

UNIVERSITY OF MANCHESTER

MANAGEMENT, TECHNOLOGY AND INNOVATION REPORT

How does torrenting affect the media industry in the UK? Should the UK continue to block torrenting websites?

Author:
Pez CUCKOW

Supervisor:
Mohammad HAJHASHM

Student ID:
7565025

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Abstract

Torrenting is used to download copyrighted works from the Internet. This report gives an overview of the technology behind it, investigating its effect on the media industry. The consequences of introducing blocking measures is reviewed from supporting and opposing evidence. In conclusion there are four suggestions for more specific research and legislation related specifically to the UK media industry.

Keywords: BitTorrent, Torrenting, Copyright Law, CDPA

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Glossary

client a software implementation of the BitTorrent protocol that a peer uses to access the network (Gregersen, 2013). 3

ISP an Internet service provider (providing access to the Internet for a particular user). 5, 9, 10, 18

peer a user in the BitTorrent network (Gregersen, 2013). 3, 17

swarm a group of computers involved in sharing a certain collection of files (Nolo - Legal Advice, 2014). 18

torrent represents a collection of files, that can be downloaded to a users computer using the BitTorrent protocol (Gregersen, 2013). 3, 5

tracker a server that keeps track of which peers have parts of a particular file and which parts are available for download at a given time. This information is passed to the users client on request, in order to begin downloading the file. 5, 18

1 Introduction

While the technology behind torrenting is legal (Klumpp, 2013), it is used to download copyrighted materials (Bright, 2011). There is legal controversy over the use of torrent networks (Duah, 2013). Some users argue the torrent network is legal regardless of whether the associated files violate copyright law (The Pirate Bay, 2010).

Piracy has been a concern for the media industry since the ‘double deck’ cassette player allowed users to duplicate cassettes. In the digital age, media can be duplicated and distributed on torrent networks. (Cameron, 2014; Bright, 2011).

This report will highlight how the increase of copyrighted works being ‘torrented’ affects the UK media industry and will review the effectiveness of the UK torrent blocks.

2 Torrenting

‘Torrenting’ is slang referring to the downloading of files using the BitTorrent protocol (Gregersen, 2013), a popular Peer to Peer (P2P) file-sharing network¹ (Pouwelse et al., 2005; Parker, 2004; CacheLogic, 2005).

2.1 Popularity

SandVine (2013) found that BitTorrent was the most popular P2P protocol in Europe, second only to YouTube in overall Internet traffic (Table 1).

Moving from the growth phase to the maturity stage of the product lifecycle, access to BitTorrent is becoming easier due to enhanced torrent clients, better understanding, and easy to follow tutorials. It is at the early majority stage in the technology adoption lifecycle with conservative users beginning to use the network.

2.2 Technology

It is important to differentiate between a ‘traditional download’ and one on the BitTorrent network. Traditionally, a remote server stores the file which downloads to the user (Reese, 2000, Chapter 7.). On the BitTorrent network, the file is downloaded from the other network users whilst simultaneously uploading ‘pieces’ of the file to one another (Cohen, 2003) (Fig. 1). This process starts with a *.torrent*² which contains important information but significantly no part of the file itself³ (Cohen, 2003).

The network operates on an incentive basis; each user’s download speed is scaled by a sharing ratio (Fig 2), discouraging users from sharing slows the network and reduces the files available (Cohen, 2003).

¹Further details in Appendix A

²Downloaded from the selected tracker

³Appendix A.2

Rank	Uploads		Downloads		Aggregate	
	Application	Share	Application	Share	Application	Share
1	BitTorrent	48.10%	YouTube	28.73%	YouTube	24.21%
2	YouTube	7.12%	HTTP	15.64%	BitTorrent	17.99%
3	HTTP	5.74%	BitTorrent	10.10%	HTTP	13.59%
4	Skype	4.96%	Facebook	4.94%	Facebook	4.65%
5	Facebook	3.54%	Netflix	3.45%	Netflix	3.33%
6	Netflix	2.83%	MPEG - Other	3.10%	MPEG - Other	2.57%
7	SSL	2.47%	RTMP	2.82%	RTMP	2.42%
8	eDonkey	1.12%	Flash Video	2.56%	Skype	2.32%
9	Dropbox	1.12%	SSL	1.91%	Flash Video	2.16%
10	RTMP	0.85%	PutLocker	1.25%	SSL	2.03%
	Total Tracked	77.83%		73.23%		75.25%

