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Challenges and Frontiers in Intellectual Property Rights Amidst the Rise of Artificial Intelligence

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Abstract

This article investigates the impact of artificial intelligence (AI) on intellectual property (IP) rights, addressing challenges in ownership and authorship of AI-generated creations while exploring legal and ethical dilemmas in traditional IP domains. It offers strategies for navigating these complexities, drawing on legal precedents, international agreements, and policy recommendations. The research emphasizes the urgent need for legislative updates to address these challenges effectively. Recommendations include the enactment of innovative constitutional provisions, updating IP legislation to encompass AI-related issues comprehensively, and advocating for effective judicial intervention. By implementing these strategies, Sri Lanka can foster a harmonious coexistence of AI and IP, ensuring the protection of intellectual property rights while stimulating innovation in the AI era.

Keywords: Artificial intelligence, Copyright, Intellectual property, Trademarks.

Introduction

The advent of artificial intelligence (AI) technology has brought about a new era of change, significantly impacting all facets of society, including the realm of intellectual property (IP) rights. As AI systems advance, they are more able to generate original works of art, music, and literature, blurring the distinction between human and machine creation. The emergence of AI-generated compositions presents intricate challenges regarding ownership, authorship, and the adequacy of existing intellectual property frameworks in safeguarding and governing these works. To gain a comprehensive grasp of the deep implications of artificial intelligence (AI) on intellectual property (IP), it is imperative that policymakers, legal practitioners, and stakeholders possess a thorough comprehension of its complexities and challenges. In the era of artificial intelligence, effectively managing the complexities of safeguarding intellectual property necessitates a thorough comprehension of the legal, ethical, and pragmatic dimensions of AI propelled progressions. In the face of the capriciousness of existence, it is imperative to

strike a nuanced balance between protecting intellectual property rights and encouraging innovation.

This research investigates the challenges and frontiers faced by intellectual property rights as a result of artificial intelligence (AI), with the objective of clarifying the difficulties and broadening the scope of safeguarding intellectual property. This article offers a comprehensive analysis of the growing domain of intellectual property (IP) as it relates to artificial intelligence (AI). It investigates AI-generated creations and evaluates the effects of AI on well established intellectual property domains, including trademarks, copyrights, and patents. Furthermore, it analyzes the legal and ethical ramifications of advancements enabled by artificial intelligence, providing insightful viewpoints on the complex matters of ownership, authorship, and societal impact. Central to this discourse is the vexing question of determining rightful ownership of AI-generated works, a question exacerbated by the intricate interplay between human agency and machine output. While AI systems possess the capacity for independent generation, they remain reliant on human programming and input, thereby prompting a fundamental inquiry into the locus of ownership: whether it resides with the AI system itself, its human programmers, the entities deploying it, or a combination thereof (Hristov, 2016).

Legislative efforts to address this issue are met with considerable complexity, as evidenced by landmark cases such as *The Commercial Bank of Ceylon v the Director General of Customs and others*, where the delineation of ownership was significantly influenced by licensing agreements. The determination of

co-authorship or derivative creation status is contingent upon nuanced legal definitions and collaborative dynamics (Biswas & Chutia, 2023).

Moreover, the demarcation between AI and conventional intellectual property (IP) domains presents nuanced challenges. Patents, pivotal in safeguarding intellectual property rights, face hurdles in assessing the patentability of AI generated innovations and discerning the extent of human contribution to the inventive process. Copyright laws, designed to protect literary works, confront dilemmas in determining eligibility for authorship and proprietorship amidst the proliferation of AI generated content (Son et al., 2022; Katyal & Kesari, 2020).

Beyond these legal intricacies, broader ethical concerns loom large in the realm of AI riven innovation. Issues of data ownership rights, privacy preservation, and algorithmic bias necessitate the establishment of robust regulatory frameworks and ethical standards. Proactive measures, such as inclusive data collection and transparent algorithmic processes, are essential in mitigating discriminatory outcomes and upholding societal values (Paunov et al., 2019; Tischbirek, 2020).

