

# Defence Against the Dark Patterns

UX Lessons from the Deceptive  
Side of the Web



PRESENTER

Cat Easdon  
Senior Privacy Engineer

# Today

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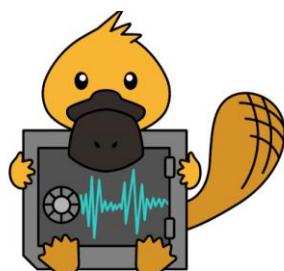
- Intro to privacy
- Privacy threat modeling
- Dark patterns
  - Examples
  - Fairer alternatives
  - Legal consequences
- Inclusive privacy
- Privacy challenges in your work



# About Me

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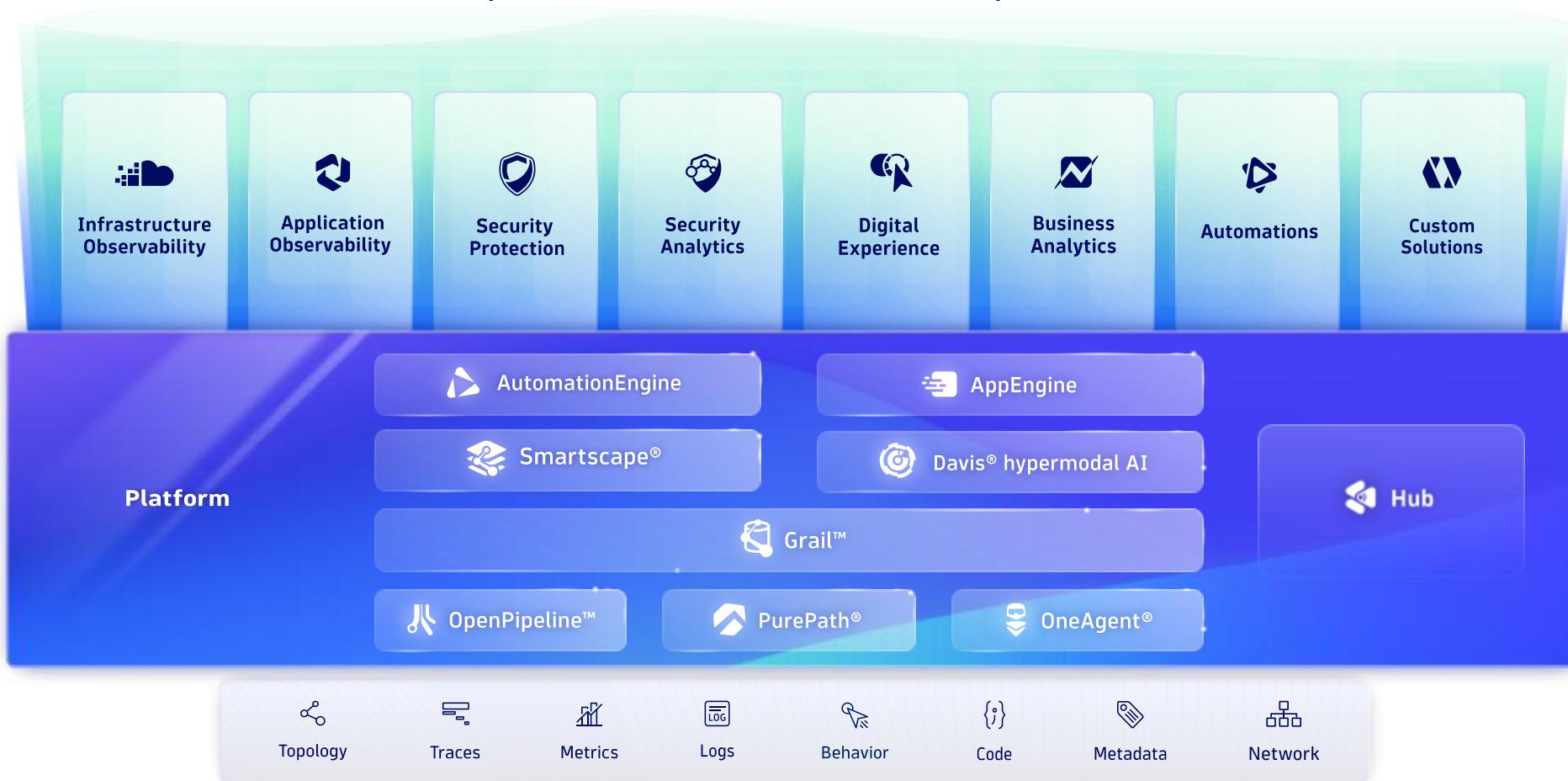
- Senior Privacy Engineer and TechEvangelist at Dynatrace
- 🏔️-obsessed Brit based in Innsbruck
- Outside of work: research and tech policy, trail running, hiking, skiing...
- Previously: hacking CPUs at TU Graz



# About Dynatrace



Analytics and Automation for Unified Observability at CLOUD DONE RIGHT.

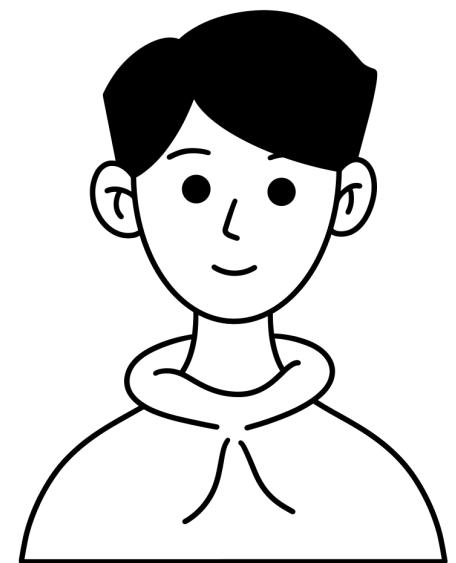
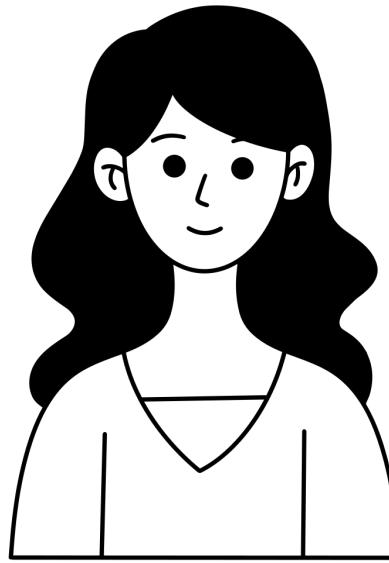
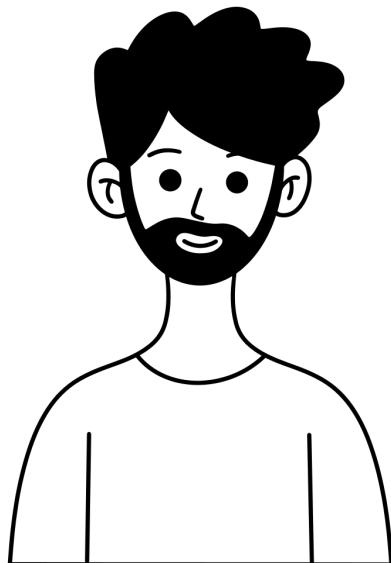


Privacy meets UX

# UX Practitioners' Engagement with Privacy

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[“Legal Trouble?: UX Practitioners’ Engagement with Law and Regulation” \(Gray et al., Companion Publication of the 2024 ACM Designing Interactive Systems Conference\)](#) interviewed 3 UX practitioners about their experiences

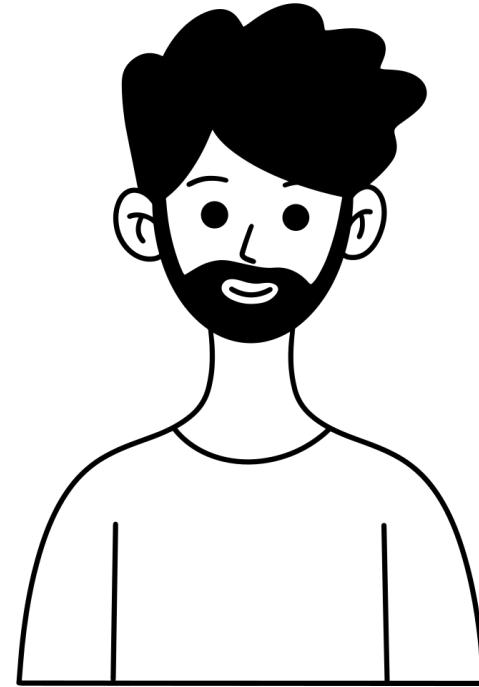


# UX Practitioners' Engagement with Privacy

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Jacob

- Tries to persuade developers not to use dark patterns because they're unethical
- Was unaware there are legal implications to using dark patterns
- Company doesn't have a legal team
- There aren't really "any protections" (like internal policies) in place to make sure they're compliant

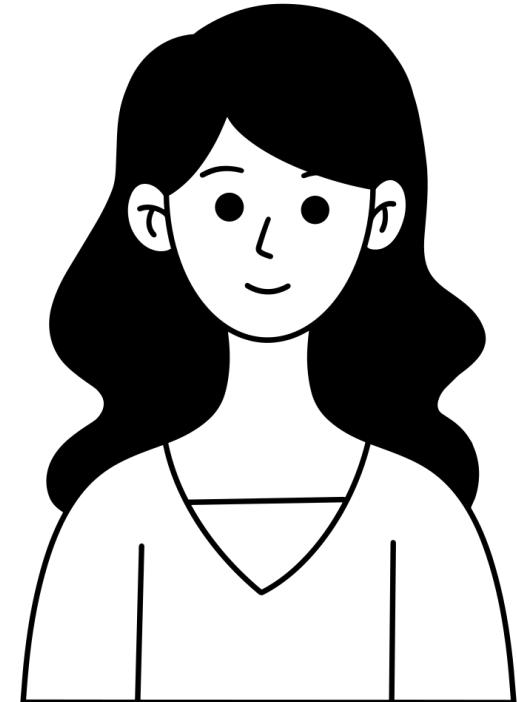


# UX Practitioners' Engagement with Privacy

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Amy

- Privacy is another team's responsibility: her responsibility is advocating for user-centered design
- Work is handed over to a central team for legal checks
- Sees privacy as “legal trouble” that it is important for the company to avoid

