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Poster: Client-Side GTM Tags: hidden data leaks and potential violations of GDPR

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Client-Side GTM Tags: hidden data leaks and potential violations of GDPR

Background

Websites collect their visitors' data for various purposes, such as targeted advertising, and rely on third parties for such collection. One option for Website Publishers to **share visitor data** with these 3rd parties is to install Tags they provide and use **Google Tag Manager (GTM)** to manage them. Until now research considers GTM as a single tracking script, our work casts light on the internals of GTM.

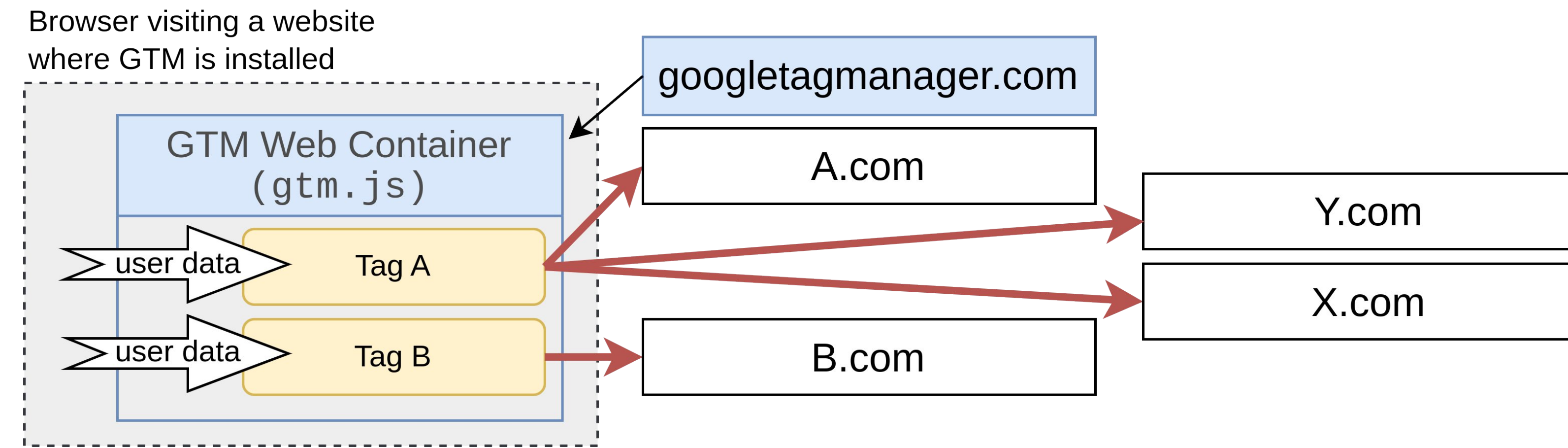
Methods

We study Tags from the **point of view of the Publisher** on an empty website. This approach enables us to install tags in **an environment we fully control**.

- **In-depth analysis.** We analyze 6 tags in-depth by hand to list types of data collected from: technical and legal documentation, tag dashboard and network traffic.
- **Large-scale study.** We develop a program that automatically installs 719 Tags and collects their traffic on our website. For the 352 Tags making network requests, we study both the data collected and with whom it is shared.
- **Policy analysis.** With a legal scholar (Cristiana Santos), we study the privacy policies of the 3rd party providing the tag. We especially focus on the clarity of the reference to the tag, the disclosure of third parties collecting data and use of cookies.
- **Consent mode.** Finally we study Google Consent mode, a feature that enables tags to be aware of user consent: we install the Google Tag on our website and visit it twice, refusing and accepting consent, to assess potential differences in data collection practices.

Findings

Tags collect information about the website visited, device features and use first- and third-party cookies. We found that **49 tags share data with multiple companies**, with one tag contacting 26 of them! Analysis of privacy policies shows that **Tag providers often omit to declare with whom the data is shared** and the cookies used. Moreover, privacy policies studied never mention tags explicitly, leaving Publisher to guess whether declarations apply to the tag they installed. Finally, we discovered that the Google Tag through its use of Google Consent Mode **collects personal data when users decline consent**, potentially violating EU data protection laws.



