
UNIVERSITY OF COLORADO LAW SCHOOL

February 18, 2011

Submitted electronically via website

Re: Preliminary FTC Staff Report on "Protecting Consumer Privacy in an Era of Rapid Change: A Proposed Framework for Businesses and Policymakers"

INTRODUCTION

I appreciate the opportunity to submit these comments to the Federal Trade Commission ("FTC") regarding its preliminary staff report, *Protecting Consumer Privacy in an Era of Rapid Change: A Proposed Framework for Businesses and Policymakers* ("Report").¹ I am a student attorney in the Samuelson-Glushko Technology Law and Policy Clinic at the University of Colorado Law School in Boulder, Colorado. I write to expand upon the dialogue underway about the future of privacy law and policy.

I suggest that the FTC examine whether a website owner could discover personal information about a user who visits the website based on the user's add-ons, plug-ins, extensions, and apps installed on the user's browser, and thus use this personal information against the user. In particular, my comment focuses on whether an employer or insurance company could determine that the user has a disability based on the add-ons, plug-ins, extensions, and apps installed on the user's browser, and thus discriminate against the user. For the purpose of this comment, I will use the term "browser enhancer" to refer to browser add-ons,² plug-ins,³ extensions,⁴ and apps.⁵

¹ Federal Trade Commission, Preliminary Staff Report: *Protecting Consumer Privacy in an Era of Rapid Change: A Proposed Framework for Businesses and Policymakers* (Dec. 1, 2010), available at <http://www.ftc.gov/os/2010/12/101201privacyreport.pdf> (hereinafter Report).

² An "add-on" is a piece of software that enhances the capabilities of a larger software application, such as a web browser. Add-on is sometimes used generally to refer to add-ons, plug-ins, and extensions. *Add-on*, WIKIPEDIA, <http://en.wikipedia.org/wiki/Add-on> (last visited Feb. 16, 2011).

³ A "plug-in" is a set of software components that adds specific capabilities to a larger software application. Browser plug-ins enable the web browser to play video, scan for viruses, and display new file types. Common plug-ins are Adobe Flash Player, Adobe Acrobat, Google Earth, and Quick Time. *Plug-In*, WIKIPEDIA, http://en.wikipedia.org/wiki/Plug-in_computing (last visited Feb. 16, 2011).

As people peruse the Internet, they leave behind a digital fingerprint that can reveal their confidential information. This digital fingerprint may include a user's personal information, such as a disability or use of an ovulation tracker. Many people do not know how easy it is for a website to detect the user's installed browser enhancers. When you visit a website, that website asks your computer for your browser's installed browser enhancers, and other information about your computer such as screen size.⁶ The website asks for this information to ensure that the content it sends to your computer is properly formatted.

Personal information encrusted in a user's installed browser enhancers presents reason for potential concern. The fear is that an employer or insurance company could see that the user (i.e. potential employee, current employee, potential or currently insured person) has a browser enhancer installed that reveals something very personal and private about the user and use this information against the user. An example would be a person with a vision impairment who uses a screen reader browser enhancer, or a woman wanting to become pregnant who uses an ovulation tracker browser enhancer,⁷ applying for a job on the potential employer's website. The potential employer sees the installed browser enhancer

⁴ The word browser "extension" is commonly used interchangeably with add-on and plug-in. However, the term really depends on the browser, i.e. Firefox and Chrome use extensions. Extensions modify the behavior of existing features or add entirely new features to the browser application. Examples of extensions include RSS readers, bookmark organizers, toolbars, e-mail, and developer tools. Greasemonkey is a Firefox extension that modifies how the user views web pages; it allows the user to customize the way a webpage displays. *Browser Extension*, WIKIPEDIA, http://en.wikipedia.org/wiki/Browser_extension (last visited Dec. 1, 2010).

⁵ "Apps" are used in Google's Chrome browser and are similar to add-ons, but with some differences.

