when integrating AI machines with conventional human capabilities and decision-making processes. Due to the fact that their algorithms are created to determine and make judgements, AI-assisted machines set themselves apart from general-purpose machines. In order to assure widespread adoption of AI systems in fields relevant to human usefulness, it is crucial to evaluate their capability in respect to attributes like intentionality, intelligence, and adaptability.

AI is defined as systems that react to stimuli in a way that is similar to how humans typically react, taking into account human faculties for thought, reasoning, and intention. According to studies, these software solutions make decisions that generally call for human intelligence skills, helping people anticipate and deal with possible problems in a deliberate, intelligent, and adaptive way.¹⁵⁷

4.3.1. Absence of Accident Real-time events frequently affect people’s comfort and convenience. AI machines are distinct from passive machines, which provide fixed and preset outputs. In order to direct them in a way that benefits society and confirms the AI system’s objective, it is required to first examine the inputs, algorithms, and real-time data returns.

4.3.2. Intuition Software developers analyse pertinent and related data using data mining and machine learning to address certain problems. With regard to data analysis and use, the AI machine’s intelligence level is essential. An effective algorithm that makes good use of the gathered data is essential to the intelligence of AI. Unstructured

¹⁵⁷ Supra Note 152.

text data from various Internet of Things sources, digital photographs, satellite photos, and human sensory inputs are typical sources of raw data. Future AI systems will need to be intelligent enough to process raw data efficiently.¹⁵⁸

4.3.3 Flexibility A number of variables affect how adaptable AI computers are. For instance, it could be necessary to limit or forbid human movement in isolation units where COVID-19 patients are receiving treatment. For such operations, sophisticated and suitable algorithms based on patient movement and requirements are required. Various sensors collect data and feed it into the system. Artificial intelligence-assisted systems should be able to successfully adapt to these new obstacles that humans are facing with the use of real-time dashboards and visual displays.¹⁵⁹

5.4. ARTIFICIAL INTELLIGENCE THAT IS BOTH HELPFUL AND HARMFUL

There are positive and negative repercussions that might result from any major technical development. By improving illness detection and treatment, reshaping transportation and urban planning, and lessening the effects of global warming, AI has the potential to solve some of the world's most intractable problems. Artificial intelligence has spread beyond the realm of personal convenience and into many facets of human society.

5.4.1. BENEFICIAL ARTIFICIAL INTELLIGENCE

AI's impact on human rights will inevitably encompass positive and negative effects. The key to maintaining positive outcomes lies in human control over AI and aligning its development with human values. By supervising, monitoring, and educating AI systems, humans can harness AI's potential to enhance human well-being and safeguard their own rights.¹⁶⁰ This notion entails exerting nudging control over robots through both hard and soft paternalism, leading to a responsible computer program. Recently, AI has been employed in risk evaluation, credit ratings, diagnostic tools, regulatory standards, recruitment and selection processes, essay grading, and various

¹⁵⁸ Andrew McAfee and Erik Brynjolfsson, *Machine Platform Crowd: Harnessing Our Digital Future* (New York: Norton, 2017)

¹⁵⁹ Available at <https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/> accessed on 10th June 2023.

¹⁶⁰ Jeremy Rifkin, *the End of Work: The Decline of Global Labor Force and The Dawn of the Post-Market Era* 59-164 (1995).

other aspects of human existence.¹⁶¹ Elaborate applications include autonomous vehicles with self-driving capabilities, facial and voice recognition systems, cloud computing, e-commerce, manufacturing, agriculture, weather forecasting, military intelligence and weaponry, investment analysis, gaming, construction, design, legal research, healthcare, teaching assistance, smart scheduling and communication, novel writing, and music composition. These advancements have been made possible by leveraging big data, enhanced processing power, high-speed networks like 5G, open-source software and data, improved algorithms utilizing deep learning and reinforcement techniques, and accelerated personalization of consumer products and automation of production.¹⁶² Numerous fields, including science, technology, finance, health, law, and the environment, have experienced the benefits of AI, prompting significant investments in AI development and research by governments and multinational corporations. In all these domains, AI utilizes existing big data to exponentially enhance its accuracy, diagnostic capabilities, and analytical prowess through deep learning and reinforcement processes that involve learning from mistakes. In the realm of human rights, AI does not directly impact the legal framework governing human rights and does not require extensive modification or amendment of existing principles. However, it profoundly influences the effective implementation of human rights.¹⁶³ AI improves the ability to monitor and document war crimes and human rights abuses, employing multimedia, photographs, aerial imagery, and other vast datasets to track violations. Forensic investigations can also benefit significantly from AI, offering improved efficiency at a lower cost. AI also contributes to advancing sustainable development by monitoring and addressing environmental threats and challenges, including climate change, ocean and marine resources, forests, land, water, air quality, and biodiversity. By leveraging big data collected from various observation points, including satellites, AI assists in analyzing environmental sustainability opportunities and risks. In the context of the Fourth Industrial Revolution,¹⁶⁴ particularly with the integration of AI, systems are capable of sensing their environment, thinking, learning,

¹⁶¹ Jason Borenstein & Ron Arkin, *Robotic Nudges: The Ethics of Engineering a More Socially Just Human Being*, 22 SCI. ENG'G ETHICS 34-35 (2016).

¹⁶² *The 10 Best Examples Of How Companies Use Artificial Intelligence In Practice*, FORBES, available at <https://www.forbes.com/sites/bernardmarr/2019/12/09/the-10-best-examples-of-how-companies-use-artificial-intelligence-in-practice/?sh=3386c5237978>, accessed on 10th June 2023.

