

Global Copyright Protest? A Comparison of DeCSS Posting in the People's Republic of China, Hong Kong, and the European Union

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Abstract

This study explored the differences in DeCSS posting between EU member nations, the PRC, and Hong Kong. In particular, it sought to investigate the degree to which website authors in the EU, the PRC, and Hong Kong used DeCSS to protest changes in copyright law brought about by the World Intellectual Property Organization (WIPO) Internet Treaties. Data were drawn from a country-restrict based sample of websites from the Google index in Spring 2004 and content analysis was conducted on each website. Results found little evidence of protest posting in PRC, some evidence in Hong Kong, and substantial evidence in the EU. Taken as a whole, the results do not provide strong evidence of global posting of DeCSS on websites in order to protest changes to copyright law. Rather, results suggest the value and meaning of DeCSS varies across different nations.

1. Introduction

In the fall of 1999 a group of European hackers released a program called “DeCSS” on the Internet. DeCSS allows users to circumvent the CSS encryption protecting DVDs to make unauthorized copies of those DVDs, circumvent the region code restrictions embedded into DVDs, or play the DVDs on a DVD player not licensed by the DVD Copy Control Association.

Before long, large numbers of website authors all over the world began posting the program on the Web. One of the people posting DeCSS was Eric Corley, the operator of an online hacker magazine known as 2600, and he — and DeCSS itself — became a cause célèbre among online activists and the Free/Open Source (F/OS) software community when the major motion picture studios sued him under the “anti-circumvention” provisions of U.S. copyright law.¹ The lawsuit caused a

huge stir throughout the online world. The U.S. anti-circumvention law was part of a wave of laws being promulgated around the world in order to comply with the World Intellectual Property Organization (WIPO) Internet treaties. These treaties attempt to raise intellectual property protection in the context of global digital networks such as the Internet, and create an environment conducive to investment and growth in Internet and intellectual property (IP) related industries [1]. As part of this, they require member nations to pass laws that restrict the circumvention of copyright protection mechanisms such as the CSS on DVDs [1].² Many other jurisdictions, including several countries in the European Union (EU)³, Hong Kong, and The People's Republic of PRC (PRC), have also passed anti-circumvention laws in order to come into compliance with, and eventually become a party to, the WIPO treaties.

Partly because of its functionality, partly because of the *Corley* case, and partly because of the persecution of one of its creators, Jon Johansen, DeCSS has become an embattled cultural icon in the larger debates surrounding anti-circumvention laws and the global harmonization of copyright law. Large copyright owners portray DeCSS and other circumvention devices as piracy tools that facilitate theft of intellectual property and discourage production of new works. But consumer groups, fair use advocates, and Free/Open Source (F/OS) software advocates argue that DeCSS is a fair use tool — a means by which consumers can retain fair use and other rights in a world where access and use of digital content is more tightly controlled.

DeCSS is widely available on the Internet today. Its persistence is noteworthy because posting DeCSS is now arguably prohibited in many nations due to anti-circumvention laws. Further, numerous more user-

¹ 111F.Supp.2d294[2000]) found Corley in violation of the antitrafficking provisions of the U.S. Digital Millennium Copyright Act, which makes it unlawful to distribute circumvention devices.

² Two different treaties have sections on “technological protection measures,” WIPO Copyright Treaty Article 11; and WIPO Performances and Phonograms Treaty Article 18.

³ Because our data collection precedes the most recent expansion of the European Union, all of our references to the “European Union” or “EU” include only those 15 countries that were members of the EU prior to 1 May 2004.

friendly DVD rippers are also available for downloading, making DeCSS somewhat obsolete [2].

Past research has explained the persistence of DeCSS posting by suggesting that some website authors post DeCSS in order to protest changes in copyright laws that decrease consumers' rights in relation to lawfully purchased entertainment media such as DVDs. [3,4]. We refer to this use of DeCSS as "protest posting." Theorizing from the social movements literature suggests that DeCSS may be a "symbol of collective action," which, according to theory, aids in producing consensus, developing shared meaning, and mobilizing action among potential protest participants. Collective action symbols are developed and have meaning within particular "collective action frames" which may vary across time, space, and culture [5].