⁶ *What Fingerprints Does Your Browser Leave Behind as You Surf the Web?*, PANOPTICCLICK, <http://panopticlick.eff.org/about.php> (last visited Feb. 1, 2010).

⁷ One Chrome browser app for tracking fertility and menstrual cycles is the Strawberry Pal Menstrual Calendar app, <https://chrome.google.com/webstore/detail/bmeafmbadejchdjffdbjdjdcgfmhjh> ("A simple app for recording and predicting your menstrual cycles. Supports export to Google Calendar and other calendar applications."). The JX Ovulation Calendar 2.0.125 is an ovulation calendar plug-in for Dreamweaver, <http://www.softwaregeek.com/calendar-plug-in-for-dreamweaver/p2.html>. Additionally, there are many iPhone, iPad, Android, and BlackBerry apps; websites; and computer programs that a woman can use to track her ovulation. It is not unlikely to expect more browser apps and extensions as women move to digital or cloud-based calendars. This website lists different fertility chart iPhone apps: http://contraception.about.com/od/naturalmethods/tp/fertility_apps.htm. A commonly used website is FERTILITY FRIEND, www.fertilityfriend.com. One ovulation-tracking program is Ovulation Calendar 2.0, <http://www.softpedia.com/get/Others/Home-Education/DICTE-Ovulation-Calendar.shtml>.

and decides not to hire the applicant because the employer does not want to pay for accessibility programs or maternity leave for the applicant, if hired.

The concern that a website owner can learn confidential information about the user is especially problematic for people with disabilities because they frequently use browser enhancers to access content on the Internet.⁸ Additionally, people with disabilities are often the subject of discrimination and harassment by employers.⁹ Therefore, the FTC's attention on this matter is warranted.

I urge the FTC to consider the possible abuse of consumers' private information through browser enhancer detection by website owners. I discuss the concerns associated with browser enhancer detection in three parts. First, in Part I, I explain the current technology that could enable website owners to discriminate against Internet users solely based on the users' installed browser enhancers. In Part II, I give a short background on the Americans with Disabilities Act. Then I discuss the current legal framework under the ADA and how it may be inadequate to protect consumers. In Part III, I urge the FTC to review the aforementioned privacy concerns.

I. THE CURRENT TECHNOLOGY

Many people assume that they can prevent a website from identifying them or their personal information by disabling cookies¹⁰ on their browsers or by setting their browser settings to the highest privacy setting.¹¹ This is not completely true. When a user visits a website, he allows that website to access a lot of critical information about the user's computer configuration.¹² This information allows the website to provide properly formatted content to the user's device.¹³ The website can determine the user's web user agent, which ranges from web browsers to screen readers and Braille browsers for people with disabilities.¹⁴ In the HTTP protocol, the User-Agent header field typically transmits a characteristic identification string to the website's server that identifies its application type, operating system, software vendor, and software version.¹⁵ The website server can

⁸ See the list of browser enhancers in Part I.

⁹ See Part II below.

¹⁰ A cookie is a piece of text stored by a user's web browser. *HTTP Cookie*, WIKIPEDIA, http://en.wikipedia.org/wiki/HTTP_cookie (last visited Dec. 2, 2010).

¹¹ PANOPTICCLICK, *supra* note 6.

¹² PANOPTICCLICK, *supra* note 6.

¹³ The word "devices" in this comment refers to computer clients, i.e. personal computers, laptops, smart phones, iPods, iPads, tablets, etc.

¹⁴ This is another way in which an employer or insurance company could learn that a person uses an accessibility program to access online content. However, this approach is beyond the scope of this comment.

