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The impact of dark patterns on user trust and long-term engagement: An ethical analysis

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Abstract

This article presents a classification of "dark patterns," data on their prevalence, and the ethical implications of their use. The objective of this study is to identify the potential consequences of ethical and unethical UX design. The relevance of this research is driven by the oversaturation of modern websites and applications with dark patterns. The article formulates a UX designer's code of ethics and presents the findings of a large-scale study assessing the effectiveness of various patterns and user reactions to them.

The study concludes that regulatory oversight of unethical design practices is necessary. It also outlines the advantages and disadvantages of dark patterns for companies. The relationship between dark patterns and the Overton window concept is examined, and a hypothesis is proposed regarding the long-term effects of widespread unethical design practices on future generations of users.

Keywords: UX design; Ethics; Dark Patterns; Deceptive Content; Consumer Protection; Manipulation; Ethical UX Design; Unethical UX Design; UX designer's Code of Ethics; Dark Pattern Classification; Dark Pattern Prevalence; Personal Data Security

1. Introduction

In modern business, user attention—whether from customers, clients, or viewers—is a valuable resource that largely determines a company's success. A business cannot operate without its end consumers. Recognizing this, companies seek to attract user attention, sometimes resorting to unethical influence techniques such as manipulative design and misinformation. This type of design often incorporates "dark patterns," which are deceptive interface design tactics that lead users to take actions beneficial to companies but disadvantageous to the users themselves.

In response to the growing prevalence of deceptive UX practices, regulatory bodies such as the Federal Trade Commission (FTC) in the United States and the Competition and Markets Authority (CMA) in the United Kingdom have begun cracking down on unethical UX design elements. Recent legislative initiatives, such as the European Digital Services Act (DSA, 2023) [7], establish stricter legal frameworks aimed at eliminating manipulative design patterns in online services. This shift in regulatory oversight indicates that deceptive UX design is no longer just an ethical issue but also a legal liability for businesses.

This article examines the principles of ethical design alongside examples of unethical practices. A classification of dark patterns is provided, and the ethical and legal implications of deceptive UX design are analyzed. The relevance of this study is underscored by the widespread presence of companies, websites, and applications that do not adhere to ethical UX design principles and the increasing pressure from regulatory bodies to enforce compliance.

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2. Material and methods

This study employs structuring, comparison, content analysis, and generalization methods to evaluate the ethical and unethical practices in UX design. A review of existing literature has revealed that dark patterns are widely used across digital platforms, particularly in e-commerce and subscription-based services (Mathur et al., 2019) [2]. The findings of a study published in the *Journal of Legal Analysis* [1] support the conclusion that the oversaturation of dark patterns negatively impacts user trust and brand perception.

However, research suggests that a limited and strategic use of "soft patterns" (less aggressive nudging mechanisms) does not significantly erode trust but can enhance business profitability (Nielsen Norman Group, 2023) [5]. To assess the regulatory landscape, this study also incorporates data from the United States Federal Trade Commission (FTC, 2024) [4], which investigated the impact of deceptive UX on subscription services and privacy. Additionally, the UK Competition and Markets Authority (CMA, 2022) [6] has analyzed how digital choice architecture can mislead consumers and harm competition. The European Commission's Digital Services Act (DSA, 2023) [7] establishes stricter legal standards for eliminating manipulative design patterns in online services operating within the EU.

Various sources [1-7] were analyzed to formulate a UX designer's code of ethics, integrating regulatory frameworks such as the General Data Protection Regulation (GDPR) and the Digital Services Act (DSA). A comparative analysis method was applied to describe the expected behaviors of an ethical designer versus one employing dark patterns, drawing upon case studies from major technology firms, including Amazon, Google, and Facebook.

3. Results and discussion

UX design (User Experience Design) determines how users interact with an interface. The designer's approach influences whether the interface is intuitive and transparent or manipulative and misleading. This study explores the issue of ethical and unethical UX design (Table 1) [2].