Table 1: Top 10 Peak Period Applications, Europe (SandVine, 2013)

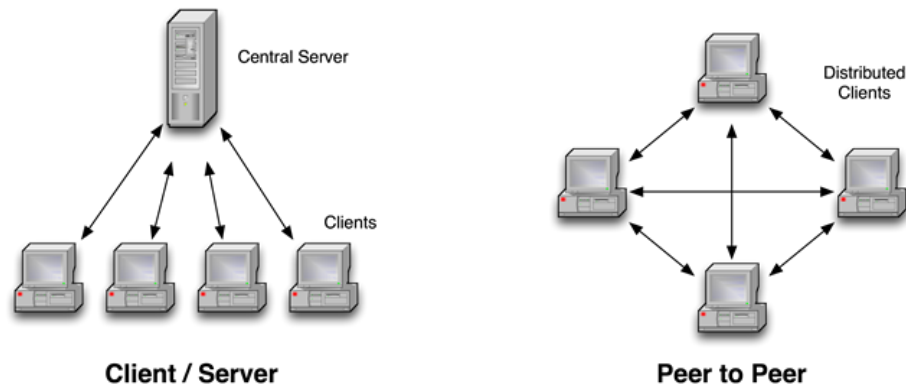


Figure 1: Client/Server VS Peer2Peer Network (Sheehan, 2009)

3 Intellectual Property Rights

As BitTorrent operates without a central authority, liability for copyright infringement on the network falls upon the users of the system (Bright, 2011).

3.1 Legal Options

There are two legal options for firms wishing to discourage torrenting of their content; place liability on those who are sharing the content (uploading) or on those who are downloading content. However it is technically difficult⁴ to track a download occurring (Klump, 2013).

⁴See Appendix B for further details.

$$\text{share ratio} = \frac{\text{total data uploaded}}{\text{total data downloaded}}$$

Figure 2: Share/seeding ratio equation for a BitTorrent client (Cohen, 2003)

As knowledge of how to effectively prosecute has increased (Bright, 2011), prosecutors are no longer targeting the individual users, but the trackers supporting the network, such as The Pirate Bay (United States Court of Appeals, 2013; Rosen, 2012, p.179 - 181).

3.2 In the UK

Most trackers are based abroad (TorrentFreak, 2014), meaning responsibility of prosecution falls within international intellectual property law (Bright, 2011, p. III.). To avoid this complexity, UK media companies, represented by the British Phonographic Industry (BPI)⁵, sought to make the ISP's providing access to the copyrighted content liable (High Court of Justice, 2012; Meale, 2013a).

The landmark case was BPI vs. The 6 Largest UK ISP's⁶. The court concluded⁷ that both the users and the operators of The Pirate Bay were liable for copyright infringement. The final judgement served an injunction against the ISP's as "service providers" (Her Majesty's Stationery Office, 1988, 97A) ordering them to 'adopt technical means to block' access to The Pirate Bay⁸ (High Court of Justice, 2012; Meale, 2013a).

The number of blocks against UK torrent websites has increased since 2012, with relevant judgements referring to this case. In 2013, 28 websites⁹ were found guilty of file sharing and blocked (High Court of Justice, 2013a; High Court of Justice, 2013b; Sky Broadband, 2014; BBC News, 2013a; BBC News, 2013b; Meale, 2013b).

3.3 Keeping Intellectual Property Laws Up to Date

To address online copyright infringement, the Digital Economy Act (DEA) was written. There are two phases; 1. sending warnings to customers suspected of infringement; 2. allowing ISP's to disconnect persistent infringers from the Internet (Her Majesty's Stationery Office, 2010).