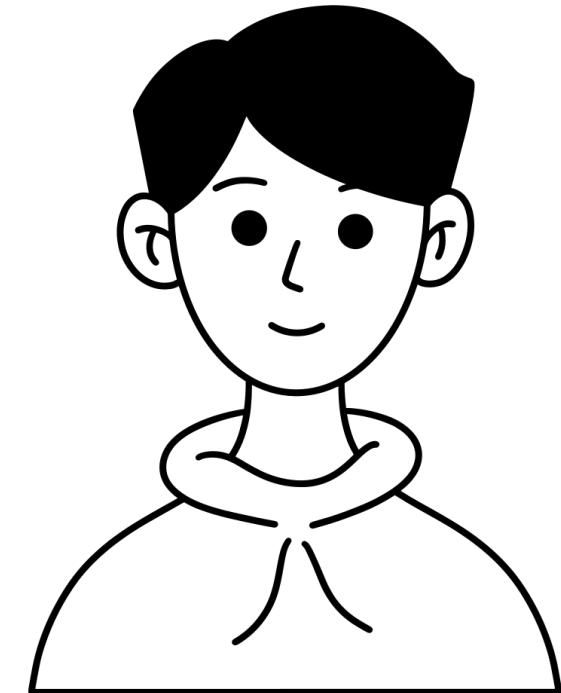


# UX Practitioners' Engagement with Privacy

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## Conrad

- GDPR is “important” but has added friction to his design workflow
  - To avoid liability, his company now outsources user testing to an external agency
- Would like to have access to a legal expert for advice
- Wary of talking to his company’s legal team as “they are not on our side” and try to block everything

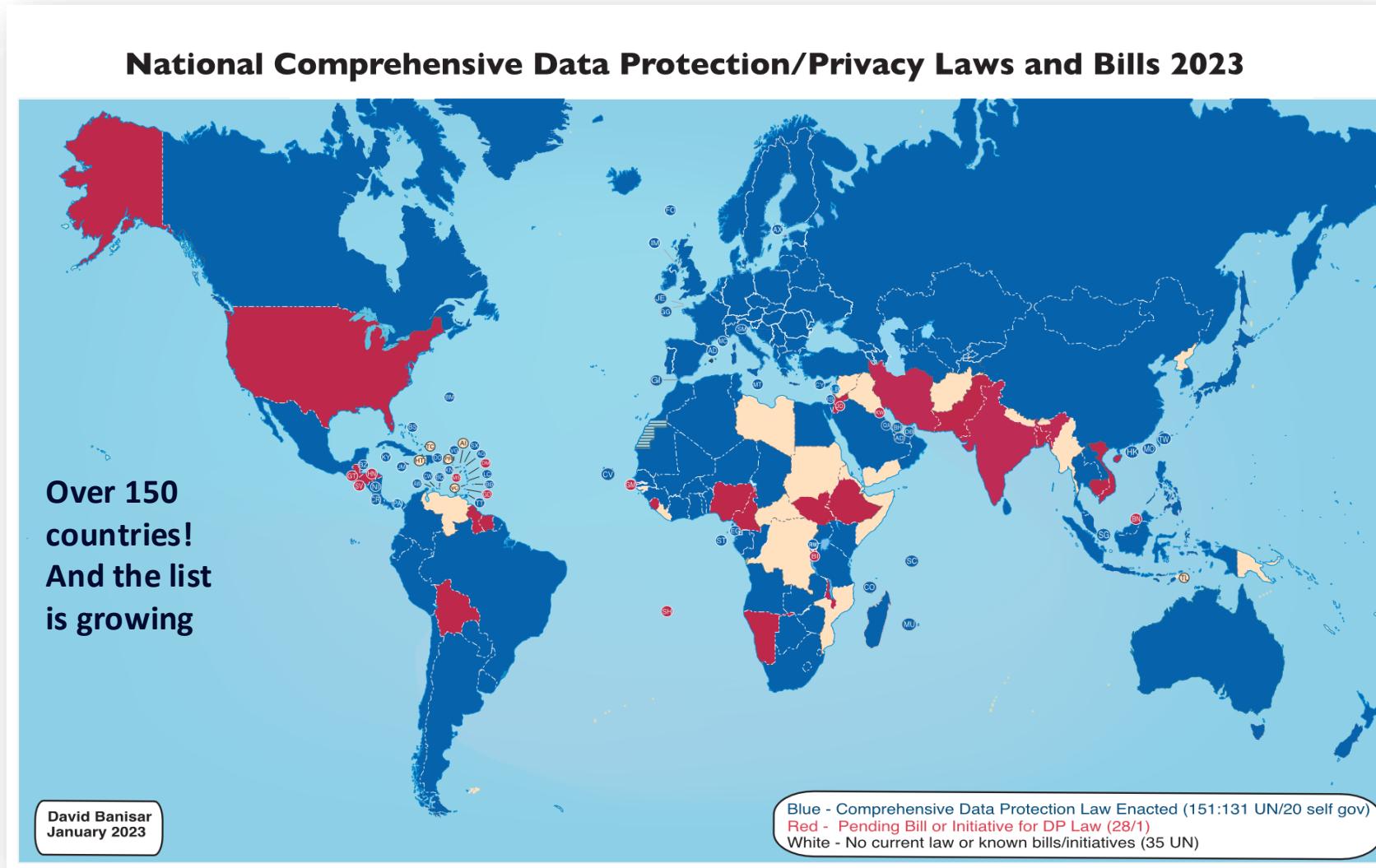


What does privacy mean to you? What contact have you had with it in your UX work?

# Intro to Privacy

# What Does Privacy Mean?

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# What Does Privacy Mean?

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- Right to know, access, export
- Right to update (rectify)
- Right to delete (“be forgotten”)
- Right to data portability
- Plus more...
  - Right to restriction of processing
  - Right not to be subject to automated decision-making, incl. profiling (GDPR)
  - Right to opt out of sensitive data processing (CPRA)

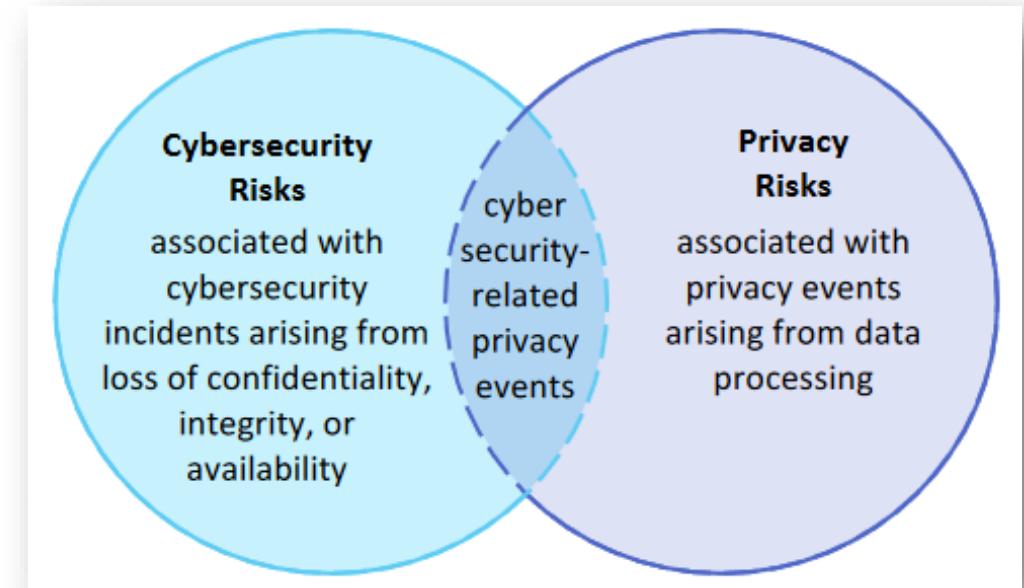


# What Does Privacy Mean?

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## Privacy OWASP Top 10

1. Web Application Vulnerabilities
2. Operator-sided Data Leakage
3. Insufficient Data Breach Response
4. **Consent on Everything**
5. Non-transparent Policies, Terms and Conditions
6. Insufficient Deletion of User Data
7. Insufficient Data Quality
8. Missing or Insufficient Session Expiration
9. Inability of Users to Access and Modify Data
10. Collection of Data Not Required for the User-Consented Purpose



# What Does Privacy Mean?

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*Image: Gatha Varma*

# What Does Privacy Mean?

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- Privacy isn't about hiding everything!
- Society runs on information flows, but these flows should be *context-appropriate*
- Know your users and their context(s)
  - Which information is it normal to share in this context? In this culture?
  - What do they care about? What are they afraid of?
  - How technically literate are they? Do they understand your product?



# Privacy Threat Modeling

# What is Threat Modeling?

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Anyone can threat model!

