

FROM PATENTS TO CODE: UNDERSTANDING INTELLECTUAL PROPERTY AND TECH LAW

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Abstract

The idea of Intellectual Property is linked to or equivalent to the principle underlying privacy. The need is to do something by convention that is impossible by force, such as ring-fencing information, since one cannot persuade individuals to give up Intellectual Property while also attempting to prevent them from doing the same in terms of privacy. “You cannot eliminate privacy and expect to retain a sense of respect for IP” argues Nick Harkaway in the ‘The Blind Giant’.¹ Thus, the researchers addressed the first half of the study issue, which is IPR and Technology law, in the context of privacy. However, the second probable component of the problem is how IPR and Technology law are coping in today’s digitalized era. In this case, the researchers have analysed the ‘Metaverse’ as a whole, as well as streaming, which is increasingly popular as a new sort of business among the country’s young population. Furthermore, the third topic is of scientific nature, namely Quantum Computing and its affinity with Intellectual Property Rights. This research voyage sheds light on the alarming rise of Intellectual Property theft, the complexities surrounding Copyright issues in live streaming, the pressing need for specialised Intellectual Property Courts, the impediments in technology transfer, and potential solutions to these challenges. Other issues include obsolete legislation that has to be amended and explained, as well as a general lack of awareness about Intellectual Property among the masses. The answers lie in forging a robust framework that balances innovation, protection, and education, assuring creators and consumers alike that their rights are safeguarded in an ever-evolving digital landscape.

Keywords: Intellectual Property Rights, Technology Transfer, Artificial Intelligence, Metaverse, Quantum Computing

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¹ Rajat Rashmi and Sneha Shilpi, “Artificial Intelligence: IPR, Liability and Ethical Issues” 11 *International In-House Counsel Journal* 22 (2018).

1. Introduction

In the rich tapestry of knowledge, a delicate balance between accessibility and protection unfolds. At its core, the World Trade Organisation's TRIPS agreement stands as a guiding light, navigating the vast realm of Intellectual Property Rights (IPR). India, known for its unity in diversity, weaves a tapestry of IPR laws, encompassing varied rights under one harmonious canopy. Through IPR, creators are granted exclusive dominion over their intangible creations, fuelling innovation and honouring ingenuity. However, as new technologies emerge, the spectre of IP theft looms large. Enter Technology Law, a realm where the interplay between IPR and progress is deftly governed. Here, the convergence of public and private spheres nurtures incentives for audacious ventures that drive economic growth.

Knowledge, a precious gem of humanity, possesses an inherent public benefit. The shield of IPR has propelled remarkable technological breakthroughs from the humble cotton gin to the intricate web of computer networking and biotechnology.² Yet, in our swiftly evolving digital landscape, the shadows of theft, fraud, and abuse loom ominously. To match the complexities of our time, the concept of Intellectual Property Rights must evolve. Quantum Technologies, blending Quantum Mechanics and Artificial Intelligence, stand poised to revolutionise our world. The Metaverse, a realm where physical and digital realities intertwine, beckons with infinite possibilities. Amidst this transformative backdrop, technology transfer emerges as a vital mechanism, facilitating the exchange and commercialisation of invaluable information and know-how.

In the crucible of the COVID-19 era, the urgency of technology transfer became starkly apparent as nations united to combat the global health crisis, sharing prestigious prototypes.³ Today, the imperative for robust Intellectual Property Rights and Technology Law has never been more pressing. To safeguard the fruits of human ingenuity, we must interweave legislation that celebrates innovation while providing robust protection. Modernised IP offices, fortified by technology and a dedicated workforce, form the bulwark against IP theft. Electronic application filing, expedited examination procedures,

² Tejaswi Sitaram Kandi and Divyansh Gautam, "Patent Trolls and Their Regulation in India" 5 *International Journal of Law Management & Humanities* 128 (2018).

³ Avinahs Kumar, "Economics and IPR System in India" 4 *International Journal of Law Management & Humanities* 273 (2021).

and comprehensive IP awareness programs bolster our defences. As the symphony of progress continues its melodious journey, India aspires to achieve its vision of a USD 5 trillion economy. To realise this audacious goal, the nation must dismantle procedural and substantive barriers that impede Intellectual Property Champions.

