Google

September 2025

Unpacking deceptive design

A more user-centric framework for assessing and categorizing dark patterns

Summary

At Google, our mission is to organize the world's information and make it universally accessible and useful.

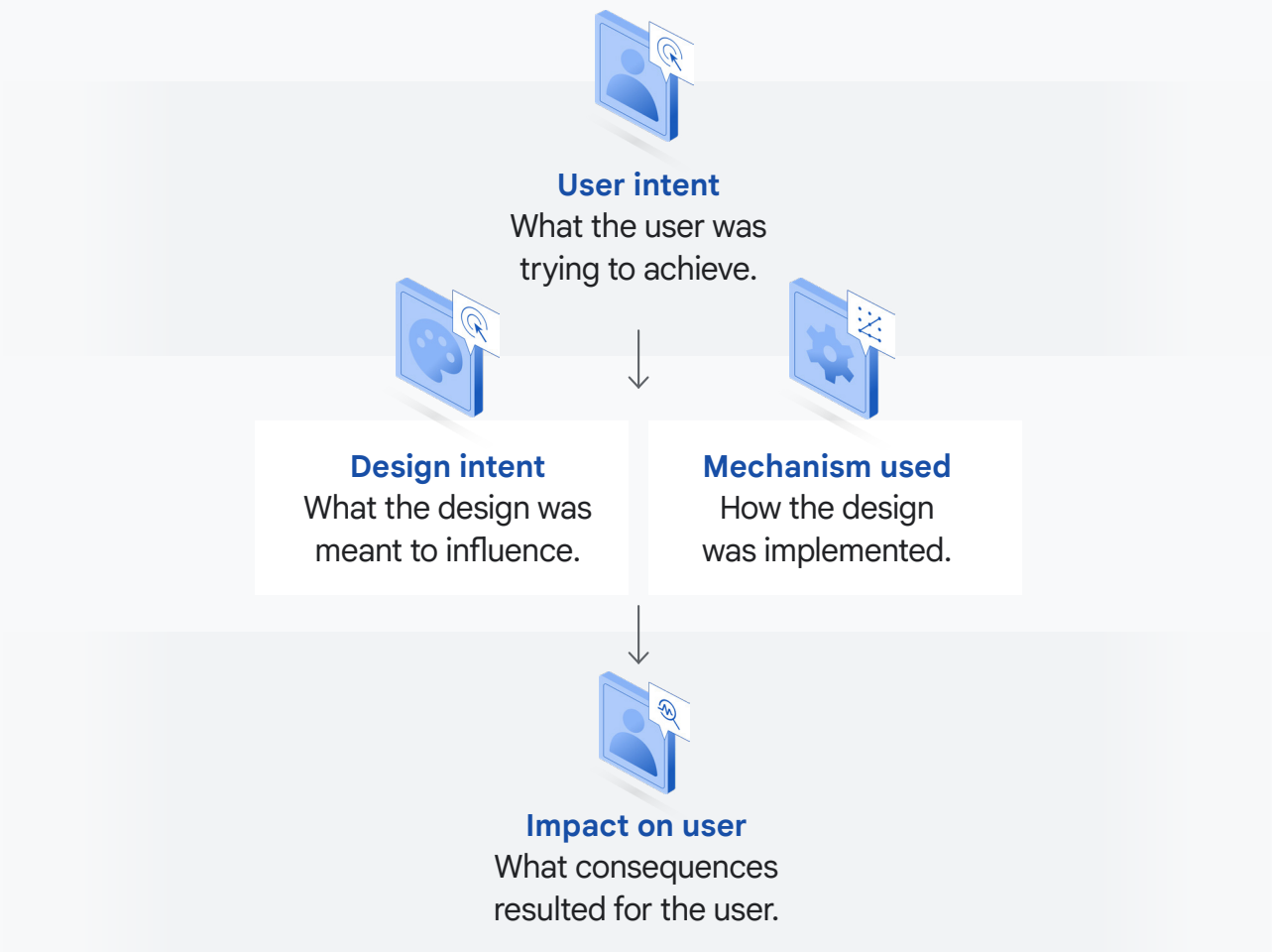
Delivering on that mission means helping people navigate the web safely, make informed choices, and access information they can trust. That's why we invest in original research to better understand the evolving ways users may be misled or manipulated online. One such challenge is the rise of dark patterns and the potential negative impact they can cause.

Dark patterns are design mechanisms used by companies to steer users towards outcomes they didn't intend, undermining their ability to make informed decisions online. This can include, for example, signing up for unwanted subscriptions, struggling to cancel a service, or spending money they weren't planning to spend.

Not surprisingly, dark patterns have drawn scrutiny from industry, academia, and regulators. While each of these groups tends to approach the issue differently, many existing frameworks for assessing dark patterns often fail to fully account for the user's perspective—a critical lens for understanding how users regard dark patterns and their relative impact. This whitepaper proposes a more user-centric taxonomy, grounded in original empirical research, for assessing practices that may constitute dark patterns.

To better understand user perceptions and experiences of dark patterns, Google conducted a survey across six European countries. Although most survey respondents were unfamiliar with the term "dark patterns", they had strong intuitions about their relative impact. The survey also revealed that the context in which dark patterns are experienced significantly impacts user perception. These findings underscore the importance of considering dark patterns through a more user-centric lens.

Our framework evaluates dark patterns based on four key factors:



By evaluating a design based on the interplay between the user's goal, the intent of the design, the mechanism used, and the impact on the user, this framework demonstrates that dark patterns vary significantly in severity. It introduces a more nuanced understanding of dark patterns as compared with existing frameworks, offering (i) a clearer way to assess risk and responsibility and (ii) a means of creating more trustworthy user experiences.

