Review on Digital Rights Management (In Video-Games)

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ABSTRACT

This review explores Digital Rights Management (DRM) in the video game industry, focusing on its evolution, criticisms, functionality, and legal implications. While DRM has developed to combat software piracy, it faces criticism for its limited effectiveness and the inconvenience it causes legitimate users. The impact of DRM on game performance shows mixed results, highlighting the need for consumer-friendly strategies that balance security with user experience. Additionally, the review addresses legal complexities surrounding DRM, including consumer rights. Ultimately, emerging technologies like blockchain may offer new solutions for digital rights management in gaming.

1. INTRODUCTION

Digital Rights Management (DRM) refers to a range of technologies and methods designed to ensure that users have the rights and permissions to access digital products. Primarily aimed at combating software piracy and copyright infringement, DRM employs techniques like encryption and permission management to control access to content. The gaming industry, facing significant challenges from rampant piracy, has been at the forefront of DRM debates [1] [2]. This review will explore the evolution of DRM in video games, criticisms surrounding its implementation, its impact on game functionality, and the legal and ethical implications it raises.

2. REVIEW ON DRM

2.1 Evolution of DRM in video games

In [1] an overview is given on the evolution of DRM in video games, in both pc and console gaming. The evolution for pc games has undergone significant changes in comparison to consoles games due to pc games compatibility with general-purpose hardware and software, which complicates installation and setup. The evolution of DRM in video games has varied significantly between PC and console platforms. Initially, PC games in the 1980s had minimal copy protection, but rampant piracy led

to the introduction of various measures, such as embedding instructions in game files and using physical modifications to floppy disks. As hard drives became common, manual-based protections emerged, but these were easily circumvented. The shift to CD distribution in the early 1990s introduced CD keys, which provided some level of protection but still allowed for unauthorized copies. With the rise of online multiplayer games, subscription models became prevalent, reducing concerns about piracy. In contrast, console games have relied more on hardware restrictions and legal protections, making them less susceptible to piracy but also limiting consumer access to exclusive titles [1] [3].

2.2 Criticisms of DRM in Video Games

Yoon [2] highlights criticisms of DRM and questions whether it is a concept that is defective by design. With people claiming that DRM's effectiveness in fighting piracy is limited with hackers consistently bypassing DRM systems and always releasing cracked versions of protected games to the public. These claims insinuate that DRM systems fails in it's main objective of protecting these games all while causing significant inconvenience for legitimate users, essentially a failure on all fronts. The inability of DRM systems to put a stop to piracy along with the voiced frustrations of legitimate players who feel these systems restrict and negatively impact their gaming experience. Examples such as Assassins Creed II and Diablo III which required constant online verification which led to severe and warranted backlash from players [4]. Even DRM systems that are great ideas in principle can often turn make playing a legitimate copy of a game an inconvenience. Electronic Art's Spore DRM which "greatly limits the number of installations possible, essentially turning legitimate purchases into long-term rentals" [3], whereas Steam- an online distribution service, is embraced by gamers due to secure and permanent product registration and a "download anywhere" philosophy. This points to DRM systems being widely unpopular among the gaming community especially when it is poorly implemented.

2.3 Impact of DRM on the functionality of video games.

In [5] quantitative methods are used to assess DRM's effects on the functionality of games. The study outlined by [5] employs quantitative methods to evaluate the impact of Digital Rights Management (DRM), specifically Denuvo, on the functionality of video games. It compares DRM-laden games to DRM-free counterparts, focusing on differences in executable file sizes, loading times, and frame rates. The research utilizes correlational methods and benchmarks the games using a combination of the games themselves and a data acquisition tool called Afterburner. The benchmarking process is divided into four stages:

- ❖ Stage 1(Raw Performance)

   At the end of this stage it was found that games using Denuvo anti-tamper did perform minimally better than their DRM free counterparts [5]. The difference in performance, though, was insignificant, with a combined average of 1.63 percentile points.

- ❖ Stage 2(Loading times)

   The second stage focused on measuring loading times in seconds for both DRM-laden and DRM-free versions of the games. Results showed that all DRM-free versions loaded faster than those with Denuvo, with differences reaching up to ten seconds. This finding highlights that fewer functions to call during loading can lead to improved speed, making loading times a significant factor in user experience [5].

- ❖ Stage 3(Executable size file comparison)

   In the third stage, the research evaluated the size of the executable files used to run the games. It was found that four out of six games exhibited a noticeable reduction in file size when DRM was not included, with an average decrease of 41.23 percentile points. This suggests that DRM can contribute to larger executable sizes, potentially affecting storage and performance [5].