2. IPR along with its Components

The rights connected to intangible property that is owned by a person or business and is prohibited from being used without permission are known as Intellectual Property Rights. The so-called Intellectual Property Rights (IPRs) are those that pertain to the ownership of Intellectual Property. **Article 27** of the Universal Declaration of Human Rights (UDHR), declares that *“Everyone has the right to the protection of the moral and material interests emanating from any scientific, literary, or creative achievement of which he is the creator,”*⁴ also mentions IPRs.⁵

2.1. Different types of IPRs which are as follows:

2.1.1 Copyright

The term ‘copyright’ refers to the legal rights of the authors and creators of creative works. Copyright is frequently referred to as an ‘author’s right’ or a ‘literary privilege’. An author is granted exclusive rights to his or her work through copyright, which also forbids unauthorised publishing and copying. In India, the duration of copyright protection lasts for the duration of the author’s life and then for sixty years following his passing.⁶ The copyright act currently active in India is the Copyright Act, 1957.

2.1.2 Patent

An invention or innovation that presents a novel method of doing something or provides a new technological solution to a problem may be the subject of a patent, which is an exclusive right given to that invention or innovation. To put it another way, it is a monopoly privilege given to an inventor for a brand-new, helpful article, an

⁴ Mahesh K., “Shaping IPR Legality of Artificial Intelligence in India” 1 *Law Essentials Journal*, 22 (2021).

⁵ Aleena and Maria Moncy, “IPR and Recognition of Indigenous Cultural Identity” 2 *Jus Corpus Law Journal* 360 (2018).

⁶ Princy Varghese, “Traditional Knowledge and Limitations of IPR” 21 *Supremo Amicus* 54 (2020).

improved version of an old article, or a brand-new method of producing an article. Patent law currently in action in India is the Patent Act, 1970.

2.1.3 Trademarks

A trademark is a design that separates a company's products from those of its rivals. A trademark can be made up of a single letter, a logo, a symbol, a pattern, or even numbers, as well as three-dimensional elements like form, packaging, etc. A 'trademark' is a mark that may be represented graphically and that can be used to differentiate the goods or services of one person from those of others. The distinguishing feature of a trademark is uniqueness. The Trademark Act currently in action in India is the Trademark Act, 1999.

2.1.4 Geographical Indications

Products with a particular geographic origin are identified using a geographical indicator (GI). These signs indicate the calibre, reputation, or other qualities of these commodities that are primarily related to their place of origin. Geographical designations are often utilized for food, agriculture, wine, industrial goods, and handicrafts. GI products include things like Basmati rice and Darjeeling tea. Indian law governing GI tags is the Geographical Indications of Goods (Registration and Protection) Act, 1999.

2.1.5 Industrial Designs

Industrial design refers to the decorative or aesthetically pleasing elements of a product. It might include two-dimensional elements like lines, patterns, or colour, as well as three-dimensional elements like the geometry of an object. Industrial design is merely aesthetic, utilitarian, and non-functional. To prevent others from imitating an industrial design, its creative uniqueness must be given legal protection. It includes Industrial goods and handmade things like lighting apparatus, Jewellery, electronic apparatuses, fabrics, etc. The Designs Act, 2000 governs the use of designs in India.

2.1.6 Semiconductor Integrated Circuit Layout Designs

Products like televisions, radios, smartphones, washing machines, and data processing equipment all employ integrated circuits. The integrated circuit architecture innovations improve the system's capacity and performance while also taking up less

room. The Semiconductor Integrated Circuit Layout Design Act, 2000 governs the naming, usage and security of unique and original layout designs in India.

2.1.7 Plant Varieties

Plant variety protection, sometimes known as a ‘plant breeder’s right’, is a type of intellectual property right granted to a new plant variety’s breeder regarding specific activities relating to the exploitation of the protected variety that requires the breeder's prior authorization. The Convention for the Protection of New Varieties of Plants (‘the UPOV Convention’) was adopted in Paris in 1961.

