Research Article

Copyright Protection of Computer Software: A Comparative Study of India and Indonesia

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ABSTRACT

Since its invention around fifty years ago, computer technology has drastically changed people's lives. As well as providing various conveniences, the existence of computers has also given rise to a number of legal issues. This research project aims to examine comparative law in the context of copyright protection for computer programs in Indonesia and India. Multiple approaches were used: comparative, statutory, conceptual and case. The results obtained are as follows: (1) In Indonesia, a country with a civil law tradition, the benchmark for protecting authors is a reward system. Meanwhile, India, which has a common law legal tradition, uses a benchmark of copyright on the object of work creation as an incentive system;(2) The standard of copyrightability in Indonesia emphasises originality and creativity to a high degree. India, however, places more emphasis on fixation;(3) Both countries provide automatic protection for computer programs for a term of 50 years;(4) In Indonesia, copyright encompasses both economic and moral rights. India, however, places more emphasis on economic rights;(5) There are limitations and exceptions to author's rights in Indonesia. India has a system of fair use or fair dealing;(6) Copyright infringement can be direct or indirect. In Indonesia, law enforcement includes criminal sanctions in the form of imprisonment and fines. In India, it is mostly based on civil lawsuits and damages.

Keywords: Copyright; Computer Program; Protection; Law Enforcement.

A. INTRODUCTION

In contemporary society, the convergence and advancement of information communication technology often referred to as digital information have fundamentally transformed established concepts of Intellectual Property Rights (IPRs), which have traditionally been confined to the physical manifestation of ideas and intangible goods, thereby presenting significant challenges to conventional copyright legislation, particularly (Jened, 2017); (Roisah et al., 2017b). An effective intellectual property protection framework is regarded as the cornerstone of innovation, facilitating the mitigation of risks associated with innovation while simultaneously promoting private investment in knowledge-intensive endeavors (Xu, Luo, & Xu, 2026).

Computer software introduces distinct challenges due to the ease with which it can be replicated and the striking similarity that often exists between counterfeit and authentic versions (Rahardjo, 1996); (Roisah et al., 2025). The intrinsic properties of digital content, including lossless duplication, effortless distribution, modification, and publication, render the replication and dissemination of digital products exceedingly straightforward (Feng, Pan, & Xiao, 2025). Software developed with substantial financial investment, encompassing considerable time and effort, can be reproduced within mere seconds. The global community is undergoing a digital transformation, which has engendered profound alterations in activities, lifestyles, and even the creative processes themselves (Mayana et al., 2024). This digital transformation is imperative for advancement and economic development, necessitating a swift reconfiguration of resources coupled with a proactive strategic outlook (Xu, Luo, & Xu, 2026).

Since computer technology became known around fifty years ago, it has drastically changed people's lives. In the current digital era, technological innovation is rapidly evolving, enabling information and ideas circulate more widely and swiftly than ever before (Budi, Hutagalung, & Irawati, 2024). Apart from providing various conveniences, the existence of computers has given rise to various legal problems (Raharjo, 1996). The development of digital technology allows for the rapid and massive reproduction and distribution of creative works across country (Budi, 2014). Because the Internet is fast, creative, and flexible, it has a huge potential to spread information across borders (Lumbanraja, & Khasanah, 2022). In fact, digital technology is one of the most important changes of the last 100 years (Samekto, 2017). The widening disparity between technological advancement and legal adaptation engenders a VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) environment within society, ultimately leading to the law's inadequacy in fully addressing emerging innovations and developments (Arvante, Sulistyawan, & Riyanto, 2025).

This challenge is increasingly looming with the Internet of Things (IoT) and Artificial Intelligence (AI) as part of automation technology (Dosi, Santoso, & Njatrijani, 2017). The expansion of IoT across multiple sectors presents significant security problems due to the increasing number of users and associated services. The advancement of IoT has effectively linked several devices; however, many are inadequately secured due to intrinsic resource limitations, including restricted processing power and little energy usage (Ikhwan, Purwanto, & Rochim, 2025). In particular, the use of generative AI presents significant legal challenges, as many models are trained on copyrighted works without proper authorization or compensation to the rights holders (Pasetti et al., 2025).

The legal quandary currently under examination pertains to the provision of legal safeguards for computer programs. In the preliminary phases, certain scholars advocated

for protection oriented towards the patent system (Budi, 1999). This perspective was predicated on the premise that patents are attainable for inventions (Waspiah et al., 2023), encompassing both products and processes across all technological domains, contingent upon their novelty, the presence of an inventive step, and their industrial applicability (Roisah, 2017). Nonetheless, as the discourse evolved, numerous nations, including Indonesia, opted to confer protection through copyright legislation. While the safeguarding of computer programs under the Copyright Act in Indonesia and India is extensive, the swift advancement of technology poses persistent challenges to the legal framework governing the protection of computer programs. Computer software remains susceptible to piracy, which incurs significant costs for development yet is effortlessly replicable (Miyashita, 1992). Issues such as software piracy the advent of open-source software and emerging technologies like IA require ongoing legal adaptation and refinements. This has resulted in many violations of computer programs which include the reproduction and use computer without authorization. These infringements have also resulted in substantial economic losses for copyright holders, diminishing their incentive to expand business operations through online platforms (Feng, Pan, & Xiao, 2025).

Indonesia's population is estimated to be around 285.7 million people (Badan Pusat Statistik, 2025). There were 185.3 million internet users in Indonesia at the start of there were approximately 185.3 million internet users. This means that around 66.5% of the population had access to the internet. Indonesia was home to 139.0 million social media users in equal to 49.9 percent of the total population trend can be attributed to easier access and a general preference for going online via smartphone (Nurhayati & Suryadi, 2017).

India is the most populous country in the world, with one-sixth of the world's population. Around 23 percent of households in urban India had access to computers for distance learning. On the other hand, only four percent of households in rural India had access to computers (Gohain, 2020). In general, the ownership rate of computers is relatively low, although the share of people who access the internet is still increasing. This is due to the easier access and the general tendency to go online via a smartphone.

In 1994, the world reached a multilateral agreement on the Agreement Establishing the World Trade Organization (WTO) in the Uruguay Round-Marrakesh with a commitment schedule for developed countries on 1st January 1995, developing countries on 1st January 2000, and under-developed countries on 1st January 2005 (Jened, 2007). Indonesia and India are both developing countries and are members of the WTO. Both Indonesia and India, as developing countries and members of the WTO, were required to incorporate the provisions of the TRIPS Agreement into their national legal

systems within five years after the agreement entered into force (Roisah, 2017).

On November 2, 1994, Indonesia ratified the Agreement on the Establishment of the World Trade Organization through Law no. 7/1994 was published in the State Gazette of the Republic of Indonesia of 1994 at Number 57 and the official Elucidation in Supplement Number 3564 to the State Gazette. There are 15 WTO agendas, one of them is the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS). In order to implement the TRIPS Agreement, the WTO member states enact legislation in their domestic legal system. The TRIPS Agreement requires full compliance by all WTO members in enforcing these minimum standards of intellectual property protection (Roisah et al., 2017a). In this light, Indonesia has enacted different laws regarding copyright, patents, and trademarks in fulfillment of the obligation resulting from the TRIPS Agreement. It has made various reforms to ensure better protection of Intellectual property rights (IPR) (Geofrey & Roisah, 2020).

A review of relevant literature reveals at least five prior studies that have addressed similar topics regarding copyright protection of computer software and digital copyright protection. Mayana, Santika, and Cintana (2024), in *Digital Copyright Protection as a Form of Intellectual Property Development Implementation in Electronic System*, examined the actualization of intellectual property development within the copyright regime through derivative works in electronic media. Their study emphasized the need for extra protection beyond conventional copyright law to respond to the growing complexity of digital copyright infringements.

Additionally, Sihombing, Permata, and Ramli (2021) conducted a comparative analysis of the digital copyright protection mechanisms in the United States and Indonesia with respect to over-the-top (OTT) streaming content media. Their findings suggest that Indonesia's digital copyright protection is still primarily concerned with conventional copyright objects, which is why sui generis legislation is necessary to enhance the protection of digital works in the contemporary era. In a subsequent study, Rahman et al. (2023) examined the evolution of copyright law from the protection of traditional works to the inclusion of digital creations in Protecting Intellectual Property in the Digital Age with A Law. The authors emphasized the significance of technological protection measures and security technology as complementary instruments in copyright protection, particularly within the context of the WIPO Internet Treaties. In Copyright Protection in Cyberspace: A Critical Study with Reference to Electronic Copyright Management Systems (ECMS), Ahmad (2009) investigated the level of maturity of copyright protection for computer programs and identified unresolved challenges related to technological protection measures. The study also addressed the crucial equilibrium between the preservation of the principles of fair use and users' rights and the enforcement of access control mechanisms.The long-standing debate between copyright and patent law as

models of protection for software was analyzed by Pikhurets et al. (2021) in Copyright Regulation of Relations with regard to Software: Current State and Perspectives. Their research demonstrated that, despite the widespread preference for copyright protection due to its efficiency and cost-effectiveness, there are substantial voids in the protection of software structural components and algorithms.