¹⁶³ Steven Livingston & Mathias Risse, *The Future Impact of Artificial Intelligence on Humans and Human Rights*, 33 ETHICS & INT'L. AFFAIRS 141, 141-58 (2019)

¹⁶⁴ *Fourth Industrial Revolution*, World Economic Forum, available at <https://www.weforum.org/focus/fourth-industrial-revolution>, accessed on 10th June 2023.

and acting in accordance with programmed objectives. AI enables better analysis, forecasting, and management of climate change with increased speed. By utilizing models capable of resolving complex equations and heuristics to predict weather conditions, AI can run algorithms and process equations more efficiently, reducing energy consumption and dependence on supercomputers. Public agencies like NASA and private entities such as Microsoft and IBM have already embraced AI to enhance climate change monitoring.¹⁶⁵ AI-enhanced models and deep reinforcement learning techniques will enhance the processing of vast climate data, ultimately bolstering climate resilience. Furthermore, AI contributes to the efficiency and predictability of renewable energy sources like solar power, leading to a reduced environmental footprint. Autonomous vehicles assisted by AI technology and powered by electric or solar batteries, such as Waymo,¹⁶⁶ contribute to emission reduction efforts and combat climate change. Companies like Tesla, BMW, and GM are poised to manufacture self-driving electric cars with innovative designs by 2021, further reducing the demand for gasoline and hybrid vehicles. The pace of replacement is expected to accelerate, particularly with the expansion of Tesla's production through Giga factories in America, China, and Germany. In addition to government tax credits for electric car purchases, ambitious plans are being developed to transition to electric vehicles on a significant scale by 2030 to 2035.¹⁶⁷

Moreover, self-driving cars with shared ownership and robotaxis have the potential to decrease the number of vehicles on the roads, contributing to emissions reduction. The development of smart cities, facilitated by the Internet of Things (IoT), presents an opportunity to create efficiently connected networks of autonomous vehicles, enhancing environmental sustainability efforts. Through AI and big data, a smart city can monitor autonomous vehicles, energy and water consumption, transportation systems, pollution levels, and weather conditions with high accuracy and efficiency.

¹⁶⁵ Mark Latonero, *Governing Artificial Intelligence: Upholding Human Rights & Dignity*, available at https://static1.squarespace.com/static/5d9cd746f868246584955686/t/608312af2d46c62193598497/1619202735_993/lee-artificial-intelligence-and-human-rights-four-realms-of-discussion-research-and-annotated-bibliography-spring-2021-rutgers-ilhrj.pdf, accessed on 10th June 2023.

¹⁶⁶ WAYMO, <https://waymo.com/>, accessed on 11th June 2023.

¹⁶⁷ 146 EU to target 30 million electric cars by 2030 – draft (Dec. 4, 2020), <https://www.reuters.com/article/us-climate-change-eu-transport/eu-to-target-30-million-electriccars-by-2030-draft-idUSKBN28E2KM>; China plans to phase out conventional gas-burning cars by 2035, <https://asia.nikkei.com/Business/Automobiles/China-plans-to-phase-out-conventionalgas-burning-cars-by-2035>. Accessed on 11th June 2023.

This data-driven approach enables civic leaders to make informed decisions regarding the sustainable development of their cities.¹⁶⁸

AI, in conjunction with IoT, also has the potential to revolutionize agricultural production and supply by improving the management and monitoring of factors such as diseases, insects, fertilizers, water, soil, and weather throughout the planting and harvesting cycles. AI can enhance the management of water quality, quantity, and access, thereby improving the conditions for human rights related to development, health, and water resources.

Furthermore, AI has the capacity to amplify efforts to increase transparency and accountability in many countries. With increased knowledge and data availability, corrupt and populist officials can be exposed and removed from positions of power. While the adoption and application of AI to political and governmental decisions remain uncertain, it is a possibility for the future.

In conclusion, AI possesses immense potential to both benefit and impact society. Its statistical data analysis technologies have the capability to address significant challenges in various fields. By ensuring human control and aligning AI development with human values, positive outcomes can be achieved. AI's influence extends to human rights, environmental sustainability, renewable energy, transportation, agriculture, and governance. Through the utilization of big data, advanced algorithms, and IoT integration, AI can enhance monitoring, analysis, and decision-making processes, leading to a more sustainable and prosperous future.¹⁶⁹

3.5.2 CRIMINAL JUSTICE

Investigation, eyewitness accounts, and establishing the motive behind crimes are crucial elements in the field of criminal justice. However, the rise in sedentary lifestyles, significant disparities in social status, and the overall comfort-oriented nature of modern life have contributed to an increase in criminal activities. It is important to recognize that crimes are not natural occurrences, and through the utilization of advanced algorithms, big data mining, and machine learning, it becomes possible to

¹⁶⁸ Morteza Taiebat & Ming Xu, *Synergies of Four Emerging Technologies for Accelerated Adoption of Electric Vehicles: Shared Mobility, Wireless Charging, Vehicle-To-Grid, and Vehicle Automation*, 230 J. CLEANER PROD. 794 (2019)

¹⁶⁹ Luigi Atzori et al., *The Internet of Things: A Survey*, 54 COMPUT. NETWORKS 2787, (2010).

predict criminal characteristics and monitor societal patterns in order to effectively control criminal activities.¹⁷⁰

In the realm of security, various surveillance technologies such as fixed cameras, roaming surveillance cameras, and satellite monitoring generate vast amounts of data. This data needs to be stored and analyzed in order to develop robust systems that can effectively monitor criminal activities. The New York Police Department, for example, has implemented a geospatial modeling technique known as CompStat (Computer Statistics), an AI-assisted program that enables predictive mapping of future crime concentrations. By leveraging this technology and geographic information systems, law enforcement agencies can implement multi-level preventive measures to reduce crime rates and improve resource management. AI-assisted computers' main goal is to adopt a preventive and corrective strategy aimed at fostering a crime-free society, not just to identify criminals.

On an international level, organizations like Interpol combat human trafficking and child sexual abuse through the use of an effective database called the International Child Sexual Abuse Database (ICSEDB)¹⁷¹. This database stores detailed information on previous cases, allowing for the generation of sophisticated algorithms. The advantage of these systems is that they are free from biases, enabling the identification of actual criminals. In the future, criminal courts may become more reliant on machine assistance and automation to guide judges' decision-making processes based on a broader set of crime-related factors rather than solely focusing on the criminal.

5.4.3. HEALTH CARE

In the healthcare sector, advancements in the pharmaceutical industry and changes in lifestyle have led to increased life expectancies. AI-integrated diagnostic equipment has significantly aided doctors in the analysis and early prediction of diseases, thereby facilitating more effective treatment. Big data management and AI algorithms have been implemented by designers of medical equipment into diagnostic devices, improving illness analysis and prediction accuracy and dependability. Deep learning

¹⁷⁰ Jeff Asher and Rob Arthur, “*Inside the Algorithm that tries to Predict Gun Violence In Chicago*”, <https://www.nytimes.com/2017/06/13/upshot/what-an-algorithm-reveals-about-life-on-chicagos-high-risk-list.html>, accessed on 11th June 2023.

