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THE ROLE OF DIGITAL RIGHTS MANAGEMENT (DRM) TECHNOLOGIES IN MITIGATING PIRACY A COMPARATIVE STUDY BETWEEN INDIA AND THE USA

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ABSTRACT

This is an exploratory study that uses comparative methods to look at the efficacy of Digital Rights Management (DRM) technologies as a weapon to fight digital piracy. It examines the anti-piracy landscape in India and the USA to understand DRM implementation and its effectiveness in controlling digital piracy. DRM technologies such as encryption, digital watermarking and access controls play a core role in providing digital content its technological and legal safeguard against misuse, unauthorized distribution and infringement. This paper examines two different countries, India and USA's, approaches to DRM enforcement by looking at their legal, implementation, and cultural, economic and technological factors at play. It also analyses emerging technologies such as blockchain and DRM tools to show the diversification in AI mechanisms that are in use or can be used to further tighten DRM enforcement on digital content. Digital Rights Management, known as software that checks the usage of digital content and relies on licensing contracts, comes into force where the statutory copyright ends. Since India had a low level of copyright awareness, its initial agreements and commitments under the TRIPS were below the minimum standards. Anti-piracy laws in India are also restrictive and can lead to jail time. In closing, DRM enforcement should be sustained without being a hindrance in digital rights and freedom. International cooperation, legal reforms, and public-private partnerships all play a vital role in ensuring DRM enforcement is done in a manner that doesn't violate our digital rights and freedom.

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1.1 INTRODUCTION

The digital technology has transformed the scenery of intellectual property rights, presenting new opportunities and challenges in many dimensions. Among them, the digital piracy issue has become emerging threat to the authors and copyright holders worldwide, implicating the development and application of corresponding countermeasures. An example of such countermeasure is the adoption of Digital Rights Management (DRM) technologies. This paper will provide an analysis of the function of DRM technologies for control of piracy. Through comparing India and the USA, as the two different legislative and digital areas, it will examine the efficacy of DRM systems in the two countries.

Digital Rights Management (DRM) is a suite of technologies that allow copyright owners to regulate how their products are used after sale. Using DRM tools, copyright owners control how digital content, such as music and eBooks, or hardware, such as video games and high-definition (HD) cameras, are copied and shared across the Internet. The stated goal of DRM is to prevent unauthorised reproduction and distribution of copyrighted material, an endeavour that is intended to protect rights-holders' revenues and intellectual property interests. Intellectual property is the driving engine of the creative economy: it incentivises innovation by ensuring that creators and their employers can realise economic benefit from their inventions or works. In the digital environment, where content can be easily copied at low cost and instantly distributed far and wide, intellectual property rights are at their most threatened. DRM protects those rights by allowing copyright owners to control how content that they own or manage is used and distributed. DRM restricts access to and use of the digital content of buyers and users of goods and services, thereby restraining infringement or piracy and ensuring that creators and copyright owners are compensated for their work.

1.2 DIGITAL RIGHTS MANAGEMENT (DRM) TECHNOLOGIES

Digitalization has revolutionized intellectual-property usage and ownership, as content can be

both created and spread planetarily. Digital Rights Management technologies (DRM) are means of protecting certain rights, specifically protecting the rights of the content creators and the copyright holders, on how, when and where digital media should be distributed, used or consumed, and can play a significant role as a source of content protection, by restricting and/or controlling access to contents. This section presents the functionalities, implementation and the challenges faced by the technologies known as DRM.

1.2.1 Types of DRM Technologies

DRM is multifaceted and there are many different technologies associated with it, but they all have the same goal of preventing users from using and distributing digital content in ways that are not sanctioned by the creators and copyright holders. From this perspective, DRM is not the root of the problem with copyright; it is crucial to the copyright system. Without it, the balance would tip even further towards infringement.

1.2.1.1 Encryption

At the top of the DRM pyramid sits encryption: content that is encoded in a special way so as to protect it from piracy and to be readable or usable only by people who have access to the decryption key or password. A digital lock for your digital safe. For example, Netflix and Amazon Prime Video are made available only to people who have paid subscribers in specific geographical regions; the content is made available by them only in an encrypted form, and decrypted via secure methods to only the people who have a code, algorithm or password that allows access.

