WIDENING THE BOUNDARIES OF TECHNOLOGY: IMPLICATIONS OF ARTIFICIAL INTELLIGENCE ON LAW AND SOCIETY

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ABSTRACT

John McCarty originally used the term "artificial intelligence" for the first time in 1956 at the Dartmouth Conference. It is identified as the fourth industrial revolution since it has had a substantial impact on many facets of human life and has widened the boundaries of use of technology. Due to artificial intelligence, a number of industries have undergone rapid revolution. By virtue of the use of outdated technology in the sector, there is currently minimal application of AI in the legal sector. Despite being recent, this increase in the use of artificial intelligence is seen in businesses across all industries, from start-ups to well-established organizations. The legal sector may prosper like other sectors have in recent years as a result of technological advancements and the introduction of artificial intelligence. It is significant to protect the intellectual property and that the business stakeholders should be aware of the key indicators to be taken into consideration in its application to artificial intelligence's innovations. In order to prevent and protect society from emerging concerns and to ensure that the Society is prepared to address the challenges relating to artificial intelligence, Thus, it is the need of the hour for us to analyse and evaluate the existing laws and make necessary amendments or bring in law and policy, essentially to prevent and protect the society from arising concerns and ensure the State's readiness to address the challenges pertaining to Artificial Intelligence. This paper therefore, highlights the growth of AI and its impact on society and law with respect to patent, copyright, and competition laws.

Keywords: Artificial Intelligence, Patent, Copyright, Competition Law.

INTRODUCTION

The concept of "artificial intelligence" is older than one could imagine it neither a new word nor a new technology. John McCarthy, an American computer scientist, coined the phrase "artificial intelligence" for the first time in the academic world in 1956 at the Dartmouth Conference. The first chatbot was developed in 1966, shortly after which researchers focused on creating algorithms to tackle mathematical problems during the golden years of 1956 to 1974. In 1980, an expert system that could formulate decisions resembling a human expert was developed. After experiencing phases of growth and decline, artificial intelligence finally made its way into households in 2002 in the form of the Roomba vacuum cleaner. Eventually in 2006, it also made its way into the business world and started being used by well-known social media platforms like Facebook and Twitter and has now developed to a remarkable level.

Artificial intelligence, often referred to as the fourth industrial revolution, has significantly impacted various aspects of human life and raised legal ambiguity. As technology continues to develop, parallel complexities arise, negatively impacting society and introducing new legal issues. The non-static nature of law is particularly relevant when dealing with technology. To avoid a widening gap between legal application and interpretation, it is crucial to address the legal issues associated with the digitalized world and the technological effects on human subsistence. With artificial intelligence taking supremacy in the market, the rate of technological growth and innovation has implausibly escalated to different dimensions, enabling the use of previously unachievable technologies. While some view AI as a 'job killer', it is expected to simplify tasks, avoid repetitive roles, and keep individuals engaged. This trend is widespread across various sectors, from startups to established institutions. The implications of AI deployment can create legal uncertainty, and immediate attention is needed to bridge the gap between technology and law application. This paper highlights the impact of AI on patent, copyright, and competition law.

PART I: GROWTH OF ARTIFICIAL INTELLIGENCE AND ITS IMPACT ON SOCIETY

The term "artificial intelligence" has been around for an extensive period of time; yet, when it was initially used in the 1950s, it was not well-known or accessible to the general public. The researchers coined this term to describe the stimulation of human intelligence by machines. As

the years passed by, AI experienced two winter phases: the first from 1976 to 1980, and the second from 1987 to 1993. During these phases, the government ceased sponsoring AI research considering that it was too expensive and produced ineffective results.[1]

The 18-member Indian task committee that defined the phrase "artificial intelligence" describes it as "the science and engineering of creating intelligent machines, particularly computer programs, with 'intelligence' being the computational part of achieving goals in the world." [2] It can be characterized as technology that was developed human, improved by a machine, and it has the potential to disrupt almost all aspects of human life. [3] There are three types of AI: strong AI, super intelligence AI, and weak AI. Strong AI behaves intelligently by thinking as a human, while super intelligence AI surpasses humans. Weak AI behaves intelligently but lacks consciousness. The last type is 'narrow' and limited to a single task, involving direct human intervention. Concerns arise with the emergence of strong AI, believing it to hold the capability of human intelligence, which may evolve further to create improved systems.