01
Introduction

Dark patterns and the digital environment

The online world has become a crucial part of modern life, enabling (among other things) human connection, access to information, and digital commerce. User interfaces (UIs) make these interactions possible, affecting both the quality and usefulness of the experience.

While many companies aim to create clear and user-friendly experiences, some deploy deceptive design mechanisms known as "dark patterns." These tactics are intended to exploit users' psychological vulnerabilities and cognitive biases, steering behavior in ways that benefit the company. In doing so, they can negatively impact users, sometimes compromising their online experiences and financial well-being.

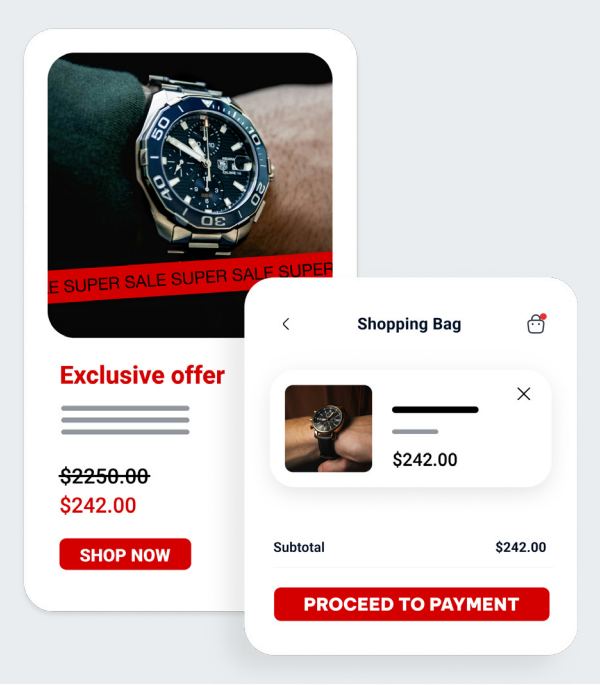
Dark patterns pose a growing risk to the broader digital ecosystem and, as they proliferate, they are drawing increased scrutiny from industry, academia, and regulators. Consumer protection authorities, in particular, have identified these practices—including, for example, opaque switching procedures[1]—as direct threats to consumer choice and digital fairness.

This whitepaper builds on both new and existing research to propose a more user-centric taxonomy for categorizing and assessing dark patterns—one that recognizes their different levels of impact on users. While not a silver bullet, it is intended to support ongoing work of designers and product teams, in particular, in assessing and improving digital design practices.

What are dark patterns?

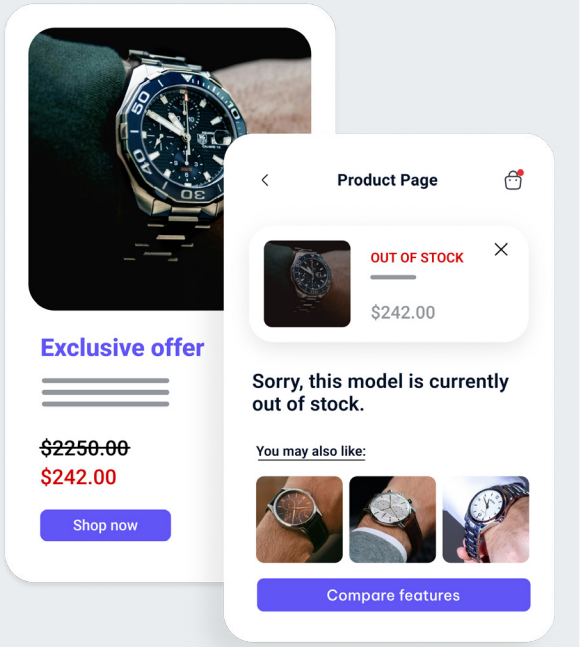
The term "dark patterns" was first coined in 2010 by UX designer Harry Brignull, who described the term in a recent speech to the US Federal Trade Commission as "a manipulative or deceptive trick in software that gets users to complete an action that they would not otherwise have done, if they had understood it or had a choice at the time."[2] Other research has refined and extended this definition to cover mechanisms like overt coercion and subversion of autonomy, or the deliberate exploitation of user psychology as features.[3] Fundamentally, dark patterns represent a subversion of the user's intended choice, including replacing their own goal with another goal, often without the user's meaningful consent. Contrast this with regular design mechanisms, which aim to help users achieve their intended goals.

Example 1



Dark pattern

A company issues an advertisement for a popular, high-end product at a drastically low price. The user's goal is to purchase that specific model. However, when they click the advertisement and add the item to their cart, the website automatically swaps it for a similar-looking but lower-specification model. The user, focused on the attractive price, may not notice the switch before completing the purchase. The user's stated goal (buying the advertised high-end product) is subverted and replaced with the company's goal (selling excess inventory of a less desirable product).



Regular design

A company issues an advertisement for a popular, high-end product at a drastically low price. The user's goal is to purchase that specific model. When they click the ad, they are taken to a transparent product page. If the advertised model is out of stock, the page clearly states this and offers helpful, clearly labeled alternatives. For instance, "While the High-End Model is currently out of stock, the Lower-Specification Model is available now. Click here to compare features." The design respects the user's original goal and autonomy by providing genuine, non-manipulative choices, allowing them to make an informed decision that is beneficial to them.