1.2.1.2 Digital Watermarking

Digital watermarking is the process of embedding information into the digital content that can help track the origin of the content or verify its authenticity. Digital watermarking is the reverse of encryption, which restricts access to users, while watermarking is a way to track the unauthorized use of the content without making it unusable for authorized users. It can be used to track pirated content and enforce copyright infringements. Watermarking in digital file can be of two types: visible or invisible. Visible watermarks are physically manifested as logos or barcodes on an image or video. Invisible watermarks, on the other hand, is embedded into the

code of a digital file.

1.2.1.3 Access Control

Access controls define who is authorized to use digital content, under what circumstances, and on what kind of device or in what way. In other words, they put obstacles in the way of illegal redistribution and copying of digital content. As is the case with digital rights management, there are various types of access controls. Start with basic time limitations on access: you'll pay a particular amount for a cloud subscription and get access to a particular library of digital content for a fixed period. You might check out what we call one-shot content – a movie, a manuscript, an audio track – and have various permissions granted to view, listen to, read it or download it or not. A piece of software might enable you to take screenshots of some of it, but not of others; you might be given a limited number of times you can play something, after which you'd have to pay more if you want to hear or view it again; the content might come bundled or locked onto your telephone or piece of hardware, so that you couldn't take it off and re-use it on any device – say, by trying to move the content from an Apple device to an Android device.

1.2.2 Implementation of DRM Technologies

Software as well as hardware technologies have been employed to provide DRM solutions in order to shield and control digital rights.

1.2.2.1 Software

Software-based DRM solutions are prevalent since they're flexible and easily modifiable as technology changes, and work well with different digital content forms, such as digital licenses, authentication systems, and software wrappers that prevent unauthorized executions of digital media. Software DRM is commonly used in the distribution of digital music, video games and software applications because it allows for much more dynamic forms of control.

1.2.2.2 Hardware

Hardware-based DRM solutions incorporate physical devices or components embedded in hardware as a part of the enforcing device: examples of this include hardware-based crypto processors – such as the Trusted Platform Module chip found in PCs – which provides secure

storage of cryptographic keys, passwords and digital certificates; and secure media paths, which prevent HD content on a Blu-ray player, for instance, from leaking from its input to its output through different routes than the trusting audio-visual chain, so as to guarantee protection against interception and copying.

1.2.3 Challenges and Criticisms of DRM

Although they are designed in part to protect copyright and reduce piracy, DRM technologies can conflict with rights to use, have logic bugs or be circumvented.

1.2.3.1 User Rights and Accessibility

A key criticism of DRM is its alleged infringement of users' rights and the freedom to read. According to its critics, DRM technologies can excessively restrict the possibilities for legitimate use of content, both for productive purposes such as educational use and for practice of fair use and personal backup; DRM can also lead to compatibility issues by locking the content onto specific platforms or devices and thus limiting the sovereignty of the consumer over the use of their content and the freedom to access content that has been purchased across various media.

1.2.3.2 Effectiveness in Preventing Piracy

It is also not clear whether DRM helps to prevent piracy. While it can deter the casual copying and sharing of materials, intentional pirates will go to great lengths to defeat such DRM protections. In addition, overly constrictive DRM limits access to works and harms legitimate customers, potentially driving them to piracy as an easier alternative.

1.2.3.3 Impact on Market and Innovation

There are creative upsides and downsides to DRM technologies. They clearly encourage creation and distribution costs, for instance, by allowing creators and copyright owners to protect their creations by sticking them in a digital prison. But DRM technologies likely limit innovation. They make it more difficult to use or reuse content in new forms that can threaten the development of new technologies or creative works. DRM also seems to have adverse consequences for innovation through the monopoly power that it gives to monopolists, closing the market to other players, limiting choice for consumers and forcing prices up.

