4.2. An Ongoing Arms Race: Protecting Through Technology

The art of protecting from copying predates even copyright itself. Map-makers, for instance, would add "trap streets" (streets that did not exist) and dictionaries and directories would include fictitious entries. In this way, they could prove their competitors had copied them. The practice of adding identifying information to a work still exists today. In addition, contemporary works often include technological measures to make them harder to copy.

Digital rights management

The digital world has made it easier than ever to create reproductions and copies. Indeed, a computer needs to make copies in order to function. Viewing an image online means copying it from the internet server to your own hard disk, then from the hard disk to the random-access memory (RAM), from which it is copied to the graphical processing unit, which sends instructions to the screen about which pixels get which colour. The EU had to add a copyright exception for such "temporary acts of reproduction", otherwise each of these copies would constitute an infringement. 📖

    Interestingly, as the trade of digital goods has evolved, not all kinds of copies have been equally loved by publishers. If I want to play a computer game, I need to put a copy of that game on my hard disk. But if I copy those files
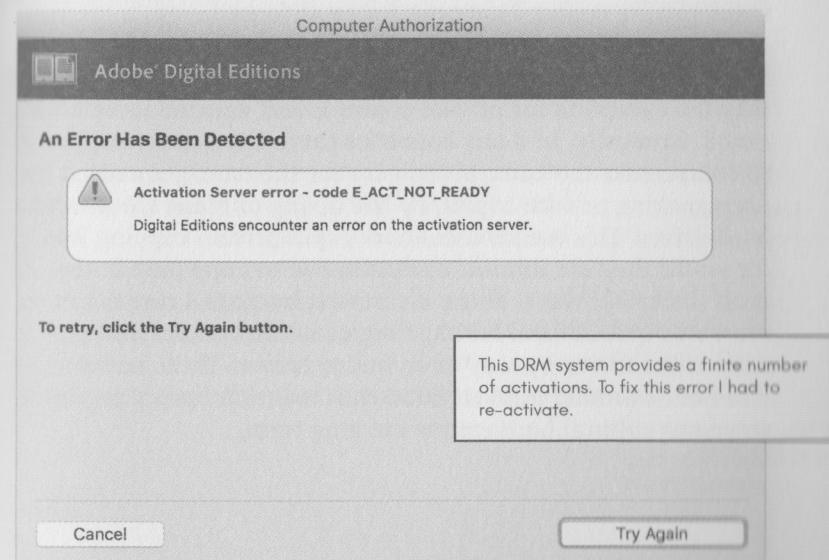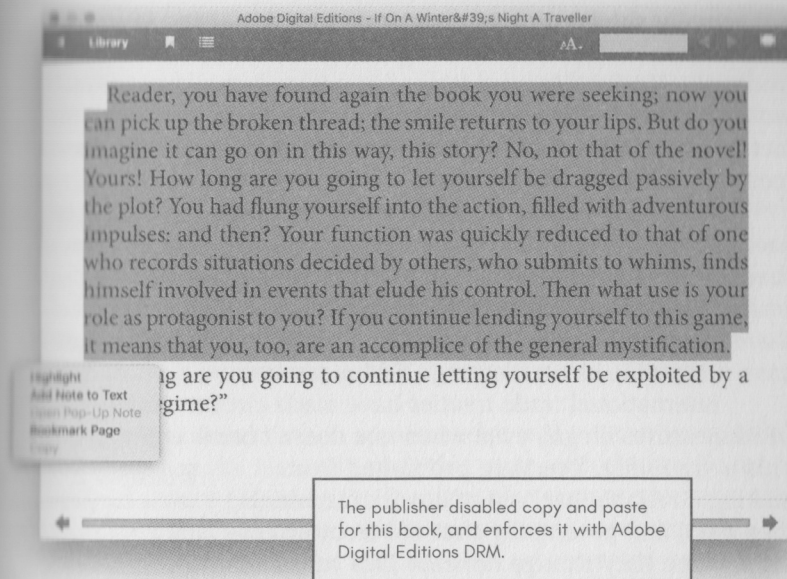
📖 Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society, Article 5.1.

on a CD for a friend, the publisher may not be happy.