Artificial intelligence has significantly impacted various aspects of human life, including government, healthcare, and the economy. It has played a significant role in various sectors, from robotics to automated entertainment and cellphones. [4] The Indian government is focusing on building a "Digital India" to become a digitally empowered society, resulting in more efficient bureaucracy and quicker responses. [5] Artificial intelligence has also changed public administration systems and patterns. The National Digital Health Mission 2020 in India allows every Indian to get a health ID card, which serves as a repository of health-related information. This technology has made the healthcare system more accessible and affordable. Artificial intelligence will help doctors start treatment immediately in case of an emergency, as data pertaining to an individual's health is easily retrieved. By leveraging artificial intelligence, we can ensure a connected and efficient society, fostering a more inclusive and efficient society.

[1] What is history of Artificial Intelligence (AI)?, https://www.tableau.com/data-insights/ai/history (Last visited on August 18, 2023).
[2] Are We Ready for AI Disruption? An Indian Patent Law Perspective, https://www.iam-media.com/global-guide/iam-yearbook/2019/article/are-we-ready-ai-disruption-indian-patent-law-perspective (last visited on August 19, 2023).
[3] Artificial Intelligence and the Future of Human, https://www.pewresearch.org/internet/2018/12/10/artificial-intelligence-and-the-future-of-humans/ (Last visited August 19, 2023).
[4] How Artificial Intelligence is Transforming the world, https://www.brookings.edu/articles/how-artificial-intelligence-is-transforming-the-world/ (Last visited August 19, 2023).
[5] Government of India, "Report of Digital India Programme" (Department of Electronics and Information Technology, 2014).

With the passage of time, the market share of AI increased profoundly. In 2022, "the market for artificial intelligence was estimated to be worth USD 136.55 billion. From 2023 to 2030, it is expected to increase at a CAGR (Compound annual growth rate) of 37.3%." The adoption of cutting-edge technology is being fueled by ongoing research and innovation led by tech giants in sectors like manufacturing, healthcare, retail, and finance.[6] For instance, in March 2020, McDonald's invested its largest sum in technology—$300 million—to acquire a Tel Aviv-based AI start-up in order to offer a customized customer experience. The World Health Organization (WHO) proclaimed the novel coronavirus COVID-19 outbreak a pandemic in March 2020, which resulted in a global lockdown and had a significant negative impact on the global economy, businesses, and population. However, this pandemic has benefited internet-based companies and education, in a similar way the pandemic paved the way to growth in AI-enabled computer systems. As various technology-driven corporations and start-ups began focusing on preventing, mitigating, and limiting the virus, AI-enabled computer systems were employed to combat the epidemic. According to reports, the Damo Academy research center of Chinese tech giant Alibaba has created a diagnostic algorithm to find new coronavirus cases leveraging the chest CT (Computed Tomography) scan. The system's AI model was developed using sample data from more than 5,000 coronavirus positive cases. In order to streamline the management of COVID-19 cases, Lunit created an AI solution in June 2020. They also provided support with interpreting, monitoring, and patient trials. In an attempt to foster greater availability across the globe, tech companies are additionally broadening the range of products and services they offer. For instance, Google LLC developed the Rapid Response Virtual Agent chatbot for call centers in April 2020. This chatbot is designed to address concerns clients may have regarding the coronavirus (COVID-19) outbreak via voice, chat, and other social media platforms.[7] The growth of artificial intelligence has seen a rapid upsurge due to the digital technological advancements. The development of AI is being greatly accelerated globally by the rapid rise in numerous life-saving medical equipment and the self-driven function in the new electric vehicles. For the purpose of accelerating the development of robots, AI, IoT, big data, cyber security, and machine learning in 2020, the Indian government invested $477 million in Digital India. It is projected that the banking, financial services, and insurance

[6] Artificial Intelligence Market Forecast, https://www.marketsandmarkets.com/Market-Reports/artificial-intelligence-market-74851580.html (Last visited September 14, 2023).
[7] Artificial Intelligence Market Size, Share & Trends Analysis Report, https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-ai-market (Last visited September 06, 2003).

industries would witness considerable expansion in the artificial intelligence market due to the rising applications of artificial intelligence in data analytics, fraud detection, cybersecurity, and database systems. [8]

I. POSITIVE IMPACT OF ARTIFICIAL INTELLIGENCE ON SOCIETY:

A. Improving economy: India faces increasing unemployment, a major issue in its economy. Artificial intelligence has the potential to create jobs, change work patterns, increase productivity, and create new enterprises. It can also facilitate the development of new sources that add value to the economy, overcoming physical constraints like labor and capital, and capturing entire production. This could lead to new earnings opportunities and a more sustainable growth trajectory.