Example 2

Dark pattern

An airline's website takes a customer to the seat selection page during checkout. The page displays a colorful map where every available seat has a price attached, creating the impression that paying for a seat is mandatory. The option to skip this step and receive a free, randomly assigned seat at check-in is presented as a small, low-contrast text link at the very bottom of the page, which is easily overlooked. This approach pressures the customer into making an unplanned purchase to complete their booking.

Regular design

The same airline's seat selection page clearly states at the top, "You can select your seat now for a fee, or we'll assign one to you for free at check-in." It presents the seat map for those who wish to pay but also includes a prominent, equally weighted button that says, "Continue with free random assignment." This approach transparently informs the customer of their choices, allowing them to make a decision that is beneficial to them without pressure or confusion.

These examples illustrate that design mechanisms themselves are not inherently deceptive. What matters is how they're used, the intent behind them, and the impact on users.

02

The pervasive impact of dark patterns

Existing research, leveraging different methods and covering different regions, consistently reveals the existence of dark patterns across the digital landscape.[4] They have become a common feature of the modern online environment, particularly as defined by existing frameworks.

However, the diversity and volume of these frameworks—along with the continuous evolution of dark patterns—make it difficult to establish a universally accepted and comprehensive approach to classification. This, in turn, complicates efforts to address the spectrum of practices across interfaces.

At the time of publication, examples of frameworks that have been used to classify and regulate against the use of dark patterns include:

- American legal approaches, such as the *Federal Trade Commission Act*[5], *Restore Online Shopper's Confidence Act*, interpreting guidance[6], and state laws such as the *California Consumer Privacy Act*[7]. These frameworks concentrate on whether a design has a "detrimental effect on user control and informed decision-making," and tend to identify and prohibit specific harmful outcomes rather than providing a broad evaluative framework.
- European legislation, such as the *Digital Services Act*[8] and *Unfair Commercial Practices Directive*[9], which are applicable to dark patterns. These frameworks categorize dark patterns based on the intent behind the design and its effect on a consumer's transactional decisions.
- Guidance issued by the European Data Protection Board (EDPB) for categorizing dark patterns.[10] This approach categorizes dark patterns based on the psychological tactics they employ.

A common thread across these frameworks is the call for more user-centric research. This paper responds to that need. Any new framework must be grounded in rigorous user research, given that dark patterns can cause significant and far-reaching negative outcomes:

Financial harm	Users can be deceived into making unintended purchases, subscribing to unwanted services, or incurring unexpected charges due to hidden fees or pre-selected options.	Example: A checkout process uses vague wording to nudge users toward a higher-cost option, without making it easy to opt out or see the true final cost.
Privacy violations	Users may be manipulated into sharing more personal data than intended or consenting to privacy settings that are not in their best interest.	Example: A "free" mobile game prompts the user to grant access to their contacts to "find friends to play with." In reality, the app uploads the user's entire address book to its servers and sends unsolicited invitations to every contact, using this data to expand its user base without clear consent.
Loss of autonomy	Users' ability to make informed decisions and exercise genuine control can be undermined through the exploitation of emotions and user psychology. This harm includes the fundamental subversion of a user's intended choice, where an interface is deliberately designed to steer them away from their desired action—like canceling a service—and toward an outcome that benefits the company.	Example: An online retailer presents a pop-up during checkout offering free shipping. It forces the user to click "Accept & Continue" to complete their purchase. This action secretly enrolls the user in a costly, auto-renewing "VIP membership" whose terms are hidden within a separate hyperlinked document. To cancel, the user must leave the retailer's app, navigate a confusing website portal, and ultimately call a customer support number that is only open during limited business hours.
Choice limitation and steering	Users' ability to make free and informed decisions is also affected when design patterns actively obstruct or degrade access to alternative options. This can involve, for example, creating artificial friction or disparaging competing services without basis.	Example: A food delivery app allows a user to search for a specific, non-partner restaurant. When the result appears, the app displays a prominent banner over it stating, "This location often has slow service. Try [Partner Restaurant] instead for faster delivery!" This tactic disparages the user's intended choice without basis in an effort to steer them toward the platform's preferred partner restaurant.

Increased time and effort	Users may be forced to spend unnecessary time navigating confusing interfaces, canceling subscriptions, or fixing mistakes triggered by deceptive design.	Example: Tasks that should be simple—like turning off notifications or deleting an account—are drawn out, with misleading or redundant confirmations along the way.
Erosion of digital trust	Users' trust in the online world, including digital services—and the companies providing them—can be significantly damaged.	Example: After struggling to cancel a subscription through a deliberately complex process, a user may become less likely to trust similar companies in the future.
Systemic harm to competition	Beyond individual harm, these practices can represent a systemic constraint on competition and innovation. Manipulative designs can structurally exclude third-party services, preventing them from accessing users and competing on the merits.	Example: An e-commerce marketplace designs its 'Buy Box' algorithm and visual badging to favor its own logistics service. This design structurally excludes competing fulfillment providers by implying the first-party option is superior, thereby locking in sellers and preventing fair competition on the merits of cost or speed.

03

What existing research is missing

Current research on dark patterns pays little attention to how users actually experience them, yet this perspective is essential. Without involving users, research offers an incomplete picture of the real-world impact of dark patterns. As a result, solutions may fall short, failing to address the problems users actually face.

Key questions remain underexplored:

- Do users have the ability to determine which dark patterns are more severe than others?
  If users can intuitively identify which patterns are more deceptive, their insight could help prioritize regulatory and design efforts toward the most deceptive approaches.
- Are some dark patterns inherently more deceptive than others? If so, what factors contribute to this disparity?
  Designers and other interested parties can incorporate this perspective into efforts focused on specific, relevant countermeasures.