These studies have helped us understand digital copyright security in a big way, but there are still some areas that need more research. First, there isn't a lot of research that compares how different copyright rules in civil law and common law jurisdictions, like Indonesia's focus on originality and creativity versus India's focus on fixation, affect how well software copyright protection works. Second, there isn't much written that merges the need for functional protection of algorithms and program structures with form-based copyright protection yet. Third, limited attention has been given to the interaction between technological protection measures and emerging issues such as open-source software, AI-generated code, and automation systems. Fourth, there remains insufficient discussion on the enforceability and practical effectiveness of digital copyright mechanisms across jurisdictions with distinct legal traditions. Finally, empirical comparative studies on Indonesia and India's implementation of international copyright treaties and their adaptation to contemporary technological challenges are still scarce, highlighting the urgency for further systematic research to inform future policy and legislative reform.

B. RESEARCH METHODS

This legal research was conducted through library or desk-based research. This research used multiple approaches, comparative, statutory, conceptual, and case approaches. Primary and secondary legal resources used in this research. All legal resources are analysed qualitatively to produce prescriptions according to the problem being studied (Marzuki, 2017).

C. RESULTS AND DISCUSSION

1. Legal Traditions and Their Influence on the TRIPS Agreement

Pursuant to Article 2, Paragraph 2, the TRIPS Agreement gives member countries the legislative freedom to implement the Agreement according to their own laws and legislation. The TRIPS Agreement also recognises that there are two legal traditions in the world (three if you include Islamic shariah). The common law tradition involves judge-made law or case law (Postema, 2004); (Marzuki, 2014). This tradition originates from Anglo-Saxon England. The common law tradition is currently applied in England, Ireland, Canada, Australia, New Zealand and several Asian and African countries (Merrymann, 1969). The United States has developed its own legal system, known as Anglo-American law (Bodenheimer, Oakley & Love, 1988).

The civil law tradition is statutory law inherited from Roman law, which began in 450 BC. It currently applies to almost all of Western Europe, Central America, South America, Louisiana, Quebec, Puerto Rico and former European colonies (Merrymann, 1969).

Indonesia is a country with a civil law tradition and has inherited much of its legal system from Dutch law. It is also a constitutional state (Rechtsstaat). According to Friedrich Julius Stahl, the key characteristics of a constitutional state in countries with a civil law tradition are as follows (Azhary, 1995):

1. Recognition and protection of human rights;
2. Separation of powers to guarantee these rights;
3. The government is based on laws;
4. Existence of a state administrative court.

In contrast, common law tradition countries adhere to the Rule of Law concept, as outlined by A.V. Dicey (Dicey, 1982):

1. Human rights guaranteed by law
2. Equality before the law
3. Supremacy of the rule of law, prohibiting arbitrariness without clear rules.

Prof. Peter Mahmud highlights the differences between civil law and common law traditions as follows (Marzuki, 2017):

CHARACTERISTICS	
Common Law	Civil Law
Jurisprudence is the primary source of law.	Codified laws are the primary source of law.
Judges are bound by precedent and adhere to the doctrine of stare decisis.	Judges are not bound by precedent.
	There is an Administrative Court

The philosophical foundation of IPR began with the idea of rewarding creators or inventors for their intellectual creations that benefit society, as discussed in Aristotle's Politics in the fourth century BC (D'amato & Long, 1996). In his various discussions, Aristotle often sharply criticized the views of Hippodamus of Miletus, who proposed a reward system for those who made useful discoveries for society. Hippodamus's proposal stated that: 'If you reward the creators of useful things, you get more useful things.' In response to this proposal, Aristotle argued that:

> 'A such system of individual reward may otherwise reduce social welfare... A reward for revealing information to the state would give rise to fraudulent claims of discovery or malfeasance on the part of public officials'.

There are two philosophical theories regarding the legal assumption that IPR is a property system. These theories were proposed by John Locke (1632-1704), who was highly influential in countries following the Common Law tradition, and by Georg Wilhelm Friedrich Hegel (1770-1831), who was highly influential in countries following the Civil Law tradition (Hughes, 1988) also in (Jened, 2007), (Drahos,

1996), and also in (Maxwell, Bolger, & Zeggane, 2009).

a. Copyright Protection in Common Law Tradition

In his book Two Treatises of Government, John Locke: Chapter V of Property, taught the concept of property in relation to human rights, stating: 'Life, liberty and property.' He stated that, originally, in a state of nature, there was peace and security and no positive law dividing property or granting authority to one person to rule over others. This moral obligation was imposed by God and was evident for various reasons. However, the state of nature could not be maintained because it lacked a judge who could provide a binding interpretation of natural law to resolve conflicts of interest between individuals. Therefore, people formed a civilised state, whose authority would provide security for natural rights that were unavailable in the state of nature (D'Amato & Long, 1996). Furthermore, John Locke stated that, since humans are equal in the state of nature, their duties to one another are equal to their rights. According to Locke, there are two types of rights:

a. Liberty rights that are free of duty;
b. Claim rights that are areas where the right-holder is owed a duty by others.

In general, everyone has an obligation not to harm others, except in cases of special necessity that can be justified. The right not to be harmed is a natural right that precedes all others. According to Drahos (1996) and D'Amato & Long (1996), there are two key liberty rights:

1. All persons have a liberty right to dispose of their efforts as they see fit;
2. All persons have a liberty right to use the common, 'the earth and all its fruit which God gives to humankind.'

These two rights mean that, according to natural law, no one can claim against another for the non-harmful use of their efforts or the non-harmful use of the commons. In this regard, there are three important things:

1. Our claim right to be free from harm;
2. Our claim right to have a share of others' plenty in times of our great need;
3. Our liberty right to use the common.

These three rights are known as 'fundamental human entitlements'. Therefore, if a person works productively, they have the right to possess more goods than less productive people. However, a person's actions cannot infringe on the human rights of others. No one has the right to harm others or hinder their access to the commons. John Locke developed the theory of the fruit of labour, the logic of which is as follows (Jened, 2007):

> 'Labor is mine and when I appropriate objects from the common, I join my labour to them. If you take the objects I have gathered, you have also taken my labour, since I have attached my labour to the objects in question. This harms me, and you should not harm me. You therefore have a duty to leave these objects alone. Therefore, I have property in the objects'.

According to Locke, the concept of ownership (property) is related to human rights, as expressed in the statement: 'Life, liberty and

property'. Locke argued that humans should be able to reap the rewards of their labour, regardless of the form that labour takes. This concept of property is closely related to basic human rights. In his seminal work, 'Two Treatises of Government', Locke argued that all of God's creations were given to humankind as common property to be shared collectively (Sajogo, Sugianto & Yamamoto, 2025). However, each individual possesses unique property in their own person. According to one of Locke's key principles, when a person mixes their labour or effort with something held in common, they transform it into their own property (Sajogo, Sugianto & Yamamoto, 2025). Therefore, only the creator has rightful ownership of property produced or created in the world (Drahos, 1996); (Jened, 2007).

The philosophy underlying intellectual property (IP) protection is to incentivise innovation involving human effort and labour (Kusuma & Roisah, 2022). In the common law tradition, justification is based on 'functionalist justification' (Baulch, 1997). Intellectual property rights (IPR) are an incentive system that protects copyright as an economic instrument to increase knowledge and support socio-economic development. In a copyright system, protection is given to the object, i.e. the copyrighted work, as the starting point. Initially, the common law tradition emphasised economic rights more. In the common law tradition, moral rights theory cannot be separated from the Romantic conception of authorship that emerged in the 18th century, as this conception encompasses the same ideas of authors' originality and creative genius, and the connection between authors and their works. Functional justification begins with the restricted right to protect the copyrighted work. Public access to copyrighted works is limited to fair dealing or fair use. However, it is impossible to define what constitutes 'fair dealing'. It must be a question of degree. First, you must consider the number and extent of quotations and extracts. Are there too many, or are they too long, to be considered fair? Then consider the use made of them. If they are used as the basis for comment, criticism or review, this may constitute fair dealing. However, if they are used to convey the same information as the author for a different purpose, that may be considered unfair. Next, consider the proportion. Taking long extracts and attaching short comments may be unfair. However, short extracts with long comments may be fair. Other considerations may also come to mind, but ultimately, it must be a matter of impression (Sterling, 2005b).

