How People Recognize Dark Pattern in E-Commerce?

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Abstract

In the digital era, many manipulative design tactics, commonly referred to as 'dark patterns', have emerged. These tactics aim to conceal, mislead, deceive, and even exploit users during their use of an application. This study explores how users in Indonesia recognize dark patterns on e-commerce platforms, contributing to understanding of user perceptions in this context. The study involved evaluating 11 participants through in-depth interviews and exposure to 12 screenshots from Indonesian e-commerce platforms containing these design tactics. Thematic analysis was used to analyze qualitative data, identifying recurring themes and user challenges in recognizing dark patterns. Not all participants were able to recognize dark patterns in screenshots. Those who were able often attributed their awareness to personal experiences, highlighting the importance of experiential learning in identifying and understanding deceptive interface elements. Unclear interface information, user trust in the interface, and the conflation of marketing strategies with dark patterns were identified as key barriers to recognition. Beyond Indonesia, the findings of this study have broader implications for countries with similar digital ecosystems or socio-economic contexts. Understanding how users in Indonesia perceive dark patterns can provide valuable insights for countries with comparable characteristics, particularly in terms of digital literacy levels, trust in online platforms, and regulatory frameworks, where similar manipulative tactics may be prevalent. This study highlights the role of ethical and transparent UX design principles in reducing the harm caused by manipulative tactics and increasing user trust and satisfaction. Stricter regulations and clear guidelines are needed to protect consumers from unethical, manipulative tactics.

Keywords: Dark Patterns, Ethical Issues, User Interface, E-Commerce, Indonesia.

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Introduction

Dark patterns in user interface (UI) design are to manipulate users into unintended actions, such as automatically adding items to their shopping carts or subscribing them to newsletters without clear consent. These tactics, defined by Brignull (2010) on darkpatterns.org, include sneaking unwanted items into shopping baskets and adding hidden costs to subscriptions. Mathur (2021) defines dark patterns as UI choices that benefit online services by coercing or tricking users into making unintended, often harmful decisions.

These deceptive tactics have evolved over the last three decades. Trends in retail, research, public policy, and design have influenced them (Karagoel & Nathan-Roberts, 2021). Particularly in e-commerce, dark patterns have become widespread, designed to encourage purchases and generate profits (Narayanan et al., 2020). An online experiment by Di Geronimo (2020) involving 589 users found that many struggled to identify dark patterns in apps, demonstrating that these tactics are ingrained in everyday use. Moser (2019) identified 64 elements that encourage impulse buying, such as product reviews and quick add-to-cart buttons, on 200 shopping sites. Kim et al. (2021) analyzed dark patterns in travel agency websites, showing how they exploit users' cognitive biases.

Di Geronimo (2020) highlights the difficulty users have in detecting deceptive UI interactions, a concept termed "dark pattern blindness." This concept highlights the need for greater transparency due to users being unaware and manipulated. Voigt (2021) suggests that users may remain unaware of these tactics because hidden actions lead to unanticipated costs. Designed awareness programs could help users recognize and avoid these hidden strategies (Gunawan et al., 2021). The consequences of engaging with dark patterns in e-commerce include financial losses, such as unintentional purchases and unexpected fees, and emotional tolls, such as frustration and distrust in online platforms (Kim et al., 2021). These losses erode user satisfaction and trust, impacting their relationship with e-commerce platforms (Gray et al., 2018).

This study focuses on Indonesia, which is a rapidly growing e-commerce market and is expected to become the largest digital economy market in this region (Google and Temasek, 2020). E-commerce has become an integral part of the digital economy, with millions of Indonesians engaging in online shopping regularly (Lestari, 2019). The rapid adoption of smartphones and the increasing affordability of mobile data have accelerated the growth of online shopping (Tarhini et al., 2019). The examination of why individuals recognize manipulative patterns in e-commerce reveals that users initially view interfaces positively and often overlook the manipulative elements. This conclusion is drawn from qualitative methods, including in-depth interviews and image analysis. Sazid (2024) explored dark patterns in the local context of Bangladesh, analyzing data from 715 e-commerce websites and uncovering dark patterns in 18.3% of the websites. This study introduced the categorization of dark patterns into two groups: 'Passive Dark Patterns' and 'Active Dark Patterns,' with the majority being passive. The findings also indicated that users with backgrounds in technology education were more aware of and concerned about dark patterns than others. Bangladesh, as a developing country, has quickly embraced digitalization, which has recently led to significant growth in its e-commerce sector. Similarly, Indonesia, another developing country, is experiencing rapid expansion in e-commerce. Examining dark patterns in the e-commerce industry provides valuable insights into the extent to which local users are exposed to these manipulative design strategies. Additionally, exploring local user perceptions of dark patterns is a crucial area of study.

Understanding how dark patterns are perceived by users in Indonesia also provides valuable insights for other developing countries with similar digital ecosystems. Heeks (2021) identified countries with emerging digital markets, and the widespread use of tactics can have similar impacts on user trust and satisfaction. By comparing the perceptions and challenges faced by users in Indonesia with those in similar countries, this study offers a broader understanding of the global impact of dark patterns. This knowledge is critical for policymakers, designers, and consumer protection agencies to develop effective strategies to mitigate these manipulative tactics, ensuring fairer and more transparent digital markets worldwide.