Table 1 Examples of Ethical and Unethical UX Design [2, 4, 5, 6, 7]

Action	Ethical Design	Unethical Design	Regulatory Status (as of 2024)
Subscription process	Clear notification of paid features	Automatic renewal with hidden cancelation options (Amazon case)	FTC fined Amazon for manipulative subscription UX (2024)
Promotional timers	Genuine time-limited offers	Fake countdown timers to pressure users	FTC issued warnings to e-commerce sites using false urgency (2023)
Data access	Transparent notifications, easy opt-out	Hidden data collection settings, pre-checked boxes	GDPR & DSA prohibit default opt-ins for personal data
Subscription cancellation	Easy-to-find cancel button	Multi-step cancelation process with misleading choices	Amazon fined by FTC for complex cancelation flows (2024)
Account deletion	Simple and quick procedure	Lengthy, complex multi-step process	DSA requires clear account deletion options (2023)
Product promises and descriptions	Honest and clear descriptions	Misleading claims, false promises and hidden fees	CMA investigating misleading advertising in digital marketplaces (2022)
Accessibility	Adaptations for diverse users, including visually impaired individuals	Lack of support for users with disabilities	DSA & ADA require accessibility compliance for digital services

Recent legal actions against deceptive UX practices illustrate the growing regulatory focus on dark patterns. In 2024, the Federal Trade Commission (FTC) imposed fines on Amazon for designing a complex and misleading cancellation process for its Prime subscription service [4]. Similarly, the UK Competition and Markets Authority (CMA) investigated several e-commerce platforms for using false urgency tactics, such as countdown timers that were not tied to actual stock levels [6]. These cases highlight the increasing legal risks associated with manipulative UX practices.

Furthermore, research by Nielsen Norman Group (2023) [5] indicates that users who encounter deceptive UX elements, such as forced continuity subscriptions or hidden opt-outs, report significantly lower trust in the platform and are less likely to return. These findings reinforce the notion that while dark patterns may generate short-term revenue, they can ultimately harm brand reputation and user retention.

3.1. Unethical Design Dark Patterns

Unethical UX design may involve the use of dark patterns—manipulative design techniques aimed at influencing users to act in ways that benefit the company rather than themselves. These patterns exploit cognitive biases, often leading users to make unintended decisions.

A classification of dark patterns, along with examples and their prevalence across digital platforms, is presented in Table 2 [2, 3, 5, 6, 7], based on research findings from Mathur et al. (2019), Di Geronimo et al. (2020), and other key studies.

Table 2 Prevalence of Dark Patterns, Their Classification, and Examples [2, 3, 5, 6, 7]

Pattern Types	Pattern Classes	Prevalence (%)	Examples	Legal Implications
Obstacles	Intrusiveness	54% [2]	Pop-ups interrupting users; requests for ratings; inability to delete an account.	Violates DSA rules on fair UI design [7].
	Traps	38.5% [2]	Trick questions in UI that mislead users.	Regulated under FTC deceptive practices law [6].
	Copy-paste restrictions	12.0% [3]	Preventing users from copying passwords.	May violate accessibility guidelines (ADA) [7].
	Internal currency	8.0% [3]	Requiring proprietary tokens for transactions.	CMA regulates misleading currency practices [6].
Hidden Information	Sneaky Additions	1.3% [2]	Unnoticed addition of unnecessary items to cart.	FTC fined companies for this practice in 2023 [6].
	Misleading Expectations	15.7% [2]	Automatic subscriptions to pages; default-enabled data sharing.	GDPR mandates explicit user consent [7].
	Hidden Information	29.8% [3]	Essential information concealed in UI.	Violates DSA transparency requirements [7].
	Preselection	59.2% [3]	Default opt-ins for newsletters or tracking.	Banned under GDPR's "opt-in" requirement [7].
Interface Manipulation	Visual Manipulation	32.7% [5]	Moving ad buttons; small close buttons for ads.	FTC issued warnings for misleading UI design [6].
	Emotional Exploitation	8.9% [5]	Shaming users for inactivity.	Considered unethical under CMA consumer rights laws [6].
	False Hierarchy	60.5% [2]	Prioritizing business-favored options.	May violate fair competition rules (CMA) [6].
	Disguised Advertising	31.4% [2]	Sponsored content appearing as organic.	EU DSA mandates ad transparency [7].
	Tricky Questions	2.9% [5]	Double negatives in choice options.	FTC prohibits deceptive UI elements [6].
Coerced Actions	Forced Actions	37.1% [2]	Countdown timers on ads; logging in required to claim rewards.	Regulated under GDPR fairness policies [7].
	Privacy Manipulation	30.5% [2]	Watching ads to unlock features.	Violates GDPR user autonomy rules [7].