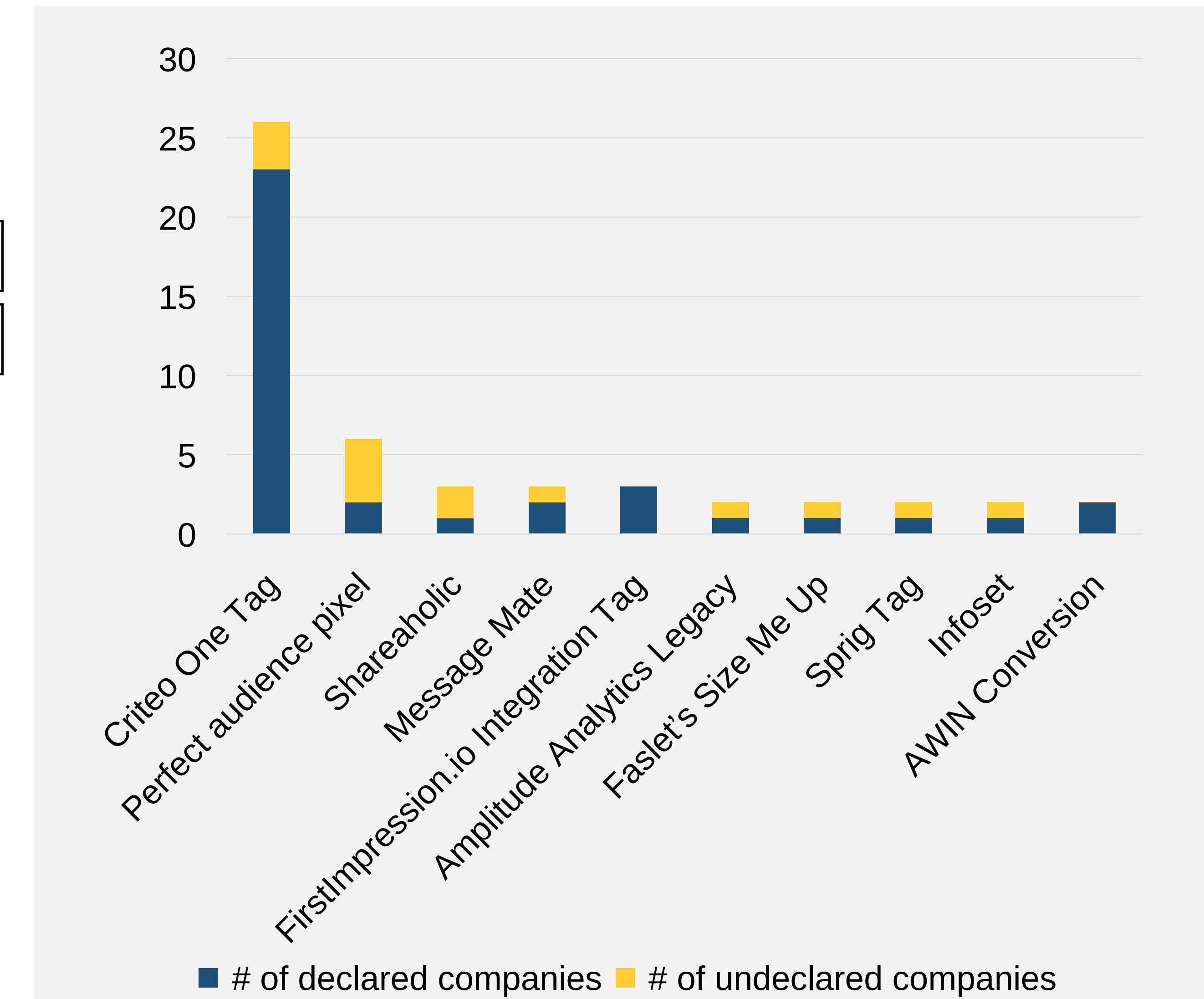
In-depth analysis : Architecture of a GTM installation. Tags run in the browser, collect data and send it to third parties.

| URL param. name | Value of url parameter when refusing all | Value of url parameter when accepting all |
|-----------------|--|---|
| v | 2 | 2 |
| tid | G-XSKNFL9CWM | G-XSKNFL9CWM |
| gtm | 45je43p0v9181346581za200 | 45je43p0v9181346581za200 |
| _p | 1711640211524 | 1711640309156 |
| gcs | G100 | G111 |
| gcd | 13p3p3p2p5 | 13t3t3t2t5 |
| npa | 1 | 0 |
| dma_cps | - | sypham |
| dma | 1 | 1 |
| cid | 1337464789.17116 | 1994365208.17116 |
| ul | en-us | en-us |
| sr | 2560x1440 | 2560x1440 |
| uaa | x86 | x86 |
| uab | 64 | 64 |
| uaflv | Chromium%3B122.0.6261.94%7CNot(... | Chromium%3B122.0.6261.94%7CNot(... |
| uamb | 0 | 0 |
| uap | Linux | Linux |
| uapv | 6.6.17 | 6.6.17 |
| uaw | 0 | 0 |
| pscdl | denied | noapi |
| _s | 2 | 2 |
| sid | 1711640211 | 1711640280 |
| sct | 1 | 1 |
| seg | 0 | 1 |
| dl | https%3A%2F%2Fga4consent.webexp... | https%3A%2F%2Fga4consent.webexp... |
| dr | https%3A%2F%2Fga4consent.webexp... | https%3A%2F%2Fga4consent.webexp... |
| dt | My%20experiment%20page%20title | My%20experiment%20page%20title |
| en | view_search_results | view_search_results |
| tfd | 5620 | 5613 |
| _eu | AEA | AEA |
| _et | 2 | |
| ep.search_term | my%20search | my%20search |