By incorporating a data-driven, user-centric approach, stakeholders can gain a more complete understanding of dark patterns and develop mitigation strategies that better reflect the experiences of users. Recognizing that not all patterns are created equal requires a closer look at user perceptions of dark patterns, to tailor interventions and prioritize those with the greatest potential for harm.

04

What user experience reveals about dark patterns

To better understand how users experience dark patterns, Google conducted original research to gather direct user insights and answer the underexplored questions. The findings suggest that users not only recognize dark patterns intuitively, but also regard some as significantly more problematic than others, with broad agreement on which mechanisms are most troublesome.

The research involved a large-scale quantitative survey, administered through the Ipsos panel across six European countries: Germany, France, the United Kingdom, Italy, Spain, and Poland.[11] The survey included 2,000 respondents per country—12,000 in total—targeting the general population aged 18 and over.

The goal was to better understand how users interpret and experience dark patterns. To do that, we showed respondents randomly chosen sets of dark patterns and asked them to rank them in terms of acceptability or unacceptability.[12] This allowed us to identify the full ranking of which patterns were judged to be worse by respondents, and which were relatively less severe to them.

We also sought to understand whether existing taxonomies were too broad to account for contextual differences—for example, whether the details of how a pattern was implemented changed how people interpreted it.

To account for this, we tested two different framing methods: abstract categories from existing taxonomies, and concrete, real-world examples of those same dark pattern categories. Respondents were randomly assigned to one of the two groups to complete the ranking exercise.[13]

- **Group A** evaluated broad categories of deceptive patterns, as defined in existing taxonomies.[14]

  Example: Hard to Cancel—It's easy to sign up for something, but very hard to cancel (e.g., a subscription).

- **Group B** evaluated specific examples.

  Example: A subscription service requires you to call customer support during limited hours to cancel, rather than offering an online option.

In your view, which of these design patterns is least acceptable, and which is most acceptable?

Group A: Categories	Group B: Examples
Fake Reviews: You see fake reviews or comments that make a product seem better than it is.	A product page displays fabricated customer reviews with 5-star ratings and glowing testimonials.
Hidden Costs: You see a low price, but at the end there are extra fees you didn't know about.	An online retailer offers free shipping, but only after you reach a high minimum order value, which is revealed at the checkout.
Hard to Cancel: It's easy to sign up for something, but very hard to cancel (e.g., a subscription).	A subscription service makes you call their customer support during limited hours to cancel, instead of offering an online cancellation option.

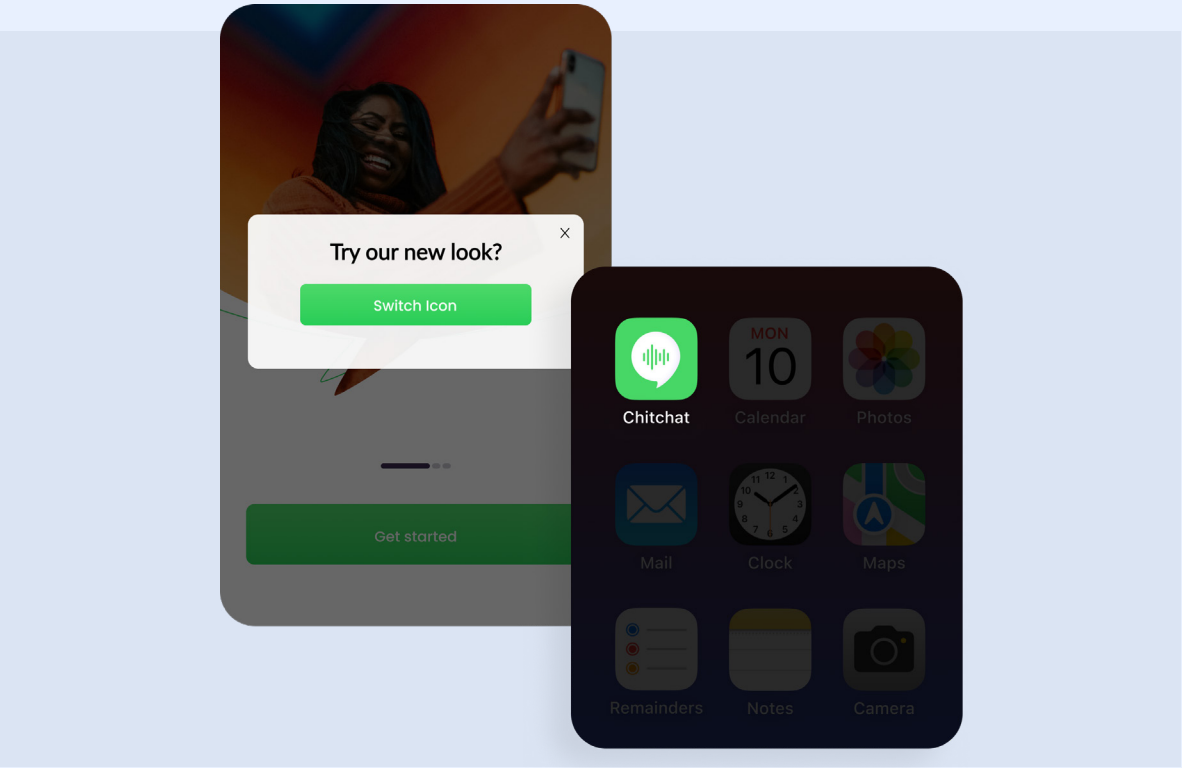
These ranking exercises produced important insights for developing a more user-centric, effective approach to analyzing and categorizing dark patterns:

Understanding despite lacking formal knowledge

A significant majority of respondents were unfamiliar with the term "dark patterns." Yet respondents did recognize that manipulative techniques can be used to influence behavior, and they recognized that some of these techniques are more pervasive and pernicious, harder to detect, and more difficult to escape than others.