It's about answering:

- **What could go wrong?**
- **What are we going to do about it?**
  - Risk = likelihood x impact
  - Cost of mitigation

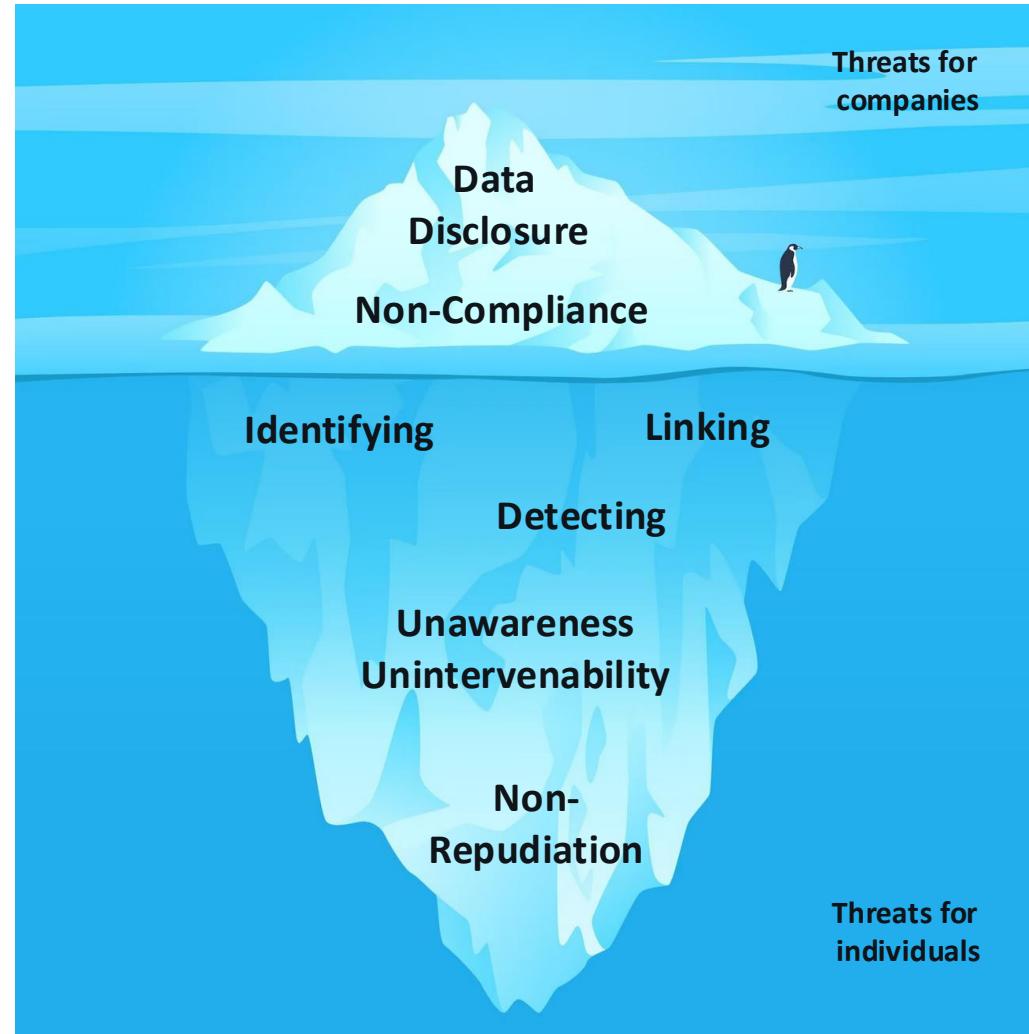
Good starting points:

- [The Threat Modeling Manifesto](#)
- [A Guide to Threat Modeling for Developers](#)



# Privacy Threat Modeling: LINDDUN

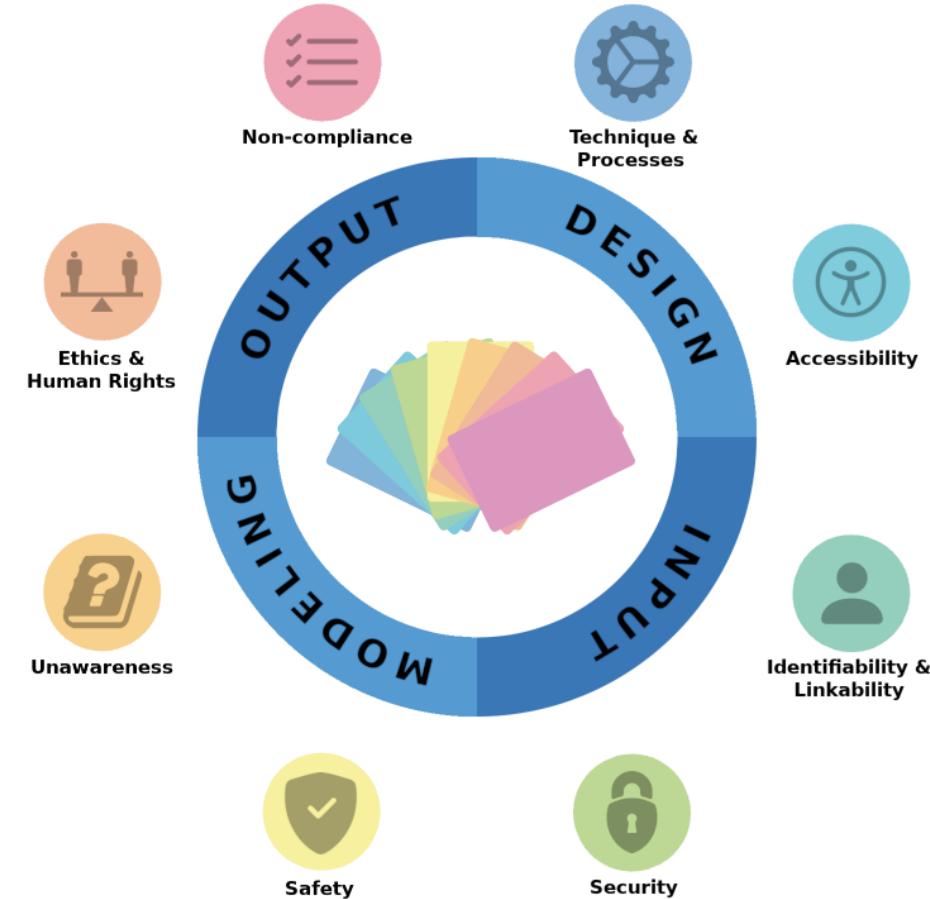
[LINDDUN](#)



- **Linking:** connecting the dots
- **Identifying:** who's who?
- **Non-repudiation:** I know what you did
- **Detecting:** I don't need to read the data to know you're in there
- **Data disclosure**
  - Not identical to a breach of confidentiality!
  - Includes collecting unnecessary or excessive data, sharing the data too widely, retaining it for too long...
- **Unawareness & unintervenability:** I had no idea you were doing that and now you won't stop
- **Non-compliance:** that'll be \$5 billion please, Facebook

# Privacy Threat Modeling: Plot4AI

- Library of 86 threats relating to AI and ML across 8 categories
- Examples:
  - Are we protected from membership inference attacks?
  - Could the AI system become persuasive, causing harm to the user?
  - Could the AI system limit the right to be heard?
  - Will our AI system make automatic decisions without human intervention?
  - Will any of our users be children?



[Plot4AI](#)

# Linkability -> Identifiability -> Non-Repudiation

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Hannah Al-Othman  
@HannahAlOthman



CPS providing significantly more detail on this case at court — it is understood that the woman had said she did not know how many weeks pregnant she was.

But police gathered evidence of web searches and messages, which dispute this.

A 41-year-old woman is facing felony charges in Nebraska for allegedly helping her teenage daughter illegally abort a pregnancy, and the case highlights how law enforcement can make use of online communications in the post-*Roe v. Wade* era.

But in mid-June, police also sent a warrant to Facebook requesting the Burgess' private messages. Authorities say those conversations showed the pregnancy had been aborted, not miscarried as the two had said.

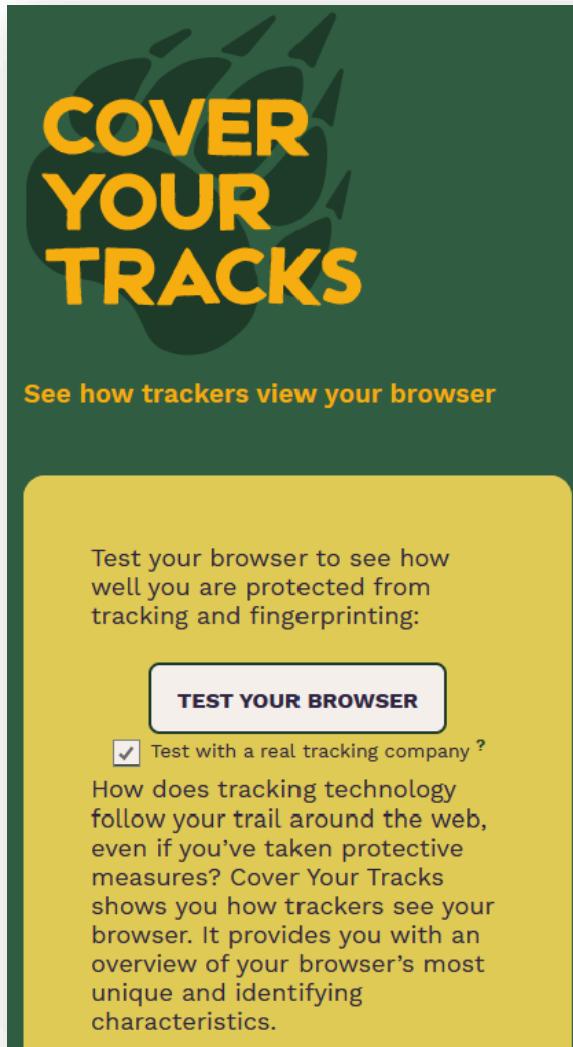
The messages appear to show Jessica Burgess coaching her daughter, who was 17 at the time, how to take the abortion pills.

"Ya the 1 pill stops the hormones an rhen u gotta wait 24 HR 2 take the other," read one of her messages.