B. Social development: Artificial intelligence has the potential to revolutionize society and contribute to the greater good. It can raise living standards and increase access to a wider area of the globe. However, it may serve as a real-time advisor, anticipate unforeseen events, and boost productivity. It can also be used to build smart, efficient cities with appropriate infrastructure that complies with societal standards.[9]

C. Education: Artificial intelligence has the skill of augmenting and learning and has inbuilt potential to provide accurate solutions with quality, expediting administrative tasks and improve access issues prevailing in the Indian education sector.

D. Banking and financial sector: India has seen an upsurge in implementation of artificial intelligence-based banking and finance system in recent times. Banking has become much easier with the Fintech coming into place. Artificial intelligence has improved the process through deployment of intelligent machines for back-office operations, credit scores analysis, fraud analysts, virtual customer assistance etc.[10]

[8] Artificial Intelligence (AI) Market Size, Growth, Report by 2032, https://www.precedenceresearch.com/artificial-intelligence-market (Last visited on September 07, 2023).
[9] Y. Prakash, *Smart Cities Mission in India: An Empirical Study on Opportunities and Challenges,* 1 Avni Publications 125, 125-137 (2017).
[10] Dr. C. Vijay, *Artificial Intelligence In Indian Banking Sector: Challenges and Opportunities*, 7 IJAR. 1581, 1581-1587 (2019).

II. NEGATIVE IMPACT OF ARTIFICIAL INTELLIGENCE ON SOCIETY:

A. *Increased Unemployment:* AI robots progressively become more proficient and intelligent, therefore requiring less human labor and replacing certain roles. By 2025, AI is expected to create 97 million new employment roles. However, many lack the technical skills required for these tasks due to a lack of training and awareness, potentially leading to increased unemployment and falling behind in the job market.

B. *Threat to Privacy:* Unauthorized access to online activities and the privacy of disconnected users are significant threats. Proper awareness is crucial for informed decisions about AI usage. Ethical and privacy issues are more likely in the healthcare industry, where users' private information is collected and stored securely. The educational sector also faces challenges, as AI systems collect and evaluate significant student data. Ensuring safe handling and proper privacy protections is essential for handling this data effectively. In 2018, Facebook admitted to using 87 million users' data without their consent to aid the 2016 US elections following the Cambridge Analytica revelations.[11] Therefore, proper awareness and awareness are crucial for ensuring the ethical and privacy of AI usage.

C. *Hindrance in social development:* People seeking to transform society are hampered by the fact that AI systems use past data to forecast the future. As AI becomes more involved in major decisions, it threatens human reasoning capacity and severely restricts it.

D. *Inaccurate information:* Since AI is ultimately just a computer or system with algorithms, it cannot always produce 100% accurate results. In fact, there are some tasks that can only be performed by human brains. In these circumstances, it is quite likely that AI may provide false data under the guise of responding to queries. The ChatGPT, a new technology, is the finest example; when it is unsure of the response, it creates random details and repeats them, and at the conclusion of its explanation, it also suggests that you consult with an expert in the subject.

[11] Facebook and Data Privacy in the Age of Cambridge Analytica, https://jsis.washington.edu/news/facebook-data-privacy-age-cambridge-analytica/ (Lat visited on September 14, 2023).

Artificial intelligence (AI) therefore, has the potential to transform various societal aspects, including how we live and work. However, it also poses risks, such as potential disadvantages and increased unemployment rates if individuals lack the necessary knowledge to use AI effectively. The digitization of society is a challenge, as systems become more capable of blurring the line between online and offline. As technology becomes more widespread, smart cities will become more prevalent. Despite its advantages, AI has the potential to impact human subsistence, but without a proper framework or infrastructure, it could be costly. The legal system of a country is constantly evolving, and stakeholders must actively participate in debates to ensure the positive impact of AI on society.