To answer these questions, this article conducts an analysis of relevant legal precedents, international agreements, and policy developments to propose efficacious approaches for reconciling the protection of intellectual property (IP) with the imperative to promote innovation in the age of artificial intelligence (AI). The primary objective of this article is to make a scholastic contribution

to the ongoing discussion on intellectual property rights through an in-depth analysis of the particular difficulties presented by AI generated works and an evaluation of the broader ramifications of innovation propelled by AI. Through embarking on this undertaking, the objective is to foster an all-encompassing comprehension of the dynamic correlation between intellectual property (IP) and artificial intelligence (AI), while also laying the groundwork for subsequent research and the development of policies.

Materials and Methods

This study employed a qualitative research design to investigate and comprehend a specific legal context. This research design was chosen to comprehensively explore the multifaceted nuances of the legal complexities surrounding artificial intelligence and intellectual property rights, allowing for rich data collection, interpretive analysis, and contextual understanding. The primary focus was on utilizing primary legal sources, encompassing legislations and provisions of the Constitution within the jurisdiction of Sri Lanka (SL). By engaging with these foundational legal documents, the research aimed to obtain a nuanced understanding of the legal framework under scrutiny. Complementary to these primary sources, the study incorporated secondary legal sources, specifically drawing upon journals and research. The secondary sources served to provide interpretative insights and scholarly perspectives that contribute to a comprehensive exploration of the legal subject matter. These online resources facilitated the retrieval of additional legal materials and scholarly literature, enriching the depth and

breadth of the study's analysis within the SL legal context.

AI generated works and ownership

The integration of artificial intelligence (AI) into the realm of creative expression has given rise to AI generated art, music, and literature. This section examines the challenges surrounding the ownership and authorship of AI generated work, shedding light on the many problems that arise in developing legal frameworks and establishing ownership rights (White & Matulionyte, 2019). Furthermore, it delves into relevant case law and legal precedents that impact the debate over the ownership of AI generated works.

The interest garnered by AI generated works stems from their capacity to produce distinctive and innovative creations. Artificial intelligence systems autonomously generate art, compose music, and author books with techniques like machine learning and deep neural networks. These works exemplify a unique combination of human programming and machine-generated output, causing the boundaries of authorship to become indistinct and presenting a fundamental challenge to conventional ideas of creativity.

The determination of ownership for AI generated works is greatly hindered by the extent of human involvement and input. AI systems has the ability to generate works independently, but they rely on human programmers and data inputs to function. This raises the fundamental inquiry: Who is the rightful owner of an AI -generated work? Is the responsibility for the AI system primarily attributed to the AI system itself, the human

programmer, the entity that has the AI system, or a combination of these entities? (Hristov, 2016).

The determination of ownership in the domain of computer-generated works is a complex conundrum, intimately entangled with legal concerns and interpretations. The crux of this puzzle is in defining the word “author,” as explained in Section 5 of the Intellectual Property Act (IPA) of Sri Lanka, and the subsequent moral and economic rights outlined in Sections 10 and 11. Legislation faces the challenge of determining ownership when dealing with the rise of computer-generated products. Its main objective is to provide ownership to those who have dedicated their time and resources to the creative process. At first look, the application of conventional ideas of authorship to computer-generated works seems to be free of conflicts. However, the issue gets more complex when numerous persons contribute artistically to such works. In the landmark case of *The Commercial Bank of Ceylon vss the Director General of Customs and Others*, the licensing agreement played a pivotal role in shaping the contours of ownership. Here, the provider retained ownership of the software, while the licensing agreement granted solely the right to use the software. Whether co-authorship is established in the context of an AI application or if the work is regarded as a derivative creation or another form of joint authorship hinges substantially on the specific definitions of ownership stipulated by national legislation and the degree of collaborative endeavour required.

The subject also pertains to the first allocation of copyright in AI applications, namely

whether it should be attributed to a separate legal organisation rather than individuals. The inclusion of an exemption, as specified in Section 47, which permits the transfer of rights but excluding cinematographic works, adds intricacy to the situation. Different legal frameworks may be used to govern different aspects of an AI application, such as expert systems. In 1985, France chose to create unique laws specifically for computer software protection, in addition to the larger framework. The intellectual property characteristics of the knowledge base were placed under the jurisdiction of the general Act on Literary and Artistic Property of 1957.