The following sections make up this article. The first section presents the study's background. This

portion is followed by the base literature, which is explained in section 2. Section 3 then provides a detailed description of the research method. Next, section 4 presents the research results. Section 5 provides a detailed discussion based on the findings. Finally, conclusions, including research implications and limitations of this review study, are presented in section 6, followed by a bibliography.

Literature Review

Terminologies of Dark Patterns

Key contributions from influential researchers have enriched the landscape of dark patterns terminology. Brignull (2010), a leading figure in the field, introduced the term' dark patterns' to capture various deceptive design tactics used in digital interfaces. This term describes a spectrum of manipulative practices aimed at influencing user behavior. In addition, Geronimo's concept of 'dark pattern blindness' highlights the phenomenon of users unintentionally overlooking or failing to recognize manipulative design elements within interfaces (Di Geronimo et al., 2020). This highlights the importance of awareness and education in combating such practices. Taking together, these terms provide a nuanced framework for understanding the breadth and intricacies of manipulative design, allowing for a more comprehensive examination of its impact on user experiences in digital environments.

Many types of dark patterns are illegal in some regions, such as the European Union and the United States (Brigull, 2010). In the European Union, there are provisions in the General Data Protection Regulation (GDPR) that indirectly prohibit certain dark patterns by requiring clear and informed consent from the user. For example, pre-checked boxes for marketing consent or the use of misleading language to obtain consent are not permitted under the GDPR. Similarly, in the US, the Federal Trade Commission (FTC) has acted against companies that use dark patterns to deceive consumers, such as hidden subscription fees or misleading advertising tactics (Kawaf et al., 2023).

Outside of these regions, the legal status of dark patterns remains less clear, with many countries lacking specific regulations to address these deceptive practices (Luguri & Strahilevitz, 2021). The lack of standardized terminology and legal frameworks further complicates the problem, making it difficult to universally define and regulate dark patterns (Bongard-Blanchy et al., 2021). As understanding of the patterns grows, so does the need for a global definition and implications. Many researchers have suggested that creating a unified set of terminology and classifications could facilitate international cooperation in addressing these practices. For example, building on Brignull's original framework (Brigull, 2010), researchers have proposed different categories of dark patterns, such as 'forced continuity' or 'Zuckering privacy,' each with its own specific impacts on user autonomy. This terminology helps not only identify and categorize dark patterns but also raise awareness and guide regulatory efforts in different countries.

Dark Patterns Tactics in E-Commerce

Somehow, the user interface was intentionally embedded with manipulative design tactics to influence user behavior (Gao et al., 2023). In the context of e-commerce, these tactics are widely used to force users to do things that they are not aware of. This manipulation has become a prevalent issue in the highly competitive landscape of a rapidly growing internet user base and the exponential rise of e-commerce companies (Balasubramanian & Parayitam, 2023). The pattern of these manipulative tactics does allow e-commerce businesses to achieve marketing goals that users may fail to recognize or remain unaware of the manipulative dark patterns used on e-commerce platforms (Isuwa et al., 2023). Moreover, societal tolerance for aggressive marketing practices creates legal gray areas in addressing dark patterns, as consumers often accept or overlook unethical and deceptive strategies used in online shopping environments (Singh et al., 2024).

Scarcity is a widely recognized dark pattern tactic often employed in e-commerce platforms to create a sense of urgency among consumers (Luguri & Strahilevitz, 2021). Specifically, limited-time messages have been shown to outperform other types of dark patterns in driving consumption decisions, such as "Only two items left in stock!" or "Offer ends in 1 hour!" to exploit psychological

biases like the fear of missing out (FOMO). Empirical research supports the effectiveness of scarcity tactics, demonstrating their ability to significantly increase product selection and purchase rate (Hamilton & Shaheen Hosany, 2023; Sunstein, 2022; Xu et al., 2015). Scarcity messages are more effective in influencing purchase intention when users have low product knowledge or high involvement with the product category.

Another prevalent strategy is upselling, where users are encouraged to add complementary or premium items to their purchases through suggestive prompts or bundles (Park & Yoon, 2022). This commonly used strategy in e-commerce platforms encourages users to purchase complementary or premium items through suggestive prompts or promotional bundles (Gray et al., 2024). Research highlights that upselling promotions can stimulate customer exposure to higher-end products, which might result in brand-switching behavior under certain circumstances (Ahn et al., 2022; Kovacheva & Nikolova, 2024; Park & Yoon, 2022; Sher, 2011). Customers of lower-end brands who take advantage of upselling discounts and find satisfaction with higher-end products may develop increased reference quality, leading to dissatisfaction with the lower-end brand (Park & Yoon, 2022). Consequently, these customers are more likely to defect to competitors if they can afford the higher-end brand only during promotional periods. This phenomenon creates a risk for retailers as it increases customer attrition over time (Yu et al., 2022).

Many tactics, commonly known as dark patterns, support manipulative practices in e-commerce, designed to exploit user psychology and influence decision-making. Examples include pre-checked boxes for additional services (Sunstein, 2022), forced continuity with unclear cancellation processes (Mathur et al., 2019), and hidden costs that appear at checkout (Monge Roffarello et al., 2023), all of which undermine user autonomy and transparency. Other tactics subtly manipulate user decisions, promoting actions that prioritize business goals over user intent and autonomy. The ethical implications of such practices show the importance of prioritizing transparency and fairness in e-commerce design to ensure user trust and long-term loyalty (Wu et al., 2024).