# Linkability -> Identifiability -> Non-Repudiation

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# Privacy Harms

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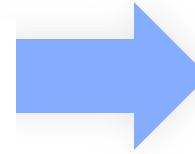
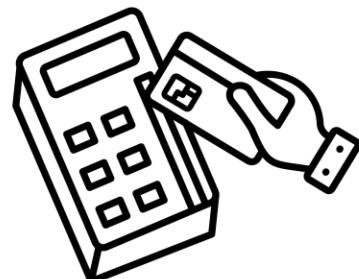
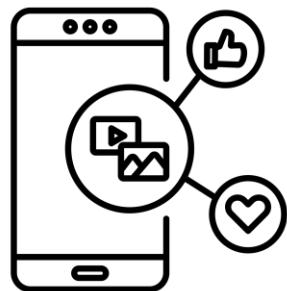


*Privacy Harms*, Citron & Solove, Boston University Law Review (2022)

# Privacy Harms: Manipulation

Neuroticism - Trapped Neuroticism - Stress Reactors Neuroticism - Self Lovers  
Neuroticism - Easily Deflated Neuroticism - Internal Escapists  
General Attitudes - I generally get a raw deal out of life Dealing with Stress - Hot and Cold  
Dealing with Stress - Emotional Dealing with Stress - Bottled Up

Clickagy > Health > **Addictions** > Alcohol



Skydeo > ConditionGraph > Disease Propensity by Type > **Depression Diagnosis**

already\_drug\_rehab (Grapeshot)

VisualDNA Lifestyle - Lifestyle - Health - Trying to cut down on **Alcohol**

Data provider: Nielsen Marketing Cloud



TransUnion - Demographics - Marital Status - Likely Recently **Divorced**

AlikeAudience: United States > Interest > Entertainment > Party And **Night Club** Enthusiasts

Eyeota - US Acxiom - CPG - **Alcoholic Drinks** - Vodka Brand - Grey Goose for age 21+ - Likely



# Dark Patterns

# Dark Patterns and Privacy

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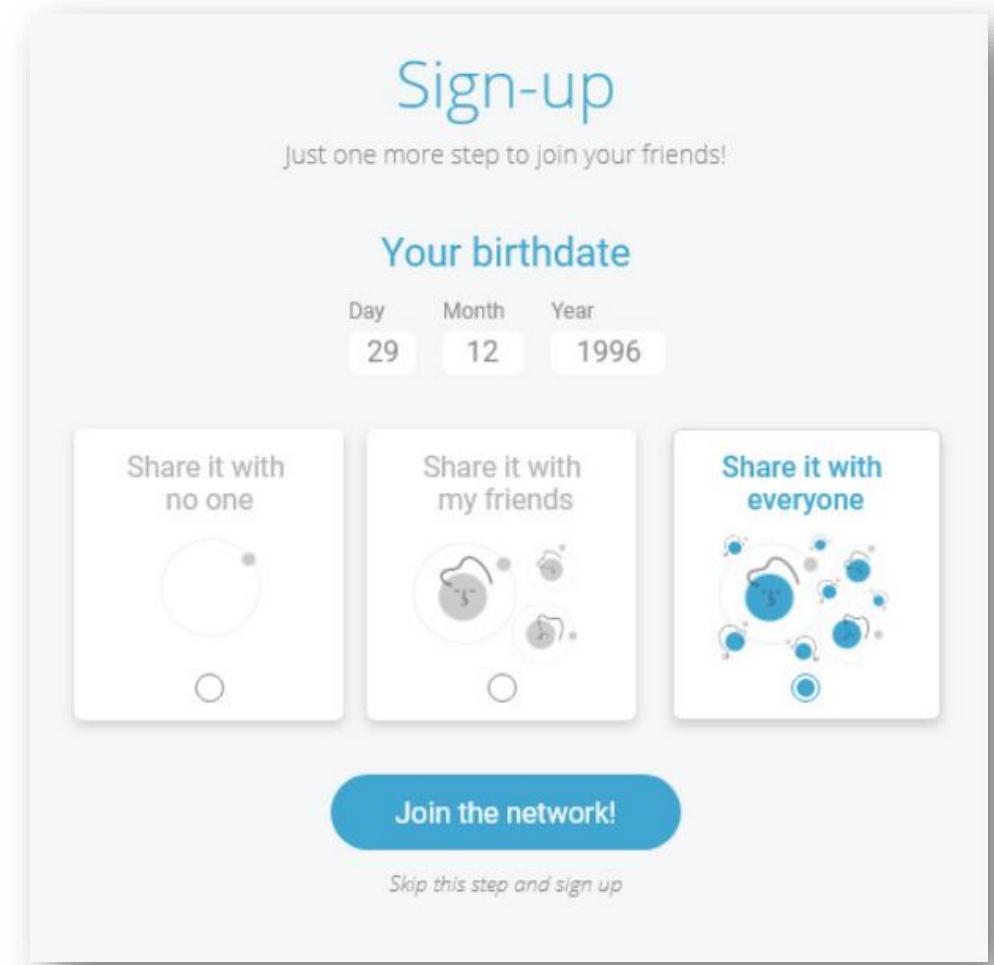
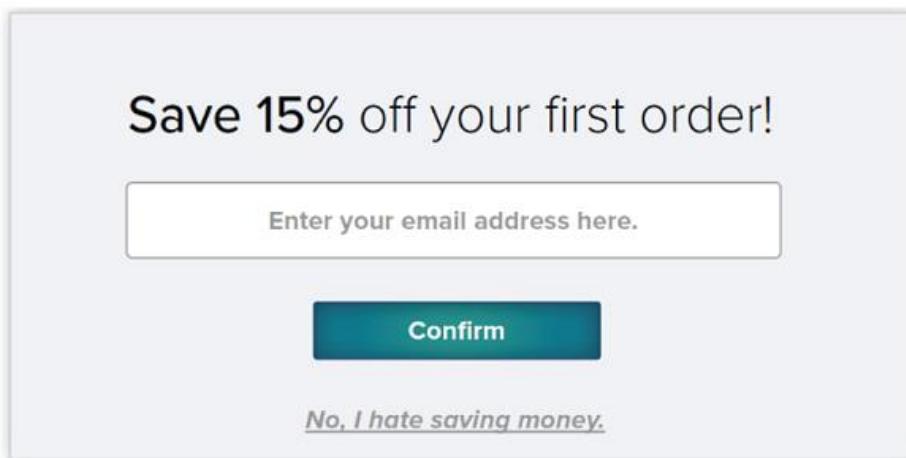
- Concept introduced in 2010 by UX professional Harry Brignull
- Just design patterns – but sinister ones! Deceive or manipulate users
- Violate the GDPR principles of fairness and transparency + Article 25 (data protection by design and default)
- Also relevant beyond the EU, see e.g.
  - [US FTC's report on dark patterns](#)
  - [Deceptive Patterns Hall of Shame](#), [Fair Patterns](#), and [Privacy Patterns](#)
  - India's ban list (more on this later!)



# Pattern 1: Stirring (influencing)

Influencing users' privacy choices by appealing to emotion or using visual nudges.

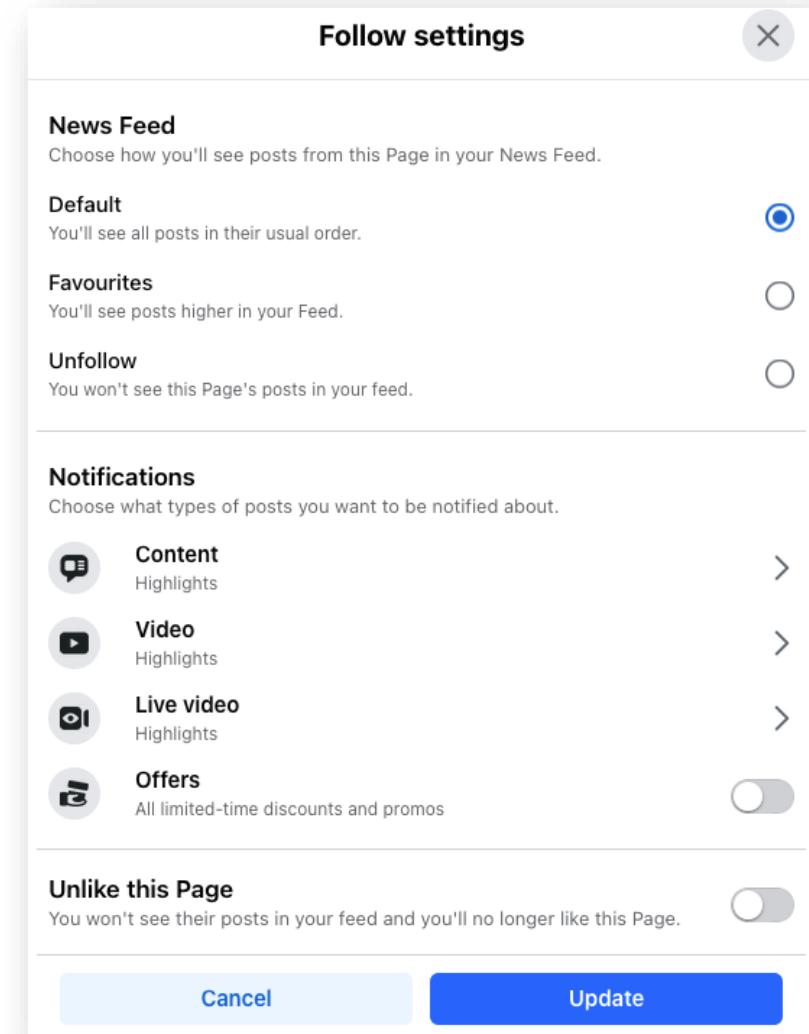
- Emotional steering
- Hidden in plain sight



## Pattern 2: Overloading

**Exhausting the user so that they give up trying to control how their personal data is used.**

- Continuous prompting
- Privacy maze
  - Labyrinth – “the Iliad flow”
- Too many options



# E-Commerce Case Study: Stirring + Overloading

**Choose your seat preference**

 Option 1: Sit where you want

 or  Option 2: Select seats later

**Our seat sections**

-  Extra legroom up front  
ROW 1
-  Get off quick  
ROWS 2-5
-  Best value up front  
ROWS 6-11
-  Stretch out for less  
ROWS 12-13
-  Best value at the back  
ROWS 14-30