Nevertheless, it is important to acknowledge that the intricacy resulting from the interaction of several contributors and the complexities of attributing ownership in works created by artificial intelligence do not seem fundamentally different from circumstances involving conventional works with numerous authors. Essentially, copyright law provides a remedy in situations when unique rules are not present. The complexities and possible differences arising from joint or co-authorship may be resolved to a great part by careful contractual agreements under existing copyright laws. It is crucial for people entering the field of marketing AI applications to have a thorough grasp of the rights associated with each component and how they should be obtained from the necessary parties.

The legal frameworks regulating the ownership of AI generated works exhibit significant disparities across different countries. Some governments acknowledge copyright protection for works that include a substantial amount of human involvement,

considering the human programmer or user of the AI system as the author and, thus, the legal owner of the work. In contrast, countries like the United States, Australia, Japan, and Canada require a human author to exercise creative judgement and intention, hence rendering AI generated works ineligible for copyright protection (Biswas & Chutia, 2023; Paquette, 2021). The discrepancies in legal approaches underscore the urgent need for a comprehensive and unified framework that can address the multitude of ownership concerns arising from AI-generated works (Bisoyi, 2022).

Case law is critical in providing useful insights on the legal handling of ownership in relation to AI generated works. For example, in *Naruto v. Slater*, No. 16-15469 (9th Cir. 2018) a disagreement arose about ownership of a selfie taken by a macaque monkey using a photographer's camera. The macaque took the selfie using a camera owned by British nature photographer David Slater, who left the camera unattended in the Indonesian jungle. The issue arose when the selfie became widely circulated and went viral, leading to debates about the copyright ownership of the photograph. In 2015, People for the Ethical Treatment of Animals (PETA) filed a lawsuit on behalf of Naruto, claiming that the monkey should be the rightful owner of the copyright, arguing that the macaque was the one who physically took the photo.

In 2016, a U.S. federal judge ruled against PETA, stating that animals cannot own copyrights. The judge argued that the U.S. Copyright Act does not explicitly grant animals the right to sue for copyright infringement. The case generated significant attention and

raised ethical and legal questions about the intersection of animal rights and copyright law. This case emphasises the difficulties of extending copyright protection to works made without human intervention, such as AI generated works.

In the case of the monkey, the court ruled that animals lack the legal capacity to own copyrights because they are not considered aware of the implications of their actions within the context of copyright law. It was argued that the Copyright Act was designed with human authors in mind, and the law does not explicitly extend to non-human entities.

Similarly, in the context of AI, questions about intention, awareness, and consciousness are raised. As of my last knowledge update in January 2022, AI lacks true consciousness and self-awareness. AI systems operate based on algorithms, data, and programming, without an intrinsic understanding of their actions or the consequences. Therefore, the idea of AI "intending" to create something or being aware of the implications of its actions is still a matter of debate.

While AI systems can produce creative works, the legal and ethical frameworks surrounding their actions are evolving. In many jurisdictions, the creator or user of the AI system is typically considered the owner of the outputs it generates. The responsibility for the AI's actions, including any legal consequences, is generally attributed to the human entities involved in its development, deployment, and use.

As AI technology advances, discussions about AI ethics, responsibility, and legal frameworks

will likely continue to evolve to address the unique challenges posed by autonomous systems. Some suggestions propose for new legal frameworks that recognise the distinct features and contributions of both humans and AI systems to address the various legal complications regarding ownership of AI generated works. These suggestions include the introduction of a new category of “AI authorship” or the creation of a system of shared ownership between the human inventor and the AI system. Such methods seek to achieve a careful balance between recognising AI systems’ innovative contributions and protecting the importance of human interaction and decision-making (Brown, 2021).

Policymakers and legal practitioners can cultivate a nuanced understanding of the legal ramifications and devise appropriate frameworks that effectively accommodate the distinctive characteristics of AI generated works while safeguarding the interests of creators and society as a whole by conducting a comprehensive study of international legal frameworks, analysing pertinent case law, and fostering interdisciplinary discussions (Yanisky-Ravid, 2017).

AI and conventional IP domains

The integration of artificial intelligence (AI) into intellectual property (IP) sectors, including patents, copyrights, and trademarks, has led to a fundamental shift in the conventional understanding of IP rights. This section analyses the impact of artificial intelligence (AI) on many existing intellectual property (IP) categories. It focuses on examining the unique difficulties and possibilities that emerge within the framework of AI-powered

progress. Furthermore, it emphasises the need of amending intellectual property rules and regulations in order to properly tackle the growing difficulties linked to AI generated concepts.