PART II: ARTIFICIAL INTELLIGENCE AND LAW

Law has been in existence from the beginning of human society to maintain order and safety. Most of the work done by lawyers can now be effortlessly replaced by AI owing to its development. As according to the estimates of McKinsey consultancy firm, 22 percent of lawyers' job and 35 percent of paralegals' job can be easily automated through modern technologies. However, a significant number of people also disagree with this viewpoint and assert that AI cannot enhance the practice of law considering that making decisions, debating, and analyzing data cannot be done by a machine. At present, there is minimal application of AI in the legal industry because most lawyers still prefer to keep hard copies of all their documents, use of software is uncommon, and there is still extensive reliance on obsolete technologies. Many legal professionals contend that the practice of law cannot be fully trained for a non-human machine-like AI. However, by utilizing AI-based modern technology, the legal industry may prosper in a manner similar to how the manufacturing, health, and other sectors have. The use of AI in the legal profession can help firms review contracts they have entered and can be used to generate contracts by setting up a basic template. AI can also be used for formatting, drafting, and reviewing patent applications. It can also be used for legal analytics, such as the documentation of cases.[12]

Laws play a crucial role in ensuring specific conduct in society, including the conduct of humans and machines like computers and cars. Artificial intelligence, which has proven its potential in various activities, is increasingly being integrated into various aspects of society.

[12] Malluwawadu, Gayasha, *Artificial Intelligence and Law,* Researchgate.net, Oct. 2019, https://www.researchgate.net/publication/341520298_Artificial_Intelligence_and_Law.

Research and development are now focusing on reinforcement learning, allowing artificial intelligence to learn from its past experiences. This has led to the adoption of AI in hardware and software solutions, as well as in AI-controlled signals and drones. Now that the law is not static, concerns about the legal system and the treatment of AI's reinforcement learning capability have arisen. Rights and liability issues are becoming more problematic. However, it is essential to ensure that law adapts to this technological development. The paper will further highlight the implications of artificial intelligence on patent, copyright and competition law, as well as the legal and ethical issues involved in recognizing artificial intelligence.

I. ARTIFICIAL INTELLIGENCE AND PATENT LAW: BACKGROUND

As the relevance of protecting innovations by registering for patent is very evident, it is pertinent to consider what constitutes invention for the purposes of obtaining patent protection and as well try to understand the why artificial intelligence's creation or innovations do not placate the said parameters. If carefully observed a primary requirement for qualifying to be an inventor is "making a significant contribution to the invention and to meet this standard, one must bring about a definite and permanent idea of the invention, sufficient to allow a skilled artisan to carry out the invention without undue experimentation." Careful analysis of the provisions of patent law will raise certain queries as to who should be considered as the inventor, is it artificial intelligence applications or human being who he is responsible for the creation of the said artificial intelligence application. However, it is very significant to protect the intellectual property and that the stakeholders of the enterprise should be aware of the key indicators to be taken into consideration in its application to artificial intelligence's innovations. As protecting intellectual property encourages innovation and creativity by avoid duplication. The growth of patent filing in past few years help us understand the growing concern not only to protect the creation of Artificial Intelligence but also to develop a regulatory framework to govern and protect the innovations created by Artificial Intelligence. Though seems simple but involves complexities in implementing the same. It is relevant for one to understand that recognition of artificial intelligence and granting protection is one step ahead, whereas recognition of work generated by Artificial Intelligence is yet another step towards future. And the patent law in India will face the implications of artificial intelligence's innovation.

Artificial intelligence is widely considered the future of innovation, as it is increasingly being

used in modern businesses. The patent filing for AI inventions is increasing worldwide, making it a prominent factor in most inventions. However, there is uncertainty regarding how to treat technologies created by computers without human intervention within existing patent laws. This uncertainty may lead to patentees not disclosing the computer's invention. The issue of whether a human inventor should be considered for patent registration remains. The decision should be left to private arrangements and judicial intervention, according to existing laws concerning inventorship disputes. The nature of any invention must be investigated for eligibility, as it should be unique in its characteristics and intended use.