There is strong opposition against the act. Cammaerts & Meng (2011) found that it "gets the balance between copyright enforcement and innovation wrong". They highlighted *disruptive technologies*, such as the Photocopier and Cassette Recorder, previously blamed by the media industry for loss of revenue. Research suggests the music industry should focus on enabling "users to download music legally at a reasonable price" (Cammaerts & Meng,

⁵More than 300 music and record companies in the UK (British Phonographic Industry, 2013)

⁶Who held a "fixed line market share of 94% of Internet users in the UK" at the time

⁷See Appendix D

⁸In addition to any website designed to enable access

⁹See Table A1 in the appendix.

2011). It was also found that the decline in sales of recorded music could be attributed to other factors, including changing music consumption patterns, decreasing disposable income, and increasing sales of digital content (see Fig. 3).

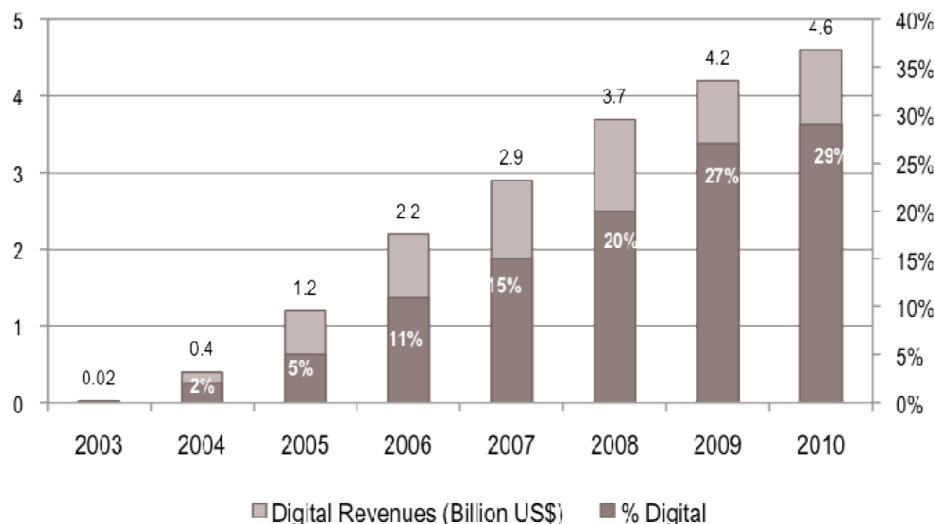


Figure 3: Worldwide online sales of music 2004-2010. Adapted from Cammaerts & Meng (2011, Fig. 3)

4 Effect of Torrenting

PriceWaterhouseCoopers (2009) reports that there was a decline in recorded and digital music sales across the EU from 2004 to 2008, with revenues in the digital market falling by 26%. Research until 2011 (Fig 4) shows this decline continuing. Further studies attribute this decrease to digital piracy (TERA Consultants, 2010; Peitz & Waelbroeck, 2004; Zentner, 2006). The UK media industry supports this conclusion (Federation Against Copyright Theft, 2014; Creative Coalition Campaign, 2014; British Phonographic Industry, 2013).

Conversely, research from the London School of Economics suggests torrenting might increase revenue in the media industry (Cammaerts, Mansell, & Meng, 2013; Hammond, 2013; Aguiar & Martens, 2013).

4.1 Negative Effects

The International Chamber of Commerce commissioned a report¹⁰ quantifying the effects of “piracy on retail revenue” (TERA Consultants, 2010). Using data from the European Commission Eurostat database (European Commission, 2008), TERA Consultants (2010) calculated the value of the UK “creative industries” (Table 2), finding the creative

¹⁰As part of the Business Action to Stop Counterfeiting and Piracy (BASCAP) initiative