The influence of AI on patents, which serve as a fundamental foundation for safeguarding intellectual property rights for inventions, is significant. The use of AI algorithms and machine learning techniques is swiftly increasing to expedite the process of innovation, enhance research and development operations, and streamline patent searches. Artificial intelligence may enhance patent examination procedures by potentially improving speed, accuracy, and consistency. Nevertheless, it introduces new challenges, including the assessment of patentability for AI generated advancements, the evaluation of inventive step or non-obviousness, and the determination of the human contribution to the creation of the invention. In order to include advancements in AI, it is necessary to carefully re-evaluate the traditional standards and limits used in patent law (Son et al, 2022). Patents are esteemed legal instruments in the realm of economics, conferring upon their owners a priceless prerogative - the exclusive power to innovate, employ, trade, propose, or import the patented invention throughout the whole duration of the patent, often spanning 20 years from the application date. The significance of patent protection lies in its ability to inhibit the replication of original ideas. In the absence of patent protection, innovative ideas are susceptible to being copied, and anybody in the open market may take advantage of the creator’s economic rights. Sampath states that a patent offers its owner a substantial opportunity to

introduce and showcase novel concepts to the market, safeguarded from competition save for non-infringing alternatives. In essence, a patent allows the developer to recoup their investments (Punchihewa, 2017).

As per the provisions outlined in Section 62 (1) of the Intellectual Property Act of Sri Lanka, an innovation is conceptualised as a practical implementation that provides a resolution to a specific technical dilemma. Moreover, the Act recognises the potentiality of acquiring patents for innovations pertaining to both tangible products and operational procedures. In Section 63 of the Intellectual Property Act, the criteria for obtaining a patent are delineated in detail. These criteria comprise the notions of novelty, inventive advance, and industrial applicability. Consequently, in order to qualify for a patent under Sri Lankan patent law, an invention must satisfy the requirements of “absolute” or “universal novelty.” Comparing the relative innovation standards of the United States and Sri Lanka, it appears that Sri Lanka has a relatively high standard that is difficult to satisfy. The examination of the inventive step, a prerequisite for a patent application to be deemed non-obvious, is conducted through the lens of an individual with average expertise in the pertinent field. While Sri Lankan patent law provides limited guidance regarding the interpretation of inventive step, an instructive case study is *Windsurfing International v. Tabur Marine*, which illustrates the approach taken by the United Kingdom. The criterion for inventive step is deemed more stringent in this particular instance compared to that for novelty. Section 66 of the Intellectual Property Act defines industrial relevance as the capacity of an innovation to be utilised or produced across all industries. An essential

provision of the current Intellectual Property Act in Sri Lanka is that computer programmes remain susceptible to patent protection. Karunaratne underscores the contentious nature of the patentability of computer programmes. Conversely, in the event that a computer programme fulfils the designated criteria for patentability, it could potentially be eligible for patent protection. Therefore, the Sri Lankan circumstance indicates that software patents are still potentially grantable. It is imperative to note that the existing intellectual property framework in Sri Lanka does not overtly forbid or endorse the practice of software patenting.

In conclusion, the current legal framework in Sri Lanka pertaining to copyrights and patents fails to sufficiently address the intricacies that arise from the integration of artificial intelligence databases and software. Prompt technological progress has precipitated a substantial transformation within the domain of artificial intelligence, thereby drawing attention to several urgent challenges that demand immediate resolution. The contemporary landscape is notably marked by the swift progression of technology with respect to intellectual property rights. For the Intellectual Property Act to retain its applicability, a comprehensive revision may be necessary, as it is predominately predicated on conventional rights. Certain clauses are susceptible to flexible interpretation by the judiciary. When difficulties arise, the majority of the drawbacks of this approach stem from its exclusive reliance on interpretation. One aspect that serves as an example is the patenting of artificial intelligence (AI) software, where a deficiency in Sri Lankan legislation arises from the absence of explicit

limitations or authorization. Likewise, the domain of copyrights encompasses well-defined regulations, notwithstanding disputes that arise due to divergent legal precedents and a dearth of judicial involvement. The matter at hand pertains to whether the Sri Lankan court possesses the authority to construe these clauses through a modification of existing legislation, or if the circumstance necessitates the proposal of novel legal frameworks.

