Intellectual Property Rights in the Era of Technological Innovation

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Abstract

Intellectual property rights have become important since knowledge and innovation are the main forces behind technological advancement. Intellectual property rights allow creators to preserve and market their inventions by ensuring ownership and encouraging research and development. Hence, intellectual property protection has become more complicated due to evolving technologies, which increase the scope of technical innovation presenting both benefits and challenges. This paper examines the role of intellectual property rights in fostering technological innovation and its challenges. It concludes that intellectual property laws need to adapt dynamically to technological advancement so that there is a balance between the interests of innovators and society.

***Keywords*:** *Intellectual property, technology, innovation, role, challenges.*

1. Introduction

Technological advancement in this era has emerged as one of the defining features of global economic and social development. The rapid growth in the technological field signifies that knowledge, creativity and information serve as the primary drivers of progress. As such, the role of intellectual property laws has become increasingly central, in which it provides mechanisms to safeguard ownership of intellectual creations while at the same time encourage research and development.

While expansion of technologies led to advancement, it has also introduced challenges in respect of intellectual property protection and its governance. For instance, the issue of inventorship, ownership and originality in respect of artificial intelligence generated works. Previous study by Cuntz, A.et al (2024) revealed that artificial intelligence adoptions in creative sectors poses impact to the current intellectual property system while Mehrotra, A. (2024) and Poddar, A. et al (2024) argue that there is a need to identify and explore new criteria in the current intellectual property system to cater to the needs of technological innovation. Hence, this paper examines the evolving role of intellectual property rights in technological innovation and addresses its challenges. It argues that intellectual property framework must be adaptive so that it remains relevant especially in the era of digital age.

2. Defining IP, IPR and Innovation

The concept of intellectual property has been extensively discussed in legal and academic arena, primarily referred to as intangible property that includes patents, trademarks, copyright and design rights (Oxford Dictionary of Law, 2015). According to the Convention Establishing World Intellectual Property Organisation (WIPO), intellectual property consists of the following;

(a) Literary, artistic and scientific works;
(b) performances of performing artists, phonograms and broadcasts;
(c) inventions in all fields of human endeavor;
(d) scientific discoveries;
(e) industrial designs;
(f) trademarks, service marks, and commercial names and designations;
(g) protection against unfair competition; and
(h) all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields.

In short, intellectual property refers to works (which may be in the form of drawings, designs or inventions) created by human intellect which contain values. Intellectual property rights are legal entitlement given to individuals or entities which arise from the national laws that govern specific types of intellectual property. The rights are available in the event the conditions set out in the applicable legislation are fulfilled, formally granted or registered in accordance with the prescribed legal procedures as required by the said law (Kalanje, 2006). It is also viewed as multitude of legal rights pertaining to categories of information, terms, or other intangible assets that are expressed in their expressive form (Zade, M. S. et al, 2023). Therefore, intellectual property rights emerged as a result of registration of any intellectual property by its creator or inventor. On the other hand, "innovation" relates to the process of applying knowledge and technology to create, enhance, or improve the performance of goods, services, and procedures that are valuable in terms of their influence on the economy or society (UNCTAD, 2019).

3. Types of Intellectual Property

Intellectual property consists of two divisions, namely, literary and industrial property. Literary property consists of copyright while other than copyright falls within the ambit of industrial property (WIPO, 2016). This section discusses the various types of intellectual property namely, copyright, patent, trademarks, industrial designs, trade secrets, geographical indications, its scope of protection, duration of protection and the relevant statutes currently enforced in Malaysia.

3.1 Copyright

Copyright provides protection to creators over their intellectual creations, for example books, paintings, drawings, musical notes, poems, computer programs and film. However, ideas themselves are not protected by copyright law. It is only the manner in which they are expressed is given protection (WIPO, 2016). Copyright law protects software and digital works such as computer programs, databases, and multimedia creations, which are essential in the digital economy, encourage creative industries by safeguarding the economic interests of authors and innovators. In Malaysia, the relevant statute governing copyright matters is the Copyright Act 1987 in which, it provides that the duration of protection for literary, musical and artistic works shall subsist during the life of the author and continue to subsist until the expiry of a period of fifty years after his death (section 17(1) Copyright Act 1987).

3.2 Trademark

A trademark is a sign used to identify goods or services provided by an entity or business provider of a particular good or service (Zade, M. S et al. 2023). Several categories of marks exist, namely certification marks, collective marks and service marks. Certification marks are given due to adherence to certain standards while collective marks are used to indicate an association. Meanwhile, service marks are marks used by entrepreneurs in connection to services they offered in the market. Trademarks enable consumers to distinguish goods or services offered by one entrepreneur from those of others in the market. It also enhances the visibility of a particular product or services as such marks can be used to promote and sell such products or services in the market

(WIPO, 2016). According to the Trademarks Act 2019, a registered trademark is given 10 years protection upon registration at MyIPO provided all the necessary requirements have been fulfilled. A trademark can be renewed indefinitely as long as the renewal fees are paid accordingly.