1.3 LEGAL FRAMEWORK FOR DRM AND ANTI-PIRACY IN INDIA

Legal structures the world over have changed in perhaps less than a generation to confront the challenges of DRM and anti-piracy presented by the digital age. Given its digital economy and the sheer volume of information/intellectual property generated (and hosted) in it, India presents an interesting case study on how copyright law is, necessarily, evolving to accommodate the kind of restrictions demanded by the use of DRM mechanisms. This section looks at the legal backdrop of India in the context of DRM and anti-piracy. From an analytical perspective, the specific focus will be on the case laws and copyrights of India and the problems it has had in securing its content and making anti-piracy protections DRM compliant.

1.3.1 Copyright Laws Relevant to DRM

This philosophy served as the underlying basis for the endorsement of DRM and anti-piracy legislation in India encoded in the Copyright Act, 1957 and subsequent legislative amendments in the interests of a new digital regime.

1.3.1.1 Copyright Act, 1957

The Copyright Act, 1957 provides statutory authority for copyright protection in India for all forms of works being literary, musical, artistic, cinematographic, dramatic, architectural, sound recording works, etc. Under existing copyright laws, an individual has the rights to his work and he alone takes the decisions regarding its creation, exploitation and access.

Substantive changes in 2012, spurred both by these challenges and the rise of digital media, brought additional explicit provisions relating to copyright ownership and DRM. The 2012 amendments also made it unlawful to circumvent any ‘technological measure’ that ‘control[s] access to’ or otherwise ‘prevent[s] the use of’ a ‘copyrighted work’ when its owners use it. DRM, that is, is protected.

The 2012 amendments, besides adding a provision to cover Technological Protection Measures (TPMs), also provided that any activity involving the circumvention of effective TPMs used by the owner of the right shall constitute an offence, on the principle of absolute prohibition, except for acts done for purposes of research, security testing or law enforcement. This notification made it evident that DRM had entered the legal regime of Indian copyright on the

regulatory front.

1.3.2 Case Laws and Judicial Interpretations

The Indian judiciary was and remains primarily responsible for interpreting and enforcing DRM and anti-piracy laws – and, ultimately, transforming this law by way of precedential decisions.

But India has so far had very few cases that squarely engage with the question of DRM. However, given the way the Indian judiciary has interpreted copyright questions through the years, we can understand the legal position on DRM and TPMs by reading it against the cases where it has considered the question of copyright infringement. Super Cassettes Industries Ltd. v. Myspace Inc. was a question about copyright infringement in the digital world. Although the judgement did not discuss DRM directly, it characterized the problems of copyright owners who find it hard to protect their rights in the digital world, and describes the role DRM could play in resolving that problem.

There has been relatively little use of DRM protections in litigation so far thus far, largely because Indian industry is still very early in implementation of DRM technologies. But the law clearly allows and supports the use of DRM to protect copyright, and early cases giving disparaging remarks toward the technology will likely be overtaken in the future by clearer and more direct references to DRM technologies as they advance. Above all, legislators and courts have emphasized the compatibility of DRM with copyright law, and the role of technology for pirates, indicating how piracy-crippling barriers can advance the shared cause of copyright.

1.3.3 Criticisms and Challenges

Cumbersome and bloated with digital rhetoric and legal arcana, it will be an unprecedented test of DRM and anti-piracy measures in spite of the legal framework around it.

1.3.3.1 Enforcement Issues

Lack of enforcement of DRM protections might be the biggest problem. The digital environment is so vast and ever-changing that it is definitely hard if not impossible for copyright owners and the government agencies to monitor the movement of pirated media and takedown links to and from pirated websites, not to mention countering the innovative

technologies employed by pirates to make their presence untraceable. Consumers tend not to be aware of the illegality of circumvention since the culture is so ingrained and accepted in the society as a whole.

1.3.3.2 Balancing DRM with Fair Use and Fair Dealing

Another major criticism against DRM in India concerns the tensions between protecting copyright on one hand, and fair use and fair dealing on the other. An important problem with DRM technologies, its critics say, is how they potentially hamper legitimate uses of works for educational, research and other purposes covered under fair use and fair dealing exceptions. This too is a problem that India shares with other countries that are grappling with the competing claims of users' rights versus copyright owners' rights in the digital age.