Patterns are perceived differently depending on context

We found that the same pattern was often perceived differently depending on its presentation, confirming that context is not just a minor detail—it is a critical factor in how users evaluate a design. This reveals a shortcoming in many existing taxonomies: they can group together mechanisms that can be either benign or deceptive depending on the specific application.



To illustrate this concept, consider a social media app that has just released a set of new **custom app icons**. Upon opening the app for the first time after the update, a one-time pop-up appears asking, "Try our new look?" with the "Switch Icon" option highlighted. The potential negative outcome is objectively low-consequence: if the user accepts, the app's icon on their home screen changes. This causes no financial or functional harm and is purely aesthetic. If the user dislikes the new icon, it can be instantly reverted with a single tap in the app's settings menu. In this context, the prompt is a simple way to introduce a new feature, not a deceptive tactic.

Now, imagine that, upon opening the app for the first time after an update, a pop-up appears with the heading, "Unlock Your Exclusive Home Screen!" The body text promotes a new collection of "Pro" app icons, and the pop-up has a "Start My Free Trial" option pre-selected. In small, low-contrast text at the bottom, it mentions that the trial will automatically convert to a $4.99/month subscription if not canceled within seven days. The option to close the pop-up is a tiny, hard-to-see "X" in the corner.

In this context, the goal of the design is to steer the user into a paid subscription under the guise of trialing a simple aesthetic feature. The potential negative outcome is high-consequence—an unwanted, recurring financial charge—and reversing it requires the user to remember to cancel a service they hadn't intentionally signed up for.

This contrast demonstrates how the concern associated with a particular design mechanism (a pre-selected option) is determined by the context and the severity of the potential negative impact on the user.

Patterns with monetary impact are particularly negative

Regardless of whether they were judging abstract categories or concrete examples, respondents consistently identified dark patterns involving direct financial impact (for example, unexpected costs, or unwanted subscriptions) as the most unacceptable. This underscores that, for users, the most significant dark patterns are those that have direct and negative monetary consequences (as illustrated by the previous example).

Consistency across demographics and regions

The overall ranking of dark pattern categories based on unacceptability was broadly consistent across the different European countries surveyed.

These findings demonstrate the value of user perceptions in how we categorize and assess dark patterns. Existing taxonomies provide useful starting points, but we need to go further. Instead of simply labeling and grouping patterns, we must analyze the context in which a design mechanism is deployed and the real impact it has on users. Integrating user perspectives helps prioritize which patterns are most intuitively recognized as deceptive, supporting the development of more targeted, effective policy and design interventions.

05

Introducing a more user-centric taxonomy for categorizing & assessing dark patterns

Drawing on insights from this research, and acknowledging the limitations of current categorization methods, this whitepaper proposes a more user-centric taxonomy for evaluating dark patterns—one that incorporates not just what a pattern does, but also the intent behind it and the impact it has on users.

The core components of the taxonomy:

User intent
The goal a user is trying to achieve in taking specific actions. This might include completing a purchase, subscribing to a newsletter, or canceling a service.

Design goal
The goal the company is trying to achieve through the user's interaction. This might include increasing sales, or maximizing subscriber retention—even when these goals conflict with the user's.

Mechanism used
This could involve hiding important information, using ambiguous language, or introducing unnecessary obstacles.

Impact on user
The negative effects experienced by the user as a result of interacting with the dark pattern. These effects can take many forms, including financial losses due to unexpected charges, wasted time and effort in carrying out an action due to intentionally cumbersome processes, or feelings of frustration and deception.

Under this taxonomy, a design pattern could be classified as a "dark pattern" when some of the following conditions are met:

A There is a conflict between the user's goal and the intended goal of the design.

B The design mechanism deliberately uses a specific approach to manipulate or steer the user.

C The mechanism results in a negative outcome for the user, which can include tangible harm or the subversion of their intended choice.

By explicitly considering intent and impact, this taxonomy enables a more complete and nuanced analysis of dark patterns, helping to more effectively identify manipulative design practices.

A natural question arising from this proposal concerns how one might assess a dark pattern's degree of "unacceptability." We would propose an analytical approach that considers each of three framework dimensions:

