

Future-Proofing DMCA: Ensuring Rights in the DRM Era

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Abstract

This article* investigates the current discussions on Digital Rights Management Systems (DRM) or the rightly coined term Digital Restrictions Management in relation to The Digital Millennium Copyright Act (DMCA). The main aim of this article is to delve deeper into the current status of DRM systems involving DMCA and its effect on consumers. We therefore explain technical aspects of DRM systems and give real-life examples on these topics followed by arguments from scholars.

Keywords: The Digital Millennium Copyright Act (DMCA), Digital Rights Management (DRM), Fair Use, Circumvention of Digital Rights Management Systems

I. Introduction

A. Scope

This article examines recent developments in Digital Rights Management in relation to DMCA and elaborates on these topics with real-life examples. The article first starts out explaining relevant technical and organizational details of DRM in Chapter II. Then goes into detail about the methods and types of DRM systems in Chapters II.A. and II.B. The relevant legislation DMCA § 1201 is explained in Chapter III and in its subchapters contain concerns from the public and academia. In Chapter IV we present movements against wide application of DRM.

B. Limitations

Use cases of DRM systems vary. We will focus on DRM systems whose task is to safeguard the intellectual property rights of entities that incorporate the DRM system for commercial

* I would like to thank Abdulmecit İçelli and Hande Çağla Yılmaz for their help in writing this brief and their neverending comradery.

purposes. Even though DMCA was enacted as a response to the WIPO Copyright Treaty, for the purpose of this article we are talking specifically about DMCA unless otherwise mentioned.

C. Purpose of This Article

In this digital era we are living in, protecting the rights involving technological advancements is important for incentivizing authors.¹ DRM systems were created for this purpose,² to ensure digital content is shared with copyright holders consent³ and copyright holders benefit from the monopoly rights.

This article tries to enlighten the public about DRM systems which are often miscommunicated to consumers. This article claims even though the technological capabilities of DRM in itself are not inherently meddlesome, it is generally inconvenient to consumers.

II. What are Digital Rights Management Systems?

DRM is a technology that helps to enforce the rights of copyright holders throughout the digital world.⁴ “Intellectual Property Rights in the Digital World” is also loosely used as a substitute term. DRM in a high-level explanation works as follows: DRM provider encrypts the digital content and only people allowed by the content provider are allowed to decrypt the content.⁵ DRM generally acts as an authorization and encryption service.

In its detail, DRM systems are much more complicated. One complication comes from cryptographic architecture. In traditional cryptographic communication schemes, there are generally two parties. Sending and receiving parties, and they trust each other. Thus,

¹ European Commission, “Intellectual Property Rights and Digital Rights Management Systems,” 2004, https://ec.europa.eu/information_society/doc/factsheets/020-ipr_drm-october04.pdf.

² Sydney Yazzolino, “DMCA § 1201: EFFECTIVE OR OUTDATED?,” *SANTA CLARA LAW REVIEW* 62 (n.d.): 30.

³ Shannon Kathleen Coates and Hossein Abroshan, “Guideline for the Production of Digital Rights Management (DRM),” n.d., 16.

⁴ “Intellectual Property Rights and Digital Rights Management Systems.”

⁵ Yazzolino, “DMCA § 1201: EFFECTIVE OR OUTDATED?”

cryptographic communication is aimed at protecting the information from third-party threats.⁶ However, in our scenario the receiver can also be a threat. In order to reduce this risk, DRM systems have to act as if receiving parties are threats as well. This makes implementing DRM much harder⁷ because the receiving party can and should see the cryptographic message, which differs immensely from defending against a third-party threat.⁸ This creates a conundrum. The message should be decrypted but the receiving party should be unable to copy the decrypted message. Here, DRM providers found a clever way. Let me explain it in an example.

Streaming service provider C Music Platform wants to show you a video clip. They invite you to their headquarters in order to show you the clip. They insist you must wear glasses while you are present in the headquarters. After your arrival, the security asks for your ID and they check your glasses. If they authenticate your authorization, they let you into the meeting room. In this meeting room, a manager arrives holding a phone. She sits in front of you and holds the phone above her head in order for you to see it. Then, she sends you your way.

This was a lengthy example, let's go through relevant factors one by one. In this example, C Music Platform is the copyright holder. They want to make sure that the video clip only remains in their hands. Their headquarters are their website or application. They control the environment. This is important because they want to keep control of the content at all times, even when it is still encrypted. In their headquarters, the security asks for your ID, this establishes the authentication stage. Authentication of the user is crucial in securing the content from third parties. Alongside your ID, they also ask for your glasses (which they insisted you put on). This is the hardware part and it is often overlooked. The security checks if you have

⁶ Cory Doctorow, "Microsoft Research DRM Talk," 2004, <https://craphound.com/msftdrm.txt>.