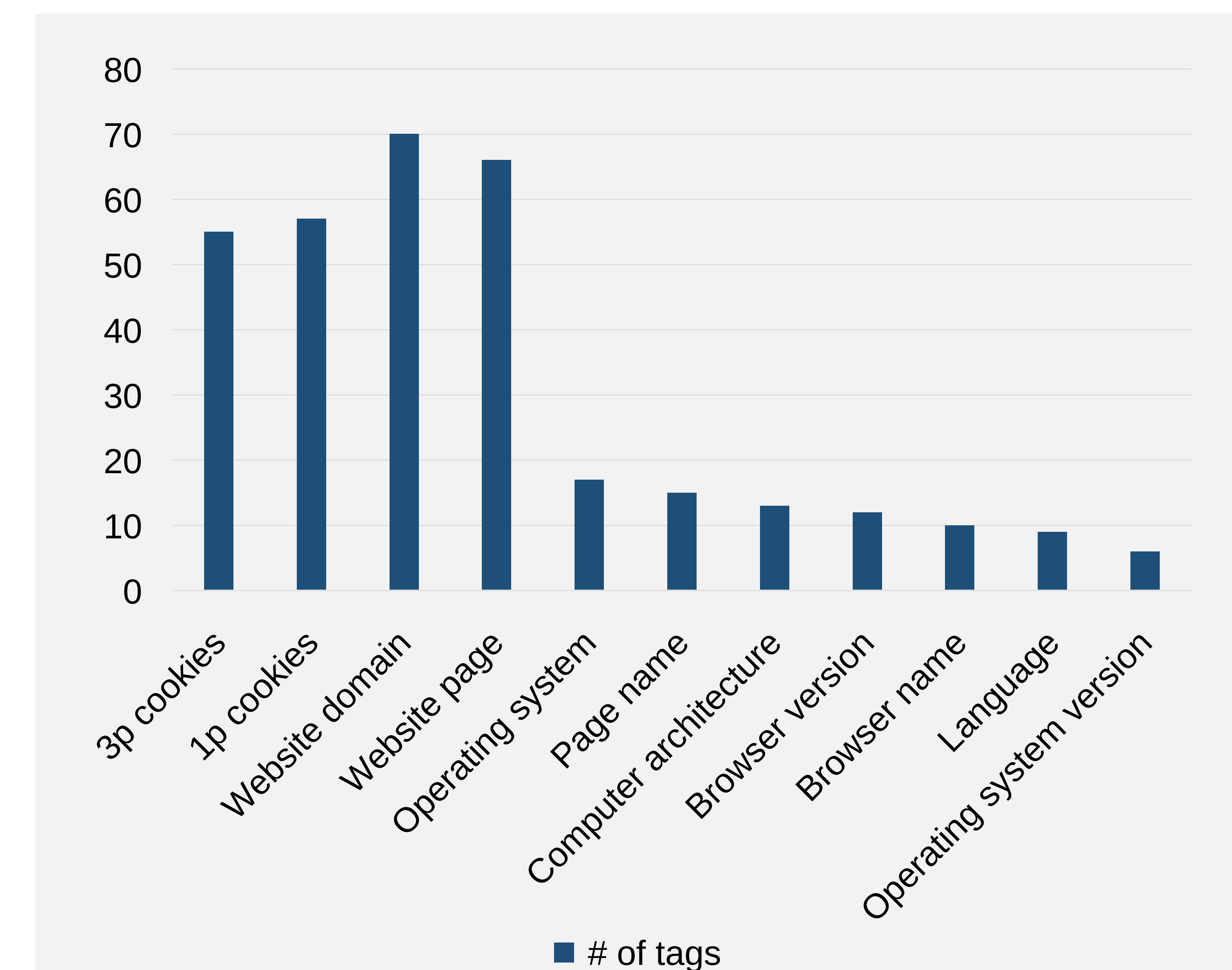
Consent mode: Data actively sent by the Google Tag when accepting and refusing consent. The values in red are sent independently of consent.



Previous submission
<https://arxiv.org/abs/2312.08806>



Large-scale & Policy analysis: Tags send data to multiple companies and don't declare it.



Large-scale study: A broad set of personal data types is actively collected by the tags