End User Perceptions of Dark Patterns

People are always facing digital products in their lives. Users' interactions with digital products significantly influence their trust, satisfaction, and decision-making processes, often entwined with their encounters with manipulative design tactics (Adar et al., 2013). In the realm of user perception, dark patterns are often regarded as deceitful elements strategically embedded in interfaces, aiming to coerce or mislead users into unintended actions or choices (Gunawan et al., 2021). Such perceptions typically stem from experiences where users feel trapped, misled, or manipulated due to the deceptive nature of these designs.

However, perceptions of dark patterns vary considerably among users, influenced by factors such as digital literacy, prior experiences, and individual awareness levels (Keleher et al., 2022). While some users exhibit adeptness in identifying and circumventing these manipulative tactics, others may remain unaware of their existence, attributing their encounters to standard online practices (Nazarov & Baimukhambetov, 2022). This variability in perception underscores the complexity of users' interactions with dark patterns and emphasizes the need for a nuanced understanding of how these tactics impact users across diverse backgrounds and experiences (Keleher et al., 2022).

Understanding these diverse perceptions of dark patterns is pivotal in unraveling their nuanced impact on users' digital experiences. It sheds light on the multifaceted nature of user interactions within digital interfaces and underlines the importance of ethical design practices to promote transparency, trust, and user empowerment (Nazarov & Baimukhambetov, 2022). Moreover, by acknowledging and addressing users' perceptions, designers and platforms can strive to create interfaces that prioritize user well-being and foster a more positive online experience for all (Mildner & Savino, 2021).

Categorization of Dark Patterns

Researchers have been defining and consolidating terminologies related to dark patterns. Several follow-up initiatives concentrated on dark patterns within sets of applications or systems. Gray (2023)

categorized dark patterns into five distinct classifications, encompassing strategies like nagging, obstruction, sneaking, forced action, and interface interference. Brignull (2010) categorized dark patterns into 16 classifications, which are shown in Table 1. These can serve to delineate and identify various manipulative design tactics prevalent across digital interfaces, providing a comprehensive framework to analyze and understand the diverse spectrum of deceptive practices within user experiences.

Table 1. Taxonomies of Dark Patterns (Brigull, 2010)

Taxonomies	Definitions
Comparison Prevention	Users struggle when comparing products; this enables them to be guided toward a choice that boosts income but might not align with the user's optimal outcome.
Confirm shaming	Users feel uncomfortable with triggered guilt or shame to influence decision-making.
Disguise Ads	Ads that looked like elements of the interface that made users click on them.
Fake Scarcity	Instilling a false perception of scarcity regarding a product or service, compelling users to take immediate action due to the fear of losing the opportunity.
Hard to Cancel	Users had difficulty getting back to us when they were on checkout pages.
Forced Action	Users want to do something, but they must do something else before.
Fake Urgency	Users were pressured to complete actions like flash sale discounts.
Fake Social Proof	When users believe those products are more popular or cheaper than they really are because they were shown by activity writing, testimonials, etc.
Hidden Costs	Users did not expect additional fees and charges when they checked out.
Hidden Subscriptions	When users don't know that they subscribed or pay additional fees automatically.
Nagging	Interruption of the user's intended task by unrelated tasks causes disruption or distraction from the primary focus.
Obstruction	Create obstacles in the user's pathway when using the products.
Visual Interference	When users expect the information on the interface to be clear, it's manipulated by lower contrast, small text, etc.
Trick Wording	The user is deceived into action because of the use of unclear or deceptive language in the presentation.
Sneaking	Where items are surreptitiously added to a user's shopping cart or basket without their explicit consent or clear notification
Preselection	When users had presented an automated selection of the checkboxes.

Each classification captures a specific type of interface and experience manipulation. For example, 'nagging' refers to persistent prompts that interrupt the user experience, urging them to make decisions they might otherwise avoid. 'Obstruction' involves creating deliberate barriers to hinder users from completing a desired action, such as making it difficult to cancel a subscription. 'Sneaking' involves hiding or misrepresenting information, such as automatically adding items to a shopping cart without the user's consent. As the digital environment continues to evolve, these

terminologies and classifications are important to keep pace with other new forms of manipulation that emerge as technology advances.

Methodologies

Literature Review

For the methodology section, the first step involves conducting a systematic literature review using the Kitchenham method. This review will systematically search and analyze relevant literature from various databases, including ACM, ScienceDirect, Scopus, Taylor & Francis, IEEE, Sage Journal, and Emerald Insight. The process began with the identification of keywords related to the research objectives, such as "dark patterns," "e-commerce," and "user behavior." The review was followed by the development of inclusion and exclusion criteria to ensure the relevance and quality of the selected studies were established:

Inclusion Criteria:

1. Studies published between 2018 and 2023.

2. Articles focusing on dark patterns in e-commerce platforms.

3. Research that evaluates the impact of manipulative design tactics on user trust, behavior, and decision-making.

Exclusion Criteria:

1. Articles published in languages other than English.

2. Papers that do not provide empirical evidence or a clear methodological framework.

The selected articles focused on the area of Human-Computer Interaction (HCI), resulting in the inclusion of 13 articles for analysis. These articles were extracted and analyzed based on their relevance to the research objectives. The extraction process examined specific elements, including the interplay between digital marketing tactics and dark patterns such as scarcity tactics, upselling, and pre-checked boxes, which are commonly employed to increase sales or subscriptions. Each database was queried separately, and the results were combined and filtered according to the predefined criteria. The findings were then synthesized to identify patterns, gaps, and emerging themes in the research landscape. This rigorous approach ensured a comprehensive and unbiased review of the existing knowledge, providing a robust foundation for further analysis and discussion.