While past research identified protest posting in English language websites, little is known about the degree to which non-English speaking website authors post DeCSS [3,4]. Given that the WIPO Internet treaties make copyright law changes international in scope, one might expect to see DeCSS used as a collective action symbol in all nations that have passed anti-circumvention laws.

In this study we investigated the degree to which website authors outside the U.S. engage in DeCSS posting. We examined a sample of websites posting DeCSS from the EU and the PRC (including the Special Administrative Regions of Hong Kong and Macau, which we treated as separate jurisdictions for purposes of our data collection and analysis). In searching for and examining the websites, we also sought to determine whether the website authors used DeCSS as a collective action symbol – that is, whether they posted DeCSS to protest changes in copyright law brought on by compliance with the WIPO Internet treaties.

Some have suggested that there needs to be a social movement to roll back these copyright changes [6-8]. And, at least in the U.S., recent years have seen numerous clashes between consumers and copyright owners, and the formation of numerous copyright related public interest groups. Evidence of DeCSS protest posting outside the U.S. would suggest that DeCSS has become an international collective action symbol, and that consumers post DeCSS to protest changes in copyright law that arguably reduce their rights. Lack of this evidence would suggest that the use of DeCSS as a protest tool is more limited and that consumers are not posting DeCSS to protest changes in copyright law required by WIPO on a global basis.

The study results suggest that the collective action symbol role of DeCSS is currently limited. Our data showed little evidence of protest posting of DeCSS in PRC. In contrast, we found evidence of DeCSS protest posting in many EU web sites. We found only minor

evidence of DeCSS protest posting in Hong Kong. This affirms findings from earlier work that suggested that DeCSS has value as a collective action symbol at least within some EU nations [3,4].

2. DeCSS and the WIPO Internet Treaties

In 1996, the World Intellectual Property Organization (WIPO) held a diplomatic conference to consider proposals to meet the challenges to intellectual property law posed by global digital networks such as the Internet. Among the principal concerns on WIPO's so-called "digital agenda" was legal protection for the technological "locks" that copyright owners were beginning to use to prevent unauthorized use and infringement of their works. These "locks" were known as "digital rights management" (DRM) technologies, or, in the legal parlance, "technological protection measures." [9] IP interests argued that the Internet made widespread infringement too easy and that copyright owners' technological "locks" needed legal protection from those who would "pick" or "crack" them with, for example, a software-based "key" [10,11]. The WIPO Internet treaties therefore came to legally protect the locks or to include provisions that required contracting parties to "provide adequate legal protection against circumvention of ... technological measures" that copyright owners use to protect their works from unauthorized acts.⁴

How exactly to implement that requirement is left to individual countries as they develop their laws [12]. Although none of the jurisdictions we studied has yet become a full party to the treaties, all have passed anti-circumvention provisions in anticipation of doing so. We explain the laws of each nation in more detail below in Section 3.1.2.

3. An Institutional View of DeCSS Posting

This paper draws on institutional theory as a theoretical framework to examine DeCSS posting in the EU, Hong Kong and PRC. Institutional theory emphasizes the role of institutions in explaining phenomena [13]; for example, how institutional forces can both empower and constrain choices for individual actors [14]. Institutions are broadly defined as social structures with a high degree of resilience, but which are subject to change processes [14]. Institutions define social roles and identities, rules and enforcement mechanisms, and situations and strategies [15]. Society is seen as composed of a diversity of competing or cooperating

⁴ WIPO Copyright Treaty, Art. 11; WIPO Performances and Phonograms Treaty, Art. 18.

institutions such as legal systems, cultural or professional norms, or shared belief systems. Any given individual is located within multiple and sometimes conflicting institutions [16]. Institutional theory distinguishes between *regulative* institutions, such as laws and governance systems; *normative* institutions, such as values, norms, and expectations; and *cultural-cognitive* institutions, such as shared understandings [14].

In using an institutional view, we posit that in order to understand variations in DeCSS posting, it is important to understand the institutions that encompass the actors who post DeCSS. In this paper, we consider the potential influence of several different regulative, normative, and cultural-cognitive institutions.

