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LEGAL FRAMEWORK OF WATERMARKS FOR COPYRIGHT PROTECTION

Muskaan Arora [1], Dr Neetu [2]

[1] Research Scholar, School of Law, GD Goenka University, Gurugram, Haryana, India
[2] Assistant Professor, Ph.D. Supervisor, School of Law, GD Goenka University, Gurugram, Haryana, India

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ABSTRACT

Laws have changed in response to technological advancements. In the digital sphere, unfair usage and unauthorized downloads of content protected by copyright give rise to serious issues. Watermark is one of the technological and legislative approaches that have been implemented to address these issues. The process of identifying the owner of a piece of data by embedding a watermark.It monitors how digital media is used and detects any unauthorized access or use. Data can be incorporated as text, audio, video, or image in watermarking. Because of the speed at which technology is developing watermarks are required to protect copyright. It is necessary to take into account the watermark's efficacy and incorporate specific changes into the current legal framework. Digital watermarking is a new concept as technology is rapidly growing. So, watermarks should be robust enough against the transformers.

Keywords: Watermarks, IPR, Copyright, TRIPs, Piracy, Digital Domain, Digital watermarking

1. INTRODUCTION

As a party to the TRIPs Agreement, India modified its legal framework to provide intellectual property with the highest level of protection possible in accordance with international standards. TRIPs are a significant international agreement that largely addresses legal concerns with the unauthorized use of intellectual property on a commercial scale. Copyright protection has been granted under the TRIPS Agreement. The Copyright Act has undergone several updates as a result of the changes in the global legal system, expanding its scope of application. It is said that resource needs are rising quickly in the contemporary period of technological growth. These eventually result in the resources being threatened. The need for rapid dissemination and easy access to information has emerged as a key driver behind the rise of contemporary technology. The usage of media on the internet has increased. The distribution of multimedia content online has grown in importance as a means of providing services to a global clientele. As internet usage increases, significant problems have surfaced. These problems include fraud, piracy, counterfeiting, and forging, and they have gotten worse as more people use the internet. This had ultimately lead to violation of copyright in the copyright act. Copyright abuse is rampant in India despite of protection given under copyright act because the users who pirate hardly gets caught and got the punishment. Digital age has brought many disputes in terms of innovation its use and abuse. Earlier the idea of copyright was limited to copying of work unauthorized sale of copyrighted medium but with the arrival of innovation the concept of piracy has been considered as a significant issue which has to be withdrawn by the legislature.

Copyright is considered as foremost intellectual property right because it is for the preservation of creator of literary, artistic, musical work and sound recordings and plays main role in contributing change and innovation. A copyright in general is a right vested by a statute to the author of a literary or artistic production. By virtue of the right the author gains sole and exclusive privilege for a limited period of time of multiplying copies of production and publishing and selling them.

Though a concept's expression is protected by copyright, the idea itself is not covered. A copyright is defined as the absolute right granted by Indian Copyright Act 1957, Section 14, to reproduce, publish, perform, adapt, or translate literary, dramatic, or musical works. The 2012 Copyright Amendment Act expanded this protection to include artistic and cinematographic films. Additionally, the statute grants the writer moral rights that do not expire even after all rights in the work have been allocated. These unique rights include the ability to assert the author's ownership of the work and the right to be identified as the creator of it Copyright gives authors a variety of rights to safeguard their original works, including the ability to produce the work, right to perform publicly. It is said that the main issue is that with the growth of technology the authors, publishers are not able to provide the distribution of documents in digital world. The reason is reproducing data in the original form lead to copyright violation and data abuse. Therefore the creators are finding out the solutions to these problems which are associated with copyright protection. Future protection of such unauthorized copying and redistribution of data is necessary in order to protect the rights and assets should be properly managed. Watermarking is the process of encoding hidden copyright information, which can be in the form of audio, image, or video, to identify the copyright owner and hidden copyright information. Previously, the cryptography technique was used for copyright protection in order to have control over the data and make the data unreadable to unauthorized users. Watermarking is a unique among the techniques that can shield the software from piracy since it is not intended to avoid the piracy of software but instead it seeks to present evidence of incidence of piracy. Watermarking programs remain relatively recent field. Although the objectives of watermarking multimedia and technology are similar in that they inject some additional information into the items that are digitally encoded. Watermarking methods are included in the program in order to preserve the operational implications of the program. It is said that watermark is a technique that is being used in order to protect the content of the person. It is a text, image or other information that is being embedded or layered into printed material. Watermarking is a method for assurance by installing mystery data into the content of programming. Watermarking gives copyright insurance of protected innovation. A signal that is permanently added to digital data—which might include text, photos, videos, and audio is known as digital watermarking. It can subsequently be measured or identified using computational techniques to draw conclusions about the data.