❖ Stage 4(Runtime profiling)

The fourth stage aimed to profile the runtime behavior of the executable files but was ultimately aborted. The use of "wrappers" for security purposes obscured the call stack, preventing the researchers from obtaining meaningful data. This highlights the challenges posed by DRM systems in analyzing their internal workings and performance impacts [5].

2.4 The legal and ethical implications of DRM in video games.

The legal and ethical implications of DRM in video games are complex and multifaceted. Legally, DRM raises questions about copyright enforcement, consumer rights, and fair use. While DRM aims to protect intellectual property, it can also restrict legitimate users' access to purchased content, leading to potential violations of consumer rights. Ethically, the use of DRM can be seen as a double-edged sword; while it seeks to deter piracy, it may also alienate paying customers and limit their ability to fully enjoy their purchases. The balance between protecting creators' rights and ensuring consumer access remains a contentious issue, prompting ongoing debates about the fairness and effectiveness of DRM practices in the gaming industry.

In [6], the various strategies that different nations use to protect video-games under Intellectual property law are looked at, it also noted that on the side of legislative uncertainty, most jurisdictions choose to safeguard these creative works as simply software.

2.5 Customer reaction to DRM

Consumer responses to Digital Rights Management (DRM) have been varied, with a significant number of gamers expressing dissatisfaction due to restrictive measures that adversely affect their gaming experiences. A survey indicated that 70% of gamers reported negative sentiments towards DRM, highlighting concerns such as limited installations, mandatory online verification, and the inability to play games offline [7]. This discontent has resulted in boycotts against specific titles and publishers, illustrating that poorly executed DRM can negatively impact both sales and brand loyalty. In light of this backlash, some developers are re-evaluating their strategies,

leading to a shift towards more consumer-friendly practices, including the availability of DRM-free versions of games on platforms like GOG.com.

2.6 The Role of Digital Distribution Platform

Digital distribution platforms like Steam, Epic Games Store, and Origin have played a significant role in shaping the landscape of DRM in video games. According to [8], these platforms often incorporate their own DRM systems, which can be both a blessing and a curse for consumers. While they provide a convenient way to access and manage games, they also create a fragmented ecosystem where players must navigate multiple DRM systems. This fragmentation can lead to confusion and frustration, as players may find themselves locked out of their games due to server issues or account problems. However, platforms like Steam have also been praised for their user-friendly interfaces and robust customer support, which can mitigate some of the negative aspects of DRM.

2.7 The impact of DRM on indie developers

The impact of DRM is not uniform across the gaming industry; indie developers often face unique challenges when it comes to implementing DRM. A study by [9] highlights that many indie developers opt for DRM-free distribution models to foster goodwill among their player base and encourage sales. This approach allows them to build a loyal community and rely on word-of-mouth marketing rather than restrictive measures that could alienate potential customers. However, the lack of DRM can expose indie games to piracy, which raises concerns about revenue loss and sustainability. This dilemma forces indie developers to weigh the benefits of consumer trust against the risks of unauthorized distribution.

2.8 Alternative Solutions and Innovations

In response to consumer backlash, some developers have begun exploring alternative solutions to traditional DRM methods. These alternatives aim to balance copyright protection with user experience:

❖ User-Friendly Authentication: Some companies are adopting less intrusive authentication methods that do not require constant online checks. For example, Steam's approach allows users to play offline after initial activation.

❖ DRM-Free Models: Platforms like GOG.com have gained popularity by offering a

catalog of DRM-free games. This model appeals to consumers who prioritize ownership and ease of access over strict copyright protections.

❖ Subscription Services: Services like Xbox Game Pass provide access to a library of games without traditional DRM restrictions, allowing users to play without concerns about ownership limitations.

These innovations reflect a growing recognition within the industry that consumer preferences must be considered when implementing protective measures [10] [11].

3. CONCLUSION

DRM like most technological advancements is a positive and a negative in the game industry. Although it adds an important layer of security against piracy, its limitations like ease of circumvention and consumer inconvenience ruins its original purpose and makes it largely unpopular among gamers. There is a clear need for adaptable, consumer-focused strategies in the applications of DRM going forward which can carefully balance security with convenience to maintain consumer trust and rights while also protecting intellectual property of developers.

Gaps remain in understanding the long-term impact of DRM on consumer trust and industry innovation. Future studies should explore how new technologies, such as blockchain, which might be able to offer more transparent and secure DRM solutions, potentially reshaping the landscape of digital rights management in gaming and beyond.

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