 Our seats policy explained

 A B C D E F

**EXTRA LEGROOM UP FRONT - €21**

**GET OFF QUICK - €14**

**BEST VALUE UP FRONT - €10**

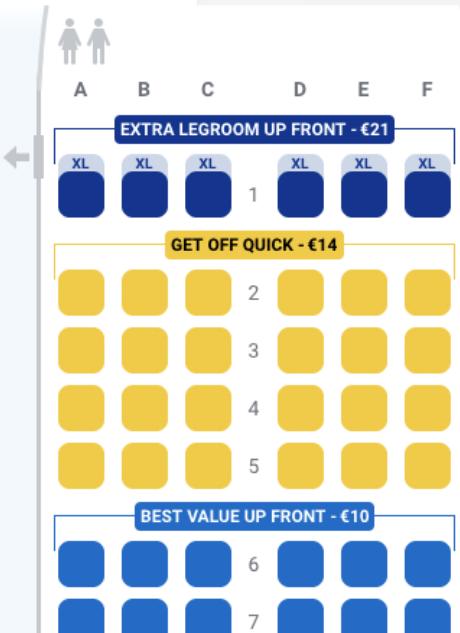
**Recommended**  **Select your own**

Our best value seats  
Check-in 60 days pre-departure

Zagreb to Brussels Charleroi  
Passengers

No window  
**11A** aa aa  
€8.00

Add recommended seats



# E-Commerce Case Study: Stirring + Overloading

**Choose your seat preference**

 Option 1: Sit where you want      **or**       Option 2: Select seats later

**Before continuing without a seat please be advised**

If you don't choose seats you will only be able to check-in 24 hours prior to departure where we will randomly allocate you a seat.

  
**Avoid middle seat**  
Most of our passengers choose their seat so we have less window and aisle seats to allocate at check in.

  
**Seat availability**  
The longer you wait the less likely you'll get the seat that you want.

  
**Best price now**  
Our cheapest seats are most likely to sell out quickly. Select seats now to avail of the best price.

**Select seats now**      **Continue without a seat**

# E-Commerce Case Study: Stirring + Overloading

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You have chosen random seat allocation

This means:

- ⌚ You can only check in 24hrs before each flight
- ⓘ You may be seated anywhere in the aircraft
- ⌂ You may be allocated a middle seat

[Select seats now](#)

[Continue with random allocation](#)

## Pattern 3: Skipping

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**Trying to make the user forget or overlook the privacy implications of an action.**

- Privacy-invasive settings enabled by default
- Distraction tactics: “Look! A free trial!”

Instead:

- Try to build trust with the user and be transparent with them -->



## Pattern 4: Obstructing

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**Making it difficult or impossible to get information about or manage your personal data.**

- Dead end
  - Broken or missing link
  - Privacy options are scattered across different menus
- Longer than necessary
  - Extra wait if you click ‘Reject all cookies’
- Misleading action

⚠ We cannot update your preferences because they are available only to residents covered by applicable state law. Please review/update your profile address information, revisit this page, and retry your submission.

### Your Privacy Rights

Hello inelligible,

If you live outside of the U.S., please visit the [Individual Rights Portal](#) for information about how to exercise your Individual Rights.

## Pattern 5: Fickle

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**Using an inconsistent UI to make it hard for users to understand what's happening with their data.**

- Lacking hierarchy
- Decontextualizing
- Inconsistent interface
- Language discontinuity

Examples:

- Privacy policy is a confusing mess and only available in English
- Privacy settings are in different places on desktop vs. mobile, or keep being moved around

Below are translations of this document into other languages. In the event of any conflict, uncertainty, or apparent inconsistency between any of those versions and the English version, this English version is the controlling version.

## Pattern 6: Left in the Dark

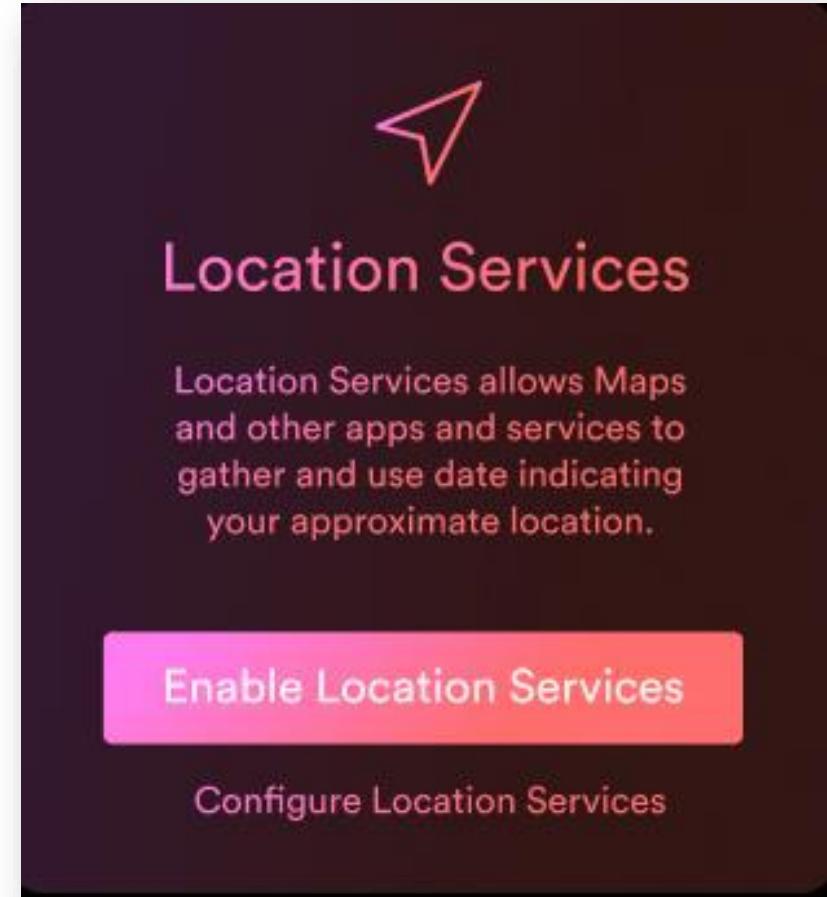
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**Hiding privacy information and controls or presenting them in a misleading way.**

- Conflicting information
- Ambiguous wording or information

Avoid by:

- Improving learnability of the UI
- Just-in-time presentation of documentation
- Minimize the number of concepts you assume your users understand



# Case Study: Left in the Dark

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**Harry, want us to show you ads that are more relevant by using your activity from ad partners?**

You can choose if we use [activity information](#) from your visits to ad partners' apps, websites and shops to improve your ads.

- You can change this setting at any time in Ad preferences.
- We always use strict security standards to keep your information safe.
- This setting also applies to ads on other apps and websites that use our [advertising services](#).
- We also use [other information](#) from ad partners, which isn't controlled by this setting.

Some information may be anonymised and used to improve our products, as described in our [Privacy Policy](#), regardless of your choice.

[Don't use this activity](#)    [Use this activity](#)

Where have you seen dark patterns in action?

# India's Ban List

# India's Banned Dark Patterns

False Urgency  
*Stirring*

Confirm Shaming  
*Stirring*

Interface Interference  
*Stirring*

Forced Action  
*Obstructing*

Bait and Switch  
*Fickle*

Disguised Ads  
*Fickle*

# India's Banned Dark Patterns

Nagging

*Overloading*

Trick Question

*Left in the dark*

Subscription Traps

*Billing-specific*

Drip Pricing

*Billing-specific*

Basket Sneaking

*Billing-specific*

Rogue Malware

*Hopefully not relevant for our work!*

# Case Study: Trick Question

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EMAIL TYPE	OPT OUT
Recommendations Trendy or popular features, templates, and other creative contents.	<input type="checkbox"/> NO <input checked="" type="checkbox"/> YES
Product Updates News about new features, product updates or changes, etc.	<input type="checkbox"/> NO <input checked="" type="checkbox"/> YES
Marketing News about promotions, events, and other campaigns.	<input type="checkbox"/> NO <input checked="" type="checkbox"/> YES
<a href="#">Save Preferences</a>	

# E-Commerce Case Study: Adobe's Subscription Trap

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Your free trial includes full versions of Adobe apps.

Individuals   Business   Students & Teachers



**Creative Cloud All Apps Plan**

Get 20+ Creative Cloud apps including Photoshop, Illustrator, InDesign, Premiere Pro and Acrobat Pro.

**Plus:**

- Step-by-step tutorials
- 100 GB of cloud storage
- Adobe Portfolio and Adobe Fonts

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7 days free, then  
£49.94 /mo

[Start free trial](#)

# E-Commerce Case Study: Adobe's Subscription Trap

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## Subscription and cancellation terms

Your eligibility to use an Adobe free trial offer is determined solely by Adobe. Your access to any free trial offer is provided at Adobe's sole discretion.

### Subscription Terms:

Your subscription begins as soon as your initial payment is processed. Your subscription will automatically renew annually without notice until you cancel. You authorize us to store your payment method(s) and to automatically charge your payment method(s) every month until you cancel. We will automatically charge you the then-current rate for your plan, plus applicable taxes (such as VAT or GST if the rate does not include it), every month of your annual contract until you cancel.

### Cancellation Terms:

You can cancel your subscription anytime via your [Adobe Account](#) page or by contacting [Customer Support\\*](#). If you cancel within 14 days of your initial order, you'll be fully refunded. Should you cancel after 14 days, you'll be charged a lump sum amount of 50% of your remaining contract obligation and your service will continue until the end of that month's billing period.

\* Specific countries require cancellations to be made only by contacting [Customer Support](#). See the list of countries [here](#).