This study emphasises the necessity of undertaking a comprehensive analysis and potentially amending Sri Lanka's intellectual property legislation to effectively address the intricacies stemming from the advent of artificial intelligence and the evolving technological landscape. Similarly, artificial intelligence significantly influences copyrights, which serve to protect authentic literary works. The advent of AI generated literature, music, and art presents complex dilemmas concerning the notions of proprietorship and authorship. The novel contributions made by AI systems give rise to apprehensions regarding the criteria for copyright protection eligibility and the evaluation of authorship. Furthermore, the implementation of AI in the production and distribution of content casts doubt on conventional conceptions of human ingenuity and the degree of human participation required to protect copyright. Therefore, it might be imperative to modify the existing copyright framework to effectively tackle the unique obstacles presented by AI generated works, while simultaneously guaranteeing sufficient protection and acknowledgment of the contributions rendered by both human beings and AI (Katyal & Kesari, 2020).

The integration of AI into the technological environment of Sri Lanka invariably gives

rise to significant inquiries regarding the implementation of fair use principles in this paradigm-shifting field. Utilising AI for objectives consistent with equity presents a multifaceted dilemma. Similar to any novel development, it requires a thorough analysis, as it inherently integrates ethical, legal, and practical factors. To secure the public interest and protect against privacy, trade secret, and national defence concerns, it is imperative to conduct a comprehensive evaluation of these intricate situations. As Sri Lanka initiates its adoption of artificial intelligence, it becomes crucial to adopt a comprehensive strategy that ensures fair use while safeguarding critical interests.

An essential aspect that warrants careful examination is the concept of "reverse engineering", an inherent practice within the realm of technology. By dissecting a publicly available product, this technique enables one to determine its composition, functionality, and manufacturing processes. It is particularly significant in facilitating the testing of computer programmes and promoting the creation of interoperable products. Conversely, reverse engineering has become a subject of significant debate, especially in the United States, where certain jurisdictions grant permission for it on the grounds of fair use principles. However, Sri Lanka's position on this issue is still ambiguous, necessitating a more thorough analysis in light of the development of AI technologies.

Fair use is a legal principle that is codified in Sri Lanka's Intellectual Property Act (IPA). Section 11 of the IPA specifies the circumstances in which copyright is not violated when copies are reproduced. It

includes teaching, scholarship, research, criticism, commentary, and news reporting, among other objectives. Section 12 additionally addresses fair use in the context of computer programmes. It provides a clear outline of the conditions that permit the unauthorised reproduction of computer programmes for personal use. However, complex dynamics are introduced when these provisions are applied to AI software; therefore, they should be reevaluated. In contrast to conventional human-authored works, AI systems give rise to inquiries regarding suitable protocols for acknowledgment and utilisation.

There is merit in considering the proposal to include “sufficient acknowledgment” within the fair use framework for content generated by artificial intelligence (S29(1) of (B) of CDPA). Acknowledgment is a critical ethical and legal aspect that recognises the function of the AI as well as the data and sources that support its development. Achieving compliance with the tenets of fair use in AI generated content requires a reassessment of the aforementioned legal provisions. This re-evaluation should aim to achieve a harmonious equilibrium among the preservation of privacy, innovation, and national interests.

In summary, with the increasing integration of AI into Sri Lanka’s technological environment, the notion of fair use gains greater significance. Tackling the intricacies that emerge from the distinctive characteristics of AI necessitates a nuanced strategy. Achieving a balance that simultaneously encourages innovation, safeguards intellectual property, and maintains ethical principles in the ecosystem of artificial intelligence is a significant undertaking that requires thoughtful consideration and prompt adjustments to legislation.

Furthermore, in the realm of intellectual property law, the duration of protection for works produced by AI systems poses an exceptional challenge. AI systems, in contrast to human authors, lack a finite lifespan. Geographical dispersion of AI systems further complicates the definition of “death” or the termination of protection. Due to its mathematical and abstract characteristics, the software that drives AI systems can endure indefinitely by merely migrating from one physical machine to another or enduring numerous implementations and versions. A possible resolution to this dilemma would be to designate all outputs produced by AI systems as public domain, thereby guaranteeing their unrestricted accessibility for utilisation by any individual. Conversely, safeguarding might be provided for a specified duration commencing from the date of the initial publication or performance of the work, akin to the durations associated with conventional copyright.