⁷ Qiong Liu, Reihaneh Safavi-Naini, and Nicholas Paul Sheppard, "Digital Rights Management for Content Distribution," n.d., <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=ce064e2c14a9f79ddf75258f6d2689af1c0b2dbd>.

⁸ Doctorow, "Microsoft Research DRM Talk."

the right type of glasses/hardware. If your glasses/hardware are very old or by any means deemed insecure, they might reduce the quality of service you are presented with (or in some cases, they may not let you in). This happens with almost every streaming service provider, nowadays. They check your hardware, such as your HDMI cable version, your monitor specifications, and so on. (They also check your software information too!) After you are deemed safe to see the clip, they let you in. A manager comes and shows you the clip. You never interact with the phone or video clip, the manager does it for you. It makes copying the video clip much harder. (Still, not impossible.) The manager is generally the video player or the application content provider is using. It restricts your capabilities with the content.

One important thing is, websites, applications and media players are crucial for DRM systems' functionality⁹ (similar to headquarters and managers). They do a lot of the hard work behind the scenes. This involves decrypting files without revealing the message and managing permissions (such as the resolution you will get etc.). A lot of media players have these functions built-in which helps enforce the rules of licenses set out in DRM systems without the need of a specific application from the provider. (Although these general use media players are deemed less secure.)

In the past years, consumers faced a lot of problems involving DRM systems (which we lay out in the IV.A. section of this article). This resulted in a dislike for DRM systems by the public.¹⁰ Even though DRM systems are mainly viewed as evil¹¹, we do not believe in the inherent viciousness of these systems. DRM is a technology that enables good and evil or ethical and unethical uses, such as any technology.¹² Leeming compares DRM to motorways. If the

⁹ Liu, Safavi-Naini, and Sheppard, "Digital Rights Management for Content Distribution."

¹⁰ Coates and Abroshan, "Guideline for the Production of Digital Rights Management (DRM)."

¹¹ Yazzolino, "DMCA § 1201: EFFECTIVE OR OUTDATED?"

¹² Rebecca Wexler, "The Private Life of DRM: Lessons on Information Privacy from the Copyright Enforcement Debates," *SSRN Electronic Journal*, 2015, <https://doi.org/10.2139/ssrn.2735430>.

use case is for good, it will speed up the process. However, it often leads to heavy traffic.¹³ There are many good use cases such as using DRM systems in transferring health data¹⁴ and the possibility of using DRM systems as an information exchange platform between education institutions.¹⁵

A. Methods of DRM Systems

DRM systems play an important part in protecting various types of content, such as music, video, and e-books on various mediums such as phones and computers.¹⁶

The example we mentioned with the C Music Platform is one possible and common method of DRM application. However, methods are almost limitless. Some DRM systems use specific and expensive types of equipment to secure digital content. Cinemas are a good example of this. They use high-cost equipment with a tremendous amount of data storage.¹⁷ Even if someone circumvented the DRM in the digital content, they would not be able to buy the equipment needed to show the movie.

Another method is runtime restrictions. This technology checks if any other contradicting process is running (such as a screen recording software) while the consumer is viewing the content.¹⁸ Sometimes, DRM systems can be applied in pay-per-view content to deduce the price.¹⁹

In general, we try to distinguish DRM systems by how they secure the integrity of the content.

¹³ Leeming, "DRM - 'Digital Rights' or 'Digital Restrictions' Management."

¹⁴ Liu, Safavi-Naini, and Sheppard, "Digital Rights Management for Content Distribution."

¹⁵ Liu, Safavi-Naini, and Sheppard.

¹⁶ Liu, Safavi-Naini, and Sheppard.

¹⁷ Gordon Lyon, "The Internet Marketplace and Digital Rights Management," n.d., 1–7.

¹⁸ Coates and Abroshan, "Guideline for the Production of Digital Rights Management (DRM)."

¹⁹ Julie E. Cohen, "DRM and Privacy," *Berkeley Technological Law Journal*, Vol. 18, p. 575-617, 2003, no. Georgetown Public Law Research Paper No. 372741 (n.d.), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=372741.