¹⁵ *User Agent*, WIKIPEDIA, http://en.wikipedia.org/wiki/User_agent (last visited Nov. 28, 2010). Again, an employer or insurance company could discover that a user uses

also ask the user's device for its screen size and color depth, system fonts, and whether cookies are enabled.¹⁶ Additionally, the user's browser transmits to the website server its HTTP accept headers.¹⁷ The accept header tells the website server what type of content the browser accepts to ensure that the server sends the browser correctly formatted content.¹⁸ Websites also can query the user's browser for a list of installed plug-ins and some browser add-ons, extensions, and apps¹⁹ (hereinafter, collectively referred to as "browser enhancers").²⁰ Knowing the plug-ins allows the website to reconfigure itself properly on the user's browser. All of the aforementioned information can be assimilated into what is known as a "device fingerprint."²¹ What personal information does your device fingerprint reveal about you?²² A simple illustration of a plug-in snooper, which is the code to detect installed plug-ins and create one part of the device fingerprint, can be found in Appendix A.

There are salutary purposes for a website to identify a user's browser enhancers. Originally, the device fingerprint was designed to protect the user from identity fraud.²³ Banks use the device fingerprint to connect a user to a specific device.²⁴ This is why when you log into your bank account online from a different computer the bank's website asks you additional security questions. Additionally, the information contained in a device fingerprint about a device's configuration is

a browser specific for his disability, such as the Zac Browser for children with autism. ZAC BROWSER, <http://www.zacbrower.com> (last visited Feb. 16, 2011). However, this approach is beyond the scope of this comment.

¹⁶ PANOPTICCLICK, *supra* note 6.

¹⁷ PANOPTICCLICK, *supra* note 6.

¹⁸ PANOPTICCLICK, *supra* note 6.

¹⁹ See *supra* notes 2-5 for an explanation of browser plug-ins, add-ons, extensions, and apps.

²⁰ PANOPTICCLICK, *supra* note 6. See also Gregory Fleischer, *Enumerate Firefox Addons*, PSEUDO-FLAW.NET, <http://pseudo-flaw.net/tor/torbutton/enumerate-firefox-addons.html> (last visited Feb. 16, 2011) ("Some Mozilla Firefox addons define their own XPCOM interfaces. These interface are registered internally within Firefox. By enumerating these interfaces and testing for their existence, it is possible to determine if the addon is installed and enabled."); and see also <http://pseudo-flaw.net/content/defcon/dc-17-demos> for more browser detection demos.

²¹ A device fingerprint, or machine fingerprint, is a summary of the assimilation of the software and hardware settings collected from a remote computing device.

²² To see some of the information your browser reveals, go to <http://panopticclick.eff.org> or <http://browserspy.dk>.

²³ George Lawton, *Browser Fingerprints Threaten Privacy*, COMPUTING NOW (Apr. 2010), <http://www.computer.org/portal/web/computingnow/archive/news057>. *The 41st Parameter Extends U.S. Patent on Improved TimeDiff Linking Technology to Detect and Prevent Phishing Transparently to Bank Customers*, Press Release 41ST PARAMETER (June 29, 2005), http://www.the41.com/docs_article.asp?articleid=4.

²⁴ 41ST PARAMETER, *supra* note 23.

commonly transmitted to a website's server to ensure that the server provides the user with properly formatted content. Lastly, under current privacy laws, none of the information collected for a device fingerprint, including a list of the user's browser enhancers, is illegal.²⁵

However, all of this legally collected information may be used for other identification purposes. Advertising companies continue to reach further and further into identifying computer users for targeted advertisements.²⁶ Because the device configuration information is commonly transmitted, easily collected, and legally collectable, it is easy to imagine savvy employers and insurance companies collecting and saving a user's configuration information.