Table 2. Methodology Based on Literature

Methodology	Reference(s)
Investigation & Observation	(Baroni et al., 2021; Bongard-Blanchy et al., 2021; Gray et al., 2018; Kim et al., 2021; M. Bhoot et al., 2021; Moser et al., 2019; Nimkoompai, 2022)
Web Crawler	(Nazarov & Baimukhambetov, 2022; Mathur et al., 2019; Voigt et al., 2021)
Online Survey	(Karagoel & Nathan-Roberts, 2021; Narayanan et al., 2020)
Interviews	(Keleher et al., 2022)
Focus Group Discussion	(Keleher et al., 2022)

As in Table 2, the methodologies employed in the selected studies included various approaches to thoroughly investigate dark patterns in e-commerce platforms. These methodologies provided a multifaceted perspective on the phenomenon of dark patterns, enabling researchers to analyze their prevalence, user impact, and potential countermeasures. Investigation and observation allowed for the in-depth exploration of real-world user interactions and the implementation of manipulative tactics. Web crawlers automated the detection of dark patterns across a wide range of e-commerce platforms,

ensuring comprehensive coverage and consistent data collection. Online surveys offered valuable quantitative data on user perceptions and behavioral responses to dark patterns, complementing the findings from observational studies. Expert interviews provided critical professional insights, shedding light on the ethical responsibilities of designers and strategies for mitigating manipulative practices. Lastly, focus group discussions facilitated collaborative exploration of user experiences, revealing nuanced perspectives on how dark patterns influence decision-making and trust in e-commerce platforms.

The study of dark patterns in digital interfaces has revealed various impacts on user experience and design. One key finding is that dark pattern strategies differ across platforms, showing the need for platform-specific analysis and solutions (Nazarov & Baimukhambetov, 2022; Gray et al., 2021). Looking ahead, the need for rules to limit deceptive practices reflects growing concerns about their impact on user trust and online businesses. Research could explore how effective these regulations might be and their influence on users and digital platforms. Additionally, creating user-focused tools and strategies to help people recognize and resist dark patterns could promote a more transparent and ethical digital environment. We employed the interview method in this research to investigate users' comprehension of dark patterns in e-commerce platforms. This qualitative approach aims to gain deeper insights into whether users can recognize manipulative design tactics and how these patterns influence their decision-making and trust in e-commerce platforms. By directly engaging with users through interviews, the study seeks to uncover nuanced perspectives, enabling a comprehensive analysis of the cognitive and behavioral responses triggered by dark patterns. This method complements the findings from the literature review and provides a user-centered understanding of the phenomenon.

Data Collection

1. **Recruitment**

   We recruited participants and sent a survey to social media to gather mobile numbers and profiles of each user. We used Google Forms to create the screening survey questions, which included closed-ended questions, multiple choices, and radio buttons. We sent the survey from November 17th to December 2nd, 2023. Users had to be at least 18 years of age, live in Indonesia, and have used e-commerce at least once time in a month. We received 91 responses but discarded 31 responses where participants rejected the request for an interview. We retained 60 responses for subsequent screening.

2. **Participants**

   After the screening, a total of 11 participants, seven males, and four females, were selected from the last education and wage range. Most participants ranged between 18 and 25 years old, the latest education mostly a bachelor's degree, with the salaries between 6.9 and 17.9 million rupiah. 2 of the participants had education related to computer science or information technology, and the rest were from other backgrounds. 9 out of the participants lived on Java Island, and others came from Kalimantan and Sumatra Island.

3. **Interview Design**

   The interview was conducted online and offline. To make it easier for participants to understand dark patterns, we used the term 'manipulative design' so they could easily understand the meaning, as Keleher (2022) mentioned. The questions contained three main sections:

   a. Demographics: we asked questions related to participants' demographics and activities.

   b. Dark Pattern Knowledge: we asked open questions to gather participants' knowledge and opinions about dark patterns.

   c. Interface Images: we show 12 screenshots of interface e-commerces that aligned with various types of dark patterns defined in the literature. These images were selected to

ensure comprehensive coverage of 16 categories. For each image, participants were asked to answer with 'Yes' if there were any dark patterns, 'No' if there were no dark patterns, or 'Maybe' if they were confused with their choices. Each answer must be accompanied by a reason. Figure 1 shows the example of the images that were asked to participants.

The interviews ranged in duration from 15 to 20 minutes and were conducted using Microsoft Teams for online sessions and recorded via mobile phones for offline interviews. There is no difference in treatment between online and offline interviews. The flexibility in the interview process, whether online or offline, provided a comprehensive understanding of user interactions with e-commerce interfaces across different scenarios and contexts.