B. Types of DRM Systems

One big problem with DRM systems is monitoring the content after the fact.²⁰ Because if you lose control of the content even once, DRM loses its purpose.²¹ This means DRM systems have to be hack-proof.²² However, there are still some ways to stop the circumvention of the copyrighted material on the internet. Automated Content Recognition (ACR) helps establish control over publicly available content on the web. ACR systems work well on finding identical texts. Albeit, they have a hard time with audiovisual content. We believe, with the help of advancements in AI, ACR systems will also advance.²³

Also, it is apparent that with the development of AI, circumvention technologies will also get stronger.²⁴ AI technologies can alter the content in ways that are almost invisible to the human eye and at the same time can fool the ACR systems of the DRM vendors.²⁵

In the sections below, we have examined a few approaches taken by DRM providers for securing their content in no particular order.

1. Always Online Approach

To prevent circumvention a lot of DRM systems use what is called an “always online” approach²⁶ where in order to access the digital content on your medium of choice, your device has to be connected to the internet for authentication purposes.²⁷ This, however, results in poor consumer satisfaction.

²⁰ Liu, Safavi-Naini, and Sheppard, “Digital Rights Management for Content Distribution.”

²¹ European Union Intellectual Property Office., *Intellectual Property Infringement and Enforcement: Tech Watch Discussion Paper 2023*. (LU: Publications Office, 2023), <https://data.europa.eu/doi/10.2814/737565>.

²² Liu, Safavi-Naini, and Sheppard, “Digital Rights Management for Content Distribution.”

²³ European Union Intellectual Property Office., *Automated Content Recognition: Discussion Paper. Phase 2, IP Enforcement and Management Use Cases*. (LU: Publications Office, 2022), <https://data.europa.eu/doi/10.2814/952694>.

²⁴ European Union Intellectual Property Office., *Intellectual Property Infringement and Enforcement*.

²⁵ European Union Intellectual Property Office.

²⁶ Electronic Frontier Foundation, “DRM,” Electronic Frontier Foundation, accessed February 21, 2024, <https://www.eff.org/issues/drm>.

²⁷ Coates and Abroshan, “Guideline for the Production of Digital Rights Management (DRM).”

Denuvo is one of the most widely known DRM suppliers implementing this approach and they recently got into a problem where legitimate players could not play the game because Denuvo's authentication servers for DRM were unreachable.²⁸ This error happened because Denuvo's authentication server's domain address was not renewed. Walmart also had a problem with DRM servers going offline. In 2008, Walmart took a decision to provide DRM-free content. However, in doing so they have decided to shut down their DRM authentication servers for the earlier sold products. Customers were suggested to take a copy of their contents.²⁹ We are not certain how it would be possible without breaking the law.

2. Watermarking

Watermarking is a process where a DRM provider company puts a mark on the digital content. At times this mark might be seeable to the naked eye but generally, it is invisible. That mark can have a lot of different information such as the ID of the initial purchaser of the content, date, rights attached to it, and so forth.³⁰ Furthermore, this mark can be used in various types of mediums alongside with audiovisual contents. For example in digital audio, watermarking works by changing specific frequencies/wavelengths to determine digital rights.³¹

After implementing the watermark, DRM companies crawl the web to determine if their digital content is published illegally,³² and if that is the case they look at the watermark to find out the source and other details.³³

²⁸ Mark Knapp, "Denuvo DRM to Blame for Games Becoming Temporarily Unplayable," PCMag, accessed April 14, 2024, <https://www.pcmag.com/news/denuvo-drm-to-blame-for-games-becoming-temporarily-unplayable>.

²⁹ Jason Puckett, "Digital Rights Management as Information Access Barrier," n.d., 15.

³⁰ Yazzolino, "DMCA § 1201: EFFECTIVE OR OUTDATED?"

³¹ Electronic Frontier Foundation (EFF), "Frequently Asked Questions about Felten & USENIX v. RIAA Legal Case," <http://www.eff.org> (Electronic Frontier Foundation (EFF)), <!--#echo var='KEYS' -->, accessed February 20, 2024, https://w2.eff.org/IP/DMCA/Felten_v_RIAA/faq_felten.html.

³² Liu, Safavi-Naini, and Sheppard, "Digital Rights Management for Content Distribution."

³³ European Union Intellectual Property Office., *Intellectual Property Infringement and Enforcement*.

3. Fingerprinting

There are various methods of fingerprinting. One method is called image fingerprinting. DRM provider creates a unique fingerprint for a certain image and stores it in the database to later on compare with possible infringing images.³⁴ Big corporations such as YouTube and Meta also use fingerprinting technologies to help copyright holders control their intellectual properties.³⁵

4. Supervising Hardware and Software

Another approach is supervising at the operating system level.³⁶ A lot of measures against screen recording are using this approach. DRM systems check for certain hardware specifications and deliver the content according to their guidelines. This means that if you are using an old HDMI cable for your monitor (one which does not support High-Bandwidth Content Protection), or if you are using Linux, you are likely to get poorer performance.