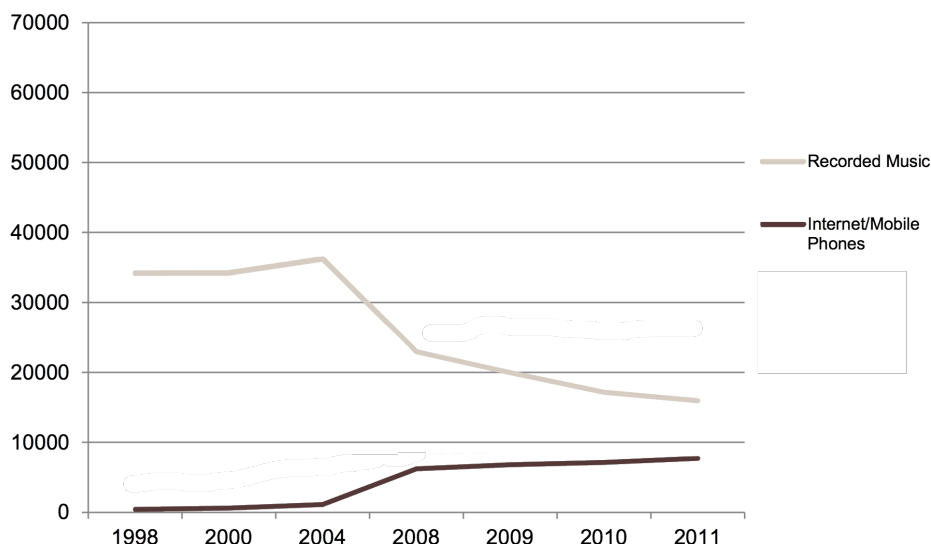


Figure 4: Trends in Revenues of the Music Industry, USD Million. Adapted from Cammaerts, Mansell, & Meng (2013, Fig. 1)

industries form 6.2% of UK GDP. The loss to the media industry¹¹ in 2008 was £533 million¹²¹³ (TERA Consultants, 2010, p.31).

	Value Added	Number of Employees
Core	6.2%	5.4%
Interdependent & support	3.4%	3.8%
TOTAL creative industries	9.6%	9.2%
GDP (billion €)	175	
Employment (million)		2.7

Table 2: Weight of Creative Industries in the UK (TERA Consultants, 2010, Table 5)

The report concludes that piracy significantly harms the creative industries and as broadband becomes more commonplace, without “sustained and effective action” (TERA Consultants, 2010, p.46), digital piracy in Europe will continue to grow, in line with similar reports (Europe Economics, 2008; Stryszowski & Scorpecci, 2009). As these reports are often commissioned by bodies representing the media industry their reliability is questionable.

¹¹Calculated taking the number of infringements per year (Table 3), applying a substitution rate (Table 4)

¹²Figures converted from EUR to GBP at 0.796651, the average 2008 exchange rate (X-Rates, 2008).

¹³Loss to music was £224 million, film £245 million and TV series £62 million.

Media	Copyright infringements per year (M unit)
Music	1,177
Film	98.05
TV Series	53.33

Table 3: Digital piracy in the United Kingdom (TERA Consultants, 2010)

Media (Position on Release Timeline)	Substitution Rate
Music (Released)	10%
Film (Cinema)	5%
Film (DVD)	10%
Film (TV)	10%
TV Series (TV)	30%
TV Series (DVD)	5%
TV Series (PayPerView)	2%

Table 4: Substitution rate, representing percentage of units likely sold if piracy was eliminated (TERA Consultants, 2010, p.19, Table 6)

4.2 Opposition

Research by Cammaerts, Mansell, & Meng (2013) extends findings from Cammaerts & Meng (2011), that “data provided by the music industry were misleading” and the “industry was doing reasonably well.”. It concludes that the evidence reviewed did not support the claims from the media industry of ‘revenue reduction’ due to copyright infringement. They found “punitive measures” in France proposed by the industry did not have the desired impact, with the HAPOPI¹⁴ law being abolished¹⁵.

Cammaerts, Mansell, & Meng (2013) recommend that the DEA needs to be reviewed, following independent research, to form fair legislation on copyright infringement.

A report by Aguiar & Martens (2013)¹⁶, observed the digital media purchasing patterns of 16,000 European consumers, finding increases in illegal downloads and legal streaming led to an increase in legal purchases, with a *purchase elasticity* of 0.04 and a *‘visit’ elasticity* 0.06.

Further research from Hammond (2013) looked into the effect of media ‘leaked’¹⁷ onto BitTorrent, finding that leaked albums cause a small increase in legal sales and not the decrease the media industry claims.

