

Dark Pattern Use In E-Commerce

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Abstract

Growing e-commerce competition has driven businesses to develop several tactics to engage and lead consumers through digital buying experience. Some merchants utilize digital nudges to help consumers through buying. Some websites employ dark patterns. A user interface element that manipulates the user to make a choice the user might not have chosen if they were free to pick.

The report characterizes the dark pattern as "intentional and deceptive design decisions meant to attain the psychological benefit of forcing users to make unanticipated and unpleasant choices; they produce value for the services for which they function."

Four variables appear to explain dark patterns' effectiveness: technological, cognitive, social, and motivational. These aspects are described in depth.

E-commerce generally uses dark pattern . The emergence of dark patterns led to industrial activity that led to much greater usage of dark patterns. Dark patterns were also used to enhance client interaction, resulting in increased financial success. With limited timeframes and small resources, designers concentrated on developing a "happy path" that lets them to focus on reaching shareholder goals without addressing the user experience as a whole. Finally, some scholars claim that most dark patterns are attributable to lack of ethical planning training.

This literature review tries to illuminate dark patterns and the reasons behind their utilization in e-commerce. It also explains why e-commerce firms shouldn't employ dark patterns on their site and provide ideas for further research.

Keywords: *dark patterns, e-commerce, digital nudges*

Introduction

“E-commerce has exploded in popularity in recent decades. People are shopping online in greater numbers than ever before. In the previous year, two-thirds of Finns made an internet

purchase (Tilastokeskus 2019). The annual growth rate in e-commerce, measured in euros, was 12% in 2019. (Kaupan liitto 2020).

The number of e-commerce businesses has increased in lockstep with the increase in online transactions. Due to increased competition, businesses have begun to place a greater emphasis on designing a website that keeps customers interested and encourages them to complete their purchase.

In order to affect user performance, e-commerce companies utilize these pumps as user interface components. Despite rules of rational economic theory, the environment in which individuals take these choices is not affected by rational decision-making alone (Djurica and Figl 2017). The goal of Nudges is to counteract certain psychological effects, to convince individuals to decide for themselves. They may also depend on the logic of decision-making (Mirsch, Lehrer and Jung 2017).

Consumers started expecting instant gratification when visiting an internet company as online shopping grew more prevalent. If you find the store difficult to navigate or the check-out process difficult to complete, you will look for another location to make your purchases (Haywood 2006).

Several e-commerce sites utilized black patterns on their sites to dissuade customers from abandoning their carts. Dark patterns are deliberate, misleading design decisions that lead people to make decisions they otherwise would not have made (Gray, Kou, Battles, Hoggatt and Toombs 2018). Customers can be pushed to complete purchases in the context of e-commerce by informing them of the product's scarcity ("10 other shoppers have this item in their baskets"), the urgency of a sale ("-30% of all items end in 12 hours!"), or the social desirability of the product they're interested in ("Karen from Florida just bought this item!"). While the products may have recently been purchased or a promotion may have finished, these notifications are often based on deceit and are designed to mislead the customer into making a purchasing decision (Mathur et al. 2019).

Academics have been interested in the effect of digital nudging on e-commerce (see, for example, Weinmann, Schneider, and Brocke 2014), but dark patterns in e-commerce have gotten less attention. Mathur et al. released the only study on dark patterns in e-commerce in 2019.

Dark pattern research currently seems to be centered on establishing or evaluating a taxonomy (Bösch, Erb, Kargl, Kopp, and Pfattheicher 2016; Gray et al. 2018). (Fansher, Chivukula and Gray 2018). As a result, the emphasis of this thesis is on dark patterns and their usage in ecommerce. E-commerce is studied from the perspective of business-to-consumer (B2C), leaving business-to-business (B2B) and consumer-to-consumer (C2C) e-commerce.

This research aims to answer the following research questions:

- 1.) What are dark patterns and how can you recognize them?
- 2.) What makes dark patterns so effective?
- 3.) What is the significance of dark patterns in e-commerce?"