Let us understand the implications of artificial intelligence's innovations on patent law in India. Given the pragmatic view to the provisions of Patent Act, it is definite that in any invention, the inventor and the owner could be involved and that they need not be the same and both could be part of the registration. The artificial intelligence predominantly play an important role in the segment where there exists a direct relationship of human with the artificial intelligence i.e., "to augment human life and enhance or extend human capabilities through a direct relationship between human interaction with the AI"[13] and the other category is of the artificial intelligence identified and considered as the source of the invention and accepted for patent registration in its name i.e., "an autonomous, making decisions within a contextual solution space and are being employed by humans to serve them"[14] it is definitely significant to identify the source of invention and maintain a proper record for tracking down the world civilization advances itself. The question arises whether human-based entities employing artificial intelligence should be considered for registration and allow a claim of inventorship or if artificial intelligence as a standalone claim the inventorship. Concerns about an artificial intelligence's rights arise from the possibility that people will not view AI as equals and accord them the same rights as themselves. In this sense, AI cannot own property, and humans are not always able to acknowledge equal rights regarding their own diversity.

However, the future of innovation is largely driven by artificial intelligence, but there are still issues surrounding the treatment of AI inventions and the rights of human-based entities.[15]

[13] Supra 9 at 5.
[14] Ron Bakker, Impact of Artificial Intelligence on IP Policy, 1 WIPO 1, 1-18 (2020), https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/call_for_comments/pdf/org_pa_consulting.pdf.
[15] How Human is AI and Should AI Be Granted Rights, https://blogs.cuit.columbia.edu/jp3864/2018/12/04/how-human-is-ai-and-should-ai-be-granted-rights/ (Last visited September 11, 2023).

Addressing these concerns will help ensure that AI continues to play a significant role in the development of technology and innovation.

I.I IMPLICATION OF ARTIFICIAL INTELLIGENCE ON PATENT LAWS:

Patent law is crucial in recognizing and registering inventions created by artificial intelligence. It is understood that artificial intelligence is created and owned by humans, and the output and benefits of its employability should be owned by entities based and operated by humans. However, concerns about transferability of intellectual property and the exclusion of patent protection to autonomously generated inventions persist. Entities with market strength tend to exhibit the employability of more resources and propose the possibility of developing artificial intelligence that can generate patentable intellectual property. If the law addresses these concerns, there is a relatable issue on the duration of patent protection. The ongoing developments in machine learning and automation have expanded the scope and patterns of artificial intelligence applications. Technology advancements have created an explosion of applications that automatically generate patentable inventions without human interference. However, there is a vacuum regarding the holder of the "title" under patent law to exclude autonomously generated artificial intelligence applications from eligibility. It is essential to recognize that an invention, created by human or artificial intelligence, should be allowed to be registered, as doing otherwise would vitiate the purpose of intellectual property policy.

The new millennium has seen three major revolutions: the Industrial Revolution, the Electronic Revolution, and the Network Revolution. These revolutions have transformed the economy from agriculture-based to industrial-based, mechanical processes to electronic modes, and connected people, trade, and commerce worldwide through digital space. Understanding the transformation and adaptability of different technologies is crucial, as law generally holds a non-static nature, ensuring that changes and concerns are addressed. The implications of artificial intelligence on patent laws include re-evaluating the requirement for specific provisions for inventions assisted by artificial intelligence or if they should be classified as computer-assisted inventions.

Companies are making significant investments in artificial intelligence (AI) technology, and they are filing and trying to enforce patents linked to AI. Courts and agencies are additionally considering about how to apply IP laws to AI. Worldwide, there has been a sharp increase in