3.1. Regulative Institutions

3.1.1. WIPO membership

We assumed that DeCSS posting might be linked with national compliance with the WIPO Internet treaties. Past research has pointed to the importance of international regulative institutional structures such as WIPO in facilitating and constraining the actions of member nations and their citizens [13]. In order to observe DeCSS posting that could possibly be in reaction to changes in copyright law suggested by the WIPO Internet treaties, we selected nations that had passed, or were in the process of passing, anti-circumvention laws, whether specifically because of the WIPO internet treaties or in anticipation of doing so in the future.

3.1.2 Existing anti-circumvention laws

In order to comply with the WIPO Internet Treaties, in May 2001, the European Union passed what is known colloquially as the “EU Copyright Directive”⁵ which requires all EU member nations to pass laws protecting copyright owners’ locks or “technological protection measures” [18, 19].⁶

EU nations were to have passed such laws by 22 December 2002; but as of 30 April 2004, 9 of the 15

⁵ The official title is “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.” It is also referred to as the “EU Directive on the Information Society.”

⁶ Specifically, article 6(2) requires EU countries to provide legal protection against the distribution of devices that “(a) are promoted, advertised or marketed for the purpose of circumvention; (b) have only a limited commercially significant purpose or use other than to circumvent, or (c) are primarily designed, produced, adapted or performed for the purpose of enabling or facilitating the circumvention of, any effective technological measures.”

EU countries (Belgium, Finland, France, Ireland, Luxembourg, The Netherlands, Portugal, Spain, and Sweden) had not yet passed anti-circumvention laws to comply with the Copyright Directive.

Although the Directive permits some exceptions for those who use circumvention devices, it does not permit any exception for those who distribute them. It is thus quite likely that making DeCSS available on one’s website would violate the law of any country that complies with the EU Copyright Directive.

In October 2001, the PRC revised its copyright law to comport with the WIPO Internet Treaties [20]. The revised Copyright Act includes a new prohibition on the circumvention of technological measures, but no explicit prohibition on their distribution. It is therefore unclear whether the distribution of DeCSS (i.e. by posting it on a website) would violate Chinese law [21]. In China, circumvention itself is prohibited as a form of infringement and it is therefore subject to any applicable limitations or exceptions that would apply to ordinary copyright infringement [22].

In 1997, Hong Kong completely rewrote its copyright law, becoming one of the first jurisdictions in the world to incorporate an anti-circumvention provision into its law [23]. Hong Kong’s law permits circumvention but prohibits the dealing with or distribution of a circumvention device where the person “know[s] or [has] reason to believe that it will be used to make infringing copies.” [24] So, distributing or possessing a circumvention device in order to engage in activities that do not constitute copyright infringement (e.g., copying of materials in the public domain) does not violate the law. Thus, there is a good argument that the posting of DeCSS would be permitted under Hong Kong law if the website owner’s aim were to permit playing a DVD on an unauthorized player (e.g. on a Linux machine or to subvert region control coding). [23]

3.1.3 National Internet usage

Internet access is growing rapidly in PRC and more recent reports suggest PRC is second only to the U.S. in total number of Internet users [25]. Looking at the ITU’s 2002 data, PRC has more overall Internet users than Hong Kong and any single EU nation; however, PRC’s Internet penetration rates remain low compared to EU nations and Hong Kong due to China’s large population [26]. Hong Kong’s number of Internet users is similar to some smaller EU nations such as Denmark [26].

3.2. Normative Institutions

3.2.1 Government tolerance for protest

Past research suggests that in at least some cases website authors post DeCSS in order to protest changes in copyright law and increasing corporate control over consumer use of digital materials [4]. Numerous other studies have illustrated how political or social organizations employ “web sites of resistance” [27] or “electronic civil disobedience” to protest government or corporate actions [28].