Figure 1. Example of An Interface Image that Containing Dark Patterns Such as Fake Social Proof

Data Analysis

We conducted the analysis process using a thematic analysis approach. After the transcription of interviews was completed, the initial step involved familiarizing data comprehensively to understand the context (Hambraeus et al., 2020). Subsequently, the coding process commenced using Atlas.ti, wherein relevant segments of text related to the research topic were identified, labeled, and grouped into broader categories or themes. Figure 2 shows the codes that were used in this study.
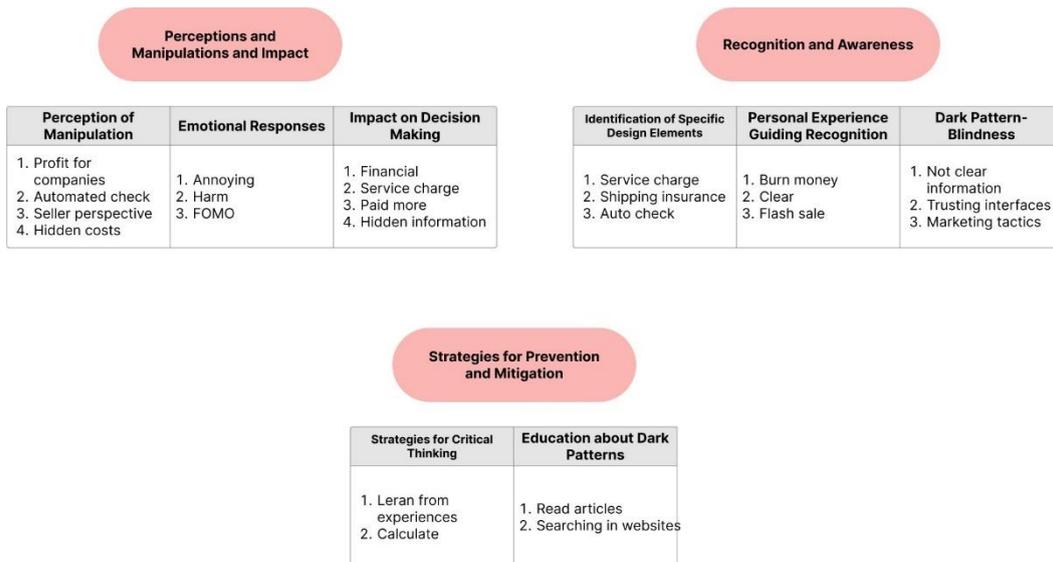

Figure 2. Thematic Codes Used

We organized these codes into three main themes: Perceptions and Manipulations and Impact, Recognition and Awareness, and Strategies for Prevention and Mitigation. Each theme has multiple

subcategories that capture specific elements of how users perceive, recognize, and respond to dark patterns in digital interfaces. Each of the main themes has distinct subcategories to provide a comprehensive analysis of the interview.

The first theme, Perceptions, and Manipulations and Impact, captures how users perceive manipulative tactics in e-commerce interfaces. Subcategories such as profit for companies, automated checks, seller perspectives, and hidden costs reflect participants' recognition of these tactics as mechanisms prioritizing business interests. Emotional responses, including feelings of annoyance, harm, and fear of missing out (FOMO), further emphasize the psychological impact of these manipulations. Decision-making processes were also affected, with issues such as financial loss, unexpected service charges, overpayment, and hidden information highlighting the influence of dark patterns on user behavior.

The second theme, recognition and awareness, examines how participants identify specific manipulative design elements. Subcategories such as service charges, shipping insurance, and auto-checked options illustrate the common elements recognized by participants. Personal experiences, such as dealing with flash sales or encountering unclear information, guided recognition of these patterns. However, instances of dark pattern-blindness, including trusting interfaces and misunderstanding marketing tactics, underline the challenges users face in identifying manipulative practices.

The third theme, Strategies for Prevention and Mitigation, explores how users can protect themselves from dark patterns. Participants emphasized the importance of critical thinking, including learning from past experiences and carefully evaluating costs. Additionally, education about dark patterns, through reading articles or researching websites, was highlighted as a key strategy to increase awareness and resilience against manipulative designs. It is important to educate users to increase critical awareness in combating manipulative design.

Results

Perceptions of Manipulations

The study involved 11 participants, selected based on their varying backgrounds and interactions with e-commerce platforms and familiarity with digital interfaces. The participants were a diverse group, including both professional and regular users, to provide a comprehensive view of how different user profiles recognize dark patterns. Of 11 participants, only three have heard about dark patterns or manipulative designs. The rest of the users have never heard about dark patterns or manipulative designs, so the authors tell the definition about it so they can easily understand the purpose of this interview.

"*I believe manipulative design is profitable for the company, but not for users*" -P6.

"*Most dark patterns had the purpose of manipulating their users to make them buy something they weren't aware of.*" -P4.

Several categories of dark patterns emerged from the discussions. Participants highlighted hidden costs, such as unexpected service charges or fees appearing at checkout, as a major source of frustration. Preselection, where optional services like shipping insurance were automatically selected, was another commonly cited example, with participants expressing annoyance over having to manually deselect unwanted options. Fake scarcity, such as messages like "Only two rooms left!" or "Limited time offer," created a sense of urgency that led to rushed and sometimes regrettable decisions. For example, P4 shared, "It traps people by making them think the price will increase." Another tactic mentioned was forced action, which required users to take unnecessary steps, such as agreeing to additional terms, to proceed with their purchase. From this perspective, participants perceive dark patterns as harmful and annoying. Despite this, the participants' knowledge of dark patterns is limited to instances where companies steal their money or privacy without consent. Participants who knew more about dark patterns were UX practitioners or worked in digital companies.

Emotional Responses

Participants felt annoyed when they had experiences with dark patterns. Their frustration stemmed from having to spend more money, even though it wasn't a significant amount. It makes them not enjoy scrolling in e-commerce applications because of dark patterns.

"*It makes me FOMO. When I wanted to book a hotel to treat myself, I searched for a hotel in an application like Agoda, and it said, 'Only 2 Rooms Left,' and then offered me an 80% discount. I think that is exactly the normal price. It can cause panic, FOMO, and a sense of being trapped.*" -P4.