the filing of AI patents.[16] In *"Mayo Collaborative Servs. V. Prometheus Labs Inc.,"*[17] Supreme Court highlighted that "laws of nature or physical occurrences are likewise not patentable, even if their discovery results in revolutionary improvements in diagnosis or care." In a case concerning the employment of an expert system to check equipment operators for intoxication, the USA Federal Circuit ruled in 2015 that "the system was not patent-eligible because it represented an abstract idea because it was focused on a task that was performed by humans in the absence of automation."[18] The door was left open for assertions of AI that refer to "specific implementations" as opposed to merely abstract ideas. In another case Dr. Stephen Thalet, a scientist and technologist from the United States, has filed patent registration requests in a number of countries for the ideas he has created using AI.[19] For the "DABUS (Devise for the Autonomous Bootstrapping of Unified Sentience) system," he has submitted a patent application. In 2020, the US Patent Office declared that this system could not be recognized as a patent due to the fact it could not be considered an inventor under law because it was not a "natural person." An inventor is "the individual or, in the case of a joint invention, the individuals collectively who invented or discovered the subject matter of invention," according to the US Patent Act. The term "individual" was defined in the case of *"Univ. of Utah v. Max-Planck-Gesellschaft"*[20] to be a natural human being. The European Patent Office, the Court of Appeal in London, the German Federal Patent Court, and the Australian Federal Court[21] all rejected Dr. Thalet's patent application on the grounds that an inventor must be a natural person. The South African Patent Office, in contrast to all other jurisdictions, became the first to grant a patent for an invention created by AI innovator DABUS. In spite of these obstacles, US courts have upheld a few AI-based patents.

India has recently seen a huge increase in the number of startups working on development of AI. Section 2(y) of the Indian Patent Act, 1970 defines the term "true and first inventor" however there is no express mention as to who ought to be a natural person, if this section is interpreted in a wider sense AI can be included in purview of this provision, but however Section 3(k) states that "mathematical or business method or a computer program per se or

[16] Seth G Benzell, Nick Bostrom, et.al., WIPO, TECHNOLOGY TRENDS 2019: ARTIFICIAL INTELLIGENCE 33 (WIPO, Switzerland, 2019)
[17] Mayo Collaborative Servs. V. Prometheus Labs Inc., 566 U.S. 66 (2012).
[18] See Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 136 S. Ct. 2390 (2016).
[19] Thaler v. Hirshfeld, 558 F. Supp. 3d 238 (E.D. Va. 2021).
[20] University of Utah v. Max-Planck-Gesellschaft, 734 F.3d 1315, 1323 (Fed. Cir. 2013).
[21] Commissioner of Patents v. Thaler, [2022] FCAFC 62.

algorithms" are not inventions. [22] Therefore, there is ambiguity in the provisions of the Patent Act as to whether AI is eligible for patent. The application of AI invention must have a significant technological effect in India in order to obtain a patent. The conditions that must be met in India in order to obtain a patent for artificial intelligence are that the type of software and algorithms used must be disclosed, as well as the method employed by the device and focusing directly on programming codes and algorithms must be refrained as much as possible. According to a report by the Economic Times, IBM holds almost 9100 patents in areas like artificial intelligence, cyber security, and cloud computing. Additionally, investors in IBM who hailed from India alone received about 800 patents, ranking as the second-highest contributor to the global record total.[23]

The existing procedures for patent examination in India do not cover inventions assisted by artificial intelligence. It is important to determine if existing provisions can be interpreted to include inventions without human intervention, or we are at a stage, the patent laws seem archaic and requires amendments ensuring procedures for patent examination in the form of guidelines for artificial intelligence assisted inventions. And establishing or proving an invention is with or without human intervention. The aspects essential to be taken care of is the intended use and liability of the patent holder. The disclosure requirements of inventions assisted or generated by artificial intelligence have become a major development, and it is essential to explain the output, intended use, and liability of the creator in the form of disclosure. This will help ensure that advancements in various fields of societal relevance are addressed and addressed.

The initial algorithm in machine learning is challenging to retain due to its constant change with data access. The main concern is the utility of disclosure of the initial algorithm. Patenting the algorithm is convenient, but it becomes difficult to explain it algorithmically. Patent laws may need to address how data is used to train an algorithm and how it is treated for disclosure purposes. The main dilemma is whether to disclose or describe this data category. It is crucial to discuss general policy considerations for the patent system and consider the sui generis system of intellectual property rights for artificial intelligence-generated inventions. This helps resolve the issue and adjust innovation incentives. The impact of artificial intelligence on science, law, and technology is significant, and these factors should be considered early to

[22] Indian Patent Act, 1970, ss. 2,3, No. 39, Acts of Parliament, 1970 (India).
[23] Adarsh G Hegde, *Artificial Intelligence and Law,* 7 Penacclaims 1 (2019).

avoid delays. The explosion seen has the potential for greater impact, yet it is yet to be unfolded rapidly.