Yet, different governments have different levels of tolerance for public protest; and this may affect the level of DeCSS posting. EU nations typically have laws requiring that governments tolerate public protest. In contrast, the government of PRC is known for its intolerance of protest, both on-line and off [29]. Further, PRC is known for filtering potentially controversial Internet content [30]. Preliminary tests by the authors however suggested that the Chinese government was not blocking major DeCSS posting sites in the U.S. and Europe at the time of the study.⁷

3.2.2 Piracy rates

We assumed that nations that had greater piracy rates for DVDs would be less likely to have numerous DeCSS posters; because, if inexpensive pirated DVDs were available, users would have less incentive to download and set up a copyright circumvention device like DeCSS.

We chose PRC and the EU in order to examine DeCSS posting in a nation with high piracy rates and in nations with (relatively) low piracy rates. The United States Trade Representatives (USTR) 2004 Special 301 Report places PRC in the “306 Monitoring” category, which includes those nations in which the U.S. experiences significant trade losses due to piracy [31]. An IP industry 2003 report estimated that U.S. companies lose 178 million dollars in motion picture revenue in PRC, and that PRC has a 95% piracy rate for movies [32]. Intellectual property trade groups also estimate that PRC has a 92% piracy rate for business software creating a loss of \$1512 million dollars for U.S. companies [32].

For the most part, EU members have low DVD piracy rates; however the USTR lists the EU on its “priority watch list” for issues unrelated to implementation of anti-circumvention clauses [31]. IP interest groups list Italy on their piracy “watch” lists [32].

⁷ The Berkman Center maintained a connection to proxy web servers at various locations in the PRC (<http://cyber.law.harvard.edu/filtering/china/test>). We successfully accessed Dr. David Touretzky’s Gallery of DeCSS Descramblers and www.lemuria.org, both well-known sites which post DeCSS.



3.3. Cultural-Cognitive Institutions

3.3.1 Cultural conceptions of copyright or intellectual property

We also considered that differences in European and Chinese cultural traditions with regard to intellectual property and copyright might influence DeCSS posting. Although it is by no means mono-thematic, the continental European tradition is largely associated with “authors’ rights,” focusing on the moral rights that inhere to the author upon creation of a copyrighted good. [33] In contrast, the Chinese tradition is largely viewed as hostile to the premises of the Anglo-American utilitarian approach to copyright law and as lacking true intellectual property consciousness. [34]

3.3.2 Free/Open source software

In other articles, the authors have argued that affiliation of website authors with the Free/Open Source (F/OS) software movement might encourage DeCSS posting [3,4]. Many have argued that DeCSS was created so that users could view legally purchased DVDs on computers using the Linux operating system because no licensed DVD players for Linux or other F/OS operating systems existed [35].

DeCSS has broad implications for the F/OS community. DRM, as a more general category of devices, block users’ access to code; and anti-circumvention laws may stymie users’ ability to tinker with purchased software, effectively prohibiting reverse engineering intended to achieve interoperability with F/OS platforms [36-39]. Further, some see DeCSS, and the broader circumvention debate, as part of a move by copyright interests to exclude F/OS systems from future software and entertainment media innovations [40].

Recently, F/OS software has been promoted as an important architecture for developing nations such as PRC [41]. Review of secondary data suggests that F/OS software use in China is behind other Asian nations, but growing rapidly [42-46]. And while F/OS software is seen as a new tool in PRC, hacker, science and other communities within EU member nations have used it since its inception, as many Europeans have been highly involved with the development of F/OS software [56].

4. Study Design and Methodology

Institutional theory argues that context matters. In using an institutional approach to examine the phenomenon of DeCSS linking and posting and its



relationship to copyright protest, we sought to maximize variance of a number of institutional factors (e.g., piracy, cultural conceptions of copyright) so that we could observe DeCSS linking and posting websites created under different sets of institutional influences.

In the data we collected from both the EU, PRC, Hong Kong and Macau we sought to answer three main research questions:

RQ1. How many unique web sites from each nation post DeCSS?

RQ2. To what extent do DeCSS website authors include speech related to copyright, court cases related to DeCSS, or legal arguments for or against circumvention devices?

RQ3. To what extent do DeCSS website authors in each nation refer to the Free/Open Source software movement on their websites?