III. DMCA § 1201 Circumvention of Copyright Protection Systems

We would advise looking at the whole section if you are unfamiliar with the text. However, paragraphs provided below would suffice for the purpose of this article.

DMCA § 1201

(1)(A) No person shall circumvent a technological measure that effectively controls access to a work protected under this title.

(2)(A) No person shall manufacture, import, offer to the public, provide, or otherwise traffic in any technology, product, service, device, component, or part thereof, that is primarily

³⁴ Xinghua Yu and Tiejun Huang, “An Image Fingerprinting Method Robust to Complicated Modifications,” n.d., https://web.archive.org/web/20200319063550id_/http://www.jdl.ac.cn/doc/2008/An%20Image%20Fingerprinting%20Method%20Robust%20to%20Complicated%20Image%20Modifications.pdf.

³⁵ European Union Intellectual Property Office., *Automated Content Recognition*.

³⁶ Liu, Safavi-Naini, and Sheppard, “Digital Rights Management for Content Distribution.”

designed or produced for the purpose of circumventing a technological measure that effectively controls access to a work protected under this title;

United States, codified DMCA for compliance with the WIPO Copyright Treaty.³⁷ Both WIPO Copyright Treaty and DMCA aim to discourage circumvention of DRM systems.³⁸ However, DMCA widens the enforcement area of the WIPO Copyright Treaty further than obligated. In the WIPO Copyright Treaty, only technical circumvention is mandated. However, DMCA regulates functional circumvention as well.³⁹

DMCA was signed into law in October 1998. From the insurgence of the DMCA, many aspects of it were criticized. Broad protection against the circumvention of DRM systems got their fair share of the discourse. DMCA also set a procedure for exemption from this article which would be granted by the Librarian of Congress. Exemptions are set out every three years and this procedure helped many sectors such as phone repairs. However, these exemptions ought to be renewed every three years by the Librarian of Congress which is not a very reliable way of exempting something.

In the paragraphs below, we set forth concerns about the DMCA.

A. Consumer Inconvenience

DRM systems protect the interests of copyright holders who are generally corporations instead of consumers.⁴⁰ As mentioned above, because of DRM systems, most of the consumers are not able to stream high-quality content even if they have paid for the service.

³⁷ Yazzolino, "DMCA § 1201: EFFECTIVE OR OUTDATED?"

³⁸ Wexler, "The Private Life of DRM."

³⁹ Terri B Cohen, "Anti-Circumvention: Has Technology's Child Turned Against Its Mother?" 36 (n.d.): 37.

⁴⁰ Yazzolino, "DMCA § 1201: EFFECTIVE OR OUTDATED?"

There is no set standard for interoperable DRM systems⁴¹ and some people argue this is restricting consumers to one technology for long periods of time.⁴² This is because you can not switch applications without losing some part of your data. This is not the sole downside of non-interoperable DRM systems. Now, consumers have to install various client-side software to access the contents they have purchased.⁴³ Furthermore, DRM providers fail to communicate with consumers about their ongoing activities on consumer's devices.⁴⁴ How many of us are aware of the DRM systems we encounter every day?

DRM systems also influence the lives of people with disabilities.⁴⁵ Some people may not be able to use text-to-speech software, because their software is not allowed by the content policy set out within the DRM⁴⁶ and some people may not be able to repair their wheelchair because it contains DRM.⁴⁷

Wexler claims DMCA is a regulation from different times. Nowadays we use smartphones and other smart gadgets which are all littered with DRM systems.⁴⁸ It is impossible to believe that lawmakers thought of all these possibilities. We think reform is mandatory. U.S. Congress Members are also skeptical about the impact of DMCA. Some of them are contemplating whether it helped innovation or hindered it.⁴⁹ One of the Congress Members, Rick Boucher, tried to reform DMCA three times. However, their efforts were fruitless.⁵⁰

⁴¹ Liu, Safavi-Naini, and Sheppard, "Digital Rights Management for Content Distribution."

⁴² Leeming, "DRM - 'Digital Rights' or 'Digital Restrictions' Management."

⁴³ Liu, Safavi-Naini, and Sheppard, "Digital Rights Management for Content Distribution."

⁴⁴ Wexler, "The Private Life of DRM."