¹⁷¹ International Child Sexual Exploitation Data Base, <https://www.interpol.int/en/Crimes/Crimes-against-children/International-Child-Sexual-Exploita>, accessed on 11th June 2023.

systems enable computers to compare normal-looking objects with anomalies in the human body by analyzing millions of data points and images stored in neural networks. This application of AI is particularly beneficial in cases of congestive heart failure, where advanced predictions and proactive interventions can be made. With ongoing research and access to disease-specific data through artificial neural networks (ANN),¹⁷² it is foreseeable that interactive AI dashboards and robots may replace doctors and paramedical staff in the future. Leveraging extensive databases and real-time machine learning, the focus will shift towards preventive and predictive diagnostics, rather than solely relying on disease treatment. Currently, trained and programmed robots are being utilized in low-stress environments, devoid of human error and associated risks.

A notable example of AI implementation can be observed in the context of the COVID-19 pandemic. SSG Hospital in Vadodara, Gujarat, India, has deployed two robots that serve food and dispense medication in the COVID-19 ward, thereby minimizing human-to-human interaction. These indigenous robots are also capable of scanning body temperatures and screening patients within the ward. The hospital administration plans to install additional robots at the entrance for screening purposes. These robots operate for four hours at a time and require minimal operating skills while efficiently performing tasks akin to human workers.

In summary, AI has significant implications for various aspects of society, including criminal justice and healthcare. By harnessing advanced technologies such as algorithms, big data mining, and machine learning, it becomes possible to predict and monitor criminal activities, thereby enhancing the safety and quality of life for individuals. In the healthcare sector, AI-integrated diagnostic equipment enables early disease detection and personalized treatment approaches. As AI continues to evolve, we can anticipate a future where AI-based interactive dashboards and robots play a prominent role in healthcare, offering preventive and predictive diagnostics to improve overall well-being. An exemplary case can be seen in the current COVID-19 crisis, where robots are being employed in hospitals like Sir Sayajiro Gaekwad (SSG) Hospital in Vadodara, Gujarat, India. These robots not only assist with serving food and

¹⁷² Zeena Saifi, Victoria Brown and Tom Page, *AI and big data joins effort to predict deadly disease outbreaks*, available at <https://edition.cnn.com/2018/03/06/health/rainier-malloy-tomorrows-hero/index.html>, accessed on 11th June 2023.

medications, but they also conduct temperature screenings and patient monitoring, reducing the risk of human-to-human transmission.¹⁷³

Looking ahead, the integration of AI into criminal justice and healthcare systems presents tremendous opportunities. By leveraging advanced technologies, including algorithms, big data analysis, and machine learning, society can proactively address crime, improve resource allocation, and enhance overall security. Similarly, in healthcare, AI-equipped diagnostic equipment and predictive models offer the potential for early disease detection and personalized treatment plans, ultimately extending and improving the quality of human life.

As we continue to explore the possibilities and refine the applications of AI, it is crucial to ensure ethical considerations, fairness, and accountability. Transparent and unbiased AI systems are essential to prevent discrimination and uphold the principles of justice and equality. By embracing the potential of AI responsibly, we can forge a future where technology and humanity coexist harmoniously, creating a safer, healthier, and more prosperous society for all.

AI plays a crucial role in the early detection of cancer, providing valuable support to dermatologists, who undergo extensive training for over a decade to become experts in skin conditions. Stanford University researchers have conducted studies on AI machines, demonstrating that these devices can perform on par with, or even surpass, the classification accuracy of human dermatologists when trained with a dataset of 129,000 skin condition images, including melanoma and carcinomas. Deep learning algorithms are instrumental in achieving these outcomes.¹⁷⁴

In the field of medical imaging, companies like Merantix in Germany employ deep learning techniques to address medical challenges. For instance, their program utilizes computer tomography (CT) images to detect and label lymph nodes in the human body. By training the deep learning model with datasets of both normal and abnormal lymph nodes and analyzing millions of images, the accuracy of identifying cancerous lymph

¹⁷³ Robots deployed to serve COVID-19 patients in Vadodara hospital, <https://www.livemint.com>.

¹⁷⁴ Rasmus Rothe, “*Applying Deep learning to Real-World Problems*”, <https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world>, accessed on 11th June 2023.

nodes improves. This aids specialists in assessing the level of risk and predicting the progression of cancer.

The benefits of AI technologies extend beyond diagnosis and treatment. They may be able to foresee problems and provide funds for preventative measures like patient education, sensing, and proactive actions that keep people out of hospitals. As AI continues to advance, there is a foreseeable future where doctors and paramedical staff may be replaced by AI systems that utilize Artificial Neural Networks to categorize, diagnose, and prescribe treatments based on provided datasets. The progress in AI has astounded doctors and researchers alike.¹⁷⁵

Numerous studies have demonstrated the superiority of AI systems in various medical domains. For instance, a study comparing the accuracy of the best dermatologists with an AI system showed that the AI system outperformed the dermatologists in diagnosing skin conditions. Machine learning has also been utilized to predict the risk of cardiovascular diseases, while modern surgeries benefit from the precision and reliability of trained robots, eliminating human errors and stress responses. Additionally, the vast amount of data generated by modern DNA sequencing technologies enables the establishment of links between mutations and diseases, facilitating early diagnoses.

Robotic surgery, virtual nurses, and 24/7 Monitoring are just a few examples of the exciting applications of AI-based systems today. These advancements are reshaping the healthcare landscape, offering improved care and assistance to individuals with visual impairments. Image recognition technology assists visually impaired individuals in navigating both the digital realm and the physical world.¹⁷⁶

In summary, AI's contributions to healthcare are transforming various aspects, from accurate disease detection to personalized treatment plans and assistance for individuals with disabilities. These advancements hold immense potential for improving patient outcomes, optimizing resource allocation, and revolutionizing medical practices.¹⁷⁷

¹⁷⁵ Eric Horvitz, "Reflections on the status and future of Artificial intelligence", http://erichorvitz.com/Senate_Testimony_Eric_Horvitz.pdf, accessed on 11th June 2023.

¹⁷⁶ IBM's Watson is being used in hospitals around the world to help doctors diagnose and treat disease. Available at <https://www.ibm.com/watson/health/>, accessed on 11th June 2023.