	Referral Pyramid	5.7% [3]	Tricky Questions. Inviting friends to receive benefits.	CMA investigates multi-level referral systems [6].

Dark patterns are rooted in human psychology and are designed to manipulate user behavior in ways that benefit the company. These patterns exploit cognitive biases inherent in human perception. One example is hidden information, which occurs when users do not have access to complete details about a transaction. Research shows that 31% of analyzed platforms conceal important information from users [3]. This includes subscription pages with automatic enrollment and a nearly invisible opt-out button, a tactic commonly observed in e-commerce and digital services.

Another example of a psychologically manipulative dark pattern is false scarcity, where companies create an illusion of limited-time offers or low stock availability to exploit the fear of missing out. Studies indicate that 11% of e-commerce platforms use false scarcity tactics [2], often leading users to make impulsive purchases.

In the long term, dark patterns can have negative consequences not only for users but also for businesses. Companies that adopt unethical UX design must be prepared for potential repercussions, including customer loss and financial impact.

- Loss of customer trust. Long-term relationships require trust, and deceptive UX patterns directly undermine user confidence. Studies show that 60.5% of dark pattern cases involve false hierarchies, where misleading UI prioritizes business interests over user needs [2].

When users realize they have been deliberately misled, their trust in the platform significantly declines. According to Nielsen Norman Group (2023) [5], users who encounter deceptive interfaces are more likely to abandon the service and avoid future interactions with the brand. While businesses may gain short-term revenue from manipulative design, the long-term consequences include customer churn and reputational damage.

- Burnout and frustration. Repeated exposure to deceptive choices can lead to cognitive overload, distress, and confusion. Studies show that 54% of users encounter intrusive UX elements, such as pop-ups and misleading prompts [2]. To avoid these negative emotions, users may choose to abandon the service altogether.
- Financial stress. An accumulation of hidden subscriptions and difficult-to-cancel paid services can create financial difficulties for users over time. 38.5% of analyzed platforms use "traps" in their UX design [2], making subscription cancellation intentionally complicated. This, in turn, may lead users to discontinue the use of services, ultimately affecting the company's revenue [1].

Thus, while dark patterns may provide short-term gains for businesses, they are unsustainable in the long run. Modern consumers have choices, and for long-term engagement, they are more likely to prefer services with transparent and user-friendly interfaces rather than those designed like a minefield, where every misstep could result in an unwanted paid subscription. Moreover, with increased regulatory scrutiny from institutions like the FTC, CMA, and the European Union's DSA [6, 7], businesses that rely on manipulative UX practices face not only reputational risks but also potential legal consequences.

3.2. Ethical Design. Long-Term Advantages

The principles of ethical design focus on creating transparent, user-friendly, and fair digital experiences. Unlike dark patterns, ethical UX design prioritizes user autonomy and trust, ensuring that people make informed choices rather than being manipulated into unintended actions. Key principles of ethical UX design include:

- Transparency – when collecting data, companies should clearly state the purpose of data collection and how the data will be used in the future. According to GDPR, users must be explicitly informed about their rights and data usage policies [7].
- Clarity and simplicity – interfaces should be designed to be intuitive, allowing users to easily understand the structure and functionality of a website or application.
- Accessibility – digital platforms should be inclusive and accessible to all users, including individuals with disabilities. Under the Digital Services Act (DSA), companies operating in the EU must ensure that their interfaces are accessible and do not create unnecessary barriers [7].
- Data security – companies must ensure that personal data is securely stored and not shared with third parties without user consent. Non-compliance with GDPR data security measures has led to fines for major corporations [7].

- Honesty in content and marketing – applications should not promise more than they can deliver. A truthful approach to content and advertising helps prevent unrealistic expectations and the resulting dissatisfaction. Research by the Competition and Markets Authority (CMA) has shown that misleading advertising practices in UX design can lead to regulatory actions against companies [6].
- Support and feedback – users should have the opportunity to express their opinions or ask questions, making feedback channels essential for companies to foster user trust and improve product development [2].