⁴⁵ Puckett, "Digital Rights Management as Information Access Barrier."

⁴⁶ Puckett.

⁴⁷ Cory Doctorow, "When DRM Comes For Your Wheelchair," Electronic Frontier Foundation, June 7, 2022, <https://www.eff.org/deeplinks/2022/06/when-drm-comes-your-wheelchair>.

⁴⁸ Wexler, "The Private Life of DRM."

⁴⁹ Cohen, "Anti-Circumvention: Has Technology's Child Turned Against Its Mother?"

⁵⁰ Billboard Staff, "Boucher Re-Introduces Fair Use Bill," *Billboard* (blog), March 5, 2007, <https://www.billboard.com/music/music-news/boucher-re-introduces-fair-use-bill-1326319/>.

One upside of DRM systems for consumers is when consumers become copyright holders. DRM systems help small content creators in enforcing their intellectual property rights. Big platforms like YouTube use their ACR technology to find infringing content and notify the copyright holder.⁵¹ However, since YouTube's technology does not determine if the content at hand is fair use, many content creators are also deprived of monetary gains on false claims. Sadly, small content creators have only little power to fight back.⁵²

B. Fair Use Concerns

Protesters of DRM systems claim the protection of DMCA is so extensive that almost everything is illegal under the DMCA.⁵³ Regulation mentions fair use as a protected right but the current interpretation of the legislation seems to be leaving no room for it. A nice example visualizing the issue at hand is given by Cohen. Cohen argues DRM systems work as a locked gate in the public town center. Even though the land is public, jumping over the fence would be unlawful under the DMCA.⁵⁴

Two arguments supporting this idea are as follows: In order to exercise your right to circumvent a DRM system under the protection of fair use, either you should be able to bypass the DRM system by yourself or you should use a tool that circumvents the relevant DRM system. Well, the former is almost impossible for anyone without vast knowledge on technology, and the latter needs illegal publishing of circumvention tools.⁵⁵ This would mean fair use is only applied to certain types of people with certain knowledge.⁵⁶ There is no way for

⁵¹ European Union Intellectual Property Office., *Automated Content Recognition*.

⁵² Wexler, "The Private Life of DRM."

⁵³ Liu, Safavi-Naini, and Sheppard, "Digital Rights Management for Content Distribution."

⁵⁴ Puckett, "Digital Rights Management as Information Access Barrier."

⁵⁵ Wexler, "The Private Life of DRM."

⁵⁶ Cohen, "Anti-Circumvention: Has Technology's Child Turned Against Its Mother?"

ordinary people to exercise their fair use right.⁵⁷ Many scholars argue DRM protection under the DMCA has to be changed in order to protect usage of fair use.⁵⁸

It is also important to remember fair use is determined on a case-by-case basis and there is no one-fits-all solution to this.⁵⁹ Programming a list of exhaustive fair use cases is very hard and in the near future it can not be added to DRM systems.⁶⁰

C. Privacy Concerns

Intellectual property discussions aside, there are a lot of privacy concerns that come with DRM.⁶¹ Wexler argues the act of detecting circumvention in essence is related to privacy.⁶² While scanning public documents is one method, we also know that DRM vendors use technologies that interfere with consumer's devices. By this, DRM systems have to possibility of accessing the personal data of consumers.⁶³ Following this thought, Neil Richards claims, in a functioning society we should maintain "intellectual privacy" to foster innovation.⁶⁴ This means privacy in things we consume intellectually. People have worked hard for the freedom to freely read books of their choosing, without someone from authority peeping at them.⁶⁵ Cohen claims, even though DRM systems have legitimate interests in supervising or collecting consumer behavior, intellectual privacy is actually a touchstone of democratic society.⁶⁶ Thus, it should be preserved in the face of DRM systems. We know that library records have been

⁵⁷ Puckett, "Digital Rights Management as Information Access Barrier."

⁵⁸ Liu, Safavi-Naini, and Sheppard, "Digital Rights Management for Content Distribution."

⁵⁹ Charles W. Bailey Jr., "Strong Copyright + DRM + Weak Net Neutrality = Digital Dystopia?," *Information Technology and Libraries* 25, no. 3 (September 1, 2006): 116–27, <https://doi.org/10.6017/ital.v25i3.3344>.

⁶⁰ European Union Intellectual Property Office., *Automated Content Recognition*.

⁶¹ Cohen, "DRM and Privacy."

⁶² Wexler, "The Private Life of DRM."

⁶³ Cohen, "DRM and Privacy."