> Fair dealing provides an exception to UK copyright law in cases where copyright infringement is for the purposes of non-commercial study, criticism, review or reporting of current events. However, it does not apply to commercial research or infringement of broadcasting or sound recordings, and its application to software is limited.

In the US, fair use is a doctrine that allows limited use of copyrighted materials for educational and research purposes without permission from the owners. It is not a blanket

exemption. Instead, each proposed use must be analysed under a four-part test. The test is as follows (Penn State, 2022):

1. What is the character of the use? Educational, non-profit and personal use is favoured for fair use, while commercial use is not. However, the educational or non-profit nature of a use does not necessarily mean it is fair. Whether the use is 'transformative' is more important than its educational or non-profit nature. A use is transformative if it builds upon, criticises, comments on, parodies, or adds something new to the original work in some other way. In other words, the question is whether the new use merely 'supersedes the objects of the original', or whether it 'adds something new, with a further purpose or different character'.
2. What is the nature of the work to be used? The use of factual works weighs towards a finding of fair use. Use of imaginative works is more likely to require permission.
3. What is the amount and substantiality of the portion to be used? Using only a small part of copyrighted material suggests fair use, whereas using large parts indicates the need for permission. However, be careful with this factor: a court recently held that copying 5% of a book into a course pack was not fair use.
4. Will the use negatively affect the value of the copyrighted material? Where a work is available for purchase or license from the copyright owner, copying all or a significant portion of the work (in lieu of purchasing or licensing a sufficient number of 'authorized' copies) would likely be unfair. If only a small portion of a work is to be copied, and one would likely forego using the portion if permission were required, then the balance tips towards fair use.

b. Copyright Protection in Civil Law Tradition

Meanwhile, in his work Philosophy of Right, G.W. Friedrich Hegel developed the concept of 'Right, Ethics and State', the essence of which is the existence of personality. According to Hegel: 'Property is, among other things, the means by which an individual can objectively express their personal will. In property, a person exists for the first time as reason.' He began his analysis of 'the will which is free in and for itself, as it is in its abstract concept'. He argues that 'the person must give himself an external sphere of freedom in order to have being as an idea'. Furthermore, Hegel stated:

> *'A person must translate their freedom into an external sphere in order to exist as an idea, and personality is the first, still wholly abstract, manifestation of the absolute and infinite will.' The will interacts with the external world at different levels of activity. Mental processes such as recognising, classifying, explaining and remembering can be viewed as the mind's appropriation of the external world. Acting upon things is an initial step in the ongoing struggle for self-actualisation.'*

Hegel defended his conception of property by distinguishing between the facilitation function of the property institution at an abstract right level, and optimum ethical life evolution. Any discussion of freedom must begin not with the concept of individuality or individual self-consciousness, but with the essence of self-consciousness itself. Humans must realise the scope of 'meum' and 'tuum'; there is no other way in which a person can distinguish themselves abstractly from the existing world and from others. This provides a prima facie justification for the institution of property, appealing to its inherent qualities. The rational aspect of property is not found in the satisfaction of needs, but in the establishment of personality subjectivity. With this statement: 'Nor does the person exist as reason until he has property.' (Jened, 2006); (Jened, 2007).

Therefore, the concept of individual welfare occurs when a person becomes the owner of property. Intellectual property arises from the way individuals shape their thoughts in their material environment. Thus, property can be transferred through the transfer of material objects or intellectuality to create new ideas.

Personality is the power that gives the ability to recognize oneself and translate one's freedom externally to exist as an idea. Therefore, according to Hegel, property at a certain stage must become something private, and private property becomes a universal institution. This is the basis for justifying IPR. According to Hegel, there is something more to property than merely human instinctual behavior. The importance of property lies in being one way to build, develop, and understand our personality, an expression we wish to master, while simultaneously establishing boundaries between other individuals and other properties of society. Ultimately, this is how humans respect the personality of each individual through respect for IPR. Humans are free to choose the property they wish to acquire and the social role they wish to fulfil. Thus, the real issue is a legal matter, not an ethical one, and for this, courts are needed to objectify the object of property (Jened, 2006; Jened, 2007).

According to Hegel, property essentially embodies personality: 'Property is the embodiment of personality...' (Lewinsky, 2004a). Property is, among other things, a means by which individuals can objectively express their personal will. Property enables a person to 'exist' for the first time as reason (Drahos, 1996). Wealth is also a means by which a person can express their personal will (D'Amato & Long, 1996). Hegel also introduced what is known as the Personality Theory, which posits that intellectual property (IP) constitutes an expression of the creator's personal identity, whose ownership is legally recognized (Zahida & Santoso, 2023). Based on this theory, a creation is viewed as an extension of the creator's personality; therefore, the creator retains the right to control how others use or reproduce their work. Accordingly, within the Civil Law tradition, the benchmark of protection lies with the author or creator. In terms of Intellectual Property Rights (IPR), so called author right justification (Baulch, 1997).

The Civil Law legal tradition reflects the author's right system as a system of reward and protection of the author's personality. The starting point for copyright protection is given to the creator as the person who owns 'intellectual personal creation' which requires elements of originality and creativity to a very high degree and is not solely based on the element of embodiment (fixation) (Lewinsky, 2004b). Copyright shall protect the author with respect to his intellectual and personal relationship with his work and also with respect to utilization of his work' (Lewinsky, 2004a). This means that Copyright protection has a moral right and an economic right dimension.

The first person using the term droit moral was Andre Marillot (French jurist) in 1898, who explained that the right of the authors consists of a dual nature. Firstly, a complete personal

sovereignty over the work (rights of publication, integrity, and attribution) and secondly, the monopoly of commercial exploitation. Moral rights include the right to have one's name indicated or omitted, the right to use a pseudonym, the right to modify a work in accordance with societal propriety, and the right to object to any distortion, mutilation, modification, or other actions that may harm the author's honor or reputation (Sajogo, Sugianto, & Yamamoto, 2025). The Right of Paternity (*droit à la paternité*) refers to the author's right to be identified as the creator of the work, while the Right of Integrity (*droit au respect de l'œuvre*) grants the author authority to prevent others from altering their work without consent (Puspita, Roisah, & Lestari, 2024). Meanwhile, economic rights constitute the author's exclusive and proprietary rights to derive financial benefits from their creation, including the rights to publish, reproduce, distribute, translate, and adapt the work.

The exclusive right of the Creator or Copyright Holder means legalized monopoly that no other person may exercise that right except with the permission of the creator. Moral rights arising from the Author's personal and intellectual relationship with his Creation, and an economic rights dimension related to the use or exploitation of his Creation (Lewinsky, 2004a). Moral right of the Author provides protection to the author for their attribution and integrity in personal intellectual creation. While the economic right of the author for utilizing their creation. Indonesia which experienced Dutch colonialism Indonesia adheres to civil law traditions-statutory law and the unique ideology of Pancasila (Jened, 2006). Therefore Indonesia recognizes both economic and moral rights, aligned with the civil law system. Perspective on the protection for the author that given exclusive rights. However, this does not mean that the exclusive rights of the Creator are absolute and unlimited. For this reason, the law provides limitations on the author or author's exclusive rights of the author (Senftleben, 2003).

> *Limitation and exceptions to copyright are provision in copyright law which allow for copyrighted work to be used without a license from copyright owner relate to a number important consideration such as market failure, freedom of speech, education and equality access. In order to maintain an appropriate balance between the interest of right holders and users of protected work, copyright law allow certain limitation on economic right that is cases in which protected work may be used without the authorization of the right holder and with or without payment of compensation*.

Both the conceptions of John Locke and Hegel originate from Natural Law Theory, which is based on morality about what is good and what is bad. Natural rights are derived from nature itself for tangible material. Both do not directly provide a conception of Intellectual Property Rights. That is, the general concept and justification of property have been dominated by physical property. Locke's ontological justification refers to rights associated with a person's effort (the Labor theory), while Hegel refers to rights associated with personality or self-identity (the personality theory). John Locke considered that goods were provided but could not be enjoyed in the state of

nature, so a person must convert goods from natural goods into private goods by exerting their effort upon those goods. The added value of effort on those goods makes them enjoyable. The effort sacrificed by a person is what must be valued (Jened, 2006); (Jened, 2007).