3. Interconnection between IPR and Technology Law

In the intricate dance of the digital age, where innovation pulsates through the veins of technological marvels, an interwoven tapestry emerges between Intellectual Property Rights (IPR) and the enigmatic realm of technology law. Like a guardian of intangible treasures, IPR wraps its legal embrace around the ethereal fruits of human imagination - inventions, trademarks, copyrights, and trade secrets - while technology law dances to the rhythm of progress, defining the rules that govern the creation, utilization, and dissemination of these technological wonders.⁷

The development of technology provides enormous advantages for companies, customers, businesspeople, and pretty much everyone with a message they want to spread throughout the globe. But technology also brings forth a whole new set of issues and moral conundrums such as our vulnerability to hackers, prospective fraudsters, and commercial irresponsibility, however, increases as more of our information is dispersed throughout the digital world. Their entwined synergy is a harmonious symphony, resonating in today’s dazzling landscape, where cutting-edge advancements like Artificial Intelligence, Blockchain, and Biotechnology challenge conventional notions. This is where the law of technology is relevant. Though its scope is constantly expanding, technology law is largely focused on creating the foundation for the collection, storage, and information which is available in the digital space.⁸ With vigilant zeal, technology law ensures the protection of intellectual property, enabling the genius of inventors to

⁷ Clemente Forero Pineda, “The Impact of Stronger Intellectual Property Rights on Science and Technology in Developing Countries” 35(6) *Research Policy* 808-824 (2006).

⁸ John Hagedoorn and Anne Kristen Zobel, “The Role of Contracts and Intellectual Property Rights in Open Innovation” 27(9) *Technology Analysis & Strategic Management* 1050-1067 (2015).

flourish, while licensing and transfer mechanisms nurture collaborations that ignite industries and invigorate economies. Amid the ever-shifting digital tapestry, technology law's stalwart resolve confronts the spectre of digital piracy, weaving legal defences to shield copyrighted works from the relentless jaws of unauthorised replication, and as the world embraces the shimmering dawn of tomorrow, technology law leaps ahead, contending with the enigmas of AI-generated creations, the patentability of ethereal software algorithms, and the delicate balance between innovation and societal welfare.⁹

Technology law also focuses on Intellectual Property Rights, a complicated area of law that handles disagreements over who 'owns' intangible 'property' including creative works, patents, copyrights, and trade secrets. Technology law protects the innovators of these concepts and guarantees their rights regarding the dissemination of their work. If a publisher decides to publish a series of hardcover novels in e-book format after an author enters into contract with them, in that case what happens to the author's writing commitment? Electronic rights ensure that all parties are aware of how a creative work will (or maybe) be distributed and what portion of the royalties go to the author.¹⁰ Recently (10th October) even Delhi High Court also issued a notice in which it proposed the draft regarding IPR and Technology law connectedness "Delhi High Court Intellectual Property Rights Division Rules, - 2021".¹¹ The 'Intellectual Property Subject Matter' for these rules is addressed in the Draft Rules under rule 2i) which includes concerns related to domain names, data exclusivity, and other issues with data protection concerning intellectual property, in addition to issues emerging under the Acts; Internet-related issues affecting any of the topics covered by clauses (i) through (v).¹² Now, in the pulsating heart of the present, the interconnection between IPR and technology law unfolds its captivating saga, embodying the spirit of progress, protection, and perpetual exploration in the ever-evolving realm of technology and human endeavour.¹³

⁹ Guifang Yang and Keith E. Maskus, "Intellectual Property Rights and Licensing: An Econometric Investigation" 137(1) *Weltwirtschaftliches Archiv* 62 (2001).

¹⁰ Hanne Candelin Palmqvist, Birgitta Sandberg, *et.al.*, "Intellectual Property Rights in Innovation Management Research: A Review" 32(9-10) *Technovation* 502-512 (2012).

¹¹ Madhu K., "Draft Delhi High Court IPR Division Rules, 2021: Observations and Concerns", *available at*: <https://www.foxmandal.in/delhi-high-court-intellectual-property-rights-division-rules-2021/#:~:text=On%2010th%20October%2C%202021,by%2024th%20October%2C%202021> (last visited on January 09, 2023).

¹² *Supra* note 6.

¹³ Cassandra M. Sweet and Dalibor Eterovic, "Do Stronger Intellectual Property Rights Increase Innovation?" 66(c) *World Development* 665-677 (2015).