⁶⁴ Neil Richards, "Intellectual Privacy: Rethinking Civil Liberties in the Digital Age," *Choice Reviews Online* 53, no. 02 (October 1, 2015): 53-1041-53–1041, <https://doi.org/10.5860/CHOICE.190970>.

⁶⁵ Electronic Frontier Foundation, "Digital Books and Your Rights: A Checklist for Readers," Electronic Frontier Foundation, February 16, 2010, <https://www.eff.org/wp/digital-books-and-your-rights>.

⁶⁶ Cohen, "DRM and Privacy."

used to prosecute people, and still are being used to prosecute people. Think what can happen when DRM systems get audited, basically anything you own will testify against you.

Some supporters of DRM give the following argument: “You do not own the content or digital medium, therefore you should not be expecting privacy”. Cohen gives an elegant reply. Cohen says there are many instances where we expect privacy on someone else’s property. Places such as restrooms or phone booths. Cohen claims interests protected by “privacy” and “property” are different.⁶⁷ Meanwhile, Paul Geller argues that privacy rights are much more essential than copyright.⁶⁸ He proposes copyright should supplement privacy rights not hinder them. Kang puts the privacy concerns one step further and suggests making Privacy Rights Management systems.⁶⁹

D. Anti-Competitive Behavior

Apart from privacy concerns, some scholars bring up the possibility of anti-competitive behavior arising from the implementation of DRM systems.⁷⁰ Companies started to include DRM systems in even the simplest tools and use DMCA to threaten other companies. Cartridges and garage doors take the lead on anti-competitive DRM discussions.⁷¹

IV. Ongoing Movements and Horror Stories

There are many different entities among the DRM protesters. European Pirate Party is one of them. As of 2024, they have four members in the European Parliament.⁷² They argue DRM systems infringe on privacy rights and fundamental human rights, therefore the regulations must

⁶⁷ Cohen.

⁶⁸ WORLD INTELLECTUAL PROP. ORG., “WIPO WORLDWIDE SYMPOSIUM ON THE IMPACT OF DIGITAL TECHNOLOGY ON COPYRIGHT AND NEIGHBORING RIGHTS,” accessed February 21, 2024, <https://perma.cc/7Z3K-GJPM>.

⁶⁹ Jerry Kang et al., “Self-Surveillance Privacy,” *SSRN Electronic Journal*, 2010, <https://doi.org/10.2139/ssrn.1729332>.

⁷⁰ Leeming, “DRM - ‘Digital Rights’ or ‘Digital Restrictions’ Management.”

⁷¹ “Unintended Consequences: Sixteen Years under the DMCA.”

⁷² “Members of European Parliament | European Pirate Party,” accessed February 20, 2024, <https://european-pirateparty.eu/mep/>.

be reformed.⁷³ Nowadays, the Pirate Party drifted their efforts from copyright reform to the free software movement.⁷⁴

One of the loudest protesters is the Free Software Foundation. Their Defective by Design campaign is an ongoing battle with DRM systems.⁷⁵ They also give legal aid to the people who are sued by big corporations.

Electronic Frontier Foundation also launched a movement called Apollo 1201, aiming to eradicate DRM in this lifetime. They also support Defective by Design in its activities. Apollo 1201 emphasizes the importance of reforming DRM with a quote I find elegant: “It’s the difference between ‘Yes, master’ and ‘I can’t let you do that Dave.’” Consultant of Apollo 1201 Doctorow claims in today’s world DRM is being used to hinder fair use and free speech.⁷⁶

Below we have shared some horror stories from the past. Let’s hope, they do not get repeated.

A. Sony Rootkit

Sony instructed their consumers to install their CD player software to be able to listen to music.⁷⁷ Later on, this software was found to be almost like a rootkit, which is often considered spyware.⁷⁸ This software apart from implementing necessary DRM features, also gathered information about the user's listening activities.⁷⁹ This problematic software later on was critiqued by the artists and copyright holders themselves.⁸⁰ All of this was found out because

⁷³ Wexler, “The Private Life of DRM.”

⁷⁴ Pirate Party Sweden, “Pirate Party Sweden About Us,” *Piratpartiet* (blog), August 15, 2022, <https://piratpartiet.se/en/about-us/>.

⁷⁵ “Defective by Design,” accessed April 15, 2024, <https://www.defectivebydesign.org/>.

⁷⁶ Electronic Frontier Foundation Press Release, “Cory Doctorow Rejoins EFF to Eradicate DRM Everywhere,” Electronic Frontier Foundation, January 20, 2015, <https://www.eff.org/press/releases/cory-doctorow-rejoins-eff-eradicate-drm-everywhere>.