¹⁴An acronym of the department that the law created

¹⁵See Appendix E

¹⁶commissioned by the European Joint Research Centre,

¹⁷Download available from BitTorrent before the official release

5 Blocks in the UK

The UK media industry has been successful in securing High Court injunctions against ISPs's, ordering them to “adopt ... technical means” (High Court of Justice, 2012) to block trackers supporting BitTorrent network, with the intention of cutting copyright infringement.

New evidence suggests that blocks have been ineffective in reducing torrenting, however the findings should be taken lightly due to the recent nature of the reports, limited supporting evidence, and lack of peer reviews (Lee, 2012; Duah, 2013).

5.1 Supporting Evidence

When discussing the effectiveness of previous blocks, the High Court of Justice (2012) noted that blocking the Pirate Bay in Italy had resulted in a 73% reduction in visits and a 96% reduction of page views (Meale, 2013a).

The NPD Group (2013) cited in Ribeiro (2013) noted a decline in illegal music sharing on P2P during 2012, observing a 17% decrease in activity, but added that “The primary reason for the reduced sharing ... was an increased use of free, legal music streaming services” and not the blocks put in place.

Despite being cited in news articles defending the blocks (Lee, 2012), the BPI and others from the media industry are yet to reference any evidence demonstrating their effectiveness in reducing UK activity on BitTorrent.

5.2 Opposing Evidence

In a University of Westminster debate, Google’s UK policy manager Theo Bertram opposed the blocks, highlighting that targeting the business is more effective, referring to the “now-defunct” MegaUpload¹⁸, explaining that its supply has “shifted to ... middle-ranking pirate sites.”. He warned that targeting individual piracy sites ends in a game of “whac-a-mole” (Maxwell, 2013; MusicTank, 2013).

Lee (2012) reported one week after the block of the Pirate Bay, falling “illegal download traffic” on one ISP’s network returned to normal as users found ways around the blocks. It is easy for both the operators of trackers and the users to circumvent them^{19,20} (Duah, 2013; Lee, 2012; The Pirate Bay Proxy List, 2014; Come In, 2014). The BPI defended the block, noting statistics (Fig. 5) from Nielsen Net Ratings showing traffic to the Pirate Bay website had dropped (Lee, 2012).

The Open Rights Group²¹ responded to the blocks, stating that blocking is extreme and will lead to “new forms of distributed infringement”. They advised the BPI’s tactics “may

¹⁸A popular file hosting service, commonly used for piracy

¹⁹Particularly with the haste of services designed to avoid the block

²⁰Appendix F

²¹Who campaign on digital rights and freedom issues (OpenRightsGroup, 2014)



Figure 5: Traffic to The Pirate Bay (Nielsen Net Ratings (2012) cited in Lee (2012))

have the opposite effect”, “legitimising and promoting resistance to their actions.” (Jim Killock, 2013).

Duah (2013) discusses the blocks, commenting they do not offer a “complete solution” and that a “significant number of blocks” is needed to effectively cover all infringing websites. Enforcing a block is not a passive process, as the copyright holder or the ISP must continually scan the situation to keep the blocks up to date. Duah (2013) notes it is still unclear who is responsible for this task.

6 Conclusions

Given the position of BitTorrent in the product and technology adoption lifecycles, usage will continue to increase and as such, clear evidence based legislation is needed.

The case against BitTorrent references reports commissioned by the UK media industry increasing the likelihood of bias. Independent reports argue in favour of BitTorrent, suggesting other factors, including changing music consumption patterns and increasing sales of digital content, affect the media industry.

Initial research suggests the use of blocks to control access to copyright material is ineffective and that blocks are easy to mitigate. It has yet to be shown that blocks lead to any decrease in the activity of sharing on the BitTorrent network.

Having reviewed the evidence:

1. Independent research into the effect of digital piracy on the media industry needs to be completed to offer a more reliable base for decisions.