The ongoing debate surrounding the status of an innovation, whether it should be the human who created artificial intelligence or the AI itself, is crucial. Patents serve as a signaling function for an entity, making them competitive in the entrepreneurial financial market. Owning a patent provides leverage over other market players and allows a party to incur costs to communicate information about itself to outside firms. According to WIPO publication 1055 – "Technology Trends 2019, the most predominant AI functional applications are filed in telecommunications, transportation, life and medical sciences, primarily in computer vision, natural language processing, and speech processing."[24] The World Intellectual Property Organization (WIPO) initiated a consultation process on AI and IP in December, 2019 seeking for input on an issues paper that was developed to assist highlight the most important concerns that IP regulators are expected to encounter as AI develops.[25] The most significant rise in patenting activity between 2013 and 2016 is attributed to machine learning techniques and deep learning, with deep learning experiencing an average annual growth rate of 175%. The fastest growing AI functional applications are robotics and control methods in aerospace and smart cities. Securing a patent sends a positive message about a firm's research and development, leading to successful investment.[26]

The Indian government must carefully consider how to treat the next generation of artificial intelligence, whether it is strong or super-intelligence, in the patent ecosystem. The question of legal responsibility for illegal actions arising from artificial intelligence lies with its owner, user, or operator. The government should clarify the possibility of humans being replaced by machines and the likelihood of humans not replicating the grand design of evolution on a piece of paper coded into a machine. With technology advancements, it is believed that basic knowledge and cognitive thinking can be programmable into machines, enabling independent decisions and inventions. The question is whether a machine's ability will determine its

[24] Supra 14 at 10.
[25] James X. Dempsey, *Artificial Intelligence: An Introduction to the Legal, Policy and Ethical Issues*, Berkeley Center for Law & Technology 1, 1-47 (2020).
[26] UN Conference on Trade and Development, World Investment Report Investment and New Industrial Policies, UN Doc UNCTAD/WIR/2018 (July 06, 2018).

eligibility for the title of an inventor. Once this question is answered, other aspects will eventually fall into place.

II. ARTIFICIAL INTELLIGENCE AND COPYRIGHT LAWS

Computer programs are copyrightable under copyright laws, but a program's algorithms are not. According to the US Copyright Office, works created by AI or purely mechanical processes cannot be registered until there is a creative input or intervention from a human author.[27] However, it is debatable how much human involvement is necessary in a piece of work in order for it to qualify for copyright protection. The author of a computer-generated work is "the person by whom the arrangements necessary for the creation of the work are undertaken," according to the copyright statutes of numerous nations. To be qualified for protection creative works as defined by most definitions must involve a human author. According to most definitions, creative works must have a human author in order to qualify for protection. Most countries, like Spain and Germany, have laws stating that only works created by humans are entitled to copyright protection. [28]

In accordance with India's Copyrights Act, 1957, Section 2(d)(iv), the person who causes a literary, dramatic, musical, or artistic work which is computer generated is referred to as the creator of such work.[29] A legal personality has not been granted to artificial intelligence in order for it to qualify as an author under the definition given in this sub-section, which refers to authors as either natural or juristic persons. Additionally, in India, a work must exhibit at least "minimum creativity" in order to be copyrighted.[30] It was noted in the case of *"Easter Book Company and Ors. v. D.B. Modak and Anr"*[31] that for a work to be granted copyrights, there must be both a trivial and a substantive variation; however, the judgment did not specifically state whether AI can satisfy this requirement. The court ruled in the *"Rupendra Kashyap v. Jiwan Publishing House Pvt. Ltd"*[32] that the author must be a natural person and not a artificial person. It is clarified explicitly in the Practice and Procedure Manual (2018) published by the Copyright Office that "only a natural person must be identified as the Author of the work for copyright protection." The Copyrights Act of 1957 does not apply to artificial

[27] Supra 23 at 12.
[28] Andres Guadamuz, *Artificial Intelligence and Copyright*, WIPO Magazine, October 2017.
[29] Indian Copyrights Act, 1957, s. 2, No. 14, Acts of Parliament, 1957 (India).
[30] Supra 21 at 11.
[31] Easter Book Company and Ors. v. D.B. Modak and Anr, (2008) 1 SCC 1.
[32] Rupendra Kashyap v. Jiwan Publishing House Pvt, 1994 (28) DRJ 286.

intelligence (AI), hence it can be said that Indian law is not equipped to address the rights of AI and its creation. As a result, AI has not been given the status of a person in India.