¹⁷⁷ Seeing AI: An app for visually impaired people that narrates the world around you, available at <https://www.microsoft.com/en-us/garage/wall-of-fame/seeing-ai/>, accessed on 11th June 2023.

5.4.4. PREVENTING NATURAL DISASTERS, MITIGATING CLIMATE CHANGE, AS WELL AS PROTECTING WILDLIFE

Machine learning techniques are now being leveraged to enhance climate change models, responding to the growing significance of temperature increases on a global scale. Artificial intelligence (AI) plays a crucial role in prioritizing climate change research, enabling the forecasting of severe weather events and accurate predictions of weather extremes. Moreover, AI empowers scientists to effectively address and mitigate the impact of catastrophic events. It aids in identifying and apprehending poachers while also locating and capturing disease-spreading animals. These advancements highlight the potential of AI in environmental conservation and disaster response efforts.¹⁷⁸

5.4.5. SPEECH RECOGNITION

AI encompasses various facets, including planning, problem-solving, and voice recognition. Algorithms play a pivotal role in augmenting AI capabilities, allowing for comprehension and self-correction when necessary. It serves as a testament to human ingenuity, as intelligent machines have been programmed to carry out tasks on our behalf. Prominent examples of AI technologies in this domain include Alexa and Apple Siri. However, it is important to recognize that human intelligence remains paramount, and AI is ultimately designed to serve human convenience.

Contrary to exaggerated concerns, the evolution of AI does not pose a threat to job opportunities or trigger a world war. Such anxieties stem from unrealistic expectations and sensationalized depictions, akin to those found in Hollywood films. In reality, AI progress is occurring in measured strides, aligning with the practical demands of our world. Rather than displacing humans, AI opens up new avenues for career options and contributes to the advancement of society. It is imperative to approach AI development with a balanced perspective, acknowledging its potential while understanding its

¹⁷⁸ Hila Mehr, “*Artificial Intelligence for Citizen Services and Government*,” Ash Center for Democratic Governance and Innovation, Harvard Kennedy School, available at https://ash.harvard.edu/files/ash/files/artificial_intelligence_for_citizen_services.pdf, accessed on 11th June 2023.

limitations and embracing the collaborative synergy between human and artificial intelligence.¹⁷⁹

5.5. HARMFUL ARTIFICIAL INTELLIGENCE

AI has both positive and negative implications for human rights, with the negative effects being a prominent concern in contemporary discussions. The potential harm caused by AI necessitates the establishment of new laws and legal frameworks to address and regulate its adverse impacts. Presently, the discourse surrounding AI and human rights primarily focuses on humans as passive beneficiaries or victims, rather than recognizing AI as active entities entitled to their own rights and protection under international law. The impact of AI on human rights can vary, either enhancing or deteriorating their performance, and these effects are not uniformly distributed across society.¹⁸⁰

One inherent challenge, known as the “Garbage in, Garbage Out” problem, arises when humans knowingly or negligently train AI systems with biased data or design AI systems that perpetuate existing social prejudices.¹⁸¹ Moreover, AI systems operating under machine learning can produce unforeseen human rights outcomes that are difficult to comprehend or detect.

Negative consequences encompass infringements on privacy, diminished accountability, and embedded biases, which can undermine human dignity, democratic accountability, and free societies. For instance, government utilization of facial recognition technology as a surveillance tool raises concerns. Additionally, individuals may intentionally or unintentionally misuse AI, manipulating algorithms to discriminate against specific population groups, invade privacy, or even cause harm. Despite efforts to mitigate harm, such as employing differential privacy techniques, AI

¹⁷⁹ Jaikumar Vijayan, “Google Introduces AI powered Text to Speech for many Application Types”, <https://www.eweek.com/development/google-introduces-ai-powered-text-to-speech-for-many-application-types>, accessed on 11th June 2023.

¹⁸⁰ Raso, Filippo, Hannah Hilligoss, Vivek Krishnamurthy, Christopher Bavitz, and Kim Levin. 2018. *Artificial Intelligence & Human Rights: Opportunities & Risks*. Berkman Klein Center for Internet & Society Research Publication.

¹⁸¹ Rebecca Heilweil, *Why it matters that IBM is getting out of the facial recognition business*, VOX, available at <https://www.vox.com/recode/2020/6/10/21285658/ibm-facial-recognition-technology-bias-business>, accessed on 11th June 2023.

can still significantly impact individuals' privacy by making predictions about their intimate characteristics.¹⁸²

AI systems pose threats to individual autonomy, as they can exploit self-conscious processes through unfair tampering, deception, corraling, and conditioning. Data-driven decision-making in areas such as criminal sentencing, parole, social service eligibility, and employment decisions inevitably carries biases embedded within the data. In such cases, governments bear responsibility for upholding civil and human rights while ensuring democratic accountability.

The current COVID-19 pandemic serves as an example of exacerbated human rights violations, as AI-driven analysis and misuse of data can negatively impact the privacy and freedom of movement of affected population groups, particularly vulnerable minorities disproportionately affected by the pandemic.¹⁸³

Looking ahead, the potential development of Artificial General Intelligence (AGI), particularly in the form of killer robots, raises concerns about the autonomous production of detrimental outcomes, including the extinction or endangerment of humanity. In such scenarios, the focus on human dignity may no longer remain the primary consideration.

It is essential for policymakers, researchers, and stakeholders to navigate these complex issues surrounding AI and human rights, addressing biases, ensuring accountability, protecting privacy, and upholding fundamental rights in the face of evolving AI technologies.¹⁸⁴

5.5.1. DISPLACING WORKERS

India, like the rest of the world, is experiencing the far-reaching effects of the global AI revolution, including its impact on employment. According to a 2014 report by Mckinsey, the advancement of machine learning and natural language interfaces, such as speech recognition, has the potential to affect a substantial number of workers in

¹⁸² Frank McSherry & Kunal Talwar, *Mechanism Design via Differential Privacy*, 48th Annual IEEE Symposium on Foundations of Computer Science (FOCS'07), Providence, RI, 2007, 94-103.

¹⁸³ Matthew Scott, COVID-19 and Human Rights, *RAOUL WALLENBERG INST.*, available at <https://rwi.lu.se/covid-19-human-rights/>, accessed on 12th June 2023.