2. The effect of the recent tracker blocks on sharing copyrighted material on the BitTorrent network in the UK should be researched.
3. On completion of this further research, the DEA should be revised in light of the findings to support the legislation or suggest changes.
4. The media industry should innovate legal uses of BitTorrent to distribute media and drive sales, rather than continuing to pursue legal means to prevent its use.

Overall, to justify continuing to block torrenting websites, significant independent evidence that the blocks are effective, and that torrenting is negatively affecting the media industry, is needed.

In future, when updating UK law, the government should observe research from independent sources, rather than from those whom the law may benefit.

Finally, the media industry may benefit from adopting BitTorrent, working with this technology, rather than against it.

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Appendices

A BitTorrent

Created by Bram Cohen and formalised in 2008, BitTorrent supports P2P filesharing and is commonly used to distribute large files over the Internet with the individual peers, rather than a single server bearing the load and costs (Cohen, 2008) .

A.1 Popularity

Since 2004, BitTorrent has been the most popular P2P protocol (holding 53% of total P2P traffic) with other competing protocols such as FastTrack, Gnutella and eDonkey falling in both users and traffic (Parker, 2004; CacheLogic, 2005).

A.2 Overview

On BitTorrent, users downloading the file are leechers and once the file is complete, seeders, uploading the file to other users in the network. Peers with a particular file are called the ‘swarm’. Fig. 6 shows an overview of the BitTorrent network during a download.

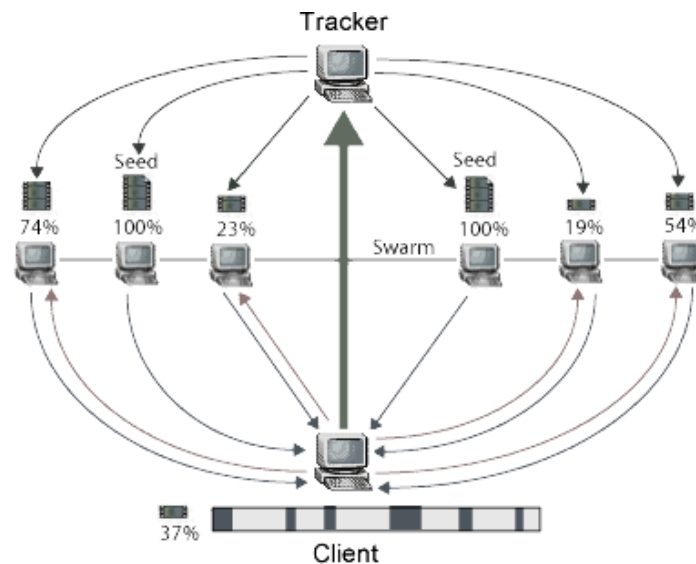


Figure 6: Architecture of the BitTorrent network Dalakov (2013)

B Prosecuting a User

Klumpp (2013) argues that the usual intent of lawsuits against torrenters is to “change user behaviour” in an attempt to discourage users from sharing files on the network and not

to recover “meaningful damages”. “Discouraging users” has been key since Chan Nai-ming, the first person to be convicted of piracy, who was sentenced to 3 months imprisonment (Hong Kong Magistrates Court at Teun Mun, 2005).

In order to prosecute an individual user of the BitTorrent network, the prosecution must present evidence of that user using the network to download or share copyrighted works without permission of the copyright holder.

B.1 Downloading

It is difficult to track a download occurring due to the distributed nature of the P2P network. Pieces of the file come from many different locations at once, no one server provides the whole file so it's hard to link the connections to one instance of infringement. Additionally, because the file is split into many pieces, it is problematic to prove each piece is a part of a copyrighted work. Legally, even if a download is witnessed it must be proven that the downloader is deliberately infringing copyright.

B.2 Sharing

Demonstrating sharing is technically simple. A user would simply need to request a particular *.torrent* from the swarm and log those listed as peers who have copies of the file available for download. This would also serve as a legal demonstration of the intent to distribute copyright-protected material.