Participants expressed that dark patterns create a sense of urgency and fear of missing out (FOMO), leading to rushed and often regrettable decisions. This manipulation leads to a negative user experience, diminishing their trust in the platform. The pressure from these tactics makes it difficult for users to make informed and calm decisions.

Impact on Decision Making

The participants had no decision when they were manipulated by design except to accept it with annoyance. Most participants said the applications should provide clear information, so users feel fair. So, users feel like things are fair, they say the apps should give clear information. Because these manipulations made people feel like they needed to act quickly, they often felt trapped and couldn't calm. This pressure was made worse by methods like confirmshaming, which made users feel bad about not buying, and forced action, in which users had to agree to extra terms in order to finish their transactions. These feelings show how dark patterns have a big effect on user trust and satisfaction. This shows how important it is to use ethical design methods that put user autonomy, clarity, and transparency first.

"*Actually, when the checklist is not automatically checked, it's not harmful for me*" -P6.

"*Most of them were insurance and service charges. On one side it was understandable, but on the other side it was annoying....*" -P9.

P6 highlighted a lack of clarity in app communications, expressing a desire for clear explanations regarding additional features such as insurance. P9 provides a detailed example, illustrating how manipulative practices inflate the total cost, leading to a sense of annoyance, especially when not relevant services, like shipping insurance for digital products, are automatically selected without user consent. Their dissatisfaction comes from a lack of choice, unclear communication regarding additional costs, and automated implementation of services. In addition to these tactics, participants also pointed to hidden costs as a source of frustration. They frequently encountered unexpected charges, such as additional service fees or preselected optional services like shipping insurance, which inflated their total expenses without prior consent. This manipulation was often paired with trick wording, where unclear or ambiguous language misled users into agreeing to unwanted purchases. These practices not only irritated users but also instilled a sense of deception, thereby reducing their trust in the platform.

Recognition and Awareness

According to Figure 3, participants are able to completely identify dark patterns in Photos 8 and 9. They perceive manipulation due to the automatic selection of service charges and shipping insurance. In contrast to Photo 1, the majority of participants indicated that there are no dark patterns present in those images. Many participants believe they were not subjected to manipulation, or they are uncertain whether the design is manipulative or merely conventional.

"*There is no information regarding the payment; I am confused because the the monthly deductions are clear but not specify the duration in months or years.*" -P10.

In the remaining photos, some participants stated that they did not recognize the manipulation or were unsure whether the design was manipulative or not. This finding reflects a common issue associated with trick wording and visual interference, where unclear communication or deceptive visual cues obscure the manipulative intent P10 expresses his confusion regarding payment information,

particularly the clarity surrounding monthly deductions, which lacked details on duration and terms. This illustrates the potential for confusion when communication is ambiguous in e-commerce interfaces.

Moreover, participants had difficulty identifying and distinguishing manipulative design from design, especially when the interface used hidden advertising or coercive actions, which required users to take unnecessary steps to complete a transaction. This further complicates their ability to identify fraudulent practices, underscoring the need for clearer communication and transparency in interface design. Overall, the findings highlight that while obvious manipulation is easy to spot, more subtle dark patterns remain difficult for users to detect, underscoring the importance of addressing these tactics within e-commerce platforms to build user trust and satisfaction.
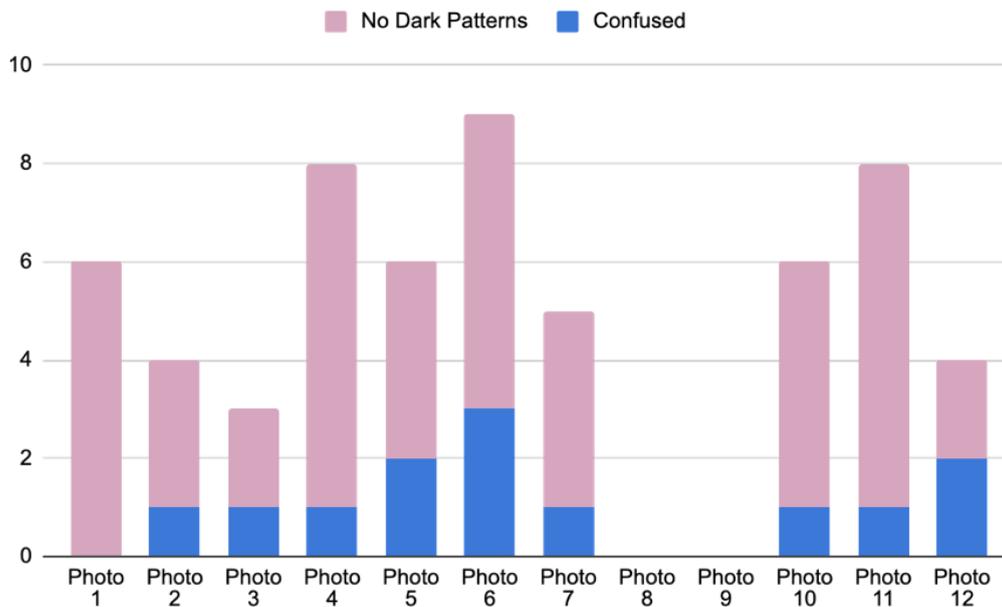

Figure 3. Comparison Between Interface Images That People Can Recognized and Confused

Personal Experiences Guiding Recognition

Numerous participants are unsure of their choices when they see dark patterns in photos. Numerous users pick the interfaces with dark patterns based on their online shopping experiences. There are people who change their answers because they don't know what "dark patterns" in displays really mean.