[Close](#)

# E-Commerce Case Study: Adobe's Subscription Trap

scott belsky ✅  
@scottbelsky

hey Gergely, after the original thread a year or so ago, team made a clearer way to show pricing options to give ppl/teams who buy an annual sub a discount w/o paying it all up front (screenshots below I just took myself). when did you last try this? I do want to understand & share the feedback with the right folks. thx

The screenshot shows the Adobe Creative Cloud website interface. On the left, there's a sidebar with '17 items in All' and a 'Filters' button. Below that is a card for 'Creative Cloud All Apps' at 'US\$54.99/mo'. To the right, there are three main pricing options:

- US\$82.49/mo**: 'Cancel anytime, no fee.' This plan is highlighted with a blue border.
- US\$54.99/mo**: 'Annual, paid monthly'. A note says 'Fee applies if you cancel after 14 days.'
- US\$54.99/mo**: 'Annual, prepaid'. A note says 'No refund if you cancel after 14 days.'

At the bottom of the card, there are links for 'See plan & pricing details', 'Add a 30-day free trial of Adobe Stock.\*', and 'Buy now'.

4:19 PM · May 24, 2023 · 48.9K Views



Cookies from the Dark Side

# Cookies from the Dark Side

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**Store and/or access information on a device** ▼

**Personalised ads and content, ad and content measurement, audience insights and product development** ▼

**Actively scan device characteristics for identification** ▼

If you're okay with these purposes, click 'Fine By Me!' below; this will allow us to personalise your website experience. For more information or to change your cookie settings, click 'Cookie Settings'. You can withdraw your consent at any time by visiting Cookie Settings in the footer. To learn more, read our [Privacy and Cookie Policy](#).

[Cookie Settings](#) Fine By Me!

# Cookies from the Dark Side

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Više o našim Politikama zaštite privatnosti te Politikama kolačića možete pročitati ovdje: [Politika zaštite privatnosti](#), [Politika kolačića](#). Korištenje kolačića može dovesti do prijenosa podataka u zemlje izvan područja EU. Za prijenos podataka u određenim slučajevima potreban nam je vaš pristanak.

Uz vaš pristanak, mi i [naš 846 partneri](#) koristimo kolačice ili slične tehnologije za pohranu, pristup i obradu osobnih podataka kao što su Vaša posjeta ovoj web stranici, IP adrese i identifikatori kolačića. Neki partneri ne traže Vaš pristanak za obradu Vaših podataka i oslanjaju se na svoj legitimni poslovni interes. Možete povući svoj pristanak ili se usprotiviti obradi podataka na temelju legitimnog interesa u bilo kojem trenutku klikom na "Saznajte više" ili u našoj Pravilima o privatnosti na ovoj web stranici.

Mi i naši partneri obrađujemo podatke kako slijedi:  
Personalizirano oglašavanje i sadržaj, mjerjenje oglašavanja i sadržaja, uvidi u publiku i razvoj usluga, Pohrana i/ili pristup podacima na uređaju, Precizni geolokacijski podaci i identifikacija putem skeniranja uređaja, Prijenos podataka

[Saznaj više](#) [Prihvati i zatvor](#)

# Cookies from the Dark Side

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Preferences

Only necessary

Accept all



# Cookies from the Dark Side

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I AGREE

EXIT SITE

By continuing to use this site you consent to the use of cookies on your device as described in our [Cookie Policy](#)

What are the worst cookie dialogs you've seen? How do they compare to other cases of dark patterns?

# Inclusive Privacy

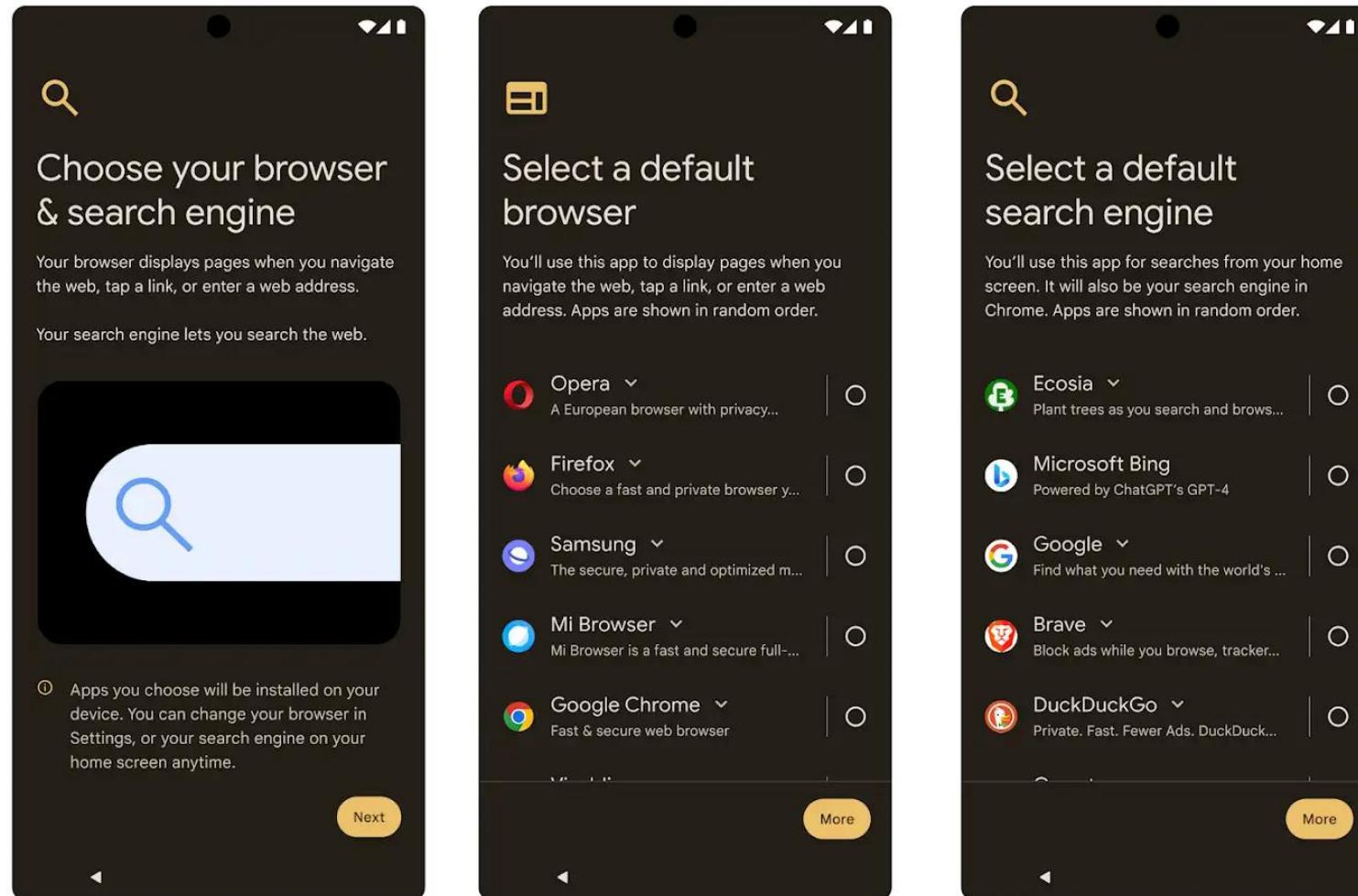
# Users Have Different Privacy Needs

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- Not only are their threat models different...
- But also their awareness and understanding of privacy
- And their understanding of tech in general!
  - “*What’s a browser?*”
  - “*What’s end-to-end encryption?*”
- Many users don’t understand what they’re consenting to or the choices they’re being asked to make