In order to obtain a sample of websites posting DeCSS in the EU and PRC, we used a revised search engine based sampling methodology [47]. We defined DeCSS posting sites as those sites which hosted a DeCSS file on the same server as the html address for the website.

Our sample was drawn from the index of the Google search engine in January 2004.⁸ We used a custom search string run through the Google application programmer interface (API).

It is generally acknowledged that search engine based samples do not represent a random sample of all websites (regardless of the size of the search engine index). Because search engines seek to index popular websites, they do not capture many unpopular sites, short-lived websites, password protected websites, or websites that do not allow spiders. Website indexes therefore do not represent random samples from all possible websites; rather, they represent popular websites likely to be visited by average Internet users [47].

The search query we entered via the API included two types of delimiters. First it specified nine key terms, at least one of which had to be included on the text of the resulting web pages. The key terms consisted of variations of the DeCSS file name (e.g., decss.exe, css-auth.tgz).⁹ The second type of delimiter was nation of origin, and we limited the search to 2003 EU member nations, China, Hong Kong and Macau.¹⁰

⁸ We did not sample by random IP number to generate the sample because we were only interested in pages posting DeCSS and IP sampling does not target particular types of websites. We did not employ a metasearch engine to gather our sample because we wished to target websites by host nation, not just by language.

⁹ The file names included in the search included the following: css-auth.tar.gz, css-auth.tgz, decss.c, decss.exe, decss.pl, decss.tar, decss.tar.bz2, decss.tar.gz, decss.zip.

¹⁰ According to Google "Google allows you to search for Web information within one or more countries, using an algorithm

Our sampling unit and our unit of analysis was websites posting DeCSS [48,49]. We defined website as all web pages that appeared to be written by the primary website author, and that appeared under the URL prefix generated by the search result (e.g., www.cs.wisc.edu/~alderman) [47].¹¹

We collected data using a custom-built, open source software-based spider. The spider traveled to each of the resulting web pages, archived a copy, and archived a copy of all pages within two links. The archived pages and metadata were saved in a PostgreSQL database. The search archived a total of 946 results pages.

From this set, we identified 200 unique URL prefixes. Under this definition we counted mirror sites (sites with different URLs, but the same content) as two different websites. But if a website posted DeCSS in multiple file formats (e.g., .zip and .gz), or if DeCSS was posted in multiple directories on one URL prefix, we only counted the URL once.

We also removed the following sites from our results set: sites that no longer functioned, news stories about DeCSS which did not include the code, sites linking to DeCSS on a secondary site, and sites linking or posting to the PigDog "DeCSS fog" which does not decrypt the CSS on DVDs [50]. We were left with a total of 114 unique websites that contained a functional copy of DeCSS to download or a textual form of DeCSS (i.e., written source code or binary strings). We refer to these sites as DeCSS download sites.

After a final list of resulting posting websites was produced, paper copies of the websites were printed out to facilitate their translation and content analysis. Results included websites written in English, French, Spanish, German, Dutch, Danish, Italian, Swedish, Norwegian, and Chinese. The study team recruited students who were native or experienced speakers of each of the languages to translate the websites into English. Further data analysis was done from the translated copies of the websites.

In our content analysis we examined 4 elements of websites: a) The nation of origin of the website as indicated by the Google index b) The number of DeCSS posting websites found in each nation. c) The existence of text or images in which the author commented on copyright law, DeCSS related court cases, or laws related to circumvention devices. d) The existence of text or images in which the author referenced the F/OS community or F/OS software such as Linux.

that considers the top level domain name of the server and the geographic location of the server IP address."

(http://www.google.com/apis/reference.html#2_4) How exactly this occurs is proprietary information.

¹¹ In this definition, a mirror site containing identical content but existing on a different server counts as a separate website.

5. Results

5.1 Number of Unique Websites Returned in Results

Table 1 summarizes the data from each nation from the 114 DeCSS download websites. Macau and Luxembourg did not produce any results, so we do not include them in our tables.