4. IPR Lagging in the Sector of Technology: The Factors Behind

In the fast-paced realm of technology, the domain of Intellectual Property Rights (IPR) often finds itself lagging behind. Several factors contribute to this gap, leaving technology susceptible to Intellectual Property challenges. Firstly, the rapid pace of technological advancements outpaces the legal frameworks designed to protect Intellectual Property. Innovations emerge at an unprecedented speed, rendering traditional IPR laws inadequate and slow to adapt. Secondly, the complex nature of technology itself presents challenges for IPR. Technologies like artificial intelligence and blockchain, with their intricate algorithms and decentralized nature, pose unique difficulties in defining and enforcing intellectual property rights. Thirdly, the global nature of the technology sector amplifies IPR challenges. With technology, companies operating across borders and the ease of information sharing online, it becomes increasingly difficult to enforce IPR laws internationally.¹⁴

In Section 3 of the Indian Patent Act, particular requirements render an invention that relates to a) pharmaceutical drug derivatives, b) stem cell patentability, c) diagnostic procedures and kits, d) isolated DNA sequences, e) computer-related discoveries, etc. non-patentable. These limitations are in addition to the requirements for inventions to be patentable that they are unique, imaginative, and useful in the industry; as a result, these innovations are subject to further examination and research. The Indian Patent Office has created rules on the patentability of medical, biotechnological, and software advancements, yet patent holders still face difficulties.

4.1. Inventions involving Computers and Quantum Algorithms:

Algorithms or computer programs are *not patentable under Section 3(k)*. For all computer related inventions, this objection is the default position. The conclusion in these situations is inconsistent because various controllers (at the patent office) have formed their own opinions regarding the specifications for hardware and whether they must satisfy the requirements for patentability. India has civil courts where patent rights can be enforced, but no IP courts have been established to handle the cases.

¹⁴ Frederick Mostert, "The Global Digital Enforcement of Intellectual Property", *available at*: https://www.wipo.int/wipo_magazine/en/2018/si/article_0005.html (last visited on January 10, 2023).

4.2. *Backlog and deadline for decision-making:*

The amount of time it takes for the court to provide a decision is the main barrier to the enforcement of patent rights. A patent dispute normally takes between five and seven years to get a final decision if the other party opposes the case. The Commercial Courts Act helps to expedite the process through case management hearings and trial schedules that are based on deadlines. The court's case backlog and a shortage of judicial officers' influence how long it takes to decide a case.

4.3. *Subject-matter specialists:*

According to Section 115 of the Indian Patent Act, the courts may appoint a scientific consultant to help them make decisions on technical matters. This provision has not frequently been cited by the courts. Nominating a technical expert in a case involving patent infringement can not only hasten the decision-making process but also improve the quality of the verdict.

Moreover, the prevalence of patent trolls, who exploit the system by acquiring patents solely for litigation purposes, further exacerbates the IPR lag. In today's time, where innovation and technological progress are more prominent than ever, addressing these factors is crucial. Policymakers and legal institutions must embrace agile approaches to IPR, recognizing the need for flexible and adaptive legal frameworks that can keep pace with technological advancements. Additionally, fostering international cooperation and standardization efforts can enhance the enforcement of Intellectual Property Rights across borders. Only by bridging the IPR gap can we ensure a vibrant and thriving technology sector that continues to drive innovation and benefit society as a whole.¹⁵

5. IPR and Metaverse

In today's technologically immersive landscape, the emergence of the Metaverse presents both new possibilities and challenges in the realm of intellectual property rights (IPR). Although governed by actual people within a Metaverse, the law regarding the legitimacy of activities taken by virtual characters is still in its early stages and needs more time to mature. It is demanded that real-world rules also be applied in the Metaverse since it has the appearance of being 'real'. It would be challenging to determine whether

¹⁵ Sanjaya Lall, "Indicators of the Relative Importance of IPRs in Developing Countries" 32(9) *Research Policy* iv (2003).

human rights might be upheld within the Metaverse, for instance, it would be challenging to defend against assault without ‘bodily injury’, yet sexual harassment laws would still be applicable as they do not need physical contact. A lady was sexually attacked in the ‘Horizon Worlds’ Metaverse in 2021, which prompted the platform to begin an investigation into the incident.¹⁶ When it comes to Intellectual Property Rights (IPR), which are fundamentally works of human intelligence, their application will inevitably cross the real-virtual divide, necessitating the establishment of procedures for their protection. The Metaverse, a virtual world blending physical and digital realities, raises intricate questions about ownership, creativity, and the protection of ideas within its expansive digital domain. As users create and engage with virtual content, the need for robust IPR frameworks becomes increasingly crucial. Intellectual property concerns such as copyright, trademarks, and patents must adapt to the metaverse’s dynamic and boundary-blurring nature.