2. Standard of Copyrightability of Copyrighted Works

All applications are programs, but a program is not necessarily an application. All three words are 'software', 'computer program', and 'application'. are often used interchangeably, but there is a technical difference as follows (Kemp, 2024):

a. Software is the program and other operating information used by a computer. Software can be made up of more than one program. All is encompassing term is often used in contrast to hardware (the tangible part of a computer);
b. Computer Program is a set of instructions telling a computer what to do. In computing, a program is a specific set of ordered operations for a computer to perform. In the modern computer that John von Neumann outlined in 1945, the program contains a one-at-a-time sequence of instructions that the computer follows. Typically, the program is put into a storage area accessible to the computer. The computer gets one instruction and performs it, and then gets the next instruction. The storage area or memory can also contain the data that the instruction operates on. Note that a program is also a special kind of data that indicates how to operate on application or user data;
c. Application software is usually in the form of compiled object code. You may have heard people talking about using a program, an application, or an app. But what exactly does that mean? Simply put, an app is a type of software that allows you to perform specific tasks. Applications for desktop or laptop computers are sometimes called desktop applications, while those for mobile devices are called mobile apps. App is a common term for an application, especially for simple applications that can be downloaded inexpensively or even for free. Many apps are also available for mobile devices and even some TVs, or are a set of computer programs designed to permit the user perform a group of coordinated functions, tasks, and activities. The application cannot run on itself, but is dependent on system software to execute.

In general, the process of creating a computer program takes place in two stages, namely (Budi,1999):

1) Making plans in the form of written notes or a flowchart, which is an expression of the basic idea of creation. By using a special language in the form of codes that can only be read in a computer language.
2) Converting Source Code to object code and making it possible to operate computer equipment using magnetic signals.

Computer program specifically regulated in Article 9 to 11 of TRIPS Agreement. Pursuant to TRIPS Agreement Article 9 that (WIPO, 1997):

(1) Member shall comply with Articles 1 through 21 of the Bern Convention (1971). However, member shall not have rights or obligation under this agreement in the respect of the right conferred under Article 6 bis of that convention, or of the right derived therefrom.
(2) Copyright protection shall extend to expression and not to idea s, procedures, methods of operation or mathematical concepts as such

Furthermore, Article 10 of TRIPS Agreement stipulates:

(1) Computer programs, whether in source or object code, shall be protected as literary works under the Berne Convention (1971).
(2) Compilation of data or other material machine-readable or other form, which by reason of the selection or arrangement of their content constitute intellectual creations

> shall be protected as such. Such protection, which shall not extend to the data or material itself, shall be without prejudice to any copyright subsisting in the data or material itself.

Computer program whether in source code or object code, shall be protected as literary works under the Berne Convention (1971). Based on this definition, computer software is instructions that form source code and object code (Rahmah, Widyantoro, & Jened, 2000). Source code is generally understood to mean programming statements that are created by a programmer with a text editor or a visual programming tool and then saved in a file. Object code generally refers to the output, a compiled file, which is produced when the Source Code is compiled with a Compiler. The object code file contains a sequence of machine-readable instructions that is processed by the CPU in a computer (University of Washington, 2024). A computer program is a form of expression in a language, code, or notation that causes a device that has the ability to process digital information to perform certain functions (Wardana, Rahayu, & Sukirno, 2024). A good computer program in the form of source code and/or object code is a creation protected by copyright (Schubert, 2004).

According to Paragraph 2 of Article 9, 'Copyright protection shall extend to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such.' This is further elaborated in Article 10, Paragraph 2, of the TRIPS Agreement: 'Compilations of data or other material, whether in machine-readable or other form, which by reason of the selection or arrangement of their contents constitute intellectual creations shall be protected as such. Such protection, which shall not extend to the data or material itself, and shall be without prejudice to any copyright subsisting in the data or material itself.', a computer program qualifies as a form of expression rendered in a language, code, or notation, designed to direct a device capable of processing digital data to perform certain functions (Fitriyanti et al., 2024).

Copyright cannot protect every work. Basically, a work can be protected by copyright if it meets the copyrightability test (Kintner & Lahr, 1982).

1. Originality: A work is considered original when it was created independently by the creator. It doesn't have to be innovative or distinctive. Even a work based on public domain material might be considered original if the creator incorporates their own creative expression.
2. Originality: A work is considered original when it was created independently by the creator. It doesn't have to be innovative or distinctive. Even a work based on public domain material might be considered original if the creator incorporates their own creative expression.
3. Fixation: A work is deemed fixed if it is in a tangible medium that can be observed, reproduced, or conveyed for more than a temporary duration. This comprises electrical or magnetic storage devices, such as computer memory, that are capable of storing programs.

According to Silke Lewinsky the standard of copyrightability recognized in both legal traditions with the different degree of conception. In civil law tradition, originality is the primary requirement for copyright protection, followed by a

high degree of creativity. Unlike patent law, which requires novelty (Waspiah et al., 2022), a copyrighted work can be based on public domain material. Originality in this context refers to the original expression of ideas, not the ideas themselves. Originality means if created by a human creator with a minimal level of creativity or 'spark' or 'medicum' creativity (Azoro, Onah, & Agulefo, 2021).

Creativity is therefore one of the basic requirements for copyright protection. To meet this criterion, a work must include something that is above and beyond the original. Though verbatim use is not considered original, reference to the original work that is used to discuss a new concept is considered original. The creativity, therefore, needs only to be slight for the work to be eligible for protection. A work must have a minimum amount of creativity over and above the independent creation requirement for getting copyright protection. These two are so-called 'intellectual personal creation' (Lewinsky, 2004b). In terms of copyright for computer programs belongs to the programmer who has intellectual personal creation, for the first time.

In the Common law legal tradition, the creation must always have a fixation, while the elements of originality and creativity must not be too high, followed by marking of the letter in a circle (Sterling, 2005a). In terms of the standard of copyright ability of a computer program can be justified by its source code and object code. In India, as a Common Law tradition, the copyright of a computer program can be owned by a corporation (Ghosh, Ghosh, & Ghosh, 2024).

Fixation for computer programs is satisfied when they are stored in a medium capable of being read and processed, such as magnetic or electronic storage. This criterion ensures that a program can be perceived and utilized over time, fulfilling the requirement for a tangible expression (Keough & Stewart, 1997). In the digital realm, fixation occurs when the work is created and stored in a file format that can be clearly identified, such as JPEG, PNG, MP4, or when the source code is stored on the server that can also be accessed. According to Jill Mc. Keough, quoting the Australian Copyright Act Amendment, a computer program is 'An expression in any language, code, or notation of a set of instructions (whether with or without related information) intended either directly or after conversion to another language, code, or notation, or reproduction in a different material form, to cause a device having digital information processing capabilities to perform a particular function.' (Keough & Stewart, 1997). The fixation may then provide the true underlying value of a particular literary works or series (Said, 2013).

Article 9 (2) TRIPs stipulate: *'Copyright protection shall extend to expression and not to idea, procedures, methods of operation or mathematical concepts as such'.* In addition, pursuant to *Article 2 Berne Convention:*

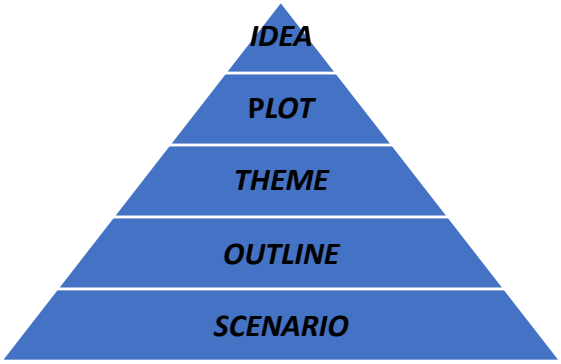
1) *the expression .... 'Literary and artistic works*' ....;
2) *It shall, however, be a matter for legislation in the countries .... to prescribe that works in*

general or any specified categories of works shall not be protected unless they have been fixed in some material form;
3) *Translation, adaptation.... shall be protected as original works without prejudice to the copyright in the original work.*

So, there is a dichotomy between idea and expression. There is no copyright on ideas and plots. Copyright exists at the outline and scenario levels. At the theme level, there is a demarcation line that allows copyright protection if the theme is very strong (Budi, 2014). This dichotomy forms the foundation of the intellectual property (IP) system, as protection is afforded solely to the concrete manifestation (the *expression*) of a concept, not to the abstract concept itself (Du et al., 2025); (Meesala, & Thounaojam, 2026). This distinction lies at the core of IP governance, which establishes the framework for defining protectable technologies as well as the scope and duration of such protection (Yang et al., 2025b). The analysis did not provide protection for the idea that inspired the creation. The central function of the IP system is to provide incentives for innovation through the granting of exclusive rights, meaning that such incentives are directed toward tangible or sufficiently substantive creative outcomes rather than mere initial inspiration.