⁷⁷ Leeming, “DRM - ‘Digital Rights’ or ‘Digital Restrictions’ Management.”

⁷⁸ Leeming.

⁷⁹ “Digital Books and Your Rights.”

⁸⁰ Leeming, “DRM - ‘Digital Rights’ or ‘Digital Restrictions’ Management.”

Mark Russinovich investigated Sony's DRM system further.⁸¹ He found out that Sony used methods commonly used in malware to disguise its wrongdoings.⁸² Even worse, there were no uninstallers provided by Sony at the time.⁸³ When Sony created the uninstaller, they made the use of it conditional upon giving Sony your e-mail address and agreeing to receive marketing e-mails.⁸⁴

In the aftermath of this instance, the US Department of Homeland Security's Assistant Secretary made the following announcement: "And in the pursuit of protection of intellectual property, it's important not to defeat or undermine the security measures that people need to adopt in these days."⁸⁵

B. Dmitry Sklyarov

Dmitry Sklyarov is a computer engineer from Russia. He was a speaker at a tech conference and in his speech, he demonstrated the vulnerabilities within Adobe's E-Book DRM systems. He was jailed for 30 days until he got a plea. After this incident the Russian State Department issued a warning to its citizens, advising them to not attend conferences in the United States.⁸⁶

C. Kindle

Kindle is notorious for DRM troubles. In one instance, due to a request from the Author's Guild, Kindle revoked access to the text-to-speech feature in requested books. This affected people with disabilities and no substitution was presented to those affected.⁸⁷ Another instance with Kindle is when they deleted certain editions of *Animal Farm* by George Orwell.⁸⁸ This removal was not communicated to the users beforehand. Furthermore, many of the users were

⁸¹ Leeming.

⁸² Coates and Abroshan, "Guideline for the Production of Digital Rights Management (DRM)."

⁸³ Coates and Abroshan.

⁸⁴ Leeming, "DRM - 'Digital Rights' or 'Digital Restrictions' Management."

⁸⁵ Leeming.

⁸⁶ Doctorow, "Microsoft Research DRM Talk."

⁸⁷ Puckett, "Digital Rights Management as Information Access Barrier."

⁸⁸ Wexler, "The Private Life of DRM."

not aware that Amazon had the capability of doing so. Because of this, a lot of people lost the notes they had taken on those books.⁸⁹

Linn Nygaard is another victim of Kindle deleting her books. An article published by WIRED claims her books were deleted from her Kindle library due to “unspecified violation of terms of service”. She lost all of her notes inside.⁹⁰

D. Brandon Wilson

Brandon Wilson is a computer programmer who graduated from East Tennessee State University.⁹¹ He has received DMCA threats from two big companies in the span of two years.⁹²

One of them was from Texas Instruments about the reverse engineering activity Wilson conducted on their calculator. In the event, a calculator hobbyist found a way for people to run their own operating system in Texas Instruments manufactured calculators. Wilson then installed his own operating system on his calculator and wrote a blog about it. Not so long after came Texas Instrument’s DMCA threat.⁹³ However, it was later found by the Electronic Frontier Foundation that the technology Wilson was circumventing did not control access, and thus would not be classified as DRM at all.⁹⁴ After the Electronic Frontier Foundation’s defense, Texas Instruments did not pursue legal action against Wilson. However, they did not stop sending DMCA threats to other bloggers and researchers.⁹⁵

⁸⁹ Puckett, “Digital Rights Management as Information Access Barrier.”

⁹⁰ Mat Honan, “Remote Wipe of Customer’s Kindle Highlights Perils of DRM (Updated),” *Wired*, accessed February 21, 2024, <https://www.wired.com/2012/10/amazons-remote-wipe-of-customers-kindle-highlights-perils-of-drm/>.

⁹¹ Brandon Wilson, “Brandonw.Net - Me,” accessed February 27, 2024, <https://brandonw.net/me/>.

⁹² “Unintended Consequences: Sixteen Years under the DMCA.”

⁹³ Electronic Frontier Foundation, “EFF Warns Texas Instruments to Stop Harassing Calculator Hobbyists,” Electronic Frontier Foundation, October 13, 2009, <https://www.eff.org/press/archives/2009/10/13>.

⁹⁴ Electronic Frontier Foundation, “Re: Texas Instruments’ Claim of a 17 U.S.C. Section 1201 Violation by Brandon Wilson at Www.Brandonw.Net,” October 2009, https://www.eff.org/files/filenode/coders/ti_claim_ltr_101309.pdf.