¹⁸⁴ Sonja S Hutchins et al., Protecting Vulnerable Populations from Pandemic Influenza in The United States: A Strategic Imperative, 99 AM. J. PUB. HEALTH 243 (2009), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4504371/>, accessed on 11th June 2023.

routine clerical, customer service, and sales roles, estimating a range of 6-8 million individuals currently employed in these positions. The significant scale of job displacement can have profound consequences on the financial stability of a large segment of the population, particularly those reliant on these wage-based occupations. This presents a notable challenge for India, a middle-income nation striving to uplift a significant portion of its population out of poverty.¹⁸⁵

The repercussions of automation are already being felt in India's renowned IT industry, indicating that the issue of job loss may exacerbate in the coming decades. This not only poses a challenge for individuals seeking employment but also raises concerns about the broader societal impact and the need for proactive measures to address the potential population crisis stemming from widespread job displacement

5.5.2. SOCIAL DISCRIMINATION

The caste system in India represents a long-standing hierarchical social structure that has unfortunately perpetuated discrimination in various subtle and hidden forms. This discrimination has manifested in unequal wages, limited employment opportunities, higher imprisonment rates, and restricted access to credit from banks. With the introduction of data-driven algorithms, the potential for these biases to be incorporated into AI systems has become a growing concern.

An analogous situation can be observed in the United States, where algorithms designed to calculate recidivism rates have faced scrutiny for potentially exhibiting racial biases. The inclusion of caste and religious markers within names and addresses further compounds the issue, as such information can easily influence data-driven algorithms utilized in employment application evaluations.¹⁸⁶

It is crucial to acknowledge that these algorithms can inadvertently perpetuate existing prejudices and discriminatory practices if they are not carefully designed and regularly scrutinized. Addressing these concerns necessitates a comprehensive understanding of

¹⁸⁵ Samanth Subramanian. 2017. *India Warily Eyes AI*. *MIT Technology Review* (October 2017). Available at- www.technologyreview.com/s/609118/india-warily-eyes-ai/, accessed on 8th June 2023.

¹⁸⁶ Julia Angwin, Jeff Larson, Surya Mattu, and Lauren Kirchner. 2017. *Machine Bias*. *Pro Publica* (2017), available at <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>, accessed on 11th June 2023.

the potential biases inherent in data sources and a commitment to developing AI systems that uphold principles of fairness and equality.¹⁸⁷

5.5.3. GENDER INEQUALITY

By 2017, India witnessed a significant surge in the number of individuals utilizing the Internet, with 420 million users accessing the web and 300 million specifically accessing it through mobile devices. Mobile phones have emerged as the predominant means of Internet connectivity, particularly in rural areas of India, where they constitute 60% of all Internet access. While the widespread adoption of mobile phones presents opportunities for the advancement of AI technologies, it is crucial to recognize that it may inadvertently contribute to the widening gender gap.¹⁸⁸

¹⁸⁷ Issie Lapowsky. 2017. *One State's Bail Reform Exposes the Promises and Pitfalls of Tech-Driven Justice*. *Wired* (2017), available at <https://www.wired.com/story/bail-reform-tech-justice/>, accessed on 12th June 2023.

¹⁸⁸ IMAI and Kantar IMRB. 2017. *Internet in India – 2016*. (2017), available at www.bestmediainfo.com/wp-content/uploads/2017/03/Internet-inIndia-2016.pdf, accessed on 12th June 2023.

CHAPTER 6

CONCLUSION & SUGGESTIONS

6.1. CONCLUSION

“We find ourselves at the dawn of the Fourth Industrial Revolution, a transformative era where emerging technologies are reshaping our lives and extending the reach of digitization in unprecedented and unforeseen ways”.¹⁸⁹

The era of skepticism surrounding AI now appears to be fading into the past. Over the past century, engagement with AI has consistently grown across various metrics, including the proliferation of startups specializing in the field, increased business investments, and heightened media exposure.¹⁹⁰ Virtually every major technology company now leverages artificial intelligence to accurately classify images and suggest personalized recommendations. Artificial intelligence (AI) has also found a home in the workplace, with legal practitioners using AI systems to foresee court judgements, respond to legal questions, and quickly analyse large volumes of documents.¹⁹¹ These computer systems, specifically designed to exhibit artificial intelligence, have unexpectedly garnered attention and acclaim for their notable successes, rather than being seen as disappointments.

The progress made in computer programming since its inception is truly remarkable. Modern computers possess the ability to simulate cognitive functions associated with the human mind, including learning and problem-solving.¹⁹² Artificial Intelligence (AI) can be understood as the intellectual capacity of a machine, leading to a widely held belief that computers are striving to attain human-like thinking and behavior. Renowned figures such as Stephen Hawking and Elon Musk express concerns about the potential future scenario in which computers surpass and replace humans.

¹⁸⁹ World Economic Forum, Available at <https://www.weforum.org/agenda/2016/01/what-is-the-fourth-industrial-revolution/>, accessed on 12th June 2023.

¹⁹⁰ Yoav Shoham et al., “AI Index: 2018 Annual Report” (December 2018), online: AI Index Steering Committee, Human Centered AI Initiative, Stanford University, available at <https://www.itworldcanada.com/ai/wp-content/uploads/2018/12/AI-Index-2018-Annual-Report.pdf>, accessed on 12th June 2023.

¹⁹¹ Richard Susskind, *Tomorrow’s Lawyers: An Introduction to Your Future*, Oxford University Press, 2017, pp 185- 187.

¹⁹² Russell, Stuart J.; Norvig, Peter (2009). *Artificial Intelligence: A Modern Approach* (3rd ed.). Upper Saddle River, New Jersey: Prentice Hall.

The quick development of AI research is exciting and unsettling at the same time. Many industries, including public transit, healthcare, banking, financial services, and law, are using machine learning and deep learning techniques more and more. The societal effects of AI have been noted, leading AI specialists to ask for greater involvement from the legal community in establishing rules, standards, and governance structures to minimise legal loopholes in the use of AI in commerce, administration, and daily life.

Artificial intelligence is not inherently good or bad; its impact can lead to increased efficiency for some individuals while potentially causing others to become overly reliant. As society grapples with rapid technological changes, it becomes essential to address AI's repercussions on intellectual property (IP) laws, considering the profound and far-reaching effects as AI continues to advance and diversify in its applications. This raises the question of whether already existing IP rights are appropriate or if new rights need to be drafted in order to sufficiently protect resources, works, and inventions produced by AI.