Publishers are on a constant search for technological solutions that prevent the kind of copies they don't like. This used to be called "copy protection." Computer games and other software were some of the first goods to receive such protection, as were VHS tapes followed by DVDs and Blu-ray discs. Today, the preferred appellation is "digital rights management," which sounds slightly more neutral.

Digital rights management (DRM) is a layer of software added to a media file to make it harder to copy. In general, the file is encrypted and requires a code or key to be decrypted. This code needs to be installed on all devices (computers, ebook-readers, mp3-players, smartphones, etc.) that can read the file in question. The most prevalent model today has the user connect to an online service that allows for the activation of the device by way of an encryption key. This key is personal and coupled to an account linked to the service. Thus, often there is a maximum number of devices that may be activated. The idea is that if the file is copied it is useless as the key is individual. Three examples of such schemes across apps, ebooks, software and music are Apple ID, Amazon Kindle and Adobe Digital Editions.

As an artist, does it make sense to use DRM techniques? You might not always have a choice. Publishing an app on Apple's App Store, for example, immediately means you must follow Apple's code-signing procedures. You might also work with a publisher who demands a specific DRM technology. If you have a say in it, though, you should consider the negative implications DRM can have for your public.

The problem with DRM is that, by definition, it puts a burden on the public. The file you sell will be accessible only when tied to a certain account (that the buyer could potentially lose access to) and a certain brand of device (whereas one day they might switch to another brand). There was a rumour Bruce Willis sued Apple over the clause in the iTunes end-user license agreement (EULA) that prevents him from transferring songs bought on iTunes Store to his children when he dies. Willis did

The publisher disabled copy and paste for this book, and enforces it with Adobe Digital Editions DRM.

This DRM system provides a finite number of activations. To fix this error I had to re-activate.

not actually sue but iTunes does prohibit transferring licenses, even in case of death, as do Google Play and Amazon Kindle. Ironically, if your file were ever to be pirated, the encryption would need to be broken, and the file shared by pirates will in fact be more useful to users than that which paying customers receive.

Another question is: Does DRM help to stop piracy? It is hard to tell. Most of the movies and books found through file-sharing sites had originally employed some form of DRM, which had to be reverse-engineered before the file could be shared. It seems, then, that those originally uploading the files have no trouble circumventing DRM measures.

International trade treaties have made circumventing DRM measures illegal, even when one doesn't break copyright. 📑 This is troubling. Users are prohibited from making a reliable back-up of a work for which they paid, and potentially shut out from access- ing it when they change devices. This seems to conflict with the copyright exception that exists in most countries that gives users the right to make private copies. However, for most forms of DRM it's possible to copy the file without a key to the encryption: it's the access that is complicated. That's why the exception for private copies is still deemed to be hon- oured. Ironically, in many countries there is a system in place to compensate the cultural industry for the damages caused by users making private copies, by the taxing of blank CD-Rs and hard drives. This means users now pay a private copying levy for works they are in most cases allowed to copy only in the most limited of ways. These measures also pose a real threat to museums and cultural heritage organisations. Most DRM sys- tems authenticate by way of an online server. These servers will not be around forever. DRM thus makes it harder to pre- serve our cultural heritage for the long term.

📑 *Directive 2001/29/EC of the European Parlia- ment and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society,* Article 6.1.

The logic of the leak

The first publication of a work of art is a moment associated with rituals, whether it's a gallery opening, a movie premiere or a book launch. These rituals remain important, even as artists move to share more and more of their artistic process through social media, public rehearsals and residencies. There is a reason why one of the moral rights is the right of divulga- tion: the right of the artist to decide when they are ready to share their work with the world. The ritual of making some- thing public is an occasion for you to shape the reception of your work, a moment to work towards in order to create momentum.

A leak occurs when someone else makes your work pub- lic before you do. Not only does this mess with the public mo- ment you were planning for, it might also expose a version of your work that's not final and is not properly representative. Of course, it does happen that a leak is orchestrated by an artist and/or their publisher. Before a work is published, copies of it will already circulate the mastering engineer will hear the re- cord, the copy editor will read the novel. Traditionally, journal- ists would get early access so they can publish a review at the time of release. Since these days these copies are all probably digital, and it's easy to copy and distribute digital files, leaking is much easier than it was in the past.