1.4 LEGAL FRAMEWORK FOR DRM AND ANTI-PIRACY IN THE USA

The US is a leader in its development and application of Digital Rights Management (DRM) and anti-piracy measures laws (including steep penalties) and decades of landmark case laws. A deep look at the legal system through which DRM is developed and applied in the US can give us a clue for best practices of copyright protection in the digital environment. This section includes brief introductions to relevant US copyright laws and landmark case laws related to DRM technologies and anti-piracy measures, as well as the ongoing challenges with DRM and piracy mitigation.

In the US, legal precedents for DRM and anti-piracy are embedded firmly in federal copyright law, specifically the Copyright Act of 1976 and its subsequent amendments (particularly the Digital Millennium Copyright Act of 1998, or DMCA) 2.

1.4.1 Copyright Act of 1976

Arising from this, the Copyright Act of 1976 set the framework for granting copyright protection in the U.S., encompassing a balance between copyright owners' rights and the public interest. It lays out copyright owners' exclusive rights, and introduces the concept of fair use, which makes available a legal basis for the protection and use of copyrighted works.

1.4.2 Digital Millennium Copyright Act (DMCA) 1998

The Digital Millennium Copyright Act (DMCA) — enacted in 199 that was meant to address the difficulties of digital media and the internet — makes this point.

One is the legal protection the DMCA gives to 'Technological Protection Measures', which includes all of the various DRM technologies that are meant to prevent unauthorized access to or copying of copyrighted content in the digital realm. Circumvention of a TPM would be illegal as a matter of law.

1.4.2.1 Anti-circumvention provisions

But in fact, the DMCA's anti-circumvention provisions are among its most distinctive features – for these are the sections that explicitly make it illegal to 'circumvent a technological measure that effectively controls access to a work protected under this title'. It doesn't even matter if, whatever action you manage to perform by circumventing the technology, you don't end up infringing copyright afterwards. If circumventing that access control is what the law prohibits, then this prohibition can underpin all kinds of DRM technologies in ways that are entirely consistent with the interpretation of copyright law that they rely on. The DMCA was the law whose touch imparted digital piracy with an aura of illegality. It gave DRM technology a formal status never seen before or since.

1.4.2.2 Fair Use Doctrine and DRM

The Copyright Act has a Fair Use Doctrine – 'the balance between the interests of copyright holders and the public interest'. Fair use can short-circuit copyright provide unlimited public use of copyrighted works for 'criticism, comment, news reporting, teaching (including multiple copies for classrooms), scholarship, or research'. However, DRM, even if it disrupts fair use rights, should still be allowed.

1.4.3 Case Laws and Judicial Interpretations

In fact, it is the US federal courts that have reformed, interpreted and amended copyright law and the DRM provisions in subsequent cases.*1.4.3.1 Landmark Cases (e.g., MGM Studios Inc. v. Grokster, Ltd.)*

Perhaps the most pivotal ruling addressing the matter within the realms of DRM and copyright infringement is this case, when the Supreme Court found technology companies liable for copyright infringement carried out by users of their software, and largely relegated the responsibility for preventing piracy to DRM technologies. In the US, this ruling has had monumental significance for the distribution and protection of digital content.

1.4.4 Role of DRM in Copyright Infringement Litigation

And as a consequence, DRM technologies play a central role in copyright litigation, not only as the basis for protection, but also as a target for attacking. Courts have repeatedly upheld the legality of DRM measures under the DMCA, confirming the role of DRM as an effective way to protect copyrighted digital works from unauthorized uses and distributions.

1.4.5 Criticisms and Challenges

Although DRM technologies appear to be backed by clear legal frameworks and supported by the courts, the U.S. market is slower to see the revolution it seems to promise. Opponents to DRM policies maintain that such technologies encroach upon user privacy and provide ineffective tools to curb piracy.

1.4.5.1 DRM and User Privacy

DRM-imposed technical restrictions on user-information have been criticized for violating user privacy. Some DRM technologies collect and transmit data about what users are seeing or listening to, in some cases without users' explicit consent being recorded. As a result, the tension between the legislative goal of facilitating copyright protection at the expense of privacy rights is at the heart of challenges to DRM, and has given rise to proposals for more user-friendly, 'privacy-aware' DRM.