The potential for misuse of information contained a device fingerprint is especially acute for disabled individuals because they often use browser enhancers to access Internet content. A few accessibility browser enhancers are listed at the end of Part I. There are many parts of the device configuration information that an employer or insurance company may be interested in collecting, including the User-Agent, fonts, and browser enhancers. The User-Agent can tell the employer or insurance company if the user is using an uncommon browser, perhaps one specifically designed for the user's disability, such as Zac Browser for autistic children. The user's fonts show whether the user has Braille or some other disability-identifying font installed. And lastly, the browser enhancers are probably the most telling of the user's condition because many browser enhancers are developed specifically for the user's condition. Browser enhancers range in purpose from enabling a blind person to listen to the spoken words of a website, removing a website's clutter, reminding a person to take his medicine and go to his doctor appointment, preventing flashing videos so a person with photosensitive epilepsy does not have a seizure, to tracking when a woman hoping to become pregnant is ovulating.²⁷ See the following list for examples.

²⁵ Paul Ohm, *Broken Promises of Privacy: Responding to the Surprising Failure of Anonymization*, 57 UCLA L. REV. 1701, 1734-35, available at <http://uclalawreview.org/?p=1353> ("In addition to HIPAA and the EU Data Protection Directive, almost every single privacy statute and regulation ever written in the U.S. and EU embraces—implicitly or explicitly, pervasively or only incidentally—the assumption that anonymization protects privacy.").

²⁶ See Edward Wyatt & Tanzina Vega, *F.T.C. Backs Plan to Honor Privacy of Online Users*, N.Y. Times (Dec. 1, 2010); *Your Rights Online: Race On To Fingerprint Phones, PCs* (Dec. 1, 2010 12:00PM) <http://yro.slashdot.org/story/10/12/01/1619224/Race-On-To-Fingerprint-Phones-PCs?from=rss>.

²⁷ Translate this discrimination to any class of people. For example, a woman may download an add-on to track her ovulation because she would like to become pregnant. When the hopeful-mother-to-be applies to a potential employer online, the potential employer will see her ovulation tracker add-on. The potential employer may choose not to hire the woman because he would prefer to not pay for

BROWSER ENHANCERS COMMONLY USED BY PEOPLE WITH DISABILITIES

- The Browsealoud Plug-In (text to speech)²⁸
- Chrome Daltonize! (exposing details to color-blind users)²⁹
- PlainClothes (unstyles websites, removes color and simplifies the website)³⁰
- Readability Redux (removes clutter on webpages)³¹
- colorXtractor (written for people with color-blindness, helps color blind people distinguish colors)³²
- DDReader (Dorina Daisy Reader application is a DAISY 3.0 digital book reader that functions as a Firefox add-on)³³
- FoxVox (screen reader for Firefox)³⁴
- MozBraille (extension to transform Mozilla or Firefox to a stand alone accessible Internet browser designed for blind or partially sighted users so that you don't need a third part program like a screen reader)³⁵

II. DISABILITY BACKGROUND AND THE EXISTING LEGAL FRAMEWORK UNDER THE ADA

Approximately 54 million Americans have some sort of disability.³⁶ Additionally, the unemployment rates of working-age adults with a disability are also significantly higher than the unemployment rate of adults without a functional limitation.³⁷ The Americans with Disabilities Act (ADA) defines the term “disability” as: “with respect to an individual— (A) a physical or mental impairment that

maternity leave; therefore, he only hires men and women past their childbearing years.

²⁸ <http://www.house.gov/house/browsealoud.shtml>.

²⁹ <https://chrome.google.com/extensions/detail/efeladnkafmoofnbgdbfaieabmejfcf>.

³⁰ <https://chrome.google.com/extensions/detail/kleikneknnaibjhlamidabhmckbdc>.

³¹ <https://chrome.google.com/extensions/detail/jggheggpdocamneaacmfoipeehedigia>.

³² <https://addons.mozilla.org/en-US/firefox/search/?q=color+blind&cat=1,73&lver=any&pid=1&sort=&pp=20&lup=&advanced=>

³³ <https://addons.mozilla.org/en-US/firefox/addon/9276>.

³⁴ <https://addons.mozilla.org/en-US/firefox/addon/9759>.

³⁵ <http://mozbraille.mozdev.org>.