To avoid leaks, Beyoncé released her fourth studio album without any prior notice. 📑 She started a trend. When it comes to avoiding leaking, artists and their collaborators can use every trick in the secrecy book. Keeping a secret is a lost art and it has both so- cial and technological dimensions. Artists writing potential best-sellers, such as George R. R. Martin, apparently write their books on a computer that is not connected to the internet. 📑

📑 Anita Elberse and Stacie Smith, *Beyoncé.*

⏴ CONAN, *George R. R. Martin Still Uses A DOS Word Processor.*

Piracy

Everything changes once a work is released to the public as you no longer have any physical control over the copies of the work. At this point it becomes easier for others to make copies and distribute them. This is what is commonly referred to as piracy.

You have a financial interest in combatting piracy when copied works are also available through channels that would make you money and when the pirate would have bought the work if they didn't find the pirated copy. If a pirate who would not have paid for your work downloads it, it is still a net positive: someone else in the world is affected by your work. If the pirate would have been ready to buy the work were they not able to find it through a file-sharing site, you can consider it a loss.

As an artist, you can even have an interest in piracy. That is the case if you and your publisher have conflicting interests, for example, when your work is not available anymore or if it's paying few royalties. In that case, your main concern is getting the work out there. I know a musician that uploaded the back-catalogue that their record label was not willing to re-issue; I know a scientist who uploaded the monograph that their publisher made prohibitively expensive. As academic publishing tends to be especially expensive to access and pays little or no royalties it's the perfect case for self-piracy. A piracy/self-piracy hybrid lead to the Sci-Hub platform. Launched by Kazakhstani scientist Alexandra Elbakyan, whose university could not afford the subscription fees of academic journals, the platform relies on academics inside richer universities sharing their passwords. Paper by paper, a database is constructed.

When talking about piracy, both industry lobbyists and file-sharing advocates tend to give a skewed view of the equation. The industry lobby will often give numbers about the financial damage of file-sharing. To arrive at these numbers, they typically calculate the volume of illegal file sharing over a certain period and calculate how much these media would have cost were they to have been bought through official channels. This seems unfair because the amount of media bought by any given consumer, were there to be no file-sharing at all, would be not at all similar to the amount they acquire at no cost. The amount of money any consumer is able to spend on media has a ceiling. The potential losses of piracy, then, are the difference between what a consumer spends on media and the maximum of what they would be willing to spend.

A typical example: "Using various measurements, the researchers came up with a figure of 47.8 billion illegal downloads of movies in 2015, which was multiplied by the average cost of legal movie consumption." in Hugh Stephens, *Calculating the Economic Impact of Counterfeiting and Piracy: It's in the Hundreds of Billions.*

In contrast, advocates of file-sharing networks often claim there is no real financial loss in file-sharing. There are studies, for example, that suggest those who download a lot of music through file-sharing also spend more than the average through official channels. This might be true but there are still two important considerations. First, the market for recorded music and books has been on the decline since the 1999 "Napster moment." Not all of this is the fault of piracy. It also has to do with the fact that our cultural consumption habits changed with the evolution of the internet. The internet offers texts to read, photos to browse, music to listen to without us having to pay. Major media conglomerates now make their products available for free. If I want to listen to the latest Rihanna single, I just visit her YouTube channel. It is not a long stretch, though, to imagine that file-sharing has a role in the falling profits of cultural goods traded on the market.

Karl Bode and Emanuel Maiberg, *Study Again Shows 'Pirates' Tend to Be The Biggest Buyers of Legal Content* cites studies from 2018, 2012, 2011, 2009, 2005 and 2002.

Second, while file-sharing might be proportionally related to a consumer's spending habits, this is only true on a macro and not a micro level. That is to say, if a user is able to pirate the work of one artist and not the work of another, they may choose to spend their money acquiring the work they could not pirate. Again, any given person only has a given amount of money to spend. Thus, for you as an artist there can still be financial benefit in your work not being available on file-sharing networks.