1.4.5.2 The Effectiveness of DRM in Reducing Piracy

There is still disagreement about whether proper DRM technologies even do a good job at dissuading piracy. While they might prevent casual copying and sharing, die-hard pirates are often able to break the protections. Moreover, too-restrictive DRM can annoy legitimate users, making them more inclined to adapt to pirated material as a more 'frictionless' alternative.

1.5 COMPARATIVE ANALYSIS

While there is a somewhat homogenous global digital picture with regard to the understandingand experiencing of art and culture, the legal response to violations and the use of digital rights management (DRM) and piracy clearly carries a unique color. India and the United States, being at opposing ends of this bilateral relationship, are examined for this comparative study on the effectiveness of DRM technologies that are very much situated in the distinct legal, cultural and technologic context of each of the two jurisdictions. The sections to follow explore the commonalities and adjustments between the two jurisdictions in their legal approach to DRM, the drivers behind DRM and implementation and enforcement of DRM, and the efficacy of DRM in combating piracy.

1.5.1 Similarities in Legal Approaches to DRM

So, both India and the US have gone through the process of modernizing their copyright laws to fit the realities of the digital world. Legal regimes have been set up to protect copyright owners' interests in the digital environment, incorporating DRM technologies. In both jurisdictions, the Copyright Act of India (1957 with 2012 amendments) and the Copyright Act of the US (1976 with adding of the DMCA 1998), import legal recognition of TPMs and anti-circumvention provisions.

1.5.2 Differences in Implementation and Enforcement

Though the legal frameworks might be similar, everyday practice and enforcement of DRM protections, whether relating to books or music or films, levels might differ significantly across the two countries. This depends on the cultural factors involved, economic costs, and the hardware and infrastructure available.

1.5.2.1 Cultural Factors

Different cultural perceptions of copyright and piracy in the US and India affect how people feel about these measures: Indians have a strong cultural view of digital content as public property. While this might change in the near future, it has generally made DRM measures

harder to sell to the public. By contrast, in the US and other developed countries with established cultures of copyright awareness, there is a greater culture of paying for content and a greater acceptance of DRM measures as part of the digital content consumption landscape.

1.5.2.2 Economic Impact

The second difference relates to the two countries' different economic structure in handling digital content. In the US, the user market for digital content is much bigger and more monetized compared with India. This means that an economic reason exists for DRM in the US. In India, the digital market is growing more and more quickly and is likely to have huge potential, but people's average income levels are lower and free or pirated content is more widely available. This means that it might be difficult to sell paid content via DRM.

1.5.2.3 Technological Accessibility

Infrastructural access also influences the effectiveness of DRM – a technological environment that reinforces DRM technologies (such as the USA's digital infrastructure or higher internet penetration rates) makes them much more effective than in places that have lower internet penetration rates or use outdated or 'legacy' technologies (such as India, despite being a developing power with a growing digital economy and mass mobile phone usage, has only 16 per cent of its population online, situated among 174 other countries, according to the International Telecommunication Union, UN's agency for ICTs).

1.5.3 Legal and Technological Innovations

As technologies in India and the US have also created new opportunities for piracy, we have each also experimented with new laws and technologies to maximize the efficacy of DRM and the fight against piracy, each providing examples of approaches that are distinctly Indian or US in character.

1.5.3.1 India's Approach

India has invested significant efforts to improve legal education and public awareness in the field of anti-piracy and copyright respect, and technological innovations have strived to make DRM-protected content more affordable and accessible to users who might be poor and whose infrastructure comes with significant costs.

1.5.3.2 USA's Approach

The USA, where the most advanced DRM ecosystem can be found, has made use of this fact to design technically complex DRM architectures (such as blockchain and artificial intelligence DRM systems), to protect digital goods. In the legal field, the USA has continued to push for international enforcement and enforcement against piracy abroad, taking advantage of the fact that, in the context of digital content, enforcing online piracy in one country is of little use if there are no consequences abroad.