The judge who decided the case in the 1970s using the concept of the level of abstraction (Jened, 2024):

Figure 1: Copyright triangle of abstraction



Source: (Jened, 2014)

If a creation can be described as triangle and divided into 5 (five) level as follows (Jened, 2025b):

1) An idea is a thought or thought that arises in a person's mind, it can be a concept, design, or mental image of something, and often becomes the basis for innovation and action. The word 'idea' comes from the Greek 'ἰδέα' (idea) which means 'form' or 'pattern...;
2) Plot, or storyline, is a series of events or incidents in a narrative that are logically and chronologically interconnected, forming the beginning, middle, and end of a story. The plot aims to guide the story, create suspense, and develop the plot so that the reader can follow the story from one incident to the next until the resolution;
3) A theme is a central idea, message, or underlying notion that underlies a work such as a story, film, or art, and serves as its emotional or philosophical foundation. Themes are often implicit, that is, not stated directly, and can convey the author's views or moral messages about general issues in human life;
4) An outline is a rough framework or outline of a piece of writing, which summarizes the main ideas and storyline systematically and logically to guide the writing of a screenplay or other written work. A screenplay is a detailed script or story that serves as a 'blueprint' for a film, TV show, or drama, containing descriptions of scenes, dialogue, characters, and actions that make up the overall storyline. Meanwhile, at

the outline and scenario levels, there is copyright;

5) A scenario is screenplay is a written story script that serves as a guide or blueprint for the production of a film, television, or other visual work, detailing the sequence of scenes, dialogue, and descriptions of action so that they can be translated into a coherent visual image. The screenplay serves as the basis for the entire production team to understand the story, coordinate work, and create a consistent final product

No copyright protection for idea and plot. Ideas and plots are universal so they cannot be protected by copyright as personal property rights. Copyright protection is at the outline and scenario level. Here is a demarcation line at the theme level that can go up or down. If a creation has a very strong theme, then there is copyright protection and vice versa.

Almost all creations can be analyzed by this triangle of levels of abstraction, the concept of which was created by the judge who decided the case in the 1970s (Stein, 2013).

Currently, Indonesia Copyright Law is regulated in Law Number 28 of 2014 (Copyright Law No. 28/2014). The Copyright Law No. 28/2014 protects science, literary and artistic works that has a strategic role in supporting the nation's development and advancing the welfare of science as mandated by the Constitution of the Republic of Indonesia in 1945. Article 1.1 of Law No 28/2014 stipulates: '*Copyright means an exclusive right of the author vested automatically on the basis of declaratory principle after Works are embodied in a tangible form without reducing by virtue of restrictions in accordance with the provisions of laws and regulations'*

Indonesia explicitly provide definition of computer program defined in Article 1.9 of Copyright Law No. 28/2014 that:' *Computer program is a set of instructions expressed in the form of language, code, scheme, or any other form intended for a computer to perform a specific function or achieve a certain result'.* Then Article 40 Paragraph (1) Letter s Law No. 28/2014 stipulated:' *creation protected by copyright in the field of science, art, and literature consist of: a) books, pamphlets, publication of written works and all written works there of… (s) computer Program.'* Indonesia, as a Civil Law Tradition, emphasizes on a high level of originality and creativity of the copyrighted work.

Standard of copyrightability stipulated in Article 1.1, 2, and 3 of Law No. 28/2014 as follows:

1. *Orginality: …. Author means a person or several persons who individually or jointly produce **works that are unique and personal** (Article 1. 2 Law No. 28/2014);*
2. *Creatvity: Works mean any scientific, artistic, and literary works **resulted from inspiration, ability, thought, imagination, dexterity, skill or expertise** expressed in a tangible form (Article 1. 3 Law No. 28/2014);*
3. *Fixation: Copyright means an exclusive right of the author vested automatically on the basis of declaratory principle after Works are embodied in **a tangible form** without reducing by virtue of restrictions in accordance with the provisions of laws and regulations (Article 1.1 Law No. 28/2014).*

In India, computer programs are protected under the Copyright Act, 1957. Though the term

'Computer Software', lacks a precise definition but in common parlance, a computer software, or a computer program is understood as part of a computer system which comprises of data, information, and computer instructions, as opposed to the physical hardware from which the system is built (Kaundal, 2020).

In other words, computer software is a set of instructions or programs instructing a computer to achieve specific tasks. Computer programs are explicitly included under the definition of 'literary works' in the Copyright Act, 1957. Section 2 (o) of Copyright Act states that' *literary work includes computer programs, tables, and combinations, including computer databases'.* The Act further defined computer programs (software) in Sec. 2 as follow: '*Computer program means a set of instructions expressed in works, codes, schemes or in any other form, including machine readable medium, capable of causing a computer to perform a particular task or achieve a particular result.'* (Mellema, 2023).

There is no copyright protection for ideas, procedures, method of operation or mathematical concept as such (article 41 of Law No. 28/2014). If it compared to The Copyright Act, 1957 of India protects original literary, dramatic, musical, and artistic works and cinematography films and sound recordings from unauthorized use. There is no copyright protection for ideas, procedures, method of operation or mathematical concept as such (Nim, 2023). India, as Common Law Tradition that adheres to standards of copyrightability, it prioritizes a high degree of fixation accompanied by a copyright mark in a circle ©, rather than originality and creativity (Raza, Alam, & Talib, 2023).

3. Automatic, Independent Protection and Term of Protection

Copyright law universally recognizes automatic and independent protection as an inherent right, aligning with Article 27, Paragraph 2, of the Universal Declaration of Human Rights (UDHR). Copyright is an inherent human right that automatically arises once a work meets the standards of copyrightability, taking effect the moment, a work is created and expressed by its author (Rahayu et al., 2024). Pursuant to Article 5 Paragraph (1) and (2) of the Bern Convention that (WIPO, 1997):

(1) Authors shall enjoy, in respect of works for which they are protected under this Convention, in countries of the Union other than the country of origin, the rights which their respective laws do now or may here after grant to their nationals, as well as the rights specially granted by this convention.

(2) The enjoyment and the exercise of these rights shall not be subject to any formality; such enjoyment and such exercise shall be independent of the existence of protection in the country of origin of the work. Consequently, apart from the provisions of this Convention, the extent of protection, as well as the means of redress afforded to the author to protect his rights, shall be governed exclusively by the laws of the country where protection is claimed.

Jill McKeough supports this view, emphasizing 'There is no formal requirements to obtaining copyright protection in the sense there is no procedure for registering a copyright' (Keough & Stewart, 1997). This means that

copyright protection is recognized without any required formal procedures, independent of the work's protection status in other countries. This legal certainty is rooted in the principle that the intellectual property (IP) regime serves as a primary institutional framework designed to foster innovation and facilitate the dissemination of technology (Zhou, & Wei, 2025). The author's rights and means of redress are determined by the laws of the country where protection is claimed (Sanjaya, & Rajavenkatesan, 2024).

According to Article 1.1 of Copyright Law No. 28/2014, copyright is defined as 'an exclusive right that vests automatically in the author, based on the declaratory principle, as soon as the work is embodied in a tangible form. This principle affirms that copyright protection is automatic, immediate, and independent, without requiring any formal registration, though it must comply with the existing legal framework.'

Although copyright is recognized and protected from the moment of creation meet standard of copyrightability, proving ownership, especially for unpublished works, can be challenging. This has led the government to facilitate the author to register his/her works and obtain a Letter of Work Creation Recordation (Wahyuni, Ramadhani, & Tarina, 2024). Registration is not mandatory but voluntary. This registration of the work serves as preliminary evidence, not ownership evidence (Jened, 2014). The voluntary register of the work stipulated in Article 64 and Article 72 is as follows:

Article 64:

(1) The Minister administers the recordation and the Invalidation of Works and Related Rights products.
(2) The Recordation of Works and Related Rights products, as referred to in section (1) is not a requirement to obtain Copyright and Related Rights. Articles 64 and 72 of Copyright Law No. 28 of 2014 facilitate obtaining a *Letter of Work Creation Recordation*, which solidifies an author's claim.