Ethics should be a fundamental part of the design process. Companies must recognize that their products impact thousands, sometimes millions, of people. Rather than prioritizing short-term gains through manipulative UX, businesses that invest in ethical design build lasting relationships with users—leading to greater loyalty, lower churn rates, and long-term brand stability.

Education in ethical design should be an integral part of UX designer training. By understanding the risks of dark patterns and deceptive interfaces, designers can create fair, user-friendly experiences that respect consumer rights and build trust. Web designers play a crucial role in shaping clear and secure digital interactions, making it essential for them to acknowledge the responsibility that comes with their work [1].

As digital platforms have become deeply embedded in daily life, ethical UX is no longer just a moral choice—it is increasingly becoming a regulatory requirement. Legal frameworks such as the General Data Protection Regulation (GDPR) and the Digital Services Act (DSA) enforce standards for transparency, privacy, and fair digital interactions [7].

- The General Data Protection Regulation (GDPR), one of the earliest and most influential regulations in data protection, compels companies to reevaluate their approach to interface design and data processing. To ensure that privacy is considered at every stage of product development, the Privacy by Design principle was introduced [1].
- The Digital Services Act (DSA) expands on these principles, requiring that online platforms avoid manipulative design and deceptive user flows [7].
- The Competition and Markets Authority (CMA) continues to investigate how deceptive UX harms consumer rights, particularly in e-commerce and subscription models [6].

It can be concluded that ethical UX design is not just beneficial for users—it is a strategic advantage for businesses. Companies that prioritize transparency and user trust are more likely to enhance brand reputation, comply with evolving regulations, and achieve sustainable business growth.

3.3. User Attitudes Toward Ethical and Unethical UX Design

In 2021, Luguri & Strahilevitz published a large-scale study in the Journal of Legal Analysis, involving nearly 2,000 respondents [1]. Participants were asked to complete a short survey regarding online privacy preferences. Afterward, they were told that their responses suggested they belonged to a group highly concerned with personal data security. To further examine their behavior, participants were offered a free data protection service for several months, allegedly provided by an external company.

The respondents were divided into three groups, each interacting with a different type of interface:

- Group 1 was presented with a clear and ethical interface, designed according to transparency and fair UX principles. Users were provided with two straightforward choices: "Subscribe" and "Decline," without external pressure or misleading design elements.
- Group 2 encountered an interface with mild dark patterns, including pre-selected options, ambiguous wording, and subtle pressure techniques.
- Group 3 was given a heavily manipulative interface, incorporating forced continuity, misleading urgency, and multiple-step cancellation barriers.

The study aimed to measure how these different design approaches influenced user trust, engagement, and willingness to subscribe. The results are summarized in Table 3.

Table 3 Results of the study on user responses to ethical and unethical UX design, based on Luguri & Strahilevitz (2021) [1]

Group	Interface Characteristics	Conversion Rate, %	Steps to Cancel Subscription	User Reaction to the Product
First Group	Ethical interface with clear, binary choices. Users see two buttons: "Subscribe" and "Decline", with no additional pressure.	11%	1	Positive – Users reported a clear and transparent experience, with no frustration or confusion.
Second Group	Contains mild dark patterns such as pre-selected options and ambiguous wording. Instead of a "Decline" button, there is a "Continue" button with misleading phrasing: *"I do not want to protect my data or credit history."* Users must provide a reason for canceling, while a prominent "Protect Yourself" subscription button remains available.	25%	3	Mixed – Users reported a mostly positive experience, but minor negative reactions were observed in a small percentage of participants due to unclear cancellation options.
Third Group	Interface heavily reliant on dark patterns, including forced continuity, delay tactics, and fear-based persuasion. Users must navigate four screens with persuasive messages before reaching the cancellation option. Each screen becomes accessible only after a 10-second delay.	40%	7	Strongly negative – Participants expressed frustration, distrust, and a strong aversion to the product due to the complexity of the cancellation process.

Thus, participants in the second group experienced mild manipulation, while the third group was exposed to aggressive persuasive techniques. The study found that less educated participants were significantly more susceptible to dark patterns, particularly in the second group, where conversion rates were disproportionately higher among those with lower education levels [1].