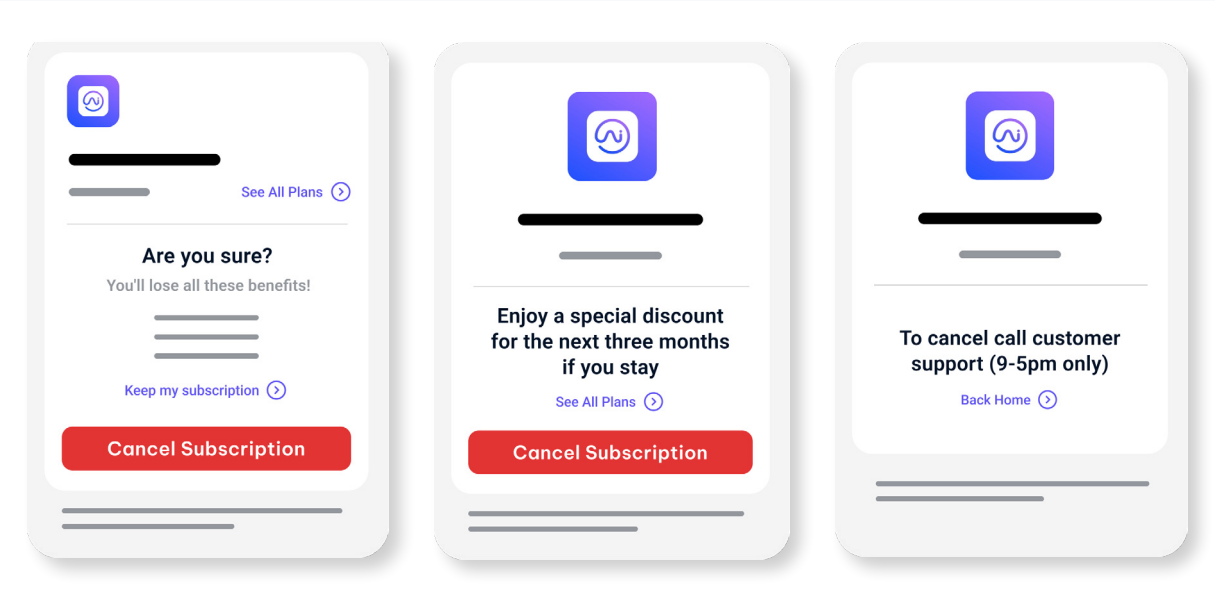
- **Intent divergence:** How great is the conflict between the user's goal and the design goal? (e.g., a user wanting to cancel vs. a design seeking to retain them is a high divergence).
- **Mechanism deceptiveness:** How manipulative is the mechanism itself? (e.g., fabricated reviews are inherently more deceptive than a pre-selected checkbox).
- **Impact magnitude:** How significant are the consequences for the user? (e.g., direct financial loss clearly constitutes much more than a minor annoyance).

A design can become highly unacceptable by scoring high on even a single dimension. For instance, a pattern with high impact magnitude (like an unwanted subscription) is perceived as severely problematic even if the mechanism deceptiveness is low (a simple, pre-selected box). Similarly, a highly deceptive mechanism, like faking user testimonials, is a highly unacceptable dark pattern even if the immediate impact isn't financial. Additional research is likely needed to better define the nuances associated with this approach.

Illustrating the taxonomy in practice

Example 1 [Dark pattern]

A cumbersome cancellation process, which carries a high degree of unacceptability.



User's intended goal
To cancel a subscription they no longer need or want.

Design goal
To create friction and inconvenience in the cancellation process for users, maintaining subscription revenue.

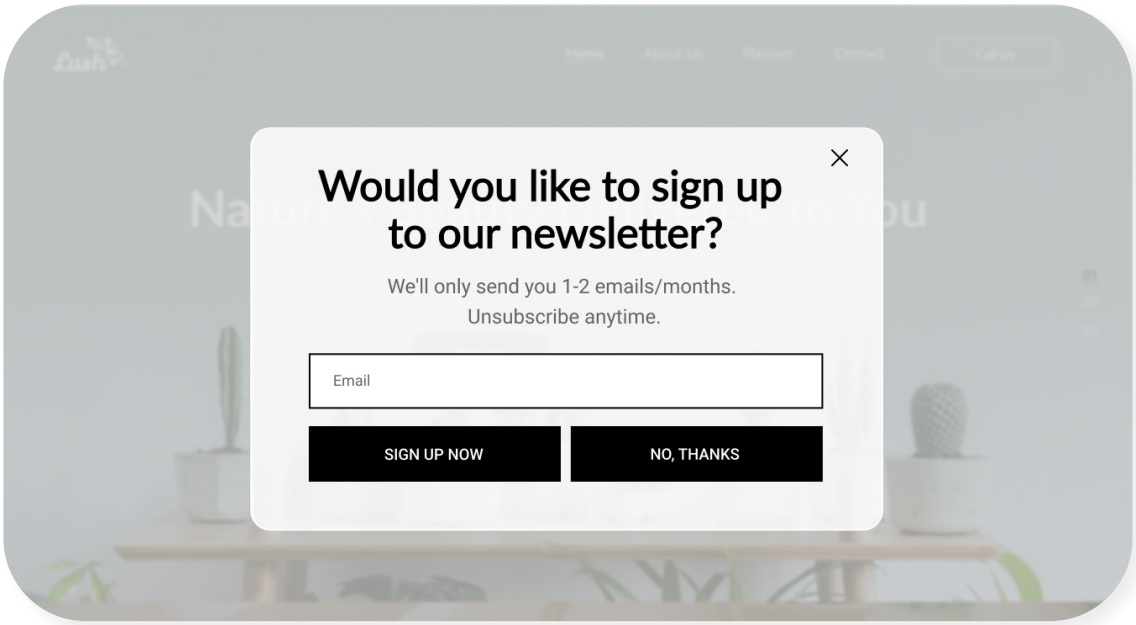
Mechanism used
The cancellation process is made intentionally cumbersome, requiring users to navigate through multiple hidden menus, answer irrelevant questions designed to deter them, watch a series of "Are you sure?" screens detailing perceived lost benefits, and potentially even call customer support during limited hours as the only way to finalize the cancellation. This type of "obstructive switching flow" can be seen as a manipulative design pattern that may even be treated as an anti-competitive and unfair practice.

Impact on user
Significant frustration and wasted time, and potential continued charges for a service they no longer want.

Illustrating the taxonomy in practice

Example 2 [Regular design]

A transparent newsletter signup, which carries with it no degree of unacceptability given the absence of a dark pattern.



User's intended goal
To browse the website's content. Signing up for the newsletter is a secondary, optional goal for some users.