Article 72:

The Recordation of Works or Related Rights products in the general register of Works does not constitute an endorsement of the content, meaning, purpose, or shape of the Works or Related Rights products being recorded.

For example, Pegadaian, a state-owned enterprise, has obtained Letters of Recordation for various computer programs or software from the Directorate General of Intellectual Property under the Ministry of Law and Human Rights of the Republic of Indonesia as follows (Rochman, 2024):

a) Letter No. EC00202232469, dated 1 January 2021, for 'Integrated Reportation and Transaction of Pawn,' developed using Java Springboot, Golang and Database DB2.
b) Letter No. EC002202232470, dated 1 January 2021, for 'Collateral Valuation,' developed using Java Springboot, Golang, and Database DB2.
c) Letter No. EC00202232471, dated 1 January 2021, for 'Collateral Auction,' developed using Java Springboot, Golang, and Database DB2.
d) Letter No. EC00202232472, dated 1 January 2021, for 'Pegadaian Digital Service,' developed using React Native, PHP, Golang, MariaDB, Postgres, and Redis.

However, practical challenges in proving ownership often led to the voluntary registration of works. William Holmes points out that (Holmes, 1983):

> While registration is not mandatory, it is highly desirable for a number of important reasons. Registration of the copyright is a statutory prerequisite to instituting an infringement action. It is also a prerequisite to recovering special statutory damages. In addition, a certificate of registration constitutes 'prima facie' evidence of the validity of the copyright. Finally, registration is necessary for a transfer of ownership to provide constructive notice to third parties of the transferee's interest.

While unregistered works are recognized and protected, voluntary registration of creation or works provides prima facie evidence that the party is the rightful creator, simplifying proof of authorship. It provides an advantage for legal certainty (Murjiyanto et al., 2025). In some jurisdictions, registration serves less as a precondition for protection and more as a strategic measure to strengthen legal certainty and evidentiary weight in case of dispute. A Letter of Recordation of the Work (not a certificate) significantly eases and accelerates enforcement and also plays a key role in transferring ownership, ensuring constructive notice to third parties (Wahyuni, Ramadhani, & Tarina, 2024). India as the same as US provides mandatory registration of the work not for acquire copyright but for prima facie evidence.

The *Berne Convention* mandates that the term of protection extends for the life of the author plus 50 years after their death (Article 7.1). Similarly, Article 12 of the *TRIPS Agreement* requires that (WIPO, 1997):

> Whenever the term of protection of a work, other than a photographic work or a work of applied art, is calculated on a basis other than the life of a natural person, such term shall be no less than 50 years from the end of the calendar year of authorized publication, or failing such authorized publication within 50 years from the making of the work, 50 years from the end of the calendar year of making.'

Copyright protection for a computer program will last within 50 years after the first publication (Article 59 Paragraph (2) of Copyright Law No. 28/2014). India has the same protection period.

The safeguarding of intellectual property (IP), at both the national and international strata, is fundamentally aimed at fostering innovation and facilitating the dissemination of technology, concurrently serving as a vital protective measure for technological integrity (Mulqi et al., 2025). Furthermore, the protection of IP imposes constraints on model efficacy for particular tasks to mitigate the risk of unauthorized utilization or replication (Yang et al., 2025b). Within frameworks such as federated learning, the protection of IP is of paramount importance to avert unauthorized access, data exfiltration, or model manipulation, particularly given that the development of a fully trained intelligent diagnostic model entails a considerable investment of time and labor (Yuan & Nie, 2025). Such protective measures ensure that both copyright ownership and the security of the model provider are effectively preserved.

4. Exclusive Right of the Owner/holder of the Computer Program & Exploitation

The Bern Convention stipulates the substantive right of the creator or author as follows (WIPO,1997):

a. *The translation right (Article 8)*
b. *The reproduction right (Article 9)*
c. *The publication right (Article11)*
d. *The public performance right (Article 11 bis)*
e. *The public communication right (Article 11 ter)*
f. *The broadcasting right the diffusion right (Article 11)*
g. *The adaptation right (Article 12)*

These exclusive rights were further strengthened by the Rental Rights stipulated in Article 11 of the TRIPS Agreement as follows (WIPO, 1997):

> *In respect of at least computer programs and cinematographic works, a Member shall provide authors and their successors the right to authorize or prohibit the commercial rental of originals or copies of their copyrighted works. An exception exists for cinematographic works unless rental leads to widespread copying that materially impairs the exclusive reproduction right. For computer programs, this obligation excludes rentals where the program is not the essential object of the rental*.'

Under *Article 4 of Copyright Law No. 28/2014* in Indonesia, authors have exclusive rights with dimensions of both economic and moral rights. *Article 5* of the same law details moral rights, such as:

a. *Deciding whether to include their name as the author;*
b. *Using a pseudonym;*
c. *Modifying the work in accordance with community beliefs;*
d. *Altering the title or subtitle.*
e. *Safeguarding the work against distortion, mutilation, or modification that harms the author's honor or reputation.*

Moral rights, as highlighted by Desbois in Le Droit d'auteur, include *droit de publication*, *droit de repentir*, and *droit au respect et à la paternité* (Damian, 2002). This is similar to Lewinsky's statement, stating that the moral rights of an author consist (Lewinsky, 2004b):

a) The right of attribution
b) The right to prevent distortion of the work
c) The right of integrity
d) The right of publication

Economic rights, on the other hand, are exclusive rights to derive financial benefit from the work (Article 8 of Copyright Law No. 28/2014). Article 9 of the Indonesian Copyright Law enumerates these rights, including the right:

a. *To publish the creation*
b. *To reproduce the creation*
c. *To translate the creation*
d. *To adapt, arrange, and transform the creation*
e. *To distribute the creation or its copy*
f. *To perform the creation*
g. *To announce the creation*
h. *To communicate the creation*
i. *To give rental of the creation*

The legal principle: 'Copyright shall protect the author with respect to their intellectual and personal relationship with their work, as well as its utilization' (Lewinsky, 2004b). As reward system in the civil law tradition, Indonesia provide economic and moral right for the author. While India, more emphasizes on economic right. Copyright protection for computer programs similarly emphasizes the safeguarding of economic rights, ensuring authors or copyright holders can financially benefit from their creations.

In both Indonesia and India, the exploitation of computer program copyrights typically includes (Jened, 2014):

a. Right to use;

b. Right to license;
c. Right to license/assign.

Licensing and infringement of computer programs depends on the nature of ownership of the computer program related to the following categories (Nack, 2004) and also in (Moufang, 2004):

a) Free Software;
b) Copyleft software;
c) Public domain software;
d) Semi-free Software;
e) Shareware;
f) Proprietary Software;
g) Commercial Software.

5. Limitations and Exception

Initially, copyright limitation was considered trivial by the United States, but when the American Copyright Act freed the commercialization of nondramatic musicals, this attracted international attention regarding the urgency of the Three Step Tests (Lin, 2017); (Geiger, Gervais & Stenlefben, 2014). These limitations on copyright constitute an essential component of intellectual property (IP) governance, which establishes the rules concerning the scope and duration of IP protection (Disemadi, & Agustianto, 2025). The primary function of the IP system is to provide incentives for innovation through the granting of exclusive rights. Copyright is not an absolute right, so limitations apply to prevent copyright owners from arbitrarily restricting public access. The Berne Convention Articles 10, 10 bis, and 13 of TRIPS Agreement address limitations involving the *de minimis* doctrine, meaning that minimal or necessary uses of works do not violate the author's exclusive rights (Jened, 2014).

Article 13 of the TRIPS Agreement stipulates: '*Members shall confine limitations or exceptions to exclusive rights to certain special cases which do not conflict with a normal exploitation of the work and do not unreasonably prejudice the legitimate interests of the right holder*.' This provision requires 3 three steps test as follows (Senftleben, 2003):

1. Criterion1, Basic rules: Limitation must be a certain special case;
2. Criterion 2: First condition delimiting the basic rule: No conflict with normal exploitation-compulsory licenses is impossible;
3. Criterion3: Second delimiting the basic rule: No unreasonable prejudice to legitimate interest-compulsory licenses possible.