Table 1: Number of Unique DeCSS Posting Websites, and Number of DeCSS Posting Websites Containing Political Speech

Nation	Number of Websites Posting DeCSS	Number of Websites Also Containing Political Speech
Austria	7	3
Belgium	2	0
Denmark	3	1
Finland	4	1
France	16	5
Germany	20	9
Greece	4	0
Ireland	4	0
Italy	5	2
Netherlands	22	10
Portugal	3	0
Spain	2	0
Sweden	8	3
UK	11	5
PRC	0	0
Hong Kong	3	1

Looking at the results, one can see that most EU member nations contained more DeCSS download sites than PRC, for which we found 0 posting sites, and Hong Kong, for which we found 3 posting sites. The PRC results did contain several sites with non-functional DeCSS links, and one contained a functional link to the “DeCSS fog,” which is a software file having the same name (DeCSS), but a purpose unrelated to DVDs [3, 50]. The data among EU member nations shows a great deal of variance, with the Netherlands having 22 download sites and Spain and Belgium only having 2 download sites each.

We initially suspected that the lack of download sites in the PRC data might stem from a bias in the Google index. In order to test for this bias, we expanded the PRC sample by running the search for the same set of nine DeCSS terms on four search engines popular within

PRC.¹² This generated 15 new websites; however none of these sites contained functional DeCSS files stored on the same URL as the website, so none qualified as download sites for our analysis purposes.

5.2 Number Of Websites Containing Political Speech

Table 1 also summarizes the number of DeCSS download sites that contained political speech. We defined political speech broadly as text or images in which the author expressed opinion or urged action related to copyright law, DVD encryption, region coding, DeCSS related court cases, or circumvention laws.

Looking at the data, one can see that 0 sites from PRC contained political speech. When we broadened our PRC analysis further to include the non-download DeCSS sites from the original search and the Chinese search engine search, none of these sites contained political speech either. Further, none of the PRC sites mention WIPO, TRIPs, or the particular Chinese laws that would arguably make use of DeCSS or DeCSS posting illegal. One site from Hong Kong contained political speech.

Many EU sites contained political speech. Several sites mentioned the EU Copyright Directive and a few sites even mentioned the names of the particular laws within their nations that now prohibit circumvention. Many of the EU download sites with no political speech were large software archives that mirrored official F/OS software distributions such as Linux, RedHat, FreeBSD, etc.

5.3 DeCSS Posting and References to F/OS

Table 2 describes the number of DeCSS posting websites that referred to F/OS software or the F/OS software movement. The table also identifies the number of F/OS software mirror sites in each set of results.

Because PRC had no functional DeCSS download sites in its sample, it appears as having 0 F/OS references. When we broadened our PRC analysis to include the non-download PRC sites, we found 3 sites that made reference to F/OS software. The first site was a large list of popular software (including cracks), which included a link to Linux resources on another website. The second site, the “Cooperation Software Alliance,” mirrored some F/OS software. The third site included an advertisement for Linux-training.

¹² www.sina.com.cn, www.sohu.com, www.yahoo.com.cn, and www.baidu.com.

Table 2: Number of Sites with F/OS Associations

Nation	Number DeCSS Posting Sites	# of Sites also Distributing F/OS Software	Number of Sites also Referencing F/OS
Austria	7	3	4
Belgium	2	0	0
Denmark	3	0	2
Finland	4	1	4
France	16	4	7
Germany	20	0	13
Greece	4	3	3
Ireland	4	3	4
Italy	5	4	3
Netherlands	22	3	15
Portugal	3	2	3
Spain	2	2	2
Sweden	8	1	5
UK	11	3	6
PRC	0	0	0
Hong Kong	3	2	1

6. Discussion: Comparing DeCSS Posting in the PRC and the EU

We were surprised by the lack of functional DeCSS posting sites in our PRC results. The expanded results (including non download sites from both Google and Chinese search engines searches) did include 9 websites that appeared to have offered DeCSS downloads at some time in the recent past, but the link no longer functioned – suggesting that the website authors had recently removed the file. And, one site contained a functional link to DeCSS on an external site. While we had suspected that we might find fewer DeCSS posting sites in China due to high rates of DVD piracy, we did not expect to find 0 functional sites!