The ethics of web design is a fundamental element of the modern digital environment. While manipulative approaches can provide short-term benefits, they ultimately erode user trust, leading to reputational damage and decreased customer retention. In contrast, ethical design fosters trust-based relationships, establishing a strong foundation for long-term engagement and strengthening the connection between a brand and its users.

To promote ethical UX practices, a designer's code of ethics can be formulated:

- Users must have access to all relevant information about a service or product.
- Consent for data processing must be explicit and clearly communicated.
- All paid features and conditions must be transparent, including costs, renewal terms, and cancellation policies.
- The process for canceling a service or subscription must be simple and free from unnecessary barriers.
- Information regarding product availability or scarcity must be accurate, avoiding misleading urgency tactics.
- The principle of accessibility must be upheld for all user groups, including those with disabilities.
- Notifications and warnings must be transparent and clearly worded to prevent deceptive communication.
- Buttons for accepting or declining offers must be visible and easily identifiable, without manipulative UI design.

4. Conclusion

Based on the research findings, several conclusions can be drawn:

The ethical aspects of UX design should be both an industry standard and a legal requirement, as certain dark patterns border on fraud. Their use misleads users and forces them into unnecessary expenses. Technology is meant to simplify life, not exploit human vulnerabilities. Unethical design poses risks beyond financial loss, affecting users' emotional well-being. The impact of such patterns on children's psychological development is particularly concerning. Due to their

age, young users struggle to distinguish truth from well-packaged deception, which negatively affects their quality of life.

However, the consequences of deceptive UX design extend beyond individual users. Regulatory bodies such as the Federal Trade Commission (FTC) in the U.S. and the Competition and Markets Authority (CMA) in the U.K. have begun taking action against companies that engage in manipulative practices [4, 6]. The introduction of the Digital Services Act (DSA) in the European Union [7] further demonstrates that deceptive UX practices are no longer just an ethical concern but a legal liability for businesses. Companies that fail to comply risk lawsuits, fines, and reputational damage.

The issue extends far beyond the inconvenience of an unwanted subscription. Regular exposure to dark patterns fosters a habit of distrust. It is impossible to predict how continuous exposure to deception will shape the next generation and its ability to trust—an essential foundation of all human relationships. This could not only deteriorate the quality of life for individual children but also have broader demographic consequences at both national and global levels.

From a market perspective, deceptive UX practices distort competition by creating artificial barriers for consumers. Research by the CMA (2022) [6] found that manipulative design patterns pressure users into decisions they would not have made under fair conditions, benefiting companies that use deception while harming ethical businesses. The rise of legal actions against companies like Amazon for their subscription cancellation flow (FTC, 2024) [4] signals that regulators are beginning to take UX design seriously as a market fairness issue rather than just a consumer protection concern.

Any long-term relationship is built on trust, which cannot be sustained in an environment of systematic deception. Most companies are established with the intent of long-term operation. If a business relies on manipulative practices, maintaining long-term relationships with users is unlikely. The study frequently identified major companies, such as Facebook, Instagram, eBay, and Amazon, as examples of dark pattern usage. Despite employing unethical design elements, these platforms have achieved global popularity, seemingly contradicting this principle. However, it is important to note that these platforms were among the first of their kind. At the time of their emergence, users had no alternatives. Furthermore, while they incorporate dark patterns, they are not oversaturated with them, which, as the study suggests, is generally tolerated by users.

Certain dark patterns, such as intrusive design elements or visual manipulation, have become so commonplace that users no longer perceive them as unethical. This reflects the Overton window concept, where users gradually become accustomed to deception and manipulation, eventually normalizing these practices.

A reasonable use of "soft patterns" does not significantly impact user trust while contributing to increased sales. The study demonstrates that a balance between ethics and profitability can be maintained. When patterns are strategically implemented, businesses can enhance revenue without jeopardizing customer trust or violating regulatory standards. This effect was clearly illustrated in the research findings.

Oversaturation with dark patterns is noticeable even to an untrained eye and provokes a strong negative reaction. A business model entirely built on manipulative language and hidden traps has little chance of long-term success. Users, already burdened with daily routines, will not tolerate such interfaces for long. However, during its operational period, such a site or application may generate short-term financial gains. In the long run, however, customer trust, legal compliance, and fair competition remain essential for sustainable business growth.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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