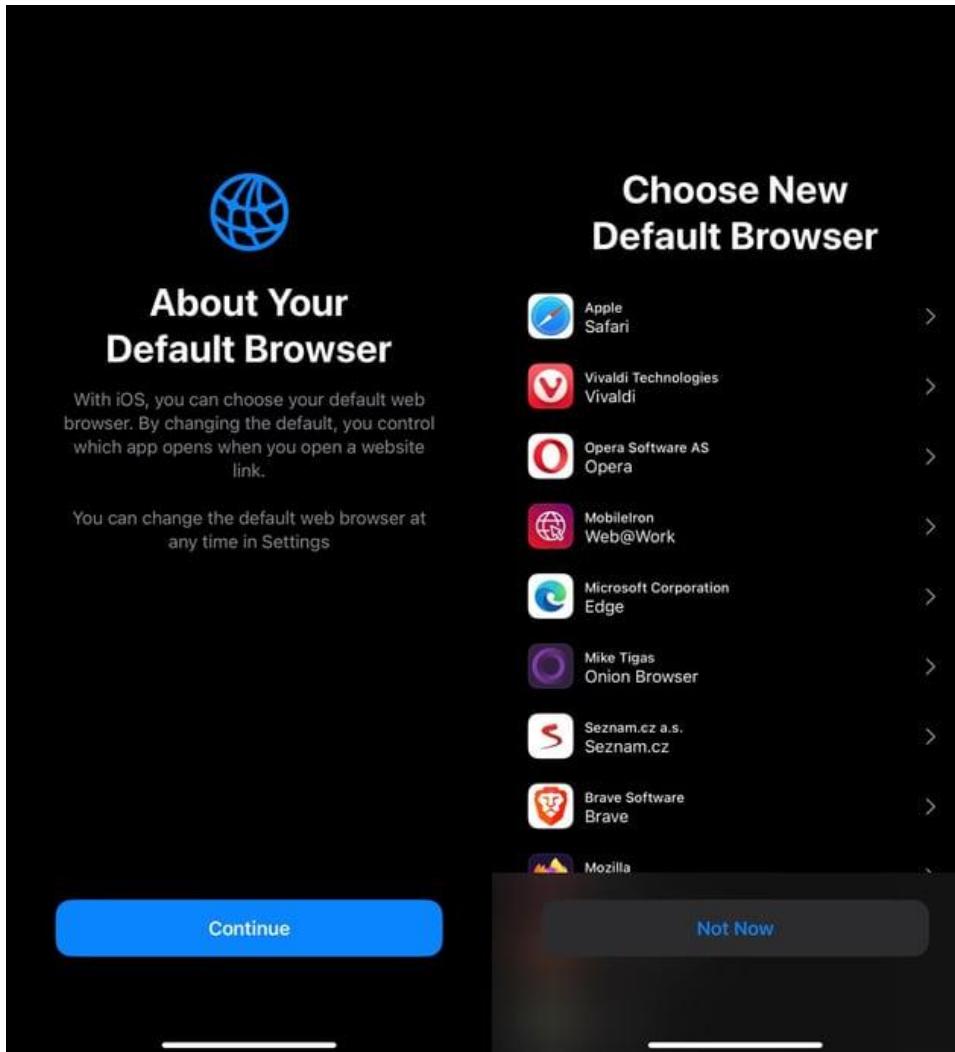


# “Free Choice” of Browser and Search Engine: Android



# “Free Choice” of Browser: iOS

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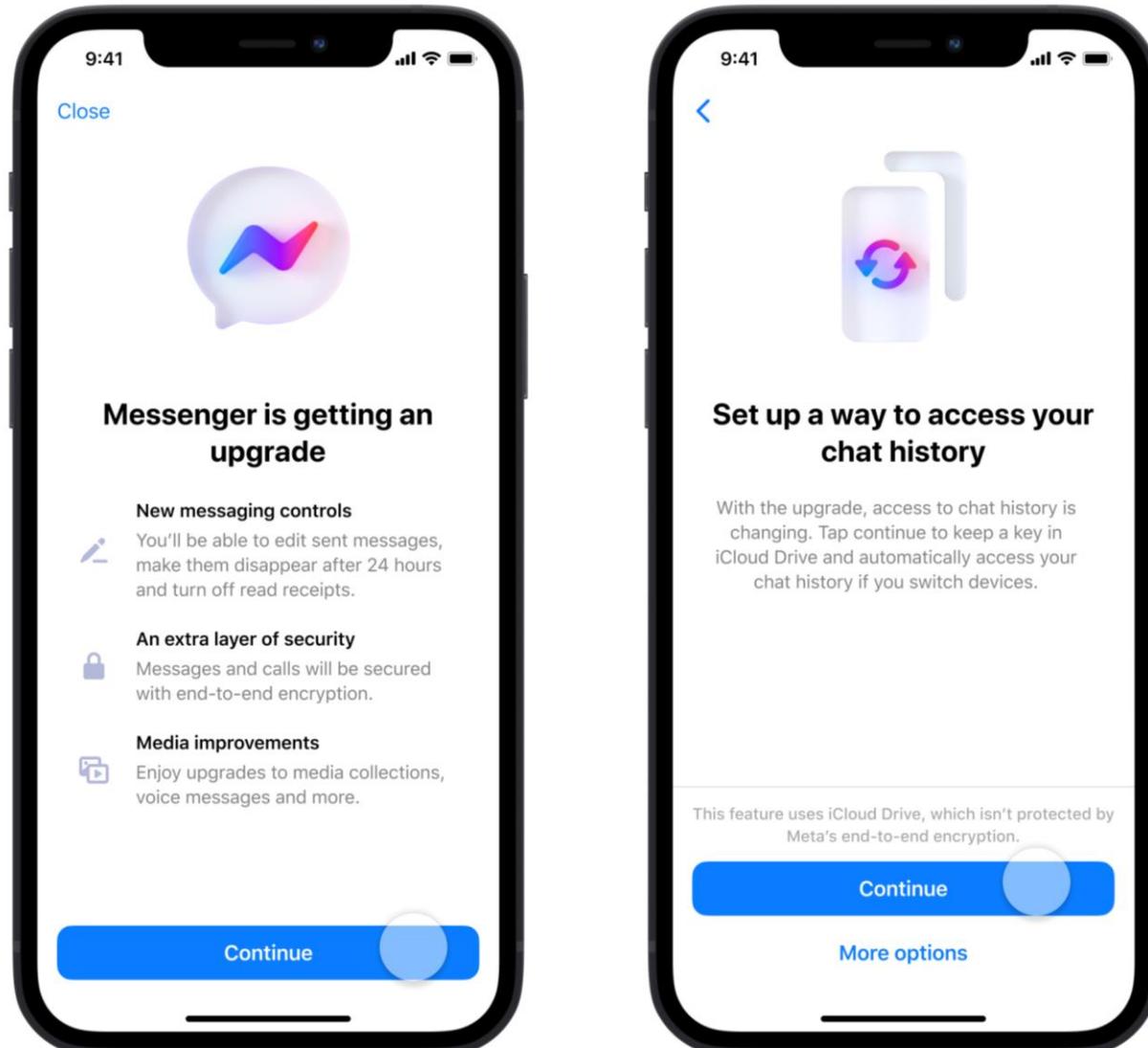


## “Free Choice” of Browser: The Reality

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We asked people what they think happens after they choose a default browser. **Only about half (52%) of people understand that their default browser is opened when they, for example, click on a link in an email or document.**<sup>60</sup> This share did not significantly vary across treatment groups, which is surprising as the Q&A screen (displayed to T2-4) explicitly states this is what happens when they select a default browser. Moreover, 6% of people incorrectly believe that they are *only* able to use their default browser (i.e., that all other browsers would be disabled). Even more significantly, **over half (53%) also erroneously believed that their default browser would automatically be pinned to their taskbar.** Previous research suggests this is a common misconception - and the impact of not being pinned to the taskbar, in terms of how this impacts people's usage of browsers, is an area where we consider further research could be undertaken.

# “Free Choice” on Facebook Messenger



# “Free Choice”: The Bundeskartellamt’s Opinion

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## II. Free and Informed Choice Options

4. Google undertakes to design the choice options to be offered to Users pursuant to para. 1 under these Commitments in a way that Users can provide consent in a freely given, specific, informed, and unambiguous manner.

5. Google commits in this regard in particular to design the choice options to be offered to Users pursuant to para. 1 for cross-service data processing in a transparent manner. This requires that Users are informed about the consent options in an intelligible and easily accessible form, using clear and plain language. This entails in particular:

- providing Users with concrete information on the choices to be offered to them with regard to cross-service data processing, including specific information on the circumstance, the purpose and the manner of the cross-service data processing, and - if this is the case - to what extent cross-service data processing also takes place without offering a consent option,
- setting up the choice options in a technical and/or visual manner to ensure that it is not too complex for Users to easily understand them, in particular when using multi-step consent processes,
- designing the choice options in a way that it is clear to the Users how the consent options relate to each other,
- phrasing the choice options objectively.

# “Free Choice”: The Bundeskartellamt’s Opinion

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6. Where Google asks Users for consent in line with para.1, Google will not make it easier for Users to give consent to cross-service data processing than not to give it. This includes in particular:

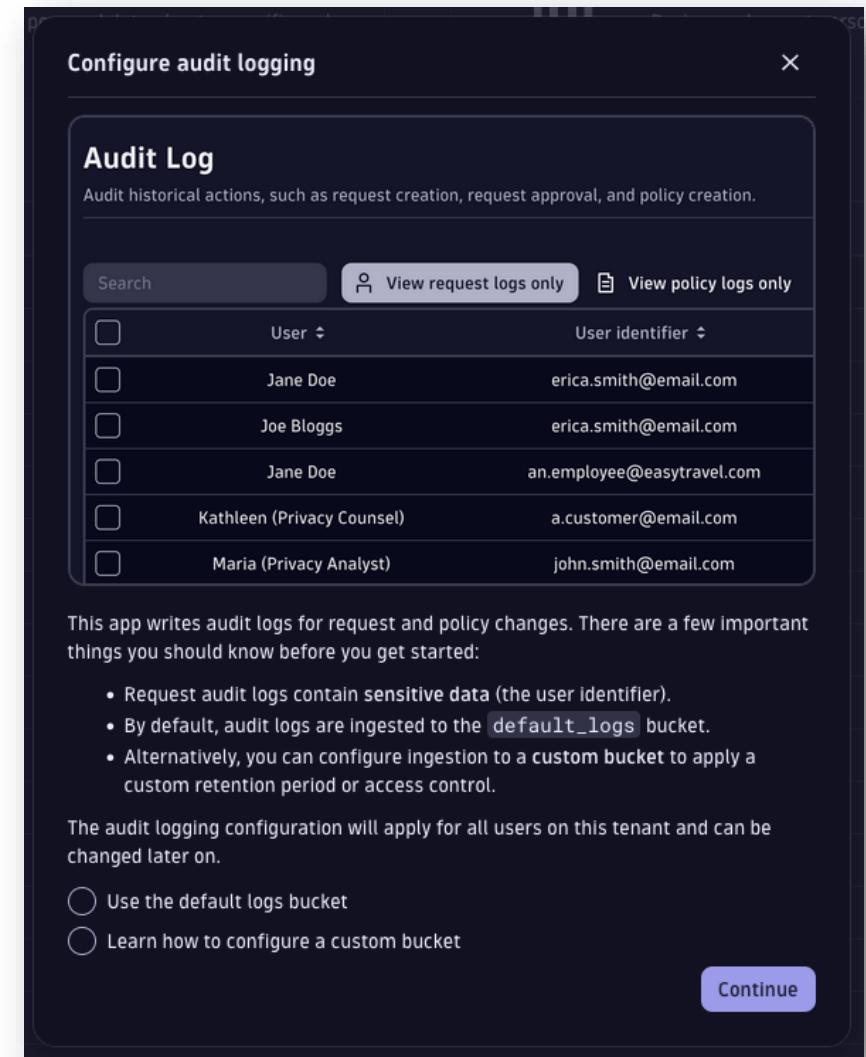
- a. Ensuring that visually, the option to reject cross-service data processing is presented at least equally to the option to consent, in particular in terms of colour, layout or font size;
- b. Ensuring that technically, the option to reject cross-service data processing is designed at least equally to the option to consent to cross-service data processing, in particular with a view to the number of clicks required;
- c. Ensuring that consent is not set as the default option; and
- d. Not offering a service at a lower quality to Users who decline to consent, unless the reduction in quality is a direct consequence of Google's inability to process Personal Data across services.