1.6 THE FUTURE OF DRM AND ANTI-PIRACY MEASURES

Turns out that the field of intellectual property is highly dependent on those fast-changing rules. The shape of the DRM and anti-piracy fight will be ever-changing as new technologies arrive digital rights and freedoms continues. The concluding section tries to anticipate the path forward for DRM and anti-piracy through consideration of emerging technologies, legal reform and international coordination, and the continuation of the balance between the enforcement of DRM and the upholding of digital rights.

1.6.1 Emerging Technologies and DRM

DRM's future is perforce technological. For digital content is becoming ever more crucial to daily for copyright protection and new threats against DRM systems.

• Blockchain Technology: Despite advances in copy protection schemes, blockchain technology has proposed another, more pre-emptive approach to DRM which relies on decentralised, transactions-based management of copyright information within a single repository. The transactions records, by virtue of being entered together with all underlying information as part of the public ledger, are immutable evidence of ownership of copyright on a given work. Using blockchain technology to document ownership and distribution of licensed works could be a radical new way of making licensing swifter and limiting unlicensed sharing.

• Artificial Intelligence (AI) and Machine Learning (ML): Intelligent content monitoring and enforcement systems are already starting to revolutionise DRM use, and will likely

explore much more extensive territories in the future. AI and ML can automate the detection of piracy in the digital world, monitor user behaviour for structured prevention of piracy, and fine-tune DRM controls to find the optimal balancing point between copyright protection and good user experience.

• Watermarking and Fingerprinting: Advances in digital watermarking and fingerprinting techniques hold the promise of new, sophisticated methods of tracking and controlling the flow of digital content. Watermarks or fingerprints are practically invisible marks embedded into content that can be sensed by detection software. Their presence serves as a sign that the content has been curated by an authorised source, whereas sensor software at the receiving end of the data can instantly detect forgeries and digitally watermarked rights information.

1.6.2 Legal Reforms and International Cooperation

However, the success of DRM and anti-piracy measures could very well depend on how the legal landscape evolves, and how strong international cooperation ends up being.

• Updating copyright law: Given the imbalance between technological change and the ability of the legal system to adapt, legal systems everywhere will need to expand their reach and their use of punitive measures Upcoming legal update areas could include future-proofing for new technologies, making DRM obligations more transparent and predictable and modernising copyright law more generally to clarify and maintain it in line with digital realities.

• International Cooperation: Piracy is a global problem and so requires global solutions. Co-ordinated international efforts to combat piracy can be strengthened by increased cooperation between countries in the enforcement of copyright laws (for example, through the signing of treaties and bilateral agreements), their sharing of good practices for DRM implementation, and the developing of legal standards that create similar and comprehensive levels of protection for digital content internationally.

• Public-Private Partnerships: Governments, copyright holders, technology companies and consumer groups can work together to innovate and develop anti-piracy

technologies like DRMs; to run awareness campaigns regarding copyright; and, importantly, to ensure that harmony exists among copyright policies and society's need for access to information and culture.

1.6.3 Balancing DRM with Digital Rights and Freedoms

But one of the most important issues for the future of DRM is going to be finding this balance between copyright and the continued preservation of digital rights and freedoms.

• Fair use/dealing: The exercise of fair use (or, in many countries other than the US, fair dealing) is the right of a user to quote small portions from copyright works without asking permission of copyright holders. Political control of DRM and copyright must respect fair use and fair dealing: educational uses, commentary, criticism and other activities in the public interest should continue to happen. Legal reforms and technological strategies must permit the existence of these commons.

• Privacy concerns: Given that DRM systems that operate in the field often harvest user behaviour as part of their assistance to provide copyright protection, there will have to be a careful balancing between the two goals – copyright protection, and protection of user privacy. Second-generation DRM will likely be more visible and will be user consent-based, allowing for private-market solutions involving secure, privacy-enhancing technologies that protect both copyright and personal data.

• Accessibility: DRM will not block access to digital content by disabled people The accessibility and inclusion needs of emerging DRM must be met, so that digital content cannot be blocked from users with disabilities by means of copyright protection technologies.