Determining ownership and protecting digital assets, avatars, virtual environments, and virtual goods within this vast interconnected realm is no small task. Striking the delicate balance between incentivising innovation and creativity while safeguarding against infringement poses unique challenges. Additionally, the decentralised nature of the Metaverse and its potential for user-generated content further complicates IPR enforcement, requiring innovative approaches to ensure appropriate attribution, fair use, and rights protection. A contentious issue in the modern period is the infringement of IPR, which includes the protection of trademarks, patents, copyrights, etc. within the Metaverse due to the uncertainty surrounding the Metaverse’s legal status. To navigate this evolving landscape successfully, policymakers, legal experts, and industry stakeholders must collaborate to establish comprehensive IPR frameworks that foster creativity, encourage innovation, and safeguard the rights of creators and users alike within the Metaverse. By doing so, we can unleash the full potential of this digital frontier while ensuring equitable and sustainable growth in today’s Metaverse-dominated era.¹⁷

¹⁶ C. Krishnasai, “21-year-old woman virtually raped, harassed in Metaverse: Report”, *available at*: <https://www.wionews.com/world/21-year-old-woman-virtually-raped-harassed-in-metaverse-report-483043> (last visited on January 28, 2023).

¹⁷ Xianzhong Yi and Alireza Naghavi, “Intellectual Property Rights, FDI and Technological Development” 26(4) *The Journal of International Trade & Economic Development* 410-424 (2017).

6. Technology Transfer and IPR

In the rapidly advancing landscape of technology, the process of technology transfer plays a pivotal role in driving innovation and economic growth. However, the interplay between technology transfer and Intellectual Property Rights (IPR) has become increasingly complex and relevant in today's time. It is a cooperative process that enables the transfer of intellectual property, scientific discoveries, and information from producers like universities and research organisations to users in the public and private spheres. Its objective is to create new goods and services that benefit society out of discoveries and scientific discoveries. Knowledge transfer and technology transfer are closely connected.¹⁸ At the heart of this process lies IPR, serving as a mechanism to protect and incentivise innovation. Patents, copyrights, and trade secrets provide legal safeguards, granting innovators exclusive rights to their creations and encouraging them to disclose and transfer their technology to others.

The usefulness of a patent and its strength impact the price of traded technologies since better patent strength gives distribution and sale services a competitive edge. Organizations promote technology transfer to nations with more robust IPR laws because these laws guarantee economic success. Additionally, it boosts market dominance, which lessens rivalry. A weaker IPR policy does not, however, totally halt the flow of technology since high-tech items are hard to copy and move swiftly but a strong IPR policy does, however, assure the transferability of both high- and low-tech items, from which the benefit of the general public may be ensured to the highest degree.¹⁹ However, striking the right balance between protecting intellectual property and promoting technology transfer can be challenging. Overly restrictive IPR regimes may hinder the free flow of knowledge and impede collaboration, limiting the potential for breakthrough discoveries and societal benefits. On the other hand, weak IPR protection can discourage innovators from sharing their technology, leading to a slowdown in progress and economic development. Today, as technology continues to advance at an unprecedented pace, the need for a nuanced approach to technology transfer and IPR is more crucial than

¹⁸ Shukhrat Nasirov, Irina Gokh, *et.al.*, "Technological Radicalness, R&D Internationalization and the Moderating Effect of Intellectual Property Protection" 145 *Journal of Business Research* 215-227 (2022).

¹⁹ Yee Kyoung Kim, Keun Lee, *et.al.*, "Appropriate Intellectual Property Protection and Economic Growth in Countries at Different Levels of Development" 41(2) *Research Policy* 358-375 (2012).

ever. Policymakers, stakeholders, and innovators must work together to establish frameworks that facilitate the efficient transfer of technology while safeguarding the interests of creators and promoting the collective pursuit of progress. By fostering an environment that encourages collaboration, respects IPR, and embraces open innovation, we can unleash the transformative power of technology transfer in shaping a brighter future for all.²⁰

7. Quantum Computing and IPR

In the realm of mind-boggling technological frontiers, where reality and imagination collide, quantum computing emerges as the enigmatic prodigy, holding the keys to unlock the unfathomable depths of computation. Today, as we stand on the precipice of a technological revolution, the interplay between Quantum Computing and Intellectual Property Rights (IPR) presents a captivating narrative that captivates our minds. Quantum Computing, with its quantum leaps and entangled states, promises to reshape our understanding of what is possible.²¹ Superposition, entanglement, and tunnelling, three concepts from the theory of the very tiny that are fundamental to quantum physics, are the building blocks of this type of computing. Now if researchers connect Quantum Computing with IPR, they will have to first classify which all parts are hardware and which all are software. As the race intensifies to harness this cosmic power and bring it into practical realms, the importance of IPR in our present times cannot be overstated. Patents, copyrights and trade secrets become the celestial guardians, shielding the brilliance of quantum algorithms, hardware designs, and software innovations from the clutches of unbridled imitation.²² Patents can only be issued for human inventors' original, innovative, useful, and non-obvious creations. While copyrights often need a minimum level of originality, ingenuity, and a human author. Patents may be issued for technical innovations that have been created and integrated into hardware. From the standpoint of IPRs, researchers may categorise the parts of a quantum computer into three