III. COMPETITION POLICY CONCERNS: RETHINKING THE CONTOURS

The 2002 Competition Act intends to safeguard consumer interests, advance market competition, and eliminate actions that might adversely affect such competition. Under the Act, the Competition Commission of India (CCI) was established to make ensure no agreement or arrangement has adverse effects on market competition. CCI curbed any activity that reduces fair and healthy competition benefits, affecting consumer interest. The Act has broadened its duties to include technological developments, particularly artificial intelligence, which has the potential to bring competitive concerns and influence market dynamics. The potential of artificial intelligence is believed to have significantly impacted the competitive spirit of the market.

Artificial intelligence has revolutionized the world by being cost-effective and accurate, replacing traditional manual processes. The digital age has increased competitive concerns in the market, with the main concern being the access and sharing of information worldwide through virtual platforms, creating huge data and evolving new business models. This has generated value data at every step of user interaction with services created through technology, which enterprises use to monetize their businesses. As the landscape of businesses changes, algorithms play a major role in controlling production and management functions. With artificial intelligence, data collection, processing, and storage are easier, and enterprises can participate in self-learning market conditions through programmed control. However, these practices may fall within the categories of anti-competitive activities, potentially affecting fair market competition.

The market power of firms in digital markets may be temporary due to the use of big data collection and processing in real-time, allowing for innovative and customized services. However, this technology also presents a potential threat of market domination by various entities, particularly through the use of artificial intelligence, which is an innovation that poses a threat.

Understanding concepts such as “price personalization,” “dynamic pricing,” “two-sided market,” “resetting,” and “tacit price collusion” is crucial in analyzing the implications of

artificial intelligence on competition law. For example, when booking a cab using apps like Ola or Uber, the app uses artificial intelligence to analyze traffic and travel time, history, and frequency of consumers to set prices that reflect on the consumer's screen, fostering loyalty through price personalization. However, the major concern lies in the potential for price personalization to reset the market equilibrium, which is considered anti-competitive practice.

Price fluctuation and adjustment to competitors' costs can sometimes lead to a drop in pricing, reducing the likelihood of substituting services with others. This can put market players at an advantageous position but also harm consumer welfare and reduce the benefits of fair competition. Tacit price collusion, where competing players collectively or collusively influence market prices, is a significant challenge. This adverse effect on competition and consumer interest is a detriment to the market. Therefore, it is essential for regulators like the Central Bank of India (CCI) to explore ways to effectively mitigate the use of artificial intelligence and ensure fair competition.

CONCLUSION

There are numerous instances of complex challenges related to artificial intelligence that are not sufficiently addressed by the existing legal frameworks. To address the issue of digital data security, Digital Data Protection Act, 2023 was passed by the parliament. Its goal is to define the processes for processing digital personal data in a way that recognizes both the need to process such data for legal purposes as well as for problems associated with or incidental to those purposes, as well as the right of individuals to have their personal data protected. Concerns over the use of such data for scraping and AI development have been raised by the DPDP Act, 2023's clause 3(c)(ii), which stipulates that the act will not be applicable on personal data that was publicly made available by the user to whom the data is associated with. This provision specifically affects how AI companies in India can access and process users' publicly available data for AI development purposes. However, despite artificial intelligence being the need of the hour, no explicit provisions regarding it are included in the Act. Therefore, it is equally imperative that the legislators must foresee the predicaments that are consequential to the development of artificial intelligence. It is vital to determine the liability which being the extremely difficult decision as these machines are emerging as automated self-learning systems. It is not just the patent, copyright and competition law on which the implication of artificial intelligence is seen through. As discussed in the paper, artificial

intelligence today has seen its application in everything possible the impact can be seen on different laws such as data protection, privacy, criminal liability, copyright etc. However, a potential solution is to bring in regulations, create transparency and cooperation requiring the public disclosures etc. A better legal framework would create a balance in the economy and human subsistence. And that the legal questions pertaining to Artificial Intelligence need to be addressed immediately to avoid an increasing gap between technological upgrade and application of law.