1.7 CONCLUSION

India and the US, through their responses to the issues of digital piracy and protection and anti-circumvention of the incursions enabled by digital uses, especially anti-copying, makes for an interesting canvas of comparison. In fact, India and the US seem rather similar in their recasting of some civil provisions of copyright law, as an accommodation to the nature of digital uses.

Their passage of the Copyright (Amendment) Act 2012 is a fairly recent event. It is a strong speech act because it curtails a mode of use that is very popular. The US enactment was through its legislature, while the Indian one occurred through government regulation – so there is a similar trajectory of process in the origin of these laws. The US adopted the Digital Millennium Copyright Act of 1998, which criminalised circumvention of TPMs and CMI (copyright-management information) with a heavy penalty, beyond the aim of simply domestic financial gains. In India, the Copyright Act 1957 was amended with its sections 65A (Advanced Technologies) and 65B (Rights and Remedies in Computer Related Copyright Cases) through the Information Technology Act 2000. The IT Act 2000 also added other sections related to technological protection measures (TPM) and anti-circumvention with heavy penalties, and added criminal liability for breach of its stipulation. In each case, these were IP laws that facilitated the provisions for the enforcement of copyright, on behalf of the creative industries such as books, music, movies and software, in the shift to the digital domain. But what is greyed out here is the difference in efficacies (working or not working), and the underlying strategies or tactics (acceptability for users or not) of DRM. DRM clearly works and is easily integrated in the US. But it is not necessarily acceptable for users in India, at least not unreservedly – in part, this is because acceptable behaviours for sharing are culturally inflected, and so is the piracy. The last point is important. Piracy lacks the appropriate tech machinery for its transmission and reception, as well as a strong socioeconomic fallout.

In the US, a robust digital infrastructure, a culture and legal standards of copyright compliance, and legal protections of copyright make DRM an unquestioned part of the digital content marketplace. In India, cultural perceptions of digital works as a common resource, economic realities and technical exclusion combine to frustrate the relevance of DRM even while copyright protections are legal in force. Emerging technologies such as blockchain and artificial intelligence promise to make that fight

even easier and more effective than those first ABC fronts ever did. Blockchain, for instance, is a distributed shared digital record book of each individually protected or copyrighted digital item. With similar data, it would be substantially easier for enforcement officials to pinpoint the source of a pirated distribution than it is today. Likewise, an ability to filter pirated content

from the merely legitimate through artificial intelligence (AI) and machine learning has gotten much easier. Flicker an eBook page or brief with the right amount of energy, though, and copyright enforcement will pounce Similarly, AI and machine learning would facilitate the identification of digital rights management (DRM) breaks – incursions through the digital firewalls that guard copyrighted creations – by allowing the recognition of returning offenders, by denying any space in the digital diffraction pattern for pirated works. With such easily identifiable facts in hand, efficient copyright surrogates would have little need to replicate the open turf and large field that traditional sports – baseball – have enjoyed. But that does not make the narratives of history that illustrate how hard-fought the resulting rationale for our copyright laws has been any less valid. Current commercial content licensing rights – broadcast exclusivity, geographic licensing, concessionary windows, subsidies for sports franchises and ballparks, concessions to broadcasters – are all good candidates for DRM makeovers. They distort volume and price for consumers' disadvantage, and DRM can do them in.

Long-term futures for DRM and anti-piracy, however, will also be shaped by legal change and international cooperation. National copyright laws could be reformed to keep pace with technology, bringing international copyright-enforcement treaties up to date, and forging public-private partnerships that support DRM. DRM enforcement must be checked with the rights and freedoms of the digital age – fair use, privacy, and access for the visually impaired and others with disabilities – in order for DRM technologies to be effective.

In short, DRM will remain a fundamental though fundamentally flawed necessity for protection of digital rights-holders against rights-pirating anime aficionados. In the end, a solution to the rights-protection problem of piracy prevention will, necessarily, require a multipronged approach built on legal reform, technological innovation and international cooperation; protecting copyright in the digital age will continue to be a tension-filled mix of rights and wrongs. A healthy dialog among stakeholders will be required to ensure that DRM evolves as a useful and fair tool for the practical and secure management of copyright in digital spaces.