Artificial intelligence (AI) represents a groundbreaking innovation encompassing a range of cutting-edge technologies. The products of AI, including technological breakthroughs, applications, artistic creations, personal data, and other tangible and intangible assets, would typically be eligible for intellectual property protection if they were created by a human. However, the current intellectual property laws in many countries may not adequately address the issue of ownership when it comes to works independently generated by artificial intelligence.

When considering the challenges related to AI and intellectual property (IP), there are various scenarios to consider where AI generates, fully contributes to, or is employed in creating new products, works, and processes. In October 2018, Christie's New York made history by auctioning the first significant artwork created by artificial intelligence, which sold for an astonishing \$432,500, representing a staggering 4,320% increase from its high estimate of \$10,000.¹⁹³ These advancements in AI have given rise to software and hardware capable of engaging in "intellectual" creation and invention. Consequently, the field of Intellectual Property law has witnessed the emergence of intellectual creations that are not solely the product of human beings. Certain aspects

¹⁹³ *"Is artificial intelligence set to become art's next medium?"*, available at <https://www.christies.com/features/A-collaboration-between-two-artists-one-human-one-a-machine-9332-1.aspx>, accessed on 12th June 2023.

of patent and copyright frameworks pose challenges to AI-generated outcomes, as AI disrupts traditional notions of authorship and inventorship. Therefore, there is an urgent need for legal solutions to address the implications of this new technology. In the context of copyright and patent laws, Artificial Intelligence (AI) challenges the concept of the juristic person as the author or inventor, shifting the focus to the AI system itself.

When weighing the choices for securing the goods, works, and processes produced by AI, it is essential to analyse the reason for preserving intellectual property and if such protection is successfully ensured. This factor will affect the degree to which changes to IP legislation may be necessary to protect outcomes produced by AI. In order to encourage the production of intellectual works and encourage innovation across all industries, intellectual property rights have been developed. These rights are a way of making up for intangible labour results.

The advantages of promoting and preserving intellectual property are emphasised by the World Intellectual Property Organisation (WIPO).¹⁹⁴ It contends that the production and dissemination of ground-breaking works in the fields of technology and culture are essential to the advancement of humanity. The legal protection of these contemporary inventions promotes more innovation investment, resulting in economic growth, the creation of jobs, and improved quality of life. Hence, it is crucial to assess whether providing IP protection in the field of Artificial Intelligence will foster or hinder innovation. Failure to adapt IP laws to accommodate AI would render the entire IP framework ineffective.¹⁹⁵ AI will significantly impact nearly every aspect of intellectual property, particularly copyright and patents.

Algorithms, in and of themselves, are generally regarded as abstract systems lacking technological personhood, making it difficult for most jurisdictions to extend intellectual property protection to them unless they are manifested as tangible software. IP authorities in various countries have developed guidelines and proposals to encourage patent protection in the realm of information technology in response to technological advancements and increased applications. These guidelines clarify the

¹⁹⁴ World Intellectual Property Organization, available at https://www.wipo.int/edocs/pubdocs/en/intproperty/450/wipo_pub_450.pdf, accessed on 12th June 2023.

¹⁹⁵ Dinev, K. D. (2018). A Humanless World: *The Progressive Artificial Intelligence and its Impact on Intellectual Property*. Kent Law Review, 4.

patentability of algorithms, allowing them to be evaluated based on criteria such as novelty and enablement.

The issue of ownership, user rights, and authorship in relation to materials created by AI systems or through AI-assisted processes is a topic of significant interest. However, it is important to note that truly autonomous AI systems creating content independently are still rare at this stage of development, and widespread use of “independently acting” computers in society is a long way off. Nonetheless, this raises important questions regarding the patentability and copyrightability of creations and content developed with the assistance of AI systems. Existing Intellectual Property Rights (IPR) laws, which grant rights to legal persons, currently do not extend such protections to AI systems in most jurisdictions.

According to a report, the number of AI-related patent applications filed in the United States increased by nearly 500% from a decade ago, with a total of 9,605 applications filed in 2016. The United States, China, and Japan account for 74% of all published AI patents, with China leading the way. China also had half the number of AI-related industries compared to the United States, but surpassed other regions in terms of AI-related patent filings, including the Patent Cooperation Treaty (PCT), Europe, Japan, and Korea.

The development of cutting-edge legal and regulatory frameworks that successfully solve the issues raised by AI while maximising its positive effects is now being pursued by a number of parties and organisations. In a human-centric paradigm, it’s critical to acknowledge AI’s limits, including its ethical implications and societal and political effects.¹⁹⁶

When determining whether new and AI-specific regulations under IP laws are required, caution is required given that the law must change to keep up with technological progress. The addition of a new right would probably complicate the complex framework of IP rights that already exists. Numerous already-existing legal frameworks have shown themselves to be adaptable and technology-neutral in dealing with issues brought up by the advent of new technologies without necessitating substantial adjustments. Only when it is evident that current law falls short of appropriately

¹⁹⁶ Stanford Encyclopaedia of Philosophy, “*The Chinese Room Argument*”, available at <https://plato.stanford.edu/entries/chinese-room/>, accessed on 12th June 2023.

addressing AI-related challenges should modifications or additions to the law be explored. Instead of rushing to establish new IP rights at this time, governments should think about establishing legal frameworks or offering AI-driven interpretations of current laws to assure the protection of intellectual property rights relating to works that are enabled by and created by AI. When enacting new IP laws or amending existing ones, legislators must carefully weigh the interests of all significant parties while avoiding overprotection that can undermine the primary goal of IP protection.

It is important to recognise that technology develops quickly, and that by the time politicians address these challenges, AI may have advanced to the point where the actions made are no longer effective. Therefore, to address the issue of IP ownership and ensure uniformity between nations and IP rights, a worldwide agreement is required, ideally through an international treaty. Finding a mechanism that guarantees the rapid spread of new discoveries benefits all countries is crucial. The World Intellectual Property Organisation (WIPO) has recommended that policymakers adopt a legal and regulatory framework that permits unrestricted global cross-border data flows in order to unlock the enormous economic potential of the digital world for shared prosperity rather than establishing a new IP right. Clear and enforceable standards should be imposed in this situation instead of unreasonable data localisation requirements, emphasising the importance of international cooperation in reaching a settlement.¹⁹⁷

Although artificial intelligence is a reality everywhere, it is mainly recognised in a small number of nations, including the United States, England, and New Zealand. It is crucial that all parties to multilateral trade agreements, including the TRIPS agreement, acknowledge the significance of artificial intelligence and its effects.