"*I think donation of Rp 5000 is a dark pattern. The option of getting money back if it doesn't work makes it look like it does, but it doesn't. Also, shipping insurance makes it hard for me to complain*" -P11

Those who had looked at the screenshots had a range of responses, and many of them were hesitant because they didn't know what to say. Many of them thought they saw manipulative design elements because they had seen them before while shopping on e-commerce platforms. People who were interviewed changed their answers right away because they weren't sure what they thought or felt about "dark patterns." P11 wasn't sure how to tell that dark patterns were tricks. In his own experience, the seller refused to pay for a broken item even though he had video evidence of the item being unboxed, which he used to show how frustrating it can be to deal with shiny insurance problems. These different answers and readings show how hard and subjective it is for users to spot dark patterns in e-commerce interfaces. This strategy makes things harder for users, which hurts their trust in and happiness with the site. Confirmshaming, a tactic that gently pushes people to make choices they don't want to, also came up repeatedly, making people even more unsure and hesitant. These different reactions show how hard and personal it can be to spot dark patterns. Overt tricks, like

fake scarcity or secret costs, were easier to spot. But subtler tricks, like using trick words or interfering with the way things look, were often not noticed.

Discussions

This study employed an interview by predefining a collection of e-commerce pages. These deceptive design tactics not only induce irritation and financial strain but also substantially undermine decision-making processes and trust in digital platforms. Keleher (2022) showed that end-users learn from their past experiences to detect manipulative tactics on the interfaces. In this research, the interview focused on how people recognize dark patterns in each picture. Consequently, it was determined that the majority of individuals are unable to identify dark patterns; this indicates that although dark patterns are crafted to be invisible, their impact on user behavior is substantial, gradually influencing decisions in ways that users frequently fail to consciously see. The absence of acknowledgment is concerning, as it suggests that users are often manipulated without their awareness.

From 12 pictures, only pictures 8 and 9 clearly mentioned that the pictures contained dark patterns. Participants were not recognized for many reasons, called dark patterns-blindness. Dark patterns-blindness are phenomena where individuals, often unintentionally, overlook or fail to recognize manipulative design tactics or dark patterns within user interfaces (Di Geronimo et al., 2020). Based on interview results, many factors that made participants not recognize dark patterns such as unclear information, trusting interfaces, confusing with marketing tactics, and limited awareness. According to the interview results, participants were unable to recognize dark patterns due to various factors, including unclear information, trusting interfaces, confusion with marketing tactics, and limited awareness. Although users cannot recognize dark patterns, they feel that the information presented to them is ambiguous or unclear. It makes them choose to answer with "unclear information" instead of "no dark patterns." The participants expressed confusion and stressed that while they did not see any clear dark patterns that were alike from Keleher (2022) and Di Geronimo (2020) in that the participants do not recognize the dark patterns because they feel the interfaces are normal things that they usually see.

The blindness of dark patterns shows that the participants feel it is not caused based on their education, sex, or wages. Participants with a master's degree or higher income levels also struggle to identify interfaces with dark patterns. Keleher (2022) who tested experts and end-users with dark patterns, the differences not significantly statistical between those two groups. Users are not always aware of dark patterns in mild cases. In this study, users are not aware if there is so much information in some interfaces like at homepage. Participants reflect on their struggle, expressing confusion due to the abundance of information, which hampers their ability to focus on specific elements. This aligns with existing literature that suggests users might overlook mild cases of dark patterns when interfaces inundate them with excessive information (Bongard-Blanchy et al., 2021; Keleher et al., 2022; Voigt et al., 2021).

Every participant has many ways to prevent them for effective prevention and mitigation strategies. Participants learn from their experiences to help themselves prevent dark patterns in e-commerce. The participants have developed a valuable sense of awareness through their encounters with dark patterns in e-commerce. Their experience has become a guiding principle, allowing them to navigate the platform more carefully and intelligently. In Keleher (2022), the end-users learn from their past experiences to detect manipulative tactics in the interfaces. This insight equips them to research payment accuracy, resist the FOMO-inducing appeal of flash sales, and detect hidden fees in granular details. The knowledge empowers them to approach digital shopping with caution, verify costs, and cross-reference information to prevent potential manipulative tactics (Bongard-Blanchy et al., 2021).

The role of ethical UX design is crucial in addressing and preventing the implementation of dark patterns in digital interfaces. Ethical design principles prioritize transparency, fairness, and user trust, which can effectively counter manipulative tactics such as preselection, hidden fees, and false scarcity. However, manipulative design practices, such as those highlighted by Hamilton (2023), demonstrate how brands strategically exploit product scarcity by repeatedly generating demand and releasing limited editions. While such practices may align with short-term business goals, ethical UX design

advocates for minimizing these tactics and addressing the most egregious cases, drawing up categories for regulation to ensure fairness and accountability.

Ethical design also aligns with the legal frameworks that regulate e-commerce practices in Indonesia. The Indonesian legal system enforces consumer protection through several key regulations, including Law Number 19 of 2016 (the amendment to the Information and Electronic Transactions Law), which governs electronic transactions and ensures secure and transparent digital interactions. Furthermore, Law Number 8 of 1999 on Consumer Protection mandates businesses to prioritize consumer rights, ensuring fair treatment and clear communication in all transactions. Complementing these is Government Regulation Number 80 of 2019 (PP 80/2019) on Trading through Electronic Systems, which aims to foster a safe and open e-commerce ecosystem to strengthen the industry's transparent growth. Additionally, Law Number 7 of 2014 on Trade includes provisions for electronic trade systems, emphasizing accountability and compliance to promote user trust.