In countries with a civil law tradition is called a limitation to the authors, while in common law it is called fair dealing, or Fair use (Elmahjub & Suzor, 2017). According to Martin Senftleben that (Senftleben, 2003):

> Limitation and exceptions to copyright are provision in copyright law which allow copyrighted work to be used without license from copyright owner relate to a number important consideration such as market failure, freedom of speech, education and equality access. In order to maintain an appropriate balance between the interest of right holders and users of protected works, copyright allow certain limitation on economic right that is case in which protected works may be used with or without authorization of the right holder and with or without payment of compensation.

Under Copyright Law No. 28/2014, the limitations on author rights are outlined in Articles 43 to 51. Specific provisions for limitation of

computer programs are found in Article 45 of Law No. 28/2014, which stipulates:

a. *Reproduction or adaptation of one (1) copy of a computer program by a legitimate user may be carried out without the permission of the author or copyright holder if the copy is used for: Research and development of the computer program. Archiving or backup purposes, as legally required to prevent loss, damage, or inoperability.*
b. *If the license for the computer program has expired, any copies or adaptations of the program must be destroyed*.

In India, the limitations on author rights are governed by the fair dealing doctrine, which provides exceptions to copyright infringement in specific cases, such as non-commercial study and criticism, review, or reporting of current events. However, this exception does not extend to commercial research, sound recordings, or broadcasts and has limited application to software.

6. Computer Program Copyright Infringement and Remedies

Copyright violations arise when a third-party exercise right that belong exclusively to the author or copyright holder without obtaining permission (Al Asy'arie, Rahmanda, & Prasetyo, 2024). Additionally, a violation may occur if someone disregards the norms of copyright limitations or the principle of fair use (fair dealing). Copyright violations can generally be categorized as follows (Jened, 2014):

a. Direct infringement
b. Indirect infringement
c. Infringement by authority

According to Business Software Alliance the main forms of computer program copyright infringement include (Microsoft, 1999):

a) *Hard disk installation/ hard disk loading: This occurs when computer vendors install unauthorized copies of software onto computer hard drives as an incentive for consumers to buy the hardware. Buyers who receive pre-installed software without proper documentation, such as diskettes, licenses, or registration forms, should recognize that these programs are illegal copies.*
b) *Soft lifting (Unauthorized Copying): Soft lifting involves the unauthorized duplication and sharing of computer programs within personal or institutional settings. This can include exchanging software diskettes or making unauthorized copies among companies or users. Soft lifting is a significant issue, responsible for substantial revenue loss in the global software industry.*
c) *Counterfeiting of computer programs: Counterfeiting involves producing illegal copies of software and selling them in packaging that mimics the original. Another form includes marketing counterfeit programs under completely different names without disclosing that the software is distributed by the original program's creator.*
d) *Uploading to Electronic Bulletin Boards: Distributing legitimate computer programs through modem connections on electronic bulletin boards without authorization is another form of piracy. Unlike sharing public domain or shareware software, this kind of piracy enables widespread, unauthorized access to proprietary software.*
e) *Cracking: This refers to the unauthorized modification of software to bypass protection mechanisms, such as license verification or security protocols. This type of infringement involves altering software to gain unrestricted access or additional features without permission.*
f) *Hacking is an activity to gain unauthorized access to a site or network by manipulating the source code, as happened to the Bank Niaga internet site in 2009 by an intruder hacked by idiot inside*

g) *Mischannelling: authorized and illegal distribution of software at special prices to consumers*
h) *End-user copying:* M*aking copies by end users, either individual end users or corporate end users*
i) *Internet or BBS: piracy by downloading from sites that sell software via the internet, bulletin boards, or mailing lists*
j) *Computer program rental:*
The unauthorized rental of software, similar to video rentals, is also a recognized form of piracy. This may include:
   i. Renting products for use on personal or office computers.
   ii. Renting through mail-order clubs.
   iii. Pre-installing software on computers rented for a limited time.

Consumers obtain software for a small fee without proper licensing, a practice that has become more prevalent in regions like the Asia-Pacific, leading to the introduction of rental rights for software through the TRIPS Agreement.

Proving direct infringement, especially with piracy, requires detailed evidence. Two primary tests are used (Budi, 1999).

1) Checking for similarities to assess potential Look and feel test: Observing and analyzing the program's sequence, structure, and organization to find substantial similarities.
2) Abstraction-filtration-comparison test: A step-by-step analysis where the program is broken down to identify its abstract structure, separating ideas from expressions. This process filters out protected elements infringement.

Proving copyright infringement of computer programs originally used the look and feel test as forementioned. However, currently, with the increasing complexity of computer program infringement, apart from the violations mentioned above, violations that are not solely copyright violations are breaches of contract (breach of contract), especially when related to licensing agreements. The growing sophistication of computer program infringement now encompasses the protection of advanced components such as trained intelligent fault diagnosis models (Yang et al., 2025a). Breaches of contract and license terms frequently occur due to the exceptionally high cost of software licensing, which can range from thousands to hundreds of thousands of dollars (Aryotejo, & Mufadhol, 2021). As a result, institutions, especially in developing countries, are often compelled to seek more affordable alternatives, such as continuing to use outdated operating systems or adopting open-source software solutions.

The Berne Convention includes various provisions related to law enforcement, but both national and international copyright law enforcement have evolved significantly due to two main factors:

1) The availability of technological tools that facilitate the creation and use of copyrighted works.
2) The rise of digital technology, which enables the easy transmission and perfect replication of copyrighted works, including those in digital format.

These developments, coupled with changes in international trade that involve the movement of goods and services containing IPR, have led to an increased emphasis on IPR protection in global business (Njatrijani et al.,

2020). Organizations such as WIPO and WCCT have noted this trend and require member states to implement adequate law enforcement procedures within their national laws to effectively address IPR violations and prevent further infractions (Samsithawrati et al., 2025). The TRIPS Agreement further underscores this by detailing comprehensive provisions on IPR law enforcement in Part III, Articles 42 to 61 of TRIPS Agreement (WIPO, 1997) that include:

a. Administrative procedures and remedies;
b. provisional measures;
c. civil law suit and damages;
d. criminal sanctions either imprisonment or/and fined.

Provisional measures is a kind of interlocutory decision or provisional measure that the court has the authority to order a party to stop the violation committed or to prevent the entry of imported goods containing elements of copyright infringement Damages (a kind of lawsuit for compensation)

The court has the authority to order the party who committed the violation to pay adequate compensation to the rights holder for the losses they suffered due to the violation of their rights account of profit (a kind of compensation for profits that could have been expected). It is different from a claim for compensation because, in this case, what is taken into account is the profit that the defendant has obtained by his actions infringing the plaintiff's copyright. Criminal procedures and penalties are to be applied at least in cases of wilful trademark counterfeiting and copyright piracy on a commercial scale.

Pursuant to Article 95, Paragraph 1 of Copyright Law No. 28/2014, 'Copyright dispute settlement can be done through alternative dispute resolution, arbitration or court proceeding. There is the Indonesian Intellectual Property Rights Arbitration and Mediation Board (BAM_HKI). Copyright infringement must be file lawsuit against the Chief Justice of the Commercial Court. Provisional measures, such as interlocutory injunctions, are stipulated in Articles 106 to 109 of Copyright Law No. 28/2014. Additionally, criminal provisions under the authority of the District Court are outlined in Articles 112 to 120 of the Law No. 28/2014.

There have been various cases of computer program copyright infringement involving end-user piracy. During the 1990s, the use of illegal software was widespread. Pirated software was abundant and easily accessible, whereas legitimate software was difficult to obtain and had limited distribution. The use of original software was uncommon and considered unnecessary or wasteful. However, with increased recognition of IPR, efforts to combat illegal software use have intensified, as shown in the table below:

Table 1: Cases of illegal software use in Indonesia

YEAR	CASE NO.	SOFTWARE PRODUCT	QUANTITY	STATUS
2004	1806/Pid/B/200	Norton Antivirus	70 pcs	The District Court of

	4			Central Jakarta sentenced Budi Santoso to 1-year imprisonment, with a condition that the sentence would be suspended if the defendant did not commit another crime within a 2-year probation period. The court also ordered the destruction of the confiscated CD software and imposed a case expense of Rp 1,000 (one thousand rupiahs) on the defendants. Budi Santoso filed an appeal with the Appellate Court, which upheld the guilty verdict, confirming that the defendant had intentionally sold infringing products. The					Appellate court increased the sentence to 3 years imprisonment.
					2004	1805 / Pid/B/2004	Norton Antivirus	50 pcs	The District Court of Central Jakarta sentenced Jimmy Rompas to 3-year imprisonment without probation. The appellate Court confirmed that Jimmy Rampas was guilty of selling, distributing, and supplying counterfeit software and upheld the sentence. The court ordered the destruction of the seized products and imposed a case expense of Rp 1000 (one thousand rupiahs) on the defendant.
					2006		Autodesk, Microsoft, Symantec, Adobe, Cisco, Macromedia	7500 pcs.	The court sentenced Danny to 2-year imprisonment and imposed a fine of Rp 3 million.