Design goal
To grow their email subscriber list for marketing and communication purposes.

Mechanism used
Offering a clear, voluntary signup with transparent information about the newsletter's content and frequency.

Impact on user
Interested users can subscribe easily; others are not pressured.

Example 3 [Dark pattern]

Artificial format incompatibility which carries a high degree of unacceptability.

User's intended goal
To load an e-book purchased from an independent bookseller, or borrowed legally from a public library, onto their e-reader hardware device.

Design goal
To prevent users from acquiring content from any competing store or free source, locking them into the platform's proprietary bookstore as the sole source of content and revenue.

Mechanism used
The platform's hardware is intentionally engineered to refuse a universal, open-standard e-book format used by all other competing retailers and public libraries. Instead, the device exclusively uses its own proprietary format. While complex, multi-step conversion processes exist, they are non-obvious, intentionally undocumented on the device, and designed to create maximum friction to deter all non-technical users.

Impact on user
The user is actively prevented from reading the content they already own or have legally borrowed, causing immense frustration. Their simple workflow (buy book -> read book) is broken, manipulating them into re-purchasing the exact same title from the platform's native store just to make it functional. This undermines user ownership and structurally excludes all competing booksellers and public libraries from the ecosystem.

The distinction lies in whether the design supports or subverts the user's goal, and the associated impact on the user. This impact isn't always financial; it can also be the loss of time or, more fundamentally, the loss of the user's ability to freely make their intended choice.

06

Potential next steps and future research directions

This proposed user-centric taxonomy provides a robust foundation for a more nuanced and effective approach to categorizing and assessing dark patterns. To further refine, validate, and support its real-world application, several next steps and research directions are recommended:

- In-depth analysis of dark pattern components
  Conduct further research, potentially through choice-based experiments, to gain a more detailed understanding of how specific components of dark patterns influence the user. Examining mechanisms, designer intent, and user impact can help quantify perceived deception associated with them.
- Targeted research on specific dark patterns
  Conduct focused research on user perceptions of specific dark pattern mechanisms that have significant implications, such as "Hard to Cancel" mechanisms or obstruction techniques.
- Evaluation of real-world design patterns
  Use quantitative research methodologies to evaluate how users perceive specific, real-world design patterns currently employed by companies in various contexts. This includes approaches highlighted in independent reports on browser choice and internal assessments of potentially manipulative designs.
- Expanding global research coverage
  Broaden the scope of current research to include other regions and cultural contexts. Understanding geographic variation in user perceptions of dark patterns is essential for designing strategies that are globally relevant and locally informed.
- Inclusive research with varied user groups
  Conduct dedicated research with users of differing digital literacy and online experience levels. Understanding how less-digitally-confident users interpret and respond to dark patterns is essential to building inclusive protections and avoiding unintended impact.
- Collaboration and externalization
  Collaborate with industry stakeholders and publish findings in accessible formats to inform ongoing regulatory and design conversations. By offering a shared, user-centric perspective, tools for identification, and support for mitigation efforts, this collaboration can contribute to creating industry-wide standards and best practices for avoiding dark pattern implementation.
- Ensuring consistency across all device form factors
  Future research and policy development should apply these principles consistently across mobile, desktop, wearables, and other emerging form factors. This is critical to avoid creating form-factor-based loopholes that could undermine enforcement and distort competition.

Together, these efforts can help advance a deeper, more inclusive, and globally relevant understanding of how dark patterns function—and how they can be addressed through design, policy, and shared accountability.

07
Conclusion

Dark patterns pose a significant threat to user autonomy, trust, and overall well-being in the digital environment. While existing efforts have laid valuable groundwork in understanding this complex issue, a more holistic approach is urgently needed to better evaluate the nature of dark patterns and determine approaches to address them.

Google's recent research represents an important step forward. It highlights that not all dark patterns are perceived equally and that users possess an intuitive understanding of which ones feel most deceptive. It also underscores the importance of context and consequence in how dark patterns are experienced.

The more user-centric taxonomy proposed in this whitepaper emphasizes the relationship between user intent, design intent, the mechanisms employed, and the resulting impact on the user, offering a more complete and actionable pathway for evaluating dark patterns. By adopting this more nuanced taxonomy, and by taking a data-driven, research-based perspective, stakeholders can help build a more transparent, ethical, and user-friendly digital ecosystem.

Moving forward, collaboration and knowledge-sharing among researchers, industry, and regulatory bodies will be essential. Only through shared insight and coordinated action can we develop effective policies and practical tools that protect users and foster a more trustworthy and empowering online experience for everyone.