Getting illicit copies removed

If file sharing is detrimental, can you actually prevent the circulation of illicit copies? It depends. When it comes to file-sharing services that use a peer-to-peer structure, it is hardly possible. The sites that provide access to such files (torrents) are more like library catalogues than libraries they provide the metadata that allow users to exchange files amongst themselves. These catalogues are easily copied and once a certain tracker goes down, you immediately see proxies spring up. The upside is that for a file to remain available, users need to seed it—that means that torrent-based file-sharing sites are mainly reliable for recent, popular content. When it comes to having copies removed, one might have more success with content that is shared on websites, especially if they are based in Europe or the United States.

When undertaking such actions, you will probably want to work with a rights-collecting organisation if represented by one. If you are independent, you can work with a lawyer, however you are not obliged to do so. For more information, see chapter 4.1, *This Coin Has Two Sides: Suing and Getting Sued*.

Is the file hosted on a web service like YouTube, Scribd, Tumblr? The website will have a mechanism in place to report copyright infringements. Is the copy hosted on a website? Check for contact information. Most website-maintainers don't hesitate to remove material when rights-holders ask. As the rights-holder, you are also within your rights to ask for compensation. Whether to do so is another question.

Even more important than removing infringing copies is making sure your work is available legally. The legal options for downloading and streaming media have multiplied in the last 10 years. You want your audience to find a way to legally access your work when they search for it on the web or on legal streaming platforms. Push your publishers to be everywhere and try to make sure your contract reverts rights to you if the publisher doesn't exploit the work properly.

Finding copies of your work

Technological innovations can help finding online copies. Create a Google alert for your name and the name of works you have published. Through an email message or an RSS feed you can keep up to date with new mentions of your work online. With images, one can do a reverse image search with Google Images or TinEye: Upload an image and see if versions of it exist elsewhere online.

Watermarks and metadata

Most file formats allow the adding of extra information about their content: metadata. In many cases it is hard to identify the rights-holder for a given image but the metadata can provide such information. If you already allow others to reuse your work, for example through a Creative Commons license, the metadata can make this clear as well. Whatever program you used to author a file will in most cases also allow you to edit its metadata.

Unfortunately, web services like Facebook and Twitter routinely remove metadata from user-uploaded images, presumably to save bandwidth. As far as I understand, this is actually illegal in the EU under the same ruling that forbids reverse-engineering digital rights management implementations, although I don't think anyone has yet taken legal steps to address this.

You can also add information about the work's author in the medium itself. A book has its author directly on the cover; a video has credits. The tradition of shout-outs in music can be seen as a way to add a form of in-line credits to the medium of music. Photographic images in most cases do not reveal the identity of the creator. This is why photographers sometimes add visual watermarks with their name. If you want to do this, have a look at what your peers are doing. It can be an efficient

way of getting your name out there, but if in your scene no-one adds watermarks it could appear presumptuous to do so.

Social DRM

Some online publishers use a less intrusive form of DRM dubbed "social DRM." This means adding some identifying information about the buyer to the digital document. The buyer might have their email address printed in the corner of the PDF pages, for example. To consumers, this approach is vastly preferable to the standard DRM implementations. You can copy the file between devices as you like, even exchange it within your social circle. As your name is attached to the file, however, you will presumably be more careful with it than with a completely DRM-free file. If a file does get out into the file-sharing networks, the legal requirement will still be on the rights-holders to prove the consumer shared the work deliberately.

The choice in this case

As a user, I really dislike digital rights management that locks down files, even if I don't mind social DRM. I'm the kind of person who keeps a neatly-organised media library, with me for a decade and a half now, while I move between many kinds of devices and operating systems. DRM never translates seamlessly. It used to be one of the reasons I still bought CDs. Today, I'm lucky that there are plenty of websites where I can buy uncompressed, DRM-free sound files. When it comes to books, I should also vote with my wallet and only buy paper books or ebooks without DRM. Luckily, about half of the publishers in the Netherlands use social DRM instead of the technical kind. Some publishers, like the English publisher of science fiction and graphic novels Tor Books, pride themselves on not including any DRM. However, sometimes I can only find a DRM'ed version of an ebook. I could understand why

someone would be tempted to remove the DRM as soon as they'd buy the book, even if that's not a legal thing to do. Since I could make the decision myself for the electronic version of this book, I went with no DRM. I figured that I'm good enough at search-optimisation to make my version come up first. And that it will take a while before other copies start circulating: it will be after sales on my part have already peaked, I figure. Let's hope I'm right!