3.3 Patent

A patent is a government grant that gives an inventor the right to temporary, exclusive protection. During this period, the patented invention can only be used by the inventor or someone who has been given permission by the inventor (B. Fowlston, 1984). By providing temporary exclusivity, patents encourage innovation and give creators control over how their inventions are used commercially (B. Lionel et al., 2001). Another related form of protection which comes under the purview of the patent law is utility innovation, also known as a petty patent, innovation patent, or short-term patent (WIPO, 2004). This option is available to inventors whose creations do not fully satisfy the requirements for standard patent protection, which is inventive steps (section 11 Patents Act 1983). Patent law grants protection to patent owners for a maximum of 20 years from the filing date, provided that all statutory requirements are met (section 35 Patents Act 1983).

3.4 Industrial Designs

Industrial designs refer to an article's decorative or artistic features, such as line or color compositions or any three-dimensional shapes that confers a product or handcraft a unique look. One of the primary importance in respect of industrial designs criteria is that such design needs to be visually appealing and capable of being reproducible by industrial process (WIPO, 2016). The Industrial Designs Act 1996 is the relevant legislation in Malaysia which provides matters relating to industrial designs such as the requirements for registering industrial designs, the scope of rights of the owner of industrial designs and conducts amounting to infringement of industrial design owners' rights. Upon successful registration of industrial designs at MyIPO, the law provides 5 years protection to the owner of industrial designs and may be extended for four consecutive terms of five years each (section 25(1) & (2) Industrial Designs Act 1996).

3.5 Trade secret

Trade secrets are protected under common law principles in Malaysia, mainly through contractual agreements and the doctrine of breach of confidence, as there is no specific legislation governing them. Trade secret is a form of intellectual property that includes formulas, processes, techniques, concepts, equipment, themes and information collections. They have intrinsic value because they are kept confidential from the public in which the owner takes reasonable measures to keep them secret (Zade, M. S et al. 2023). By preventing improper use of proprietary knowledge, trade secret safeguards companies and maintain their competitive edge. Additionally, it helps businesses to secure process-based or incremental advances that might not fit the strict requirements for patent protection. In fact, through licensing agreements, trade secret law promotes cooperation and technology transfer while guaranteeing the protection of proprietary knowledge.

3.6 Geographical Indications

Geographical indications is a sign used on agricultural or man-made products that possess certain qualities, reputation, or characteristics essentially attributable to its place of origin. The law on geographical indication is designed to preserve the authenticity of a product based on its place of origin, to protect consumers from any misleading information relating to the product as well as preventing misuse of information by person other than the producers of the said product (WIPO, 2016) The law on geographical indications in Malaysia is provided by the Geographical Indications Act 2022. According to section 23 of the said statute, registration of geographical indications is

valid for 10 years from the filing date and it may be renewed indefinitely for further periods of 10 years each.

Table 1: Summary of types of intellectual property, legislation and duration of protection

Types of IP	Legislations	Statute	Maximum Duration of protection
Copyright	Copyright Act 1987	Act 332	Life of the author plus 50 years after death
Patent	Patents Act 1983	Act 291	20 years
Trademarks	Trademarks Act 2019	Act 815	10 years upon registration and renewable indefinitely
Industrial Designs	Industrial Designs Act 1996	Act 552	25 years
Trade secret	-	-	Indefinite
Geographical Indications	Geographical Indications Act 2022	Act 836	10 years upon registration and renewable indefinitely

4. Intellectual Property Management in Malaysia

Malaysia Intellectual Property Corporation (MyIPO) is a body responsible for regulating matters relating to intellectual property in Malaysia. The Trademarks Act 2019, the Patents Act 1983, the Copyright Act 1987, the Industrial Designs Act 1996, the Layout Designs of Integrated Circuits Act 2000, the Geographical Indications Act 2022 and subsidiary regulations are among the intellectual property laws that MyIPO administers and enforces**.** MyIPO performs regulatory function by ensuring that provisions relating to intellectual property are being enforced accordingly. Advisory services are given to government by MyIPO in the event where there are issues relating to intellectual property including reviews of intellectual property legislations. MyIPO also provides services to the public at large in matters relating to intellectual property. Some of the services extended by MyIPO to the public are online services as well as management of intellectual property granted to intellectual property owners (https://www.myipo.gov.my/about-us/).