2. MEANING OF WATERMARK

A watermark is a text, image or information that is embedded into the material or digital content. This graphic that is added to an image to state the copyright or ownership. A watermark could be a company name, personal name or even the logo. Although it is sometimes claimed that a watermark by itself is never covered by copyright, our work is copyright protected from the minute it is generated, and watermarks can act as a reminder to others not to steal our work since they are protected by copyright.

The term watermark comes from the process of pressing the design into wet paper and letting it set. The first watermark was used by paper makers as a brand image and its use was extended to bank notes, postage stamps etc. The watermark could be noticeable or hidden depending upon the medium used. Some watermarks are visible to deter sharing and unauthorized use whereas other watermarks such as those printed are both visible and invisible. Watermark is displayed as text on the image which is usually transparent so that the content is easily available. In order to safeguard the material and assert ownership, it is crucial to safeguard and secure the assets with watermarks. Valuable digital assets are vulnerable to content theft and unlawful usage in the absence of watermarks. The name "watermark" was allegedly coined in the 18th century, although Andrew Tirkel is credited with introducing the concept of watermarking in December 1992. The 18th century saw the application of watermarks on paper for trademarks in both Europe and America, but nowadays watermarks are practised in different areas like photos , videos and audio. The idea of adding the watermark within the video, audio or text is known as watermarking. Watermarking is the procedure of inserting the data called watermark. This is done for ownership verification. It involves insertion of information into data for data integrity. It is said that watermarking offers many techniques and technologies to conceal the data. The information is finally revealed in a way that makes the changes invisible. A variety of visibility patterns are included as an additional assurance of source, ownership, and quality. The idea of watermarking is being regarded as a type of steganography,

which means that the message is concealed with the contents without being detected by the public. When using watermarking, specific electronic gadgets help make the secret data visible. These electronic gadgets analyze the message that has been inserted to determine its code. In some viewing situations, it is not visible. Ratio can be used to measure an image's characteristic. The proportion is applied as comparison of the original and compressed image quality. The image quality will be improved with a higher ratio.

3. WATERMARKING PROCESS

The first step in the watermarking process is choosing a watermark to be added to the document that has to be safeguarded. By itself, the watermark is only a sequence of symbols that the bearer has chosen from encoded text, images, audio files, or video clips. The watermark carries useful information which is usually a identity, origin or any information related to owner. The watermark process insertion and removal require criteria which are known only to the owner.

4. DIGITAL WATERMARKING

One innovation that is being implemented sequentially to particular access to resources and services is digital watermarking. Digital watermarking has a number of benefits. With digital watermarking, the owner of the digital data can add their information to make it invisible. An owner can safely put their work online for others to see by using watermarking it. A digital watermark is a symbol that is always added to digital data so that it can be later recognized or removed using computer processes to obtain the data's information. Since the watermark is inseparable from the data, it may withstand numerous actions without causing the host document to deteriorate. Thus, the work is permanently marked but remains accessible thanks to watermarking. Digital watermarking refers to techniques used to conceal text or numbers in digital media, including audio, video, and photographs. As piracy is the risk which proves unsafe in protecting the intellectual property rights, so the concept of digital watermarking has been presumed .Digital watermarking is a means of providing copyright protection for digital contents. The widely used and recognized watermarks are still being adapted for the digital sphere through digital watermarking. Digital watermarking refers to techniques and tools that make information concealment possible.

Digital watermarking used to verify the genuineness and integrity about owners. It is used for tracing the copyright infringement. Digital watermarking is a sub domain of information hiding. Digital watermark discourages piracy silently thereby deterring the criminals to make illegal copies

5. FEATURES OF WATERMARKS

Some of the foremost characteristics of the watermarks include:

1) **Capacity:** The quantity of data that can be incorporated into the data
2) **Security:** Whatever information is embedded is not tampered forged or even removed
3) **Robustness**: This is one of the main feature of the digital watermarking because watermark should be such that whatever data is embedded it should survive malicious attacks
4) **Fidelity:** It refers to resemblance between the watermarked and the actual type of the work. So a high quality watermark has high fidelity.
5) **Payload:** A greater payload must be inserted in order for the watermark to contain more details.
6) **Efficient:** Watermark should be efficient enough that it is correctly determined in a watermark document directly after embedding so that it should be safe from attacks and there should be no compromise in its efficacy.
7) **Probability:** It deals with the likelihood that a watermark placed inside the document will be found and withdraw without intended the parameters .So for a watermark in arrangement to be effective that expectation should be low.