Concerns arise concerning the legal standing of derivative works generated by AI systems, including output reports, databases, other software, poetry, music, and literature. A considerable number of these works are produced through the utilisation of AI system capabilities, which obscures the distinction between original creative works and derivative works. There exists a dominant perspective that certain derivatives, specifically object programmes, might not be subject to conventional copyright legislation. The complexity of determining what qualifies as a derivative is illustrated by the existence of integrated circuits and other innovations. Integrated circuit designs have been granted distinct legal protection under international treaties, an acknowledgment of their

substantial commercial importance. However, existing provisions in the Intellectual Property Act of Sri Lanka may fail to adequately address these emergent types of derivative works, which gives rise to concerns regarding the appropriate legal treatment of AI-generated creations. Furthermore, artificial intelligence (AI) systems have the capability to utilise their creative abilities in order to develop a wide range of products, arrangements, knowledge, concepts, and theories. However, these elements may not align seamlessly with current copyright regulations, thereby adding to the complexity of the legal framework pertaining to AI generated content.

In light of the dynamic nature of AI driven innovations and the intellectual property landscape, it is imperative to revise existing IP regulations and policies to accommodate AI generated goods. In light of AI applications, this entails a reassessment of patentability criteria, copyright conceptions of authorship and proprietorship, and trademark regulations. Cooperation between policymakers and legal professionals is required to strike a balance between intellectual property rights protection and innovation support. This can be achieved through the development of adaptable, technologically neutral legal frameworks that can effectively confront the challenges and opportunities presented by AI driven progress (Wu, Andrew, 1997).

In addition to fostering an environment conducive to innovation, stakeholders can ensure that human and AI inventors are adequately protected by proactively modifying intellectual property laws and regulations. Such an adjustment ought to be predicated on an exhaustive understanding of

the interplay between artificial intelligence and conventional intellectual property spheres. This would enable the formulation of adaptable and progressive legal structures that efficiently oversee and facilitate AI powered advancements.

Legal and ethical implications of AI driven innovation

The proliferation of AI driven innovations has given rise to substantial legal and ethical concerns due to the rapid progression of AI technology. This segment further examines the diverse challenges presented by AI powered advancements, investigating the subject matter from legal and ethical perspectives. The aforementioned subjects are given due attention, including data ownership, privacy concerns, algorithmic bias, and the necessity of establishing exhaustive regulatory frameworks and ethical standards in order to navigate the intricate legal and ethical landscape of the AI era in a responsible manner.

Data ownership is one of the most significant legal concerns in the context of AI driven innovation (Paunov et al., 2019). Large datasets are essential to the operation of AI systems for tasks such as training, learning, and decision-making. The issue of data ownership rights pertaining to AI systems comes to the forefront. Does the data remain the exclusive property of the AI system or the organisation that deploys it, or does it become the property of the individuals or businesses that contribute it? It is essential to establish the rights and responsibilities associated with data use, access, and management by determining data custody.

Even more so in an era of innovation propelled by AI, privacy concerns are crucial (Oseni et al., 2021). Sophisticated personal data, such as medical records, financial information, and online behavioural patterns, is routinely managed by AI systems. The widespread adoption of AI technology gives rise to apprehensions regarding the potential for data exploitation or unauthorised access, thereby compromising the privacy rights of individuals. It becomes crucial to achieve a harmonious coexistence between harnessing the innovative capabilities of AI and safeguarding individuals' privacy. This necessitates the implementation of robust privacy regulations and data protection protocols (Stahl & Wright, 2018).

Another key ethical issue that has emerged in the field of AI-driven innovation is algorithmic prejudice (Tischbirek, 2020). AI systems are trained on large datasets, which may accidentally reflect underlying social prejudices and discriminatory tendencies in the data. As a result, AI systems may produce biased results and judgements, affecting areas such as employment procedures, loan approvals, and criminal justice systems (Zuiderveen, 2018). To limit discriminatory effects and maintain justice in AI driven decision-making processes, proactive measures such as diverse and inclusive data collecting, algorithmic transparency, and frequent audits are required (Ferrer et al., 2021).