²⁰ Lee Branstetter, Raymond Fisman, *et.al.*, "Does Intellectual Property Rights Reform Spur Industrial Development?" 83(1) *Journal of International Economics* 27-36 (2011).

²¹ Mauritz Kop, Mateo Aboy, *et.al.*, "Intellectual Property in Quantum Computing and Market Power: A Theoretical Discussion and Empirical Analysis" 17(8) *Journal of Intellectual Property Law and Practice* 613 (2022).

²² *Id.* at 614.

categories: algorithms, software, and hardware (chip rights, design patents, and utility patents).²³

Public domain status should be granted to any output developed or discovered by autonomous Quantum/AI systems without the assistance of humans at any stage of the process. A strong public domain is advantageous to society since the output lacks human ingenuity and innovation.²⁴ Yet, in this quantum ballet, a delicate equilibrium must be struck, as collaboration and sharing of knowledge are essential to propel us forward on this exhilarating journey. We find ourselves standing at the crossroads of inspiration and protection, seeking to nurture an environment that ignites the fires of ingenuity while ensuring that quantum pioneers receive their rightful accolades. As the world embarks on an audacious quest for quantum supremacy, IPR considerations assume the role of cosmic constellations, guiding nations and enterprises in their strategic manoeuvres.

Furthermore, legal entities like individuals, institutions of higher learning, or businesses are the only ones that may legally possess IP rights. To own rights and assume obligations, autonomous systems lack the legal subjectivity or personhood required. Artificial intelligence (AI) and Quantum-Generated Technologies should be considered *Res Publicae ex Machina*.²⁵ Today, as the cosmic fabric of quantum computing begins to weave itself into tangible applications, we must channel our collective wisdom to navigate the intricate web of IPR challenges. By cultivating a harmonious ecosystem that embraces both the ethereal beauty of innovation and the pragmatic necessity of safeguarding intellectual creations, we unlock the quantum realm's full potential. In this tapestry of dreams and discoveries, policymakers, researchers, and visionaries weave a story of collaboration, ingenuity, and responsible progress. Together, we pave the way for a future where quantum wonders unravel and illuminate the path to unimaginable breakthroughs, solving the grand tapestry of humanity's most perplexing enigmas.

8. IP Theft and How to Prevent It

In the age of relentless innovation and digital interconnectedness, a haunting shadow looms over the landscape of Intellectual Property: the spectre of IP theft. As technology advances at a breakneck pace, so too do the methods employed by cunning

²³ *Supra* note 21 at 617.

²⁴ *Id.* at 619.

²⁵ *Ibid.*

individuals and malicious entities to pilfer and exploit the fruits of human ingenuity. Today, more than ever, the need to fortify our intellectual creations against the clutches of unscrupulous thieves has become paramount.²⁶ Intellectual Property theft occurs when someone takes an individual's or a company's concept, creative expression, or creation. Someone stealing patents, copyrights, trademarks, or trade secrets is an example of Intellectual Property theft. In this high-stakes game of cat and mouse, where valuable ideas traverse digital highways, it is imperative that we erect an impenetrable fortress of safeguards. From robust encryption and multi-factor authentication to vigilant monitoring and rapid response mechanisms, we must employ an arsenal of cutting-edge technologies and strategies to repel the relentless onslaught of IP predators. Ways to protect are as follows:

8.1. *Keep an eye on employee activity*

Just as businesses should ensure that IP is only available to the appropriate individuals, they should also keep an eye on employee activities within the network. This is done to ensure that no suspicious behaviour is taking place, as well as because employees are less inclined to access questionable sites and activities when they are aware that they are being watched.²⁷

8.2. *Use Intellectual Property Management Software*

Today's technology helps keep IP safe by allowing you to track your IP and ensure it is always in the correct hands. IP management software not only assists firms in understanding what their IP is and where it is situated, but it also ensures that it is safeguarded regularly.²⁸