6. TYPES OF DIGITAL WATERMARKS

Like notes watermarks digital watermarks have been classified into kinds according to different applications. These involve visible watermarks and invisible watermarks. These watermarks are according to human perception. These watermarks are as follows:

1) **Visible watermarks:** Either the image or the video shows information. This information identifies the media's owner and can be presented as text or a logo. Using picture editors and active human interaction, visible watermarks can be eliminated. This watermark should be robust enough to protect from such attacks.
2) **Invisible watermarks:** These are the watermarks where information is added to music, image, or video, but it is imperceptible. These watermarks blend seamlessly into the original content they are contained in. Unlike visible watermarks they cannot be removed by human intervention. These watermarks are robust enough that they cannot be easily removed.
3) **Invisible fragile watermark:** It is a watermarking system which is capable of identifying any alterations made to a marked image This type of watermark is used for integrity protection.

The exact opposite of robust watermarks is fragile ones. This is so that a slight modification to the document will instantly modify the watermark. The reason for this is that the watermark is an embedded signature from the original document. These kinds of watermarks are intended to identify efforts at tampering with the contents of documents bearing watermarks. The inability to discern between intentional and accidental attacks is a drawback with fragile watermarks.

Watermarks are categorized based on the use case. These watermarks fall under the following categories:

- **Source-based watermarks:** These types of watermarks are used to authenticate or identify ownership. They apply a special watermark to each copy of a picture that is distributed, identifying the owner.
- **Destination-based:** In destination-based distribution, each copy is marked with a distinctive watermark that uniquely identifies the individual purchaser. If there is an illicit resale, the destination-based watermark may be used to track down the purchaser.

Watermarks classified as stated by type of document

1) **Image watermarking:** This type of watermarking involves embedding a digital code which is usually in the form of digital content that is the image.
2) **Video watermarking:** This type of watermarking involves embedding a digital code which is usually in the form of digital content that is the image.
3) **Text Watermarking:** This type of watermarking involves embedding a digital code which is usually in the form of digital content that is the image.
4) **Audio Watermarking:** This type of watermarking involves embedding a digital code which is usually in the shape of digital content that is the image.

7. DIGITAL WATERMARKING TECHNIQUES

The digital watermarking methods can be classified into:

1) **Spatial Domain:** The direct use of data to incorporate the watermark is known as spatial domain. For colour separation, this kind of watermarking technique is also employed. Here, the watermark is limited to one colour band. This make the watermark visible such that it is hard to detect when viewed. But the marks appear immediately when the colours are separated. This type of watermarking method is used for confidentiality, verification and copyright defence. This domain uses LSB technique as it has less result on the image. This technique is used as it has many advantages like It is quick and straightforward to do some image processing, cropping, and compression.
2) **Transform Domain:** This method takes watermark robustness and transparency into account. This method works well in terms of processing transparency as well as robustness. This domain took into consideration the approach that is more effective than the spatial domain. Another name for transform domain is frequency

domain. The transform domain contains the watermark message. Various morphs respond to various attacks in different ways.

8. EFFECT OF PIRACY

Because of rapid advancements in technology in the digital age, copyright protection has become increasingly challenging in light of the various categories and types of work that have emerged, including software, digital music, and videos. Due to the modifications, piracy has increased in a number of sectors that are still protected by the copyright laws, but the legal measures are insufficient to stop infringement. Copyright is violated when material is copied digitally and includes downloading music, videos, or any text illegally. However, copyright violations are now easily prosecuted and have little bearing on the calibre of the work in the digital age. Although there are a number of causes for infringement, the easiest way to access the internet is one of them. It is said that the ease with which copyright material can be shared and accessed online without user consent is the reason why work is protected without limits. The primary issue is piracy. When work is downloaded illegally, pirated products like software, movies, CDs, and videos and eventually pushes customers to purchase the pirated version for less money. The owner suffered a great loss as a result, while the infringer made a tremendous profit. The largest change that is required in today's digital world is a change in the law. The new type of work has made copyright protection of the work a significant problem. The problems have emerged from the distribution and volume of content that needs to be disseminated. There are a number of causes for copyright infringement, but piracy is one of them. The ease of access to the internet is the cause of piracy. Although it is thought that digitization has sparked a revolution and made it easier for people to work from home, there are also a number of drawbacks. The primary drawback is piracy. The availability of pirated versions at a price lower than the retail price of causes piracy. While working online has been made easier by digitization, it is said to have brought about a revolution. In the end, this encouraged people to purchase the cheaper pirated versions rather than the more expensive legitimate goods. Because of this, piracy spreads like wildfire. Web links that can be downloaded illegally are also readily available on the internet, along with easily accessible pirated CDs of games, music, and movies. Internet service providers are offering the internet at lower prices as a result of the illegal downloading that is occurring at a far lower cost. Original content intended for one platform is also broadcast on another, such the internet, which eventually results in piracy.

