Problem 1: Device Fingerprint Tracking.

One of the key points the Wall Street Journal investigation, “What They Know”, surfaces is the growing prevalence and effectiveness of individual device fingerprint tracking.

(a) BlueCava is a start-up highlighted in the Wall Street Journal investigation that specializes in device fingerprinting. Describe 3 technologies that BlueCava deploys and the purposes for each.

(b) Mobile devices make up a large portion of personal devices in which users often interact through apps instead of browsers. Describe what tracking information is commonly disclosed by smartphone apps. How can it be used for tracking users? Is it more or less powerful than browser cookies? Why?

(c) In some cases sharing personally identifiable information in a raw form can be illegal, however sharing hashed versions is allowed. Discuss the differences between raw and hashed identifiers including the related privacy implications.


The Better Ads Campaign is led by a coalition of industry leaders to improve online advertising experiences in an attempt to combat the growing use of ad-blockers and protect the online advertisement business model. After conducting extensive user research, the campaign resulted in a set of Better Ads Standards.

https://www.betterads.org/standards/

While coalition members may abide by the Better Ads Standards, the success of their campaign hinges on widespread adoption of the standards, else users will still be inclined to download ad blockers. To further the end of widespread adoption, Google integrated the Better Ads Standards directly into the Chrome browser, blocking all ads (by default) on websites that fail to adhere to the standard.

https://blog.chromium.org/2018/02/how-chromes-ad-filtering-works.html

As a way for webmasters to diagnose whether their website passes the Better Ads Standards, Google created a set of web tools. If a webmaster is concerned about being blacklisted by the Better Ads Standards filter on Chrome, webmasters can register and authenticate themselves as owners on Google and view the evaluation of their website. After fixing the problems, registered webmasters can request a reevaluation of their site in order to be removed from the blacklist. Unless a webmaster registers and manually requests a reevaluation, presumably, the website would remain on the blacklist indefinitely or until it is reevaluated automatically at some longer interval.
Although privacy is not the main function of Better Ads Standards and Chrome’s auditing system, a question can be raised about its impact on privacy due to registration exposing information about website owners to Google. (You can think about this relationship similarly to the road toll system Dr. Guerses presented: not directly focusing on privacy but having privacy implications).

(a) What new informational flows are created as a result of this system (i.e. using the 5 parameters)? Is there an entrenched norm that you can compare these new flows with? Would you argue that the new informational flows are appropriate? Why?

(b) Regardless of whether you argued for or against the appropriateness of the current system, present the design of an alternate Better Ads Standards auditing system with the following functionality.

- The system must support parties querying the Better Ads Standards blacklist.
- The system must support updating the Better Ads Standards blacklist perhaps by webmaster request.

Compare your auditing system with Chrome’s in terms of informational flows. What computational/practicality tradeoffs (if any) did you make in order to achieve a different set of informational flows?

Note: Recall that privacy engineering doesn’t always mean reducing the total amount of information flowing through the system, but can mean reducing information flow along certain paths of the system, perhaps by introducing third parties with varying levels of trust.

Problem 3: New Developments in Ad Blocking.

Ghostery has announced a new business model and strategy for ad blocking. Give a 2 sentence update on your answer from Homework 1.