Differences in numbers of Internet users per nation do not explain lack of DeCSS posting in PRC. PRC now has more Internet users than any other nation save the U.S., and more than Hong Kong and individual EU member nations [25,26] This suggests that while Internet access and use may be a necessary factor to facilitate DeCSS posting, it does not, by itself, lead to DeCSS posting.

A different explanation is differences in website hosting fees. If fees for hosting websites and bandwidth fees charged by ISPs are greater in PRC, then users may have some incentive to remove functionally obsolete files from their rented Internet space.

Alternatively, it may be that some authority is requiring PRC website authors to remove the software.

In order to find out if the Chinese government had instituted an official policy to discourage DeCSS posting (since Chinese law does not seem to explicitly forbid it), we searched the last two years of several national Chinese news sources including The People’s Daily newspaper, China Daily, Xinhau News Net, and www.news365.com.cn (a compilation of newspapers in Shanghai) using DeCSS as a keyword. The search produced no results indicating an official effort to discourage DeCSS posting. Further, we found no information in either the newspapers, or on the PRC websites about U.S. law firms sending cease and desist orders to Internet service providers or end users in the PRC. Past data collection has shown that many European website authors have received these letters. The website authors either describe receiving the letter, or post a copy of the letter on their websites [4].

A different explanation for the lack of DeCSS download sites is lack of interest in DeCSS or other DVD rippers due to the availability of cheap pirated DVDs and lower quality VCDs. Most DVD movies are cheap and available in VCD format. And pirated versions of higher quality DVDs seem ubiquitous. On a recent May 2004 visit to China, author Desai found it difficult to find a legal Chinese language DVD to purchase! It may be more cost effective to buy a pirated DVD or VCD than to install and run DeCSS.

The second surprising finding was the difference in presentation of the websites in the EU and PRC. Most of the PRC websites in our samples were large collections of files for cracking security systems or playing digital audio and video media. Few sites contained F/OS software.

The PRC websites that had contained the DeCSS code had names like “DVD Rippers” “DVD Market in Guangzhou”, “Most Used DeCoding Software” and Popular Cracking Software.” The DeCSS file had been placed in categories of software such as “decoding software,” along with files such as “CRACKCODE 2000” and “Email CRACK.”

For the most part, the EU sites posting DeCSS did not present themselves as collections of crack tools or digital audio and video tools. One website did advertise itself as a collection of Linux munitions, and another provided a small collection of “prohibited software,” but this only included code to crack Internet filtering software. Numerous EU sites contained Linux software as noted in Table 2. Titles for EU sites that still posted DeCSS included “Linux DVD,” “Portuguese Linux Archive” and “DeCSS Mirror List,” “DeCSS Central” and “You Have One Bat, and There are 100 Million Holes.”

6.1 Free/Open Source References

Another difference between EU and PRC sites was the degree to which they referenced F/OS software. Only

one PRC site made reference to it in any robust sense. This site, the co-operation software alliance (www.cosoft.org.cn) mirrored some F/OS software. More EU website authors referenced F/OS, and they referenced F/OS more extensively. While some DeCSS website simply mirrored F/OS software, on other EU websites the authors explicitly explained the connection between F/OS and DeCSS, or posted graphical icons supporting projects to build F/OS DVD players (e.g., OpenDVD).

Lack of references to F/OS in the PRC data may stem from lack of usage of F/OS software. As noted in earlier, PRC lags behind other Asian nations in F/OS usage. Further, the availability of cheap pirated software may discourage F/OS usage [41]. Alternatively, it may be that the PRC government's official sponsorship of F/OS development in China has led most PRC F/OS users to reference official PRC releases, which may not contain DeCSS and which therefore would not have appeared in our result.

6.2 Political Speech

Another surprising difference between EU posting sites and PRC sites was the use of political speech. PRC sites contained no speech, while many EU sites contained speech. One Hong Kong site contained speech.

Beginning the research, we were uncertain to what extent we would observe speech on Chinese and Hong Kong DeCSS web sites. Our preliminary test of major DeCSS posting sites in Europe and the US showed that they were not blocked to Chinese users – suggesting to us that the PRC government did not consider DeCSS to be a serious concern.