The Indian Copyright Act of 1957 defines copyright infringement. This section states that doing anything for which the copyright owner has the sole authority to do so constitutes infringement on copyright in any work. In addition, copyright is violated when someone imports illegal copies of the work in question into India as well as when they hire, sell, or distribute the trade in a way that negatively impacts the copyright holder. It is stipulated that any musical, literary, or dramatic work that is saved on an electronic medium and is duplicated without the owner's consent would be considered a copyright infringement.

The scope and the risk of the infringement of the rights of the copyright owners increase in the digital world. It is believed to the fact that piracy occurs, and law and technology together have failed in eliminating it which lead to questions of provisions which need to add in order to reduce copyright infringement. The provisions along with the legal provisions would help to curb and redress copyright infringement. The entire copyright law governing the copyright gave the expression that piracy of the copyrighted material is a serious crime which should be met with measures. The struggle between private rights and the freedom of expression can be used to define copyright law. One such measure that has gained attraction in India is DRM. DRM is meant to protect the exclusive rights of the copyright owners. By its nature and functioning it provides a measure to balance between private and public rights which is the goal of copyright law. The rights granted by copyright protection serve as an incentive for writers but ultimately lead to exploitation of their work in order to provide the benefit to the public at the large. Because of the technological measure such as DRM it had led to expansion of rights guaranteed to a copyright holder under copyright holder. In order to offer better protection to the content and to create the profitable market for digital content technological standards have been adopted. The emerging DRM technology is popular as it is being used by the copyright owners in order to get the copyright protection under the act. Various challenges have emerged as a result of technological advancements and changes in digital technology. A number of international treaties have been used to control the use of copyright material. World intellectual property organization governs these international treaties of copyright besides many organizations.

9. INDIAN LAW ON WATERMARKS

It is said that because of the change in the technology copyright works are at great risk which ultimately lead to copyright infringement as copying of material amount to piracy of the work. In India watermark is not contemplated as a copyright it is examined as a means to protect the copyright work in order to ensure that the work they are using is copyrighted work. But somehow digital era has increased the risks of online attacks, fraud and theft .The digital world with regard to copyright law is somehow related to scientific advances which makes it feasible to provide materials related to music, books and distribute it through the internet, command and coordination of topic and giving out over the digital medium. So, in arrangement to protect from this the idea of the digital watermarking was being introduced in arrangement to safe the copyright work. To affect such control digital material are fed with TPMs. Owners of the digitally copyrighted works have started considering the TPM to protect the system from these kinds of internet threats. TPM uses methods like encryption, digital watermarks and passwords. Using these criteria the distributors may not only preserve the existing market but also create the new market. Even if the content has expired into the public realm, it should be available using TPMs with making slight changes making them a question matter of copyright and justify them. It is presumed that watermarks are not directly enforced in the process of the act. The copyright (amended) act 2012 however incorporates facilities to provide legal support to TPMs. Of all TPMs the digital watermarking is the most widely accepted criteria for the protection of digital documents. Digital watermarks are related to the original documents by providing permanent protection to the documents. The use of watermarks as a value effective method will ultimately increase in future. The concept of the digital watermarks is used in the circumstances of protection of copyright under intellectual property rights. The concept of watermark under Intellectual property rights in arrangement to save the copyright was done in order that watermark help in setting up possession proof in lawful matters, owner identification, tampering and authentication of content. Trusted system is the technological measure where the system can define and limit the number and set of people who can have access to information and also limit the unauthorized use.