But beyond the technological bulwarks, we must foster a culture that values integrity, ethics, and respect for the creative endeavours that propel our society forward. Collaboration between industry, academia, and law enforcement becomes the mighty shield that shields our treasures, forging an unbreakable bond in the face of relentless adversity. Together, we must champion a future where ideas flourish, innovation thrives, and the fruits of human imagination are cherished and protected. For in the battle against

²⁶ James F. A. Traniello and Theo C. M. Bakker, "Intellectual Theft: Pitfalls and Consequences of Plagiarism" 70 *Behavioural Ecology and Sociobiology* 1790 (2016).

²⁷ Benoit Godart, "IP Crime: The New Face of Organized Crime: From IP Theft to IP Crime" 5(5) *Journal of Intellectual Property Law & Practice* 378-385 (2010).

²⁸ Mark Warren, "Modern IP Theft and the Insider Threat" *Computer Fraud & Security* 5-10 (2015).

IP theft, our collective determination to safeguard intellectual property becomes the catalyst that propels us into a brighter tomorrow, where creativity knows no bounds and the fruits of our labour are shielded from the clutches of those who seek to exploit and diminish the marvels of human achievement.²⁹

9. Streaming and IPR

Live streaming is the practice of broadcasting video online in real-time and covers a wide range of themes such as concerts, athletic events, video games, and/or even the ordinary and everyday elements of one's life. In the mesmerising realm of streaming, where the boundless expanse of digital content dances before our eyes, the question of Intellectual Property Rights (IPR) takes centre stage. As the streaming landscape continues to thrive and evolve, fuelled by an insatiable hunger for on-demand entertainment, the importance of safeguarding creators' rights has never been more crucial. From riveting films and captivating series to pulsating music and thought-provoking podcasts, the digital realm teems with an eclectic tapestry of artistic expressions.³⁰ A copyright owner's exclusive rights include the right to publicly perform and exhibit a copyrighted work. A copyright holder also has the only right to reproduce and distribute a copyrighted work. A live stream might infringe on any of these rights. As a result, the most critical aspect is to verify that only permitted content is included in your live broadcast. Avoid streaming or embedding unoriginal or copyrighted items, as well as rebroadcasting background music, audio, or photos that may be copyrighted, or else you can be charged under the *Copyright Act, of 1957*.³¹

To navigate these treacherous waters, a symphony of measures must be orchestrated, blending technological advancements with robust legal frameworks. Innovative digital rights management systems, blockchain-based content authentication, and advanced watermarking techniques emerge as the valiant guardians of originality, embedding an indelible mark of ownership in the digital realm. Simultaneously, enhanced legislation and international collaborations form the steadfast pillars that fortify creators'

²⁹ *Ibid.*

³⁰ Pamela Samuelson, "Implications of the Agreement on Trade-Related Aspects of Intellectual Property Rights for Cultural Dimensions of National Copyright Laws" 23 *Journal of Cultural Economics* 99 (1999).

³¹ Brandon W. Clark, "IP Legal Considerations for Live Streaming", available at: <https://www.lexology.com/library/detail.aspx?g=69529b96-65b3-4769-841b-59aeb097293> (last visited on February 10, 2023)

rights, empowering them to harvest the fruits of their labour and inspire further innovation.

To manage rights agreements, obligations, disputes, and other crucial components, businesses must drive innovation in contracts, contractual processes, and rights information using agile tools, contemporary data structures, analytics, AI, and network technologies.

Whereas in today's time, streaming platforms reign supreme and the digital realm becomes the lifeline of entertainment, we stand at a critical juncture to preserve and protect the vibrant ecosystem of content creation. By embracing cutting-edge technologies, fostering a culture of respect for Intellectual Property, and reinforcing legal frameworks, we unleash the full potential of streaming, allowing creativity to flourish and creators to thrive. Together, we can forge a future where the streaming landscape becomes a sanctuary for authentic content, a treasure trove of originality, and an enchanting realm where the rights of creators and the delight of audiences harmoniously coexist.³²

10. Analysis

In the ever-evolving landscape of Technology and Intellectual Property, a glaring void persists, casting a shadow over the very essence of our fundamental rights. The absence of robust legislation in technology law leaves a breeding ground for privacy breaches, infringing upon the sanctity of Article 21. A creation, an invention, or a design holds an intimate connection to its creator, meant solely for their use and benefit.