This research was carried out as a literature review. The following keywords were used to create search statements: "digital nudging," "dark pattern," "ecommerce," "manipulation," "persuasive design," and "user interface design." JYKDOK and Google Schola were used to find source material. DARK PATTERNS: WHAT ARE THEY? Patterns, anti-patterns, and dark patterns are all discussed in this section. Since the 1970s, designers have utilized patterns to replicate well-known solutions to particular issues. They were initially employed in architecture, and then rapidly moved on to computer science and software development, including user interface design (Bösch et al. 2016). Studying an existing design solution to a problem and developing a solution that is extended from that particular scenario to address other, comparable issues in other settings are common sources of patterns (Greenberg, Boring, Vermeulen and Dostal 2014). Patterns change with the passage of time. As our understanding of the issue grows, a previously excellent solution to a problem may become an anti-pattern.

An antipattern is a solution to a design problem that has been shown to be ineffective. They are still important to the design community because they may be used to raise awareness and encourage designers to avoid certain design decisions ("Bösch et al. 2016). Not all anti-patterns were previously excellent design solutions: according to Greenberg et al. (2014), anti-patterns may occasionally be the consequence of unintentional design errors caused by a lack of technical skills or a lack of knowledge of user needs (Gray, Chivukula and Lee 2020). Furthermore, depending on the creator's design, the same pattern may be turned into an anti-pattern or a dark pattern (Greenberg et al. 2014). An antipattern is a design solution that is unintentionally detrimental for the user experience. Dark pattern, on the other hand, is a well-considered, well-researched pattern that has bad consequences for the user while benefiting the service that employs it. Dark patterns, according to Gray et al. (2018), are intentional, deceptive design choices made with psychology knowledge that are not in the user's best interests. The decisions that the dark patterns influence, compel, or mislead the user into making may not have been made if they had the opportunity to choose otherwise, according to Mathur et al. (2019). Dark patterns are misleading by design, according to Bösch et al. (2016), and are designed to lead individuals to make bad decisions. Dark patterns may therefore be characterized as intentional, deceptive design decisions intended to exploit psychology, sway the user to perform unexpected and undesired behaviors, and provide value to the service that employs them.

WHAT ARE DARK PATTERNS?

Since the 1970s, designer community has used patterns to replicate well-known solutions to particular issues. First employed in the area of architecture, they were soon adopted to the field of computer science and software development, including user interface design (Bösch et al. 2016). Patterns often emerge from analyzing an existing design solution to a problem and generalizing a solution from that particular

scenario to address other, comparable issues in other settings (Greenberg, Boring, Vermeulen and Dostal 2014).

Patterns develop over time. A once-good issue solution may be degraded to an anti-pattern as our understanding of the problem grows. An anti-pattern is a method to solve a poor practice-proven design issue. They are still essential to the community of designers, as they may be used to raise awareness and urge designers to steer away when making design choices (Bösch et al. 2016).

Not all anti-patterns were once a good design solution: according to Greenberg et al. (2014), anti-patterns may sometimes result from accidental design mistakes owing to lack of technical skills or user requirements understanding (Gray, Chivukula and Lee 2020). Moreover, depending on the design of the creator, the same pattern may become an anti-pattern or a dark pattern (Greenberg et al. 2014). An antipattern is an unintentional bad user experience design solution. Dark pattern, on the other hand, is a thought-out, well-researched pattern that has negative repercussions for the user, benefitting the service that uses it.

Gray et al. (2018) describes dark patterns as deliberate, misleading design decisions made with psychology understanding that are not in the user's best interest. Mathur et al. (2019) stresses that the choices the dark patterns influence, force, or mislead the user into making may not have been taken if they had the option to select differently. Bösch et al. (2016) emphasizes that dark patterns are deceptive by choice, intended to deceive people towards undesirable choices. Dark patterns may be characterized as deliberate, misleading design choices 9

Taking use of psychology, manipulating the user to make unexpected and undesired choices; generating value for the service they employ.”

Table 1 Good patterns, anti-patterns and dark patterns

	Good pattern	Anti-pattern	Dark pattern
Design intent	Intentional	Unintentional	Intentional
Knowledge of user needs	Good	Lacking	Good
Made to benefit	Mainly the user		Mainly the business
Results in	Good user experience	Poor user experience	Poor user