Given the broad impact of AI driven innovation, robust regulatory frameworks and ethical standards are critical for properly navigating the legal and ethical difficulties that arise in this sector. Data protection,

privacy, openness, responsibility, and culpability should all be included in regulatory frameworks (Schneeberger et al., 2020). Clear and simple standards are required to control data gathering, usage, and sharing while also addressing the ethical implications of AI technology deployment in sensitive sectors such as healthcare and autonomous cars (Gerke et al., 2020; Lin et al., 2017).

Furthermore, ethical principles are critical in creating responsible AI development and deployment practices (Rakova et al., 2021). The inclusion of ethical concerns such as algorithmic transparency, robust human oversight, justice, accountability, and adherence to fundamental human rights principles are imperative. The development of these ethical standards necessitates interdisciplinary collaborations consisting of experts from distinct fields such as computer science, law, ethics, and social sciences. These alliances ensure the development of ethical guidelines that establish a connection between AI technology and societal values and norms (Dignum, 2017).

In summary, the proliferation of AI powered advancements gives rise to significant legal implications and ethical dilemmas that necessitate meticulous scrutiny. Significant challenges such as data ownership, privacy concerns, and algorithmic bias necessitate comprehensive regulatory frameworks and ethical principles. It is imperative that stakeholders, policymakers, and legal professionals collaborate to establish frameworks that effectively reconcile the promotion of innovation with the safeguarding of individual rights and community values. Through proactive resolution of these

concerns, it is possible to harness the transformative capabilities of AI while upholding fundamental legal principles and ethical standards in the era dominated by AI.

Conclusions and Recommendations

Conclusions

The study has conducted an extensive analysis of the intricacies surrounding intellectual property (IP) in the era of artificial intelligence. Concerns regarding the ownership and authorship of AI generated works, in addition to the legal and ethical ramifications of AI-driven innovation, have dominated the discussions. The significant discoveries and insights are as follows:

The Intellectual Property Act of Sri Lanka, despite its extensive reach, encounters difficulties in adjusting to the rapidly changing technological environment, specifically with regard to Artificial Intelligence (AI). The existing legislation, which forms the foundation for safeguarding intellectual property, faces challenges in keeping pace with the swift advancements in artificial intelligence. Consequently, loopholes exist that may potentially erode motivations for innovators and creators to uphold their intellectual property rights. The divergence between legal frameworks and technological developments has the potential to hinder societal progress. In light of emergent technologies, it is critical that intellectual property legislation be consistently revised to effectively tackle this matter. The ownership and authorship of works generated by artificial intelligence present a challenge that necessitates thoughtful deliberation regarding

the degree of human involvement and input. The existence of diverse legal frameworks in different nations underscores the necessity for a unified and all-encompassing strategy that acknowledges the unique attributes and contributions of both human beings and artificial intelligence systems.

Particularly in regard to copyright, AI related considerations are implicit in the Intellectual Property Act, lacking the specificity necessary to navigate contemporary issues effectively. The absence of this provision in the legislation could potentially impede the safeguarding of works generated by AI. To alleviate this issue, the legislation ought to take proactive measures to address potential risks of infringement by implementing precautionary measures. This would result in a more comprehensive safeguard for content generated by artificial intelligence. Although some degree of resolution may be offered by copyright provisions, there is a greater need for an updated framework that more comprehensively incorporates AI.

Significant legal and ethical dilemmas are engendered by AI powered innovation, including issues of data ownership, privacy apprehensions, and algorithmic bias. Striking a balance between harnessing the innovative potential of AI and safeguarding individual rights and social values is of the utmost importance. It is of the utmost importance to establish exhaustive legislation and ethical standards that resolve these concerns in a responsible manner and ensure the development and deployment of AI technologies.

Sri Lanka's legal framework pertaining to patents is consistent with the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement. Nevertheless, obstacles are presented by the paucity of substantial case law in the domains of copyright and patent law, particularly as it pertains to data compilation, reverse engineering, and the treatment of novelty and inventive step. The issuance of patents for inventions related to software continues to be a multifaceted issue in the present circumstances. While the Intellectual Property Act does not expressly rule out 'computer programmes' as non-patentable subjects, the lack of definitive judicial decisions regarding copyright and patent law adds to the complexity of the situation. Clearly, Sri Lanka's legal framework pertaining to intellectual property rights must evolve in order to address contemporary challenges, especially in the context of artificial intelligence.