While we found no evidence of official discouragement of DeCSS posting in our search of PRC news sources, and numerous foreign news sources have noted that government censorship is still rife in PRC and the government has begun new initiatives to monitor Internet usage in cyber cafés and other access points [51,52]. Perhaps new surveillance has chilled DeCSS posting and speech about DeCSS within PRC. Furthermore, it is possible that the recent clamp down on Hong Kong autonomy has chilled protest posting from Hong Kong.

Another possibility is simply that those citizens inclined toward political protest have more important things to protest about. Those involved in political protest in China and Hong Kong have far greater concerns in a country whose government suppresses any attempt to challenge the government's monopoly on political power. Whether it is repression of Falun Gong, continued imprisonment of those challenging Communist Party control, or suppression of critiques of the government in the press, political protesters may simply have more important concerns to contend with.

6.3 DeCSS: Global Copyright Protest?

Theorizing from the social movements literature points to symbols of collective action such as icons, language, or dress as important to producing consensus, developing shared meaning, and mobilizing protest participants to take action. According to the theory, usage and meaning of these symbols may vary across time, space, and culture; and different groups may employ the same symbol in different ways [5]. The data from this study suggest that DeCSS is not a global collective action symbol, or at least DeCSS does not have the same symbolic value in the PRC that it has within EU member nations. Rather, the data suggest that most PRC website authors may simply post DeCSS as one of many software tools which hackers or DVD fans find useful.

There is some evidence of use of DeCSS as a collective action symbol in Hong Kong, and more evidence in Europe. Further, several EU websites posting DeCSS made specific mention of the EU Copyright Directive or the new anti-circumvention laws specific to their nations.

7. Limitations and Future Research

The findings from this study are subject to several limitations. First, the results are subject to sampling bias because they are drawn from a search engine index [47,53]. The search results represent pages more likely to be included in the Google index – typically popular pages that are linked to by other highly rated pages. Thus the results likely leave out some new or less popular websites. Further, the results do not include websites that block robots.

Further, our study attempts to infer relationships between DeCSS posting and passage of particular anti-circumvention provisions of national copyright laws. Both these variables are moving targets. Several EU member nations were in the process of passing the anti-circumvention provisions at the time of data collection. It could be that many website authors are not yet aware that the laws of their nation have changed to prohibit their posting of DeCSS.

Further, our conclusion that PRC website authors do not post DeCSS because they do not recognize DeCSS as a “collective action symbol” may be overly simplistic. We have not spoken directly with any PRC website authors, so we cannot say why they do or do not post DeCSS, or what meanings DeCSS has for them. It may be that PRC authors are well aware of the protest value attached to DeCSS elsewhere, but do not post DeCSS, and do not post political speech related to DeCSS, for the myriad of other reasons we have suggested including censorship, high web site hosting fees, availability of

cheap pirated DVDs, and more immediate protest aims. Further research involving interviews with or surveys of DeCSS site authors is necessary to better understand why DeCSS posting does or does not occur.

Another limitation of this study is that our conclusions tend to lump together the EU nations in order to contrast their results with PRC. Looking at the EU data however, one sees a good deal of variation among member nations - some post more DeCSS than others; some contain more websites with political speech. Our results cannot explain this variation among EU member nations. It may be that the cultural value of DeCSS varies among EU member nations as well.

Furthermore, in this research we tended to assume that all F/OS users were subject to similar sets of institutional forces stemming from the shared belief systems and values of the F/OS community which emphasize openness, sharing, and reverse engineering [54,55] But others have noted that a good deal more variance exists among F/OS users and their values [55,56].

Given the increasing commercialization of F/OS, it is likely that variance among F/OS users will increase. Up until recently, F/OS software was primarily seen as the domain of hackers - a group of individuals arguably operating under some shared institutional influences, including those of the F/OS community. But the spread of F/OS software usage in business, government, and education will mean that F/OS is no longer concentrated in the hands of hackers, and new users will not be acculturated to the norms and values of the F/OS community, and thus would be less inclined to care about DeCSS or other political issues related to the use of F/OS. So, increased F/OS usage may not equate with increased DeCSS posting.

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