The copyright (amendment) act 2012 lays down the provisions related to defence of watermark. These arrangements are related to watermarks because they satisfy the copyright protection criteria.

1) Protection of technological measures[1]

Anyone who intentionally circumvents an effective technological protection put in place to protect someone's rights in order to violate those rights faces a two-year maximum sentence for violation as well as a fine. This section provides out that technological measure should be used to safeguard the rights provided under copyright act. It gave emphasis on the fact that all watermarks satisfy the copyright protection. Robust watermarks help to provide the Proof of document ownership and delicate watermarks assist in determining whether or not the contents have been altered. Robust, undetectable watermarks that enforce copy controls and transmit information. By using visible watermarks and direct human intervention, copy assaults are detected. As a result, every watermark satisfies the requirement for copyright protection through evidence-based copyright enforcement. The advantage of digital watermarks is that when they are embedded into the document, they provide permanent defence to the document.

2) Protection of rights control information[2]

This section gives that if someone intentionally changes or deletes the information that manages the copyright without permission or tries to share that work to public knowing that copyright work was changed or deleted without permission that person shall be punishable with confinement of a term which might last up to two years and will moreover be responsible to fine. It is eminent that the digital watermarks which are embedded into the document in direction to give the protection can suffer various attacks such as deletions, additions and modifications. Because of this the transformations contents are being transformed and changed from one form to another. An image can be rotated or changed so these changes to the watermark whether simple or complex destroyed the watermark and its efficiency.

Users may violate watermarks in a number of ways, such as when they are added by an unauthorized party and innocent parties become the recipients of damaged, copyrighted content. It may be difficult to prove the intention in certain situations. Therefore, it might not be possible to establish beyond a reasonable doubt the imposition of criminal sanctions as a kind of intentional retribution. There are no provisions pertaining to analog problems under the copyright

[1] Section 65A of copyright (amendment)2012
[2] Section 65B of copyright (amendment)2012

legislation. This issue relates to the regular modifications made to digitally watermarked media. A pirate can just record the film into his gadget, turn it into a digital file, and be done with it. This procedure has the potential to entirely alter the watermark while simultaneously absolving the attacker of any responsibility.

The Indian copyright act however does not consider this problem. The main issue in the shielding of the watermarks belonging to copyright act arises because the word effective is left undefined under the act. In order to consider that alternatives should be adopted under the act this involves:

To provide separate sorts of TPM so that the part can be relevant to each watermark

To define the word effectiveness so in order it can be universally applicable

Remove the word effectiveness from the sections

Aside from that, the term "circumvention" should clarify and explain tamper detection and analog hole problems, which do not directly involve violating the relevant TPM. Because of the widespread occurrence of the analog hole problem brought about by the evolution of digital media, it is imperative that legislation address the issue by incorporating the term "transforms" alongside "removes" or "alters." According to some, it would be extremely difficult to determine the intent for works covered by TPM. As a result, the severity of the punishment may differ from that of traditional copyright infringement, which entails both infringement and a fine. There may be criminal consequences for circumvention with proved malevolent intent and civil damages for general circumvention, subject to case-by-case considerations. Given that the legal system is based on incentives

10. CONCLUSION

These days, digital watermarking is applied in numerous fields. Future study will focus on more improvements to deliver more information with higher security. Due to the quick advancement of technology, digital watermarking is a novel idea. Watermarks should therefore be sufficiently resistant to transformations. The watermarks have a promising future that will provide for protection. Numerous businesses have been involved in the study of digital watermarking. Because it uses copy limits and access controls to safeguard all facets of copyright, digital watermarking is a crucial TPM. It is stated that the Indian Copyright (Amendment) Act of 2012 contains some rules pertaining to TPM protection, but the concepts of word efficacy and circumvention are a little unclear. The subjective criterion for evaluating the digital watermark's effectiveness Digital watermarking will encourage content creators to create more content and trust the internet if technology is combined with appropriate legal enforcement, industry standards, and respects for the privacy of individuals seeking to legitimately use intellectual property. However, security technology is hack able. There are large no of digital content which is being distributed over the internet but somehow the development and adoption of the digital watermarking has been owned in direction to reduce copyright violation. The idea of watermarks being considered under copyright act still considers as a grey area because of the word effective before technological measures so Section 1201 of DMCA clears give the information on circumvention of effective access controls. So India in contrast to the DRM should consider the idea of watermarks in direction to get the protection.

CONFLICT OF INTERESTS

None.

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