International policy formation and treaties are indispensable for resolving the challenges associated with AI and IP. Harmonisation of international intellectual property regulations and laws is essential for establishing a unified framework for IP protection in the era of artificial intelligence. Global IP issues can be addressed through the utilisation of established international treaties, such as the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Together, policymakers and legal experts should develop regulations that support innovation, stimulate competition, and safeguard societal interests in the context of AI driven innovation.

Numerous strategies and tactics offer viable solutions for striking an equilibrium between IP protection and innovation stimulation

in the era of artificial intelligence. One of these solutions is to reevaluate copyright regulations and patentability criteria in order to account for the distinctive characteristics of AI generated ideas and works. In addition, fostering collaboration and open-source models, alongside offering adaptable licencing frameworks, could potentially stimulate innovation while addressing the distinctive challenges presented by AI-powered advancements.

Governments, legal professionals, and stakeholders must proactively manage the issues and expand the boundaries of intellectual property in the AI era in light of these findings. The establishment of collaborative efforts is imperative to develop all encompassing legislation and ethical principles that uphold responsible AI research and deployment, safeguard intellectual property rights, and foster innovation. Stakeholders have the ability to foster a harmonious coexistence of AI and IP in the future for the greater benefit of society through active engagement in interdisciplinary dialogues, continued education, and proactive resolution of legal and ethical dilemmas.

Recommendations

To commence, the implementation of an innovative constitutional provision akin to the one present in the United States that encourages literary, artistic, and scientific pursuits might bestow economic incentives and a constitutional right upon inventors and creators. By enacting this measure, a robust legal structure would be established to protect and promote intellectual property.

Moreover, it is imperative to update the Intellectual Property Act (IPA) to align with the swift progressions in Information and Communication Technology (ICT). The emergence of digital networks, databases, and computer-generated works poses unique and unprecedented challenges to intellectual property law. It is recommended that Sri Lanka take a proactive approach in addressing these concerns through the comprehensive revision of its intellectual property legislation to include all relevant issues related to artificial intelligence.

Additionally, granting patent rights to software, including AI software, is crucial. At this time, the legislation in Sri Lanka does not adequately protect inventions related to artificial intelligence (AI). Nevertheless, the nation should consider enacting measures that explicitly grant patent protection to AI software, thus bringing it in line with the approaches adopted by several East Asian countries.

In addition, expanding the definition of trade secrets is essential for the protection of novel innovations. Although trade secret law possesses the capacity to serve as a beneficial mechanism, the legal framework requires additional clarification and enhancement. Inadvertent acquisition of trade secrets, damage calculations, and provisions pertaining to the preservation of confidentiality and reasonable safeguards should all be included in the IPA. Fighting counterfeiting is, in the fifth place, an imperative. Sri Lanka should enhance its efforts to enforce intellectual property rights as a means to counter the proliferation of counterfeit goods that cause significant harm to legitimate industries. Provisions for copyright and trade secret registration, among

other legal safeguards, can be utilised to fortify security measures. Moreover, it is imperative to develop innovative strategies and advocate for effective judicial intervention. The judicial interpretation of provisions of the IPA concerning computer software and databases should be broad. To address ownership and patenting concerns in the era of artificial intelligence, it is necessary to reform the regulatory framework.

Moreover, it is critical to implement a flexible approach that can accommodate evolving needs and provide incentives for programmers and AI owners, thus encouraging further advancements and financial investments in AI.

Ultimately, by adhering to the “European Civil Law Rules on Robotics” of the European Union, the enactment of specialised legislation concerning artificial intelligence can efficiently address concerns regarding ownership and establish a comprehensive legal framework for the domain. Separate acts and specialised institutions may be necessary to effectively manage AI related issues.

The recommendations mentioned above offer Sri Lanka a strategic framework for efficiently navigating the complex landscape of intellectual property rights in the era of artificial intelligence. This approach fosters innovation and ensures that legal protections align with technological advancements.

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