C Prosecuting a Tracker

There have been several successful, high profile cases against the trackers that index the copyrighted works to make them available to the general downloader (United States Court of Appeals, 2013). Commonly in the United Kingdom, the legal responsibility now falls against the Internet Service Provider's (ISP's) that provide access to the trackers, rather than the trackers themselves (High Court of Justice, 2012). Due to the multinational nature of the Internet, there is often complication as to with whom jurisdiction falls.

D BPI vs UK ISP's

Dramatico Entertainment Limited, Emi Records Limited, Mercury Records Limited, Polydor Limited, Rough Trade Records Limited, Sony Music Entertainment UK Limited, Virgin Records Limited, Warner Music Uk Limited, and 679 Recordings Limited vs. British Sky Broadcasting Limited, British Telecommunications Plc, Everything Everywhere Limited, Talktalk Telecom Group Plc, Telefonica UK Limited, and Virgin Media Limited.

D.1 Charges

The court found the users guilty on two counts. Firstly, copying as defined in section 17 of the Copyright, Designs and Patents Act (CDPA) (Her Majesty's Stationery Office, 1988); arguing that by selecting a torrent, a user is willing infringing copyright and highlighting that during download the file contents are copied to the user's computer. Secondly, "communicating to the public" as defined in section 20 of CDPA, citing "communication to the public must be interpreted broadly" (Court of Justice (2006, p. 47.) as cited in High Court of Justice (2012)) in order to apply it to the Internet and that "at least 15% of the sample records were being shared" (High Court of Justice, 2012).

The court found the operators of The Pirate Bay guilty of authorisation or assisting the infringement; pointing out that the operators go far beyond enabling and assisting the copyright infringement, they "sanction, approve and countenance" and that they are "providing means to infringe, encouraging infringement and taking no steps to prevent" it (High Court of Justice, 2012).

E HADOPI

In an attempt to limit the spread of piracy throughout France, the French government created a dedicated department agency, the High Authority for Transmission of Creative Works and Copyright Protection on the Internet, to address this problem and to increase sales in the French media industry. This department was mandated to identify and prosecute French Internet users who had been identified as sharing or downloading copyrighted materials using a three strike system, starting with education and ending in prosecution, disconnection from the Internet and fine's. However, after enforcing this law and sending out over a million warnings, research found that increased sales stemmed from the education component of the 'HADOPI law' (Danaher et al., 2012), and not the prosecution element as expected. This suggested that prosecution of copyright infringers did not deter people from digital piracy (Peoples, 2012).

In May 2013 a government report recommended the removal of the law (Lescure, 2013). In July 2013 the French government abolished the law choosing to target 'commercial piracy' and 'sites that profit from pirated material' Dato (2013).

F Avoiding the Blocks

It is easy to avoid blocks, anybody could do it following a tutorial, particularly with the rapid increase of tutorials and proxies following a block. For example simply typing 'pirate bay proxy' into Google returns hundreds of websites designed to avoid the blocks.

The operators can also perform one of many tricks to mitigate the blocks due to the technical way that the blocks are enforced, including change of a servers IP address and use of a different domain (The Pirate Bay, 2010).

G Tables

By	Against	Reason	Date
BPI	The Pirate Bay Fenopy	Authorisation of copyright infringement	May 2012
FACT-UK	H33t KickassTorrents	Enabling mass access to infringing content	March 2013
MPAA	Movie2k	<i>Court order not published</i>	May 2013
MPAA	Download For All	<i>Court order not published</i>	May 2013
FACT-UK & MPAA	EZTV 1337x Abmp3 Bit Snoop BeeMPS Bomb-Mp3e Mp3World ExtraTorrent File Crop FilesTube Monova	Communication to the public (of copy- righted content)	July 2013
PPL & BPI	Mp3 Juices Mp3lemon Mp3 Raid Mp3 Skull New Album Releases Rapid Library Torrent Crazy Torrent Downloads Torrent Hound Torrent Reactor Torrentz	Commercially exploiting music without a licence	October 2013
FACT-UK	YIFY Torrents	Communication to the public (of copy- righted content)	November 2013

Table A1: UK Court ordered blocks against file sharing websites (High Court of Justice, 2013a; High Court of Justice, 2013b; Sky Broadband, 2014; BBC News, 2013a; BBC News, 2013b)