7. Google will provide Users a transparent, easily accessible and simple way to withdraw consent to cross-service data processing.

# Accessibility

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- Privacy choices should be accessible to all, including users with disabilities
- Readability: using clear and plain language helps everyone!
- Occasionally conflicting requirements
  - E.g. WCAG 2.1 focus order: “*...a dialog opens and focus is set to the first interactive element in the dialog...*”
  - -> Influences the user’s choice



# Accessibility

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- Is your cookie dialog navigable using a screen reader?
  - Would a user even know it exists? (Consent!)
- 

## Screen readers and cookie consents

May 12, 2020 | @LDNWebPerf | ldnwebperf.org

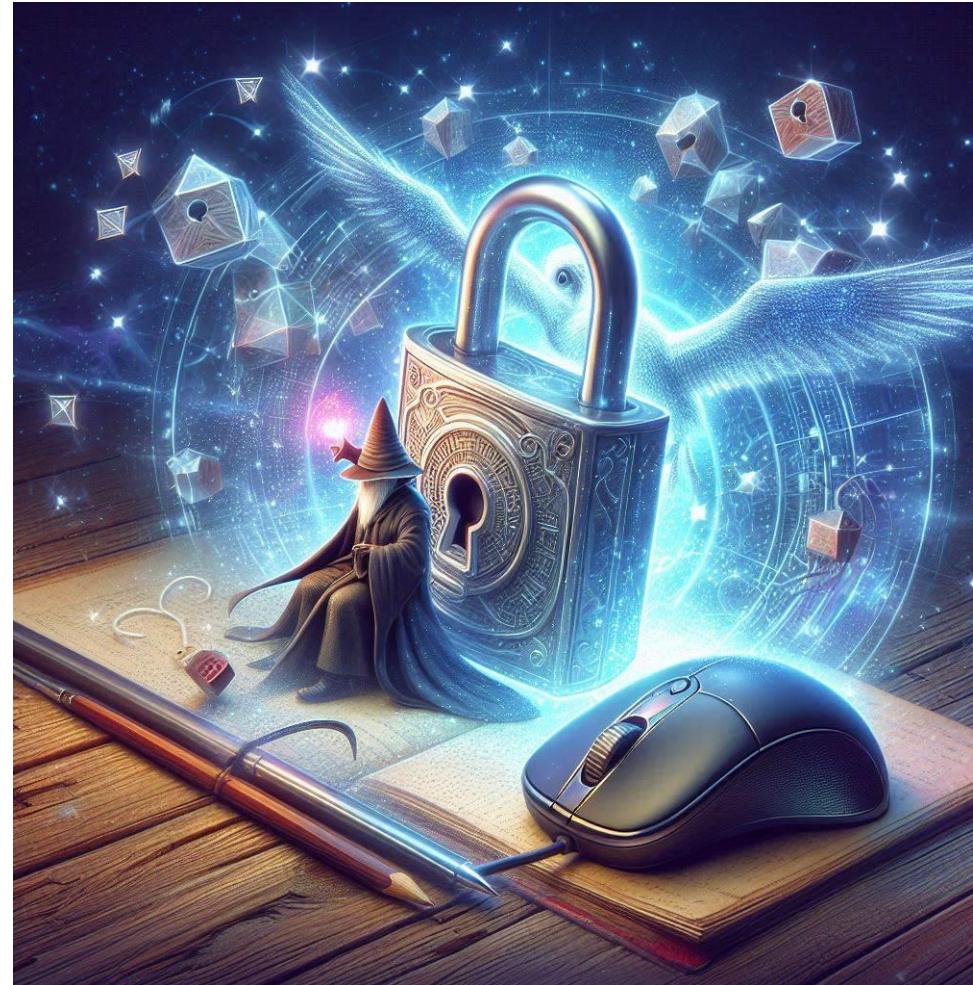


Léonie Watson  
@LeonieWatson



# Let's talk about your privacy challenges!

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# Bonus: Forrester's Five Privacy Personas

## Reckless Rebels

Very willing to share personal data. Most likely to share location data if they get something in return.

## Nervous Unawares

Unwilling to share personal data. Want to protect themselves online, but are unsure how to

## Conditional Consumerists

Use ad blockers, but are happy to share data if there's an incentive, like loyalty program perks



Sources: [1](#), [2](#)

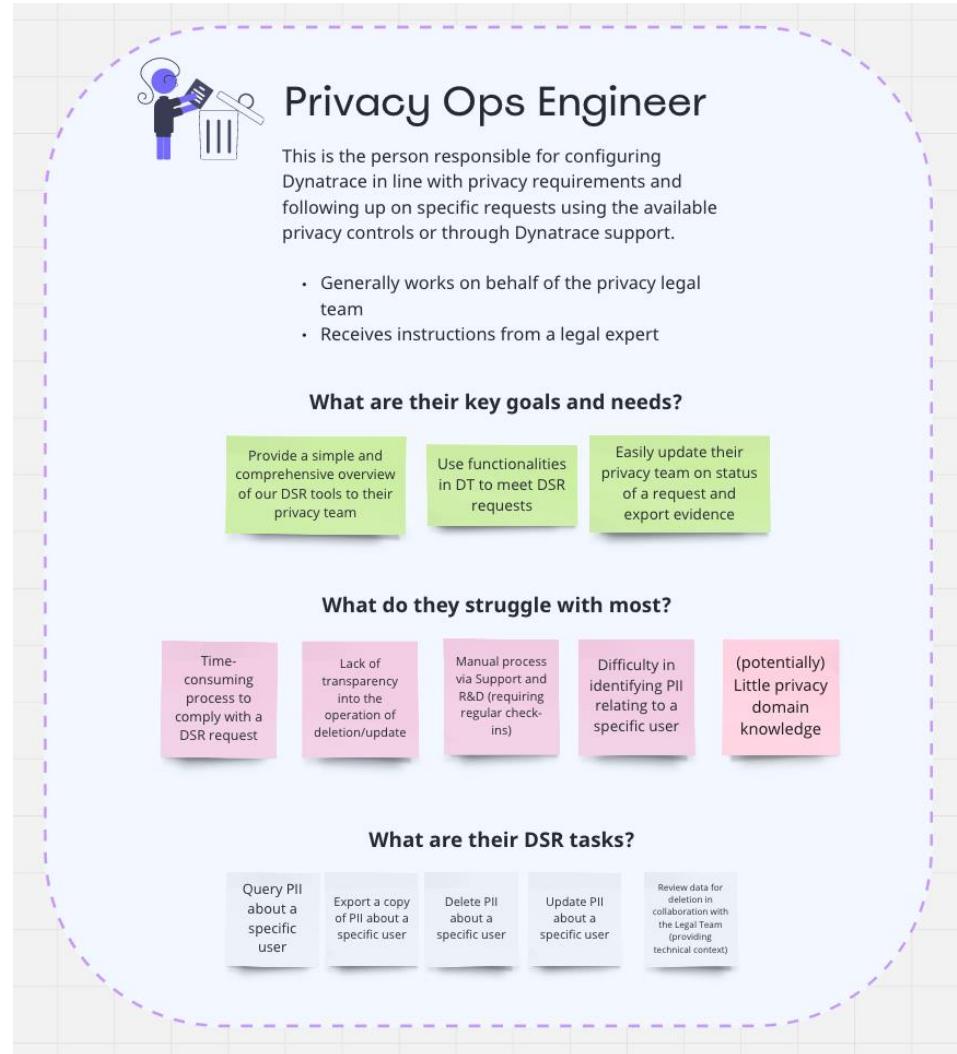
## Data-Savvy Digitals

Understand how their personal data is (ab)used online and share it only when they have to.

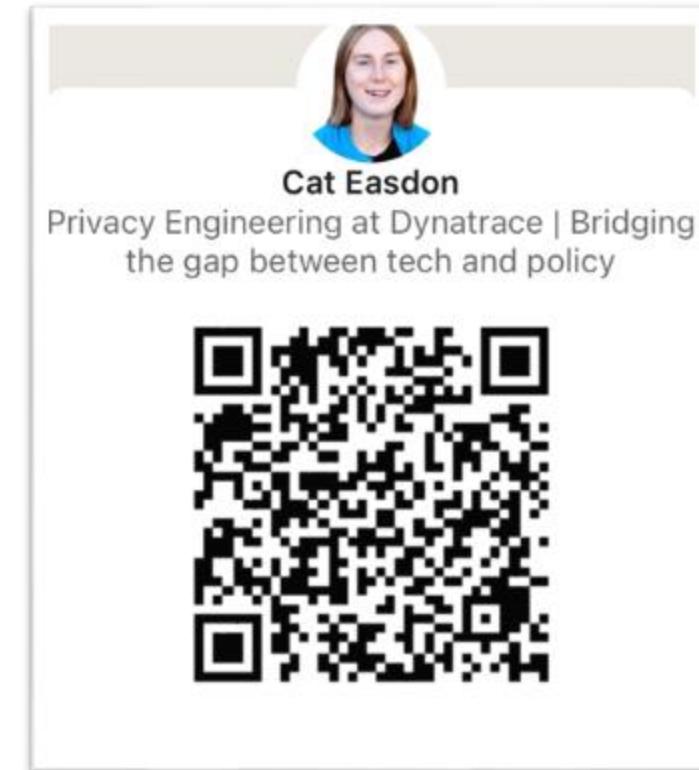
## Skeptical Protectionists

The oldest user segment; unwilling to share personal data and trust few companies.

# Bonus: The Privacy Ops Persona



# Thanks for listening!



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