⁹⁵ Jennifer Granick, “Hey, Texas Instruments -- Stop Digging Holes,” Electronic Frontier Foundation, October 29, 2009, <https://www.eff.org/deeplinks/2009/10/texas-instruments-stop-digging-holes>.

Wilson also received a cease-and-desist letter from Activision. Wilson was interested in a game called “Skylanders: Spyro's Adventure from Activision”. The game offered to interact with Activision’s real-life toys by using RFID tags. Wilson was amused with this idea and reverse engineered the protocol it uses.⁹⁶ After he published his accomplishment, which did not show any ways to circumvent the technology, he was faced with a cease-and-desist letter from Activision.⁹⁷ Wilson expressed his intent to comply with Activision’s letter and forego his research on the topic.

E. Right to Repair Your Wheelchairs

Powered wheelchairs use software to work and some companies are putting DRM on those softwares. If the company is using DRM in their software, DMCA makes it illegal to repair your wheelchairs.⁹⁸ This means when your wheelchair brakes you have to go to your manufacturer. However, this is not so straightforward. Access to your manufacturer’s facilities can be difficult. Even when the access is easy, the repair process is not so fast. According to the survey by Public Interest Research Group, it currently takes almost four weeks to get your wheelchair repaired by the manufacturer.⁹⁹ Addressing this issue “The Consumer Right To Repair Powered Wheelchairs Act” has been signed by the State of Colorado. This act forces manufacturers to provide the necessary resources to repair the powered wheelchairs.¹⁰⁰ It is a sad reality when the obvious shortcomings of the DMCA have to be corrected like this.

⁹⁶ Mike Kayatta, “Would-Be Skylanders Hacker Handed Cease and Desist,” *The Escapist* (blog), December 29, 2011, <https://www.escapistmagazine.com/would-be-skylanders-hacker-handed-cease-and-desist/>.

⁹⁷ Mitchell Silberberg & Knupp LLP, “Re: Unauthorized Hacking of Skylanders: Spyro’s Adventure,” October 2011, <https://brandonw.net/skylanders/activision.pdf>.

⁹⁸ Doctorow, “When DRM Comes For Your Wheelchair.”

⁹⁹ “Stranded,” U.S. PIRG Education Fund, June 2, 2022, <https://pirg.org/edfund/resources/stranded/>.

¹⁰⁰ John Cooke et al., “Consumer Right To Repair Powered Wheelchairs,” Pub. L. No. HB22-1031 (n.d.).

F. DeCSS

DeCSS is a somewhat funny story to me. Contents in DVD format were encrypted by a method called Content Scramble System (CSS). This made it so people using lesser known operating systems (even Linux), are unavailable to watch the content they lawfully bought.¹⁰¹ A group of programmers made the program called DeCSS, which lets you descramble the content and remove the encryption. Later on, they were sued alongside with website owners that published the content. The basis for litigation was the protection of trade secrets and circumvention of DRM. This litigation process caught the attention of the media. Defenders of DeCSS argued that reverse engineering a process and publishing the code should not be subject to a lawsuit. In the case, Judge Kaplan issued a preliminary injunction and restricted the defendants from sharing the DeCSS code on their websites. However, people invented new ways to protest this decision soon enough. Seth Schoen wrote a 465-stanza haiku about how to write DeCSS.¹⁰² Other people printed the computer code on their t-shirts.¹⁰³ Schoen says all of these projects aim to remind judicial authorities what they are actually censoring is freedom of speech.

V. Conclusion

At its core, DRM systems have to restrict user's capabilities of interacting with content. In our opinion, in many instances, people are content with this reality. Things go south when DRM systems start to inconvenience people. Moreover, it is seen from our research that DRM providers tend to overarch their entitlements over consumers even when this limits the fair use rights of the public. A right that is so endeared to copyright law itself. We believe, it is clear

¹⁰¹ Ross Anderson, "Security Engineering: A Guide to Building Dependable Distributed Systems," in *Security Engineering: A Guide to Building Dependable Distributed Systems*, n.d.

¹⁰² Seth Schoen, "DeCSS Haiku," accessed April 15, 2024, <https://www.cs.cmu.edu/~dst/DeCSS/Gallery/decss-haiku.txt>.

¹⁰³ "Gallery of CSS Descramblers," accessed April 15, 2024, <http://www.cs.cmu.edu/~dst/DeCSS/Gallery/>.

that lawmakers at the time of drafting the act, did not and could not foresee this widespread use of DRM systems. Thus, DMCA should be amended according to modern needs.

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