While ethical UX design voluntary adherence to principles of transparency and fairness, legal frameworks in Indonesia offer a robust foundation to address manipulative practices. These laws not only aim to mitigate the harm caused by dark patterns but also ensure businesses adopt user-centric practices that align with ethical and legal standards. Manipulative practices, akin to lies or false advertising, can be considered a form of theft that exploits users for business gains. As highlighted in Hamilton's work, when manipulative practices cause significant harm, legal interventions become essential to prevent exploitation and uphold fairness in the digital economy. Elaborating the ethical design and legal frameworks synergistically can create a safer and more equitable digital environment for all users.

Based on the interview, participants shared valuable insights about their strategies for preventing manipulative designs encountered in e-commerce interfaces. These narratives explain their experiences and methodology, providing an education on the ins and outs of recognizing and avoiding dark patterns in online transactions. They dedicated their time to reading and learning to use the features in the application or used QnA features to ensure steps and increased user awareness while navigating the e-commerce platforms.

Conclusion

The result of this highlights user perceptions and recognition of dark patterns, especially in Indonesia's e-commerce. It is highlighted that the prevalent limitation among users in identifying and categorizing dark patterns shows widespread deficiencies in recognizing manipulative design tactics. Moreover, those capable of recognizing such patterns on the interface often attribute their awareness to personal experiences, highlighting the significance of experiential learning in understanding and identifying deceptive interface elements. Participants were unable to recognize dark patterns on the interface due to many factors. Normalization led to the belief that they were unaffected by the interface or that the encountered elements were standard practices. Other factors, such as unclear information, trust in the interface, and confusion between marketing strategies and those of factors, contribute to what can be termed 'dark pattern-blindness.'

Findings from the interview are important not only to identify and differentiate dark patterns but also to spotlight the urgent need for user education to increase awareness initiatives. This is crucial to giving users the power to navigate digital interfaces more confidently, fostering transparency, and promoting ethical design practices for a more trustworthy digital ecosystem. This study suggests a stricter regulatory framework to address ethical concerns around dark patterns that, if left unchecked, could proliferate unchecked. Implementing clear guidelines and enforcing regulations can help reduce the prevalence of dark patterns and ensure that digital platforms adhere to ethical standards.

This research contributes to the growing body of knowledge by offering empirical insights into user awareness of dark patterns, particularly in the context of emerging markets like Indonesia. It highlights how sociocultural and digital literacy factors influence user perceptions, extending the applicability of existing frameworks on dark patterns to new contexts. Practically, this study provides actionable insights for designers, developers, and policymakers. Designers and developers will need to adopt ethical design practices that prioritize transparency and fairness. For policymakers, the study

advocates for stricter regulatory frameworks to address the ethical concerns posed by dark patterns. Implementing clear guidelines and enforcing regulations can help reduce the prevalence of these tactics, fostering a trustworthy digital ecosystem. Next, this research could expand on these findings by examining the geographical influences of user recognition and interaction with dark patterns. Comparative studies across diverse regions, including other emerging markets, could uncover how variations in sociocultural, economic, and digital literacy contexts impact user awareness and susceptibility to manipulative design tactics. Such research would provide valuable insights into how geographic and cultural factors shape perceptions and behaviors in e-commerce environments. Additionally, since this study primarily focused on analyzing user responses to static screenshots, it should adopt a more immersive approach by allowing participants to interact directly with e-commerce applications. This hands-on exploration could provide deeper insights into how users experience and respond to dark patterns in real-time scenarios, enhancing the understanding of their decision-making processes and challenges. These advancements would not only refine theoretical frameworks but also offer practical recommendations for designing more transparent and user-friendly digital platforms.

Limitations of this study include various aspects that may influence the findings. First, the sample size consisted of participants under 35 years of age, potentially limiting the generalizability of conclusions across different age groups or demographics and failing to see potential differences in recognizing and understanding dark patterns among older users or individuals from different countries or cultural backgrounds. Second, the geographical concentration of participants from the island of Java indicates a regional bias, which has the potential to ignore the various perspectives and experiences that are common in other geographic regions in Indonesia. Lastly, the scope of the research only focuses on desktop and mobile applications, thereby potentially ignoring the existence of dark patterns on other digital platforms such as web browsers, game consoles, or other platforms, thereby limiting a comprehensive understanding of the prevalence of dark patterns. in the digital landscape. Next, research research could explore several ways to improve understanding and mitigation of dark patterns in e-commerce interfaces. First, there is a need to study regulatory frameworks to establish guidelines that encourage user trust and ethical design practices, which can effectively protect individuals from fraudulent elements in digital platforms. Second, the formulation of comprehensive ethical design guidelines or frameworks can provide insight into integrating persuasive elements in interfaces without resorting to manipulative tactics. This approach aims to balance user involvement without sacrificing their autonomy or trust. Additionally, it investigates differences in perception and response to dark patterns among different age groups, such as Baby Boomers, Generation X, Millennials, or Generation Z. This comparative analysis across generations can tell diverse perspectives and help adapt strategies to cater to different user demographics more effectively

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