2007	In Batam Bonded Zone	50 computers and 1 server without licensed software	50 computers and 1 server without licensed software	The defendants were two foreign companies. Reports were submitted by the Business Software Alliance (BSA), and the case was settled out of court.

Source: (Budi, 2014)

Recently, there was an interesting case related to computer program copyright. Everyone knows that Visual Basic is copyrighted by Microsoft (Microsoft, 1999). Based on Visual Basic, the plaintiff created a hotel management computer program application based on Visual 06, created by Microsoft in the 1990s. The plaintiff has Letter of Recordation EC EC00201703390 (4 August 2017). While the Defendant has the Letter of Recordation of Computer Program EC.222016003203 (31 August 2016) for the hotel management application. The comparison between two computer programs for hotel management applications as follows:

Table 2. Comparison between Visual Basic and a hotel management computer program

COMPARISON	PLAINTIFF	DEFENDANT
Program Language	VB 6.0	VB.NET, PHP, JavaScript, C# .NET
Programmer	CA	DS
Infrastructure	Traditional IT Infrastructure	Infrastructure as a Service (IaaS)
Development Environment	Microsoft Visual Studio 6.0	Visual Studio Code, Microsoft Visual Studio
Framework		Laravel, Bootstrap, .NET framework
Front End		Laravel, jQuery, Bootstrap,
Back End		C# .NET
Interface (API)		.NET Framework
Database	SQL Server	SQL Server
Miscellaneous		Cloudflare, PowerShell
Third-Party Dependency		Keycard Integration
Third-Party Integration		Channel Manager, CRM, Hotspot, Email Service

Note. Adapted from Legal Opinion to Copyright Case Atlantis v. DSI, by R. Jened as Expert Witness before the Prosecutor and Trial, 2025 (Jened, 2025a).

The plaintiff's lawsuit reached the idea claim, which is a general feature. At the Commercial Court level, the lawsuit was rejected in its entirety. This was good and fair, although lacking legal considerations. At the cassation level, the Supreme Court decided to examine the lawsuit itself and ruled that the plaintiff or applicant (originally the plaintiff)'s lawsuit was accepted. The Supreme Court's decision was unjustified and unfair. This may have been due to the judges' lack of understanding of copyright law, and their acceptance of the digital forensic expert.

Based on the Supreme Court's favorable ruling, the plaintiff filed a criminal complaint, which continued through the investigation process. The author served as an expert witness. I presented the level of abstraction as follows (Jened, 2025a):

Case related to the copyright of hotel application computer programs.

1) There is no copyright protection at the idea and plot level. Ideas contain common features such as the name of the guest, address, job,

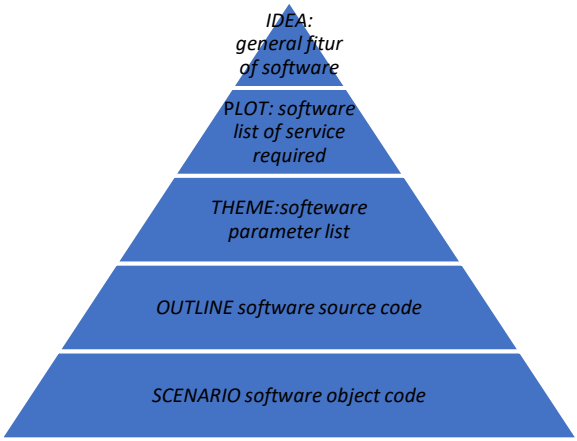
how long to stay, and what payment method, including breakfast or not;

2) Level There is no copyright protection at plot as *software list of service required* as A software list of required services depends heavily on the project's goals, but generally includes custom software development, cloud computing, DevOps automation, and quality assurance, along with specific tools for project management (like Jira), customer service (like HubSpot because it is too general;
3) In theme level, there is *software parameter list,* such as central reservation system, etc., It can be protected by copyright if the computer program can create a new invention;
4) Outline in the case in question can be protected by copyright. In the outline level, there is object code. Different developers and companies choose different approaches and technologies to build their systems, resulting in different source and object codes. In the case in question, the defendant applies a cloud-based platform offering property management, booking engine, and channel management features;
5) Finally, in the scenario level that can be protected by copyright. Defendant operates Visual Basic .NET, whose source code belongs to Microsoft.

Finally, I conclude my expert testimony by stating that the defendant's computer program meets the standard of copyrightability with full respect for the Visual Basic .NET source code copyrighted by Microsoft. The plaintiff's lawsuit is unreasonable because the plaintiff's hotel management application is outdated and incompatible when compared to the defendant's hotel management application. The plaintiff even claims that Visual Basic is his source code, which is a violation of Microsoft's copyright, even though Visual Basic has been released by Microsoft as open source (Jened, 2025c).

The case was resolved through settlement and mediation. The plaintiff, who also filed a criminal complaint against the same case, ultimately withdrew the criminal complaint. The parties are pleased that the business is running smoothly. However, the plaintiff has learned a lesson not to mess with the judiciary (Jened, 2025c).

Figure 2: Triangle of abstraction for a computer program Copyright



Note. Adapted from *Legal Opinion to Copyright Case Atlantis v. DSI*, by R. Jened as Expert Witness before the Prosecutor and Trial, 2025 (Jened, 2025a).

Copyright protects source code and object code. The source code Visual Basic belongs to Microsoft (Microsoft, 1999). How could the plaintiff claim that Visual Basic was his creation, even to the point of claiming an idea? Based on my examination as an expert, the plaintiff finally realized his mistake in claiming something to which he was not entitled. The plaintiff ultimately requested a settlement and the report was withdrawn. I note that there are many cases like

this in Indonesia, where recklessly suing or filing a criminal complaint creates a burden on the courts. (Jened, 2025c).

In India's legal practice, unauthorized copying, distribution, or modification of a computer program constitutes copyright infringement. Remedies available to the copyright owner include:

a) Injunctions to prevent further infringement.
b) Damages or account of profits.
c) Seizure and destruction of infringing copies.

Indian courts, too, have played a significant role in interpreting and enforcing the provisions related to computer programs. Landmark cases have clarified issues such as the originality requirement, the extent of permissible copying, and the applicability of fair use.

D. CONCLUSION

Significant resemblances and distinctions exist in the legal frameworks governing copyright protection in Indonesia (which subscribes to a civil law system) and India (which operates under the common law paradigm). The Indian legal framework is shaped by John Locke's labour theory, whereas the Indonesian framework is founded on G. W. F. Hegel's personality theory integrated with the distinctive philosophy of Pancasila. In accordance with the TRIPS Agreement, the Bern Convention categorises computer programs as literary works, thereby encompassing both source code and object code.

The differences in legal traditions impact the standards of copyright eligibility. In civil law emphasizes a high degree of originality and creativity. While in common law, the focus is on fixation.

Copyright automatic protection applies in both countries. However, in civil law tradition prioritize protecting the creator as author right justification. As a system reward, author given exclusive rights which has economic and moral right dimension. Common Law protect the object of the work and grant limited rights, Copyright as an incentive system that emphasizes economic right.

In civil law however, refers to such limitations on exclusive rights as exceptions to ensure public access. While in Common law so called fair dealing or fair use.

In general, copyright violations in India and Indonesia are similar, but the means of enforcement differ. Indonesia provides remedies such as temporary injunctions, civil lawsuits, criminal charges including imprisonment and fined, and also alternative dispute resolution. Whereas in India, the focus is primarily on civil lawsuits and alternative dispute resolution.

The commitment to ensuring adequate legal protection for computer technology, including both hardware and software, continues to evolve. To foster progress in computer technology, it is crucial to establish a robust legal framework. This is where the concept of responsive law can be applied. Additionally, public legal awareness must be developed through outreach, education, and widespread dissemination of information regarding IPR,

especially in computer program copyright protection. Ultimately, effective law enforcement is key to raising public awareness. Law enforcement officials must share a unified perception and exhibit consistency in the application of the law.

There is an important thing that can be a lesson for Indonesia from India, computer programs touch almost all level of society and are used in various activities. Another thing awareness of government and educational institutions that the legal regulations are truly implemented throughout the country.

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