However, when these treasures are maliciously snatched away, a grave violation of privacy ensues. Compounding this issue is the alarming lack of penalties for offenders, exemplified vividly by the recent Domino's data leak incident, where personal information of 180 million orders found its way into the hands of cybercriminals.³³ This

³² Dhanraj Dadhich, "Preventing Digital and Intellectual Property Piracy: A Global Perspective", *available at*: https://www.linkedin.com/pulse/preventing-digital-intellectual-property-piracy-global-dadhich-1f?trk=article-ssr-frontend-pulse_more-articles_related-content-card (last visited on February 10, 2023).

³³ Ratna Bhushan, "Consumers jittery after data breach at Domino's Pizza", *The Economic Times* (May. 25, 2021), *available at*: <https://economictimes.indiatimes.com/industry/services/hotels/-restaurants/consumers-jittery-after-data-breach-at-dominos/articleshow/82927124.cms?from=mdr> (last visited on February 11, 2023).

breach, orchestrated by a hacker who infiltrated the company's systems, underscores the urgent need for comprehensive regulations.

The impending Metaverse, a realm built upon technology, is poised to encounter similar challenges if not addressed swiftly. Furthermore, the race to harness the power of quantum computers outpaces the establishment of adequate regulations, leaving researchers without specialized courts to adjudicate emerging issues. Yet, amidst these concerns, we must recognize the profound impact technology transfer has had in our fight against adversity, exemplified by the swift development of life-saving COVID-19 vaccines.

11. Conclusion

In the realm where technology reigns supreme, a captivating symphony of innovation unfolds, transforming the very fabric of our existence. Like a resplendent phoenix rising from the ashes of adversity, technology has soared to new heights, propelled by the winds of change. Amidst the chaos and uncertainty of a world gripped by the clutches of a pandemic, technology emerged as a radiant beacon of hope, empowering us to connect, create, and thrive in unprecedented ways.

As the digital revolution continues its inexorable march forward, the need for robust governance looms large on the horizon. The intricate tapestry of our interconnected lives demands a vigilant shield, warding off the malevolent forces that seek to exploit the vulnerabilities of the digital realm. It is imperative that the guardians of law and order fortify the ramparts of justice, crafting legislations that protect and empower individuals in this brave new world.³⁴

Yet, the road to comprehensive technology legislation is an arduous one, fraught with intricate challenges and formidable obstacles. With every quantum leap in technological advancement, the boundaries of our collective knowledge expand, unfurling new frontiers that demand our attention. The Metaverse beckons, a shimmering realm of infinite possibilities, where virtual realms meld with tangible realities. Streaming platforms, vibrant and alluring, have become cultural touchstones, captivating the hearts

³⁴ Iryna Sopilko, Valeriia Filinovich, *et.al.*, "Protection of Intellectual Property Rights from Cyber Threats in the Global Information Environment" 17(1) *Novum Jus* 237-258 (2023).

and minds of the youthful generation.³⁵ To navigate these uncharted waters, researchers must elevate the realm of Intellectual Property Rights (IPR), forging a path that safeguards the ingenuity and creativity of the visionary souls who dare to dream.

As the sun sets on the horizon of possibilities, we stand on the precipice of a momentous future. India, with its unwavering determination to ascend to the pinnacle of economic prowess, must weave a tapestry of innovation and creativity, interwoven with the golden threads of Intellectual Property protection. As we forge ahead, driven by the passion to become a USD 5 trillion economy by 2024-25,³⁶ let us remember that the flame of progress is fuelled by the brilliance of our collective imagination.

In this dazzling tapestry of technological wonder, let us empower the dreamers, the thinkers, and the doers, as we unleash the full potential of our creative prowess. Through steadfast resolve and unwavering dedication, we shall shape a future where innovation reigns supreme, and Intellectual Property Rights stand as sentinels, guarding the fruits of human ingenuity. Together, let us script a story of triumph, where the rights of creators are celebrated, and the world dances to the rhythm of progress.

³⁵ Pedro Cunha Neves, Oscar Afonso, *et.al.*, “The Link Between Intellectual Property Rights, Innovation and Growth: A Meta-Analysis” 97 *Economic Modelling* 196-209 (2021).

³⁶ Press Information Bureau, Government of India, “Vision of a USD 5 Trillion Indian Economy” (October. 11, 2018), *available at*: <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1549454> (last visited on February 16, 2023).