Currently, copyright protection is attributed to the creator of an AI's efforts. However, this leaves a void in addressing accountability when the creator may not be aware of the AI's actions or be held liable or held accountable. To ensure a more practical approach for AI, measures should be taken to address this gap. For instance, provisions can be introduced to hold the AI system itself responsible, allowing for actions such as

¹⁹⁷ Thaddeus Burns, “*Regulating machine data: less is more for global growth*”, available at https://www.wipo.int/wipo_magazine/en/2017/06/article_0005.html, accessed on 12th June 2023.

disabling or restricting its usage. This would be a significant step towards protecting creators and discouraging malicious use or infringement of AI-generated content.

As AI-enabled processes become more prevalent, policymakers face the challenge of categorizing these processes as either inventors or inventions. The issue of security becomes increasingly urgent as these technologies are more widely utilized. By redefining the work-for-hire doctrine and expanding the scope of the employer-employee relationship to encompass non-human entities, legislation can better safeguard the work of authors and inventors in the future, particularly as Machine Learning assumes a larger role.

In conclusion, as the field of AI continues to advance, it is crucial for legal and regulatory frameworks to adapt in order to address the complex issues surrounding ownership, authorship, and intellectual property rights. While cautious deliberation is necessary to avoid overcomplicating the existing IP system, there is a need for proactive measures that strike a balance between protecting creators and fostering innovation. Global cooperation and international treaties can contribute to harmonizing IP laws across countries, ensuring consistency and maximizing the benefits of AI technology for all. By embracing a forward-thinking approach and anticipating future challenges, policymakers can establish a robust framework that promotes responsible AI development and supports the long-term interests of society as a whole.

The intersection of patent law and technology presents a unique challenge as it seeks to establish a harmonious connection between scientific advancements and legal frameworks. In the era of artificial intelligence (AI), the patent system encounters increasing complexities. Given the rapid pace of innovation, it is imperative for patent frameworks worldwide to re-evaluate their traditional norms.

To effectively address unforeseen advancements such as AI, it is crucial to strike a balance between national interests and the promotion of personal development within the patent structure. This necessitates a robust legal approach that drives significant changes for the benefit of the public at large. While some issues can be resolved within the existing patent law framework, it should not be assumed that future challenges can be adequately addressed using the same framework. Evaluating the legislative structure, akin to the patent system, demands sufficient data and resources to effectively manage AI-created innovations and their integration into the patent framework.

The regulatory aspects of patent law concerning AI carry substantial implications for innovation, the economy, and society. Given the rapid advancements in AI technology, it is essential for key stakeholders, including patent scholars and academics, to engage in meaningful dialogues to determine how the patent system can effectively foster innovation. However, it is equally important to implement measures that mitigate potential ethical and environmental consequences.

A critical examination of the current criteria for patent-eligible subject matter is warranted to assess its impact on AI and AI-driven innovations. If negative implications are identified, stakeholders must explore potential modifications to align the criteria with the primary goals of patent law. The patent system exists to encourage innovation, disseminate valuable information, and incentivize investment in infrastructure and constructive advancements.

The question of whether AI-generated inventions should be eligible for protection must be addressed considering both the positive and negative aspects of this technology. If AI-created inventions are deemed patentable, careful consideration must be given to determining the question of inventorship and whether AI systems should be recognized as inventors.

The existing liability laws do not adequately account for situations where patent infringement occurs autonomously due to AI actions. Clarity is needed regarding accountability and the assessment of liability in such scenarios. These complex issues demand careful and deliberate attention.

One potential solution to address the issue of authorship is to consider the work produced by an AI machine as part of the public domain. This solution, which carries minimal or no disadvantages, designates the machine itself as the author, as it lacks legal personality. Consequently, no rights are taken away from the machine since it possesses none to begin with. Additionally, copyright protection can be afforded to the programmer's code, ensuring adequate protection and compensation. Although the end-user cannot claim copyright over the work generated by the AI machine, they can modify it and create their own work, thereby obtaining copyright protection. Releasing AI-generated works into the public domain benefits society by providing access to artistic creations without compromising the rights of content creators.

It is worth noting that distinguishing between works created by machines and those created by humans poses challenges. Further discussions on this topic, including considerations of joint authorship, would be valuable.

A comprehensive exploration of originality in the context of AI-generated works is necessary to determine whether such works should be considered original or categorized as unoriginal copyrighted material, akin to films, audio recordings, telecasts, and typographical arrangements.

The notion of granting AI legal personality should be carefully examined and whether it equates to granting authorship rights. Scholars argue that for copyright protection to be extended to AI works, existing laws should be amended to perceive AI as a tool for creation rather than a creator in and of itself. In this case, authorship would be attributed to software developers, end-users, or owners who have legitimate claims to the artistic content. The determination of authorship, whether based on expertise, human labor, or mere investment, limits artistic endeavors to those influenced by a ‘human’ element, which is recognized in various jurisdictions. However, this proposed solution is short-sighted, lacks innovation, and fails to consider the broader impact of AI on society and the legal framework in the foreseeable future.

As intellectual property rights become increasingly important, the integration of AI into this domain further complicates matters. This calls for increased involvement of legislators to establish boundaries and regulations in this field. Currently, the future appears uncertain regarding the capabilities of AI and its impact on the intellectual property regime. AI can be a valuable ally or a formidable adversary, a companion or a sovereign entity. Proper regulation is crucial to avoid a situation where we are forced to choose between embracing or confronting it.

6.2 FINDINGS

The research findings can be summarized as follows:

1. It is recommended to recognize the inclusion of strong or super-intelligent devices that exhibit human-like behavior, actions, and learning capabilities within intellectual property (IP) law.

2. The pervasive adoption of AI in our society has transformed it into a problem-solving activity, demonstrating its potential as a game-changer. Consequently, existing IP laws need to adapt to this shift in focus.
3. The evolution of AI necessitates the evolution of patent and copyright laws. Protecting AI is akin to crafting fine wine, as it requires high-quality ingredients and time for development. Similarly, safeguarding AI warrants comparable considerations.
4. The utilization of AI technologies presents significant opportunities for advancing human rights in various sectors such as education and healthcare. However, careful attention must be given to potential issues where AI has the potential to undermine or violate human rights protections.