5. Relationship between Intellectual Property and Innovation

A linkage between intellectual property and innovation is established when intellectual property provides exclusive rights and legal protection to innovation. These mechanisms serve as an incentive to creators and inventors in research and development sector because without which, output derived from the research and development will be difficult to be exploited and consequently unable to be benefited by the public (Leger, A., 2007).

6. Roles of Intellectual Property in Technological Innovation

6.1 Legal protection

Technological innovation thrives in conditions that encourage creativity, research, and risk-taking while also providing legal safeguards for the results of such efforts. Intellectual property legislation is the foundation of this protection which provides exclusive rights to innovators so that their technological creations are acknowledged and rewarded. Intellectual property law prevents unlawful exploitation and provides incentive systems that encourage further invention.

For example, the Patents Act 1983 provides exclusive rights to inventors to enable them to exploit their inventions for a limited period and prevents others from copying the invention without authorization from the inventors. This is expressly provided by the Patents Act 1983 under its section 58. Similar provision is also provided under the Copyright Act 1983 which provides penalties to imitators in the event works protected by the copyright law is infringed (section 43 Copyright Act 1987) while other intellectual property laws such as the Industrial Designs Act 1996 provides such provision under section 32 and section 56 under the Trademarks Act 2019.

6.2 Foster innovation

Intellectual Property law grants limited exclusivity to creators of every work that is capable of being protected under its provisions. This limited exclusivity promotes a cycle of continuing invention, allowing creators to derive income from their work and providing them with the opportunity to recoup financial expenses so they can continue to innovate. For example, patent law requires the technical information be made publicly available to be protected by law. This practice enables other inventors to build upon and learn from previous ideas which in turn contributes to cumulative innovation and enhances the global knowledge base (Scotchmer, S., 1991).

6.3 Technology Transfer

Technology transfer effectiveness is often associated with intellectual property. Intellectual property provides protection to inventors against imitators and at the same time facilitates technology transfer of the products via collaboration or licensing activity. Apart from that, intellectual property law enables innovators to share their technology without the fear of losing ownership. This is due to the protection offered by intellectual property law via its legal provisions. Without intellectual property protection, businesses could be reluctant to share creative information, which could result in a lack of use of new technology (Maskus, K. E., 2004).

7. Challenges of Intellectual Property in Technological Innovation

7.1 Human Centric Law

Intellectual property law is inherently a human-centric body of law because its purpose is to safeguard the outputs of human creativity and innovation. Intellectual property law is founded on the recognition of human intellectual labor (Mala, C., 2022) and its contribution to cultural, technological and economic progress. Its core is to reward human creativity with exclusive rights while guaranteeing that the public benefits from access to knowledge and innovation.

At its foundation, intellectual property law seeks to encourage human invention by providing inventors and creators with acknowledgment and control over their intangible assets. This

recognition validates the worth of human labor and gives moral and economic incentives to continue producing knowledge and cultural works. For example, copyright protects authors' original works (section 7 Copyright Act 1987) while patents protect inventors' technical contributions. In the event such rights are infringed, the law will provide penalties to the infringers. This framework ensures that the authors and inventors' rights are protected and their intellectual labor are respected. For example, in Malaysia, the term "qualified person" as required by the Copyright Act 1987 prior to be protected under the copyright law in Malaysia indicates that the copyright law requires human to be creators of a particular work. Similarly, when the Copyright Act 1987 provides that the duration of protection for copyrighted works is lifetime of the author with additional 50 years after death demonstrates that a human is needed to be identified as an author.

6.2 Rapid Technological Change

The speed at which technology is developing in contrast to the process of passing the legislation and regulations is another difficulty for intellectual property and innovation. New concerns about authorship, ownership, and the extent of protected subject matter are brought up by emerging technology. Artificial intelligence-generated works, for example, challenge the traditional human-centric foundation of copyright and patent law, which, as mandated by the laws, attributes originality and creativity to human writers. As pointed out by U. Anusha (2024), the conventional intellectual property framework faces tremendous difficulties such as patents need to navigate the algorithmic advances, copyright needs to deal with the development of artificial intelligence generated materials while trademarks face unique hurdles in virtual and metaverse domain.

6.3 Enforcement capacity

With the advancement of technology, various types of infringement occur such as using artificial intelligence to imitate copyrighted materials, piracy and to disseminate illegal content. While the intellectual property law remains traditional, the capacity to enforce such infringements via legal provisions remains uncertain. The interaction between new technologies and traditional intellectual property framework requires sophisticated knowledge to meet the evolving situation (U. Anusha, 2024). For example, neither the Copyright Act 1987 nor the Patents Act 1983 provides clearly on the issue of artificial intelligence generated works and whether works generated by such artificial intelligence is subjected to any penalty should it infringe on any of the exclusive rights of intellectual property owners.