1 ICPEN Dark Patterns in Subscription Services Sweep, 2 July 2024.
2 Harry Brignull, "Bringing Dark Patterns to Light", 6 June 2021.
3 Mathur, A., Kshirsagar, M., & Mayer, J. (2021, May). What makes a dark pattern... dark? Design attributes, normative considerations, and measurement methods. In Proceedings of the 2021 CHI conference on human factors in computing systems (pp. 1-18).
4 Mathur, A., Acar, G., Friedman, M. J., Lucherini, E., Mayer, J., Chetty, M., & Narayanan, A. (2019). Dark patterns at scale: Findings from a crawl of 11K shopping websites. Proceedings of the ACM on human-computer interaction, 3(CSCW), 1-32. Di Geronimo, L., Braz, L., Fregnan, E., Palomba, F., & Bacchelli, A. (2020, April). UI dark patterns and where to find them: a study on mobile applications and user perception. In Proceedings of the 2020 CHI conference on human factors in computing systems (pp. 1-14). Gunawan, J., Pradeep, A., Choffnes, D., Hartzog, W., & Wilson, C. (2021). A comparative study of dark patterns across web and mobile modalities. Proceedings of the ACM on Human-Computer Interaction, 5(CSCW2), 1-29.
5 15 U.S.C. Sec. 45(a)(1).
6 FTC Enforcement Policy Statement regarding Negative Option Marketing.
7 Avoiding Dark Patterns.
8 Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC.
9 Directive 2005/29/EC of the European Parliament and of the Council.
10 EDPB (2022). Guidelines 03/2022 on deceptive design patterns in social media platform interfaces: how to recognise and avoid them-v2. 0. Technical report.
11 These countries were selected for this survey based on population size and are not meant to be representative of Europe as a whole.
12 Essentially, we showed sets of 3 dark patterns at a time, and we asked respondents to pick the least acceptable and most acceptable patterns in the set. This allowed us to construct a full ranking of all the dark patterns considered in terms of perceived unacceptability.
13 See Table A for a list of categories and examples ranked by participants.
14 Harry Brignull, "Bringing Dark Patterns to Light", 6 June 2021.
15 To generate this list, we first took the dark pattern categories laid out by Brignull et al. (2023) and then adapted the names and descriptions to improve user comprehension. For example, we used the 2nd person and a more casual tone for the descriptions. We then generated two examples for each of the categories. Brignull, H., Leiser, M., Santos, C., & Doshi, K. (2023, April 25). Deceptive patterns – user interfaces designed to trick you. deceptive.design. Retrieved April 25, 2023, from https://www.deceptive.design/

Acknowledgements

Thank you to Octavio Medina and Esra Ozkan for designing and conducting the user studies that provided critical insights into the effects of dark patterns discussed in this paper.

Thank you also to David Faye, Charles Bradley and the teams at Google that are dedicated to understanding, identifying, and mitigating manipulative design practices.

Appendix – Table A: Categories and examples provided to survey respondents[15]

Category (Group A)	Description (Group A)	Example 1 (Group B)	Example 2 (Group B)
Hidden Subscriptions	You accidentally sign up for a subscription without realizing it.	A "free trial" automatically enrolls you in a paid subscription without clearly informing you about the recurring charges.	A website offers a discount on your first purchase, but hides the fact that it signs you up for a monthly subscription service.
Hidden Costs	You see a low price, but at the end there are extra fees you didn't know about.	An airline advertises low-priced flights, but adds baggage fees, seat selection fees, and other charges during the booking process.	An online retailer offers free shipping, but only after you reach a high minimum order value, which is revealed at the checkout.
Hard to Cancel	It's easy to sign up for something, but very hard to cancel (e.g., a subscription).	A subscription service makes you call their customer support during limited hours to cancel, instead of offering an online cancellation option.	To cancel an online account, you have to navigate through multiple confusing menus and pages.
Forced Action	You have to do something you don't want to in order to do something you do want to.	To download a free app, you are required to create an account and provide personal information.	To access a website's content, you are forced to watch a 30-second advertisement.
Sneaky Extras	You're tricked into buying things because important information is hidden from you.	An online store adds extra items to your shopping cart without your knowledge.	A website advertises a product with a specific feature, but in the small print it states that the feature is only available on a more expensive model.
Fake Reviews	You see fake reviews or comments that make a product seem better than it is.	A product page displays fabricated customer reviews with 5-star ratings and glowing testimonials.	A website claims "Over 1 million happy customers!" but provides no evidence to support this claim.
Tricky Language	The words are confusing or misleading to make you do something you might not want to do.	A button says "Continue" but actually leads you to a payment page.	A website uses confusing language to describe a product's warranty, making it seem more comprehensive than it actually is.
Fake Urgency	You're pressured to buy something right away because of a fake deadline.	An online sale displays a banner that says "Flash Sale! Ends in 3 hours!" but the sale actually runs for several days.	A website shows a pop-up saying "This offer expires in 10 minutes!" to pressure you into making a purchase immediately.
Pushy Pop-ups	You keep getting interrupted with requests to buy or do things you don't want to.	A mobile app constantly sends notifications urging you to upgrade to the premium version.	A website repeatedly shows pop-ups asking you to rate their service or leave a review.
Obstruction	The website makes it hard for you to do what you want or find what you need.	A website makes the "unsubscribe" button very small and difficult to find.	A company's contact information is buried deep within their website, making it hard to get in touch with them.
Visual Tricks	Important information is hidden or hard to see on the page.	Important information about a product's limitations is displayed in a very small font size that is difficult to read.	A website uses a distracting background that makes it hard to focus on the important content.
Confusing Choices	It's really hard to compare products because the information is messy or hidden.	A mobile phone plan comparison site lists different plans but doesn't show all the features side-by-side, making it difficult to see the differences.	An online store displays similar products on different pages with different layouts, making it hard to compare their prices and specifications.
Disguised Ads	You think you're clicking on a button or something real, but it's actually an ad.	A news website has an article with a section that looks like related content but is actually an advertisement for a product.	A mobile app has a button that looks like a regular feature but when clicked, it opens an ad in a new window.
Pre-selected Options	Something is already chosen for you, trying to influence what you pick.	When buying a product online, an expensive add-on is already selected in the shopping cart.	A website automatically signs you up for their newsletter with the checkbox pre-checked.
Fake Scarcity	You're told something is almost sold out, even if it's not true, to make you buy it quickly.	An online shop shows a message saying "Only 2 items left in stock!" next to a product, even though there's plenty of stock available.	A booking site claims a hotel room is "in high demand" and displays a countdown timer to pressure you into booking immediately.