³⁶ *Understanding Disabilities*, U.S. ENVIRONMENTAL PROTECTION AGENCY, <http://www.epa.gov/inter508/technology/disabilities.htm> (last visited Nov. 30, 2010).

³⁷ H. STEPHEN KAYE, 2 DISABILITY WATCH: THE STATUS OF PEOPLE WITH DISABILITIES IN THE UNITED STATES 1, 70-71 (2001), *available at* http://www.dralegal.org/publications/disability_watch_v2.php (last visited Nov. 28, 2010) (The unemployment rate of people with mental health disabilities in 2001 was 16%, as compared to 4% of people without a functional limitation.).

substantially limits one or more major life activities of such individual; (B) a record of such an impairment; or (C) being regarded as having such an impairment.”³⁸

Microsoft commissioned a study on adult computer users in the United States.³⁹ The Microsoft Survey found that one in four adults using computers has a vision difficulty, one in four has a dexterity difficulty, and one in five has a hearing difficulty.⁴⁰ The survey also found that 16% of adult computer users have a cognitive difficulty or impairment and 3% have a speech difficulty or impairment.⁴¹

Many people believe that discrimination in the workplace rarely occurs; however, people with disabilities are often the subject of discrimination.⁴² One company, Cognitive Performance Testing Services, is now offering advanced brain function testing to screen new and existing employees for cognitive deficits, depression, impaired attention, and poor vigilance.⁴³ The test measures attention, impulsivity, and reaction time; checks for impairment in sustaining attention; and provides an evaluation of short-term and long-term memory, motor coordination, executive functions, errors of commission, and errors of omission.⁴⁴ Its website boasts:

“About twenty percent of the population suffers from clinical neuropsychiatric disorders such as Attention Deficit Disorder, learning disorders, and depression. Many more are functionally compromised by less severe symptoms. . . . On the surface these individuals are difficult to identify. . . . However, such individuals can pose a liability to your company.”⁴⁵

The Americans with Disabilities Act (ADA) prohibits discrimination against persons with disabilities in the workplace.⁴⁶ During the pre-employment process, employers “shall not conduct a medical examination or make inquiries of a job applicant as to whether such applicant is an individual with a disability or as to the nature or severity of such disability.”⁴⁷ The same is true after an applicant is hired as an employee.⁴⁸ However, an employer may require a medical examination or inquire about an applicant’s or employee’s disability if “such examination or inquiry

³⁸ 42 U.S.C. § 12102(1) (2009). For a definition key terms in the disability definition, see 42 U.S.C. § 12102.

³⁹ Study commissioned by Microsoft Corporation and conducted by Forrester Research, Inc., <http://www.microsoft.com/enable/research/phase1.aspx> (2003).

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² See MARK C. WEBER, *DISABILITY HARASSMENT* 1-25 (2007).

⁴³ Cognitive Performance Testing Services, <http://cognitivetestingservices.com> (last visited Nov. 27, 2010).

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ 42 U.S.C. § 12112 (2009).

⁴⁷ *Id.* at § 12112(d)(2)(A).

⁴⁸ *Id.* at § 12112(d)(4)(A).

is shown to be job-related and consistent with business necessity.”⁴⁹ Lastly, employers are required to provide “reasonable accommodations”⁵⁰ to assist employees in overcoming the disability.⁵¹

Because the ADA expressly prohibits employers from making pre-employment inquiries into an applicant’s disability status, an employer who seeks to gather such information surreptitiously by looking at an applicant’s or current employee’s installed browser enhancers violates the spirit, and probably the letter, of the ADA’s ban on such inquiries. A court may well find that an employer is not allowed to look at an applicant’s or current employee’s installed browser enhancers to learn about the person’s disability because the ADA prohibits an employer from inquiring about an applicant’s or current employee’s disability. Using a computer program to see a person’s installed browser enhancers when that person visits a website is a way to gather information about a person’s disability or other personal information without asking the person. Just as the goal of a (prohibited) disability-related inquiry is to learn something unknown before the inquiry, so too the goal of detecting a person’s installed browser enhancers may also be to learn about disability status otherwise unknown before the detection. Because the goal of an inquiry by an employer is similar, if not the same, as the goal of browser enhancer detection by an employer, this detection likely violates the ADA. And clearly an employer who used such information to discriminate against the person would be in violation of the ADA.