REFERENCES

1. MGM Studios, Inc. v. Grokster, Ltd., *545 U.S. 913 (2005).*

2. My Space Inc. vs Super Cassettes Industries Ltd., *FAO(OS) 540/2011*, Delhi High Court (2016, December 23).

3. Scaria, A. G. (2012). Does India need digital rights management provisions or better digital business management strategies? *Journal of Intellectual Property Rights*, 17, 463-477.

4. Arnab, A., & Hutchison, A. (2004, January). Digital rights management-An overview of current challenges and solutions. Retrieved from https://www.researchgate.net/publication/228644499_Digital_rights_management-An_overview_of_current_challenges_and_solutions

5. Scaria, A. G. (2012). Does India need digital rights management provisions or better digital business management strategies? *Journal of Intellectual Property Rights*, 17, 463-477. https://ssrn.com/abstract=2103350

6. Legal Eye Partners. (2024, January 30). Tackling digital piracy: The Indian context. The complexities of hate speech laws in India. Retrieved from https://www.linkedin.com/pulse/tackling-digital-piracy-indian-context-complexities-nyiac/

7. Bechtold, S. (2005, June). Digital rights management in the United States and Europe. *The American Journal of Comparative Law*, 52(2). https://doi.org/10.2307/4144454

8. Verimatrix. (2023, April 5). Why is digital rights management (DRM) important in video content security? Retrieved from https://www.verimatrix.com/anti-piracy/anti-piracy-insights/why-is-digital-rights-management-drm-important/

9. Nagpal, M. (2017). Copyright protection through digital rights management in India: A non-essential imposition. *Journal of Intellectual Property Rights*, 22, 224-237. Retrieved from https://docs.manupatra.in/newsline/articles/Upload/E61468AC-070C-489F-B552-6511C0E6095D.pdf

10. Roach, C. (2023, May 5). What is digital rights management (DRM)? (The definitive guide). Retrieved from https://www.digitalguardian.com/blog/what-digital-rights-

management

11. Cohen, J. (n.d.). The challenge of digital rights management technologies. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK221850/

12. Dadhich, D. (2023, April 5). Preventing digital and intellectual property piracy: A global perspective. Retrieved from https://www.linkedin.com/pulse/preventing-digital-intellectual-property-piracy-global-dadhich/13. Belleflamme, P., & Peitz, M. (2010). Digital piracy: Theory. CESifo Working Paper

No. 3222. Retrieved from https://hdl.handle.net/10419/46520

14. IDRC. (n.d.). Media piracy in emerging economies. Retrieved from https://idl-bnc-idrc.dspacedirect.org/server/api/core/bitstreams/76efdf28-d173-48a6-ba84-17afadc4ec9d/content

15. Ramakrishnan, A. (2017, May). Towards an effective regime against online copyright infringement in India. Schulich School of Law, Dalhousie University. LLM Theses and Dissertations.

16. Choudhury, P., & Yadav, S. (2022). Online piracy and intellectual property rights: A synthesis. *International Journal of Law, Management & Humanities*, 5(1), 2284-2295. https://doij.org/10.10000/IJLMH.112779

17. Trabajo Final De Grado. (n.d.). Digital piracy: How the media industry is being transformed. Retrieved from https://riunet.upv.es/bitstream/handle/10251/35922/Memoria.pdf?sequence=1

18. Scharf, N. (2022). The evolution and consequences of digital rights management in relation to online music streaming. *Legal Studies*, 42(1), 61-80. https://doi.org/10.1017/lst.2021.26

19. Danaher, B., Smith, M. D., & Telang, R. (2020, March 20). Piracy landscape study: Analysis of existing and emerging research relevant to intellectual property rights (IPR) enforcement of commercial-scale piracy. *Prepared for the U.S. Patent and Trademark Office.* Retrieved from https://www.uspto.gov/sites/default/files/documents/USPTO-Piracy-Landscape.pdf