Based on these findings, it is evident that a re-evaluation of existing intellectual property laws is necessary.

6.3 SUGGESTIONS

Based on the study, the legislative, executive, judicial, academic, and other stakeholders, such as AI businesses and research institutions, are advised to debate and examine the following:

Only a few countries, notably the UK, USA, and New Zealand, recognised AI. Multilateral accords like TRIPS Agreement revisions may help AI gain worldwide acceptance.

Redefining Section 13's subject matter would bring AI-generated work within the Copyright Act. Section 13 of the Indian Copyright Act of 1957 protects an author's original literary, artistic, or dramatic work.

Humans are the sole creators, yet this is a myth. AI tasks disprove this.

“Artificial intelligence” needs a legal definition for copyright usage. This also distinguishes it from a computer. Due to their similarities, human-assisted AI is hard to distinguish from computers.

AI-generated works should be clearly legalised as computer-generated works. Section 2(d)(vi) of the Indian Copyright Act, 1957 grants authorship to the individual who

creates a computer-generated work. This provision defines “computer-generated work,” whereas the Act does not.

AI-generated work is copyrighted. It meets all copyright requirements.

Due to its lack of legal identity, AI-generated works cannot have authorship. The “doctrine of work made for hire” and co-authorship might grant the programmer and user or owner AI authorship.

AI inventors and programmers may own AI-created works under a new “idea made-for-hire” definition. This legal incentive would enrich AI developers, stimulate AI research and investment, and update the Indian Copyright Act.

The Indian Copyright Act, 1957 grants the AI programmer authorship. The programmer develops the AI that can make copyrighted works, therefore this is acceptable. Recognising and paying the programmer would stimulate AI development and investment.

Under the same conditions as Section 2(d)(vi), the AI user may likewise be granted authorship.

Section 17 states that authorship is a prerequisite to work ownership. “Work created for hire” and “shared authorship” establish ownership immediately. Thus, the AI’s developer, user, or owner owns its work. Section 17 of the 1957 Act makes the AI-generated work’s creator the author.

TRIPS and the Berne Convention do not include work ownership. To build national laws, these agreements should define ownership technically.

The Indian government should regularly evaluate and update copyright rules to reflect emerging technology. In the near future, machine learning will develop and AI devices will be able to manufacture things on their own, hence copyright legislation for AI-created work must be re-evaluated.

Considering AI and other technological advances, the Indian court should interpret applicable laws. Because if AI-generated works are not protected, it will promote the use of AI for undisclosed work.

To advertise AI-generated work, the programmer may enable a watermark or foot print. To separate human and AI labour. This watermark should be permanent.

The programmer can predict how his AI machine will be utilised and set its limits. Thus, users may have little control over settings and controls. A programmer-user agreement should prohibit this. The user's efforts, abilities, and judgements help create the work, therefore the legitimate owner can be determined. This agreement helps calculate AI-generated profits.

Following the above advice, AI-generated works may be protected under the Indian Copyright Act, 1957.

6.4. POSSIBLE SOLUTIONS

6.4.1 PUBLIC DOMAIN FOR ARTIFICIAL INTELLIGENCE-GENERATED OUTPUTS

In one scenario, intellectual property (IP) rights would not extend protection to creative works or inventions generated by independent AI without human involvement. Consequently, such works would become part of the public domain, which has been proposed as a potential benefit to society as a whole. The unique nature of AI-generated output signals renders the theories that justify patent and copyright safeguards irrelevant, as AI does not require compensation or incentives for its work. However, this solution is not entirely satisfactory, as “computer-generated works can be both useful and beneficial.” In cases where inventors seek protection, they may resort to trade secrets. Nonetheless, this approach may deter investment in technological advancements, potentially impeding research and progress.

6.4.2. THE CREATION OF A SUI GENERIS SYSTEM

A sui generis system can effectively address the challenges posed by AI-generated outputs. Unlike traditional IP rights, this tailored approach provides clarity and consistent remedies for protecting such works. When existing legal categories don't apply, an ad hoc rule can be devised, considering the unique characteristics of the subject matter. A sui generis regime, designed specifically for the subject matter it aims to protect, promotes growth and mitigates market distortions. This system has distinct features that differ from standard IP rights, including specific criteria for inclusion.

To address AI-generated outputs, a proposed sui generis system would employ a two-pronged strategy tailored to the type of AI involved. Category 1 would cover predictable AI systems guided by a natural person who qualifies as an author or

inventor, subject to copyright and patent regimes. Category 2 would encompass AI-generated outcomes that are unpredictably unexpected.

The rationale behind this sui generis system is to protect invested capital in AI technologies, encourage advancements, and stimulate innovative thinking. A robust and concise judicial system is necessary to ensure the protection of AI-generated outputs.

When it comes to AI-generated inventions, sui generis protection may be necessary as an alternative to traditional patent monopolies. The system should be tailored to the unique characteristics of the "inventor" and the generated subject matter. Drawing inspiration from the Australian patent system's "innovation patent" could be beneficial, as it protects incremental progress on existing systems with shorter market life. This system enables quicker and cost-effective patents for iterative advancements.

The key concept of the proposed system is that determining the author or inventor becomes irrelevant for AI-generated outputs. The AI itself (in category 2) would be considered the "mind" behind the creation, eliminating the need to identify a natural person as the author or inventor for copyright or patent protection. The owner of the AI machine should be recognized as the rights holder, considering the investments made into building and maintaining the AI system. This rationale applies to the sui generis system for AI-generated outcomes.

Determining the duration of protection for AI-generated outputs is challenging due to AI's ability to constantly reconfigure and alter. One solution is to provide a time frame between the periods granted to software and databases, such as ten years. This approach applies to both artistic and innovative output signals of AI and machine learning. Technological advancements justify a shorter protection period, balanced by a swift and cost-effective protection system.

The Parliamentary Standing Committee on Commerce's report on the "Review of the Intellectual Property Rights Regime in India" recommends reviewing existing legislations, such as the Patents Act, 1970, and the Copyright Act, 1957, to accommodate evolving technologies like AI and AI-related inventions. The need for timely evaluation of both statutes is highlighted by the current prohibition of patenting AI-induced inventions in India under Section 3(k) of the Indian Patent Act, 1970.

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