6.4 Public Interest

One of the key concerns of intellectual property in the context of technological innovation is balancing innovators' exclusive rights with public access to information and technology. Intellectual property is essentially structured to reward inventors with temporary monopolies for their creative contributions, but these exclusive rights can occasionally intersection with public interest objectives. For example, in health sector, patents on medicines may limit accessibility to certain low-income countries due to its price. (Correa, C. M. et al 2022). This sparks ethical and legal arguments over whether intellectual property law should emphasize innovative incentives or public health objectives. Similarly, copyright protection for digital resources may limit information access, impeding educational justice and social progress. Hence, balancing innovation and public interest at the same time is needed to ensure that it does not stifle innovation (Mehrotra, A., 2024).

7. Conclusion and Future Recommendations

Intellectual property plays a crucial role in technological innovation since its framework safeguards, encourages, and makes it easier to commercialize creative outputs. Intellectual property gives creators temporary exclusivity via patents, copyrights, trademarks and trade secrets, allowing them to recoup investments and continue research and development cycles. At the same time, intellectual property promotes cumulative technological growth by acting as a catalyst for the transmission of knowledge as inventions finally make their way into the public domain.

However, challenges between intellectual property and technological innovation need to be overcome. Overly strict or restrictive intellectual property protection can impede access to innovation by the public. Furthermore, the speed at which technology is developing often surpasses the capabilities of current intellectual property frameworks, posing issues with regards to authorship, ownership and enforcement. These conflicts emphasize the necessity of flexible and well-balanced intellectual property laws that protect innovators' rights while maintaining the welfare of the public.

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References

B. Fowlston. (1984). *Understanding Commercial and Industrial Licensing*, Waterlow Publishers Limited. London.

B. Lionel & B. Sherman. (2001). *Intellectual Property Law*, Oxford University Press, United States of America.

Copyright Act 1987 (Act 332).

Correa, C. M., & Hilty, R. M. (Eds.). (2022). *Access to Medicines and Vaccines: Implementing Flexibilities Under Intellectual Property Law*. Springer.

Cuntz, A., Fink, C., & Stamm, H. (2024). Artificial intelligence and intellectual property: An economic perspective. *World Intellectual Property Organization (WIPO) Economic Research Working Paper Series*, (77).

Geographical Indications Act 2022 (Act 836).

https://www.myipo.gov.my.

https://unctad.org/system/files/official-document/dtlstictinf2019d1_en.pdf.

Industrial Designs Act 1996 (Act 552).

Kalanje, C. M. (2006). Role of intellectual property in innovation and new product development. *World Intellectual Property Organization*.

Léger, A. (2007). The Role (S) Of Intellectual Property Rights For Innovation: A Review Of The Empirical Evidence And Implications For Developing Countries.

Mala Chatterjee. (2022). *Intellectual Property, Independent Creation, and the Lockean Commons*. 12 UC IRVINE L. REV. 747.

Maskus, K. E. (2004). *Encouraging international technology transfer* (Vol. 7). ICTSD.

Mehrotra, A. (2024). Navigating the Intellectual Property Landscape in the Age of Artificial Intelligence: Towards a Global Legal Paradigm. *International Journal of Innovations in Science, Engineering And Management*, 253-258.

Patents Act 1983 (Act 291).

Poddar, A., & Rao, S. R. (2024). Evolving intellectual property landscape for AI-driven innovations in the biomedical sector: opportunities in stable IP regime for shared success. *Frontiers in Artificial Intelligence*, *7*, 1372161.

Scotchmer, S. (1991). Standing on the shoulders of giants: cumulative research and the patent law. *Journal of economic perspectives*, *5*(1), 29-41.

Trademarks Act 2019 (Act 815).

Unnikrishnan, A. (2024). Analyzing the impact of emerging technologies on intellectual property rights (IPR): a comprehensive study on the challenges and opportunities in the digital age. *Law & World*, *29*, 66.

WIPO. (2016). Understanding Intellectual Property. Available at https://www.wipo.int/edocs/pubdocs/en/wipo_pub_895_2016.pdf

Yang, W., & Wang, X. (2024). The impact of patent protection on technological innovation: A global value chain division of labor perspective. *Technological Forecasting and Social Change*, *203*, 123370.

Zade, M. S., Tamboli, F. A., Salunkhe, A. A., Kore, M. D., More, A. D., & Ghadge, Y. R. (2023). Intellectual property rights (IPR): An overview. *International Journal of Pharmaceutical Chemistry and Analysis*, (10), 3.