Similarly, it is also probably a violation of Title VII of the Civil Rights Act of 1964, as amended by the Pregnancy Discrimination Act, for an employer⁵² to look at an applicant’s or current employee’s installed browser enhancers and use this information to discriminate on the basis of pregnancy, childbirth, or related medical conditions.⁵³ Because the EEOC has interpreted the Pregnancy Discrimination Act to prohibit an employer from inquiring about an applicant or current employee’s pregnancy, childbirth, or related medical conditions, a court would probably find that an employer is not allowed to look at an applicant or current employee’s installed browser enhancers to learn about the person’s pregnancy information. Therefore, it is probably against the law for an employer to look for a woman’s ovulation tracking browser enhancer.⁵⁴

⁴⁹ *Id.* See also § 12112(d)(2)(B).

⁵⁰ See 42 U.S.C. § 12111(9) (2009) for a definition of “reasonable accommodation.”

⁵¹ 42 U.S.C. § 12112(b)(5) (2009).

⁵² The Pregnancy Discrimination Act covers employers with 15 or more employees, including state and local governments.

⁵³ 42 U.S.C. §§ 2000e(k) and 2000e-2.

⁵⁴ Note that Title VII governs employers, not insurance companies generally. If an insurance company is engaging in this behavior on an employer’s behalf, that would violate Title VII. Title VII does not cover insurance actions outside the context of employer-provided insurance.

III. THE FTC'S ROLE IN BROWSER ENHANCER DETECTION

I urge the FTC to consider the possible abuse of consumers' private information through browser enhancer detection by website owners in its final report on "Protecting Consumer Privacy in an Era of Rapid Change: A Proposed Framework for Businesses and Policymakers." The potential for misuse of information contained a device fingerprint is especially acute for disabled individuals because they often use browser enhancers to access Internet content.

The FTC's proposed consumer privacy framework would apply broadly to online and offline commercial entities that collect, maintain, share, or otherwise use consumer data that can be reasonably linked to a specific consumer, computer, or device.⁵⁵ The browser enhancer detection information fits within the FTC's proposed framework because employers and insurance companies are commercial entities and the browser enhancer detection is collecting and using consumer data linked to a specific consumer, computer, or device. The Report contains three main components: (1) the "privacy by design" approach, (2) consumer choice in tracking ("Do Not Track"), and (3) transparency measures. Under the second component of the Report, the FTC should propose that companies provide choices to consumers about their browser enhancer practices. Additionally, the FTC should propose that companies impose transparency measures regarding browser enhancer detection under the third component of the Report.

I hope the FTC agrees and considers browser enhancer detection in its final report.

Sincerely,



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⁵⁵ FTC, *supra* note 1.

APPENDIX A: SAMPLE CODE OF A PLUG-IN SNOOPER

This code was written by Dr. Clayton Lewis, Professor of Computer Science at the University of Colorado at Boulder. Dr. Lewis's code was adapted from code found at <http://www.java-gaming.org/index.php?topic=96.0>.

```
<html>
<head><title>plugin list</title>
</head>
<body>
<script type="text/javascript">
var i
with (document){
write("<b>appName:</b> "+navigator.appName+"<br />")
write("<b>appVersion:</b> "+navigator.appVersion+"<br />")
write("<b>userAgent:</b> "+navigator.userAgent+"<br />")
write("<b>platform:</b> "+navigator.platform+"<br />")
for (i in navigator.plugins)
{
write("<b>plugins:</b> "+navigator.plugins[i].name+"<br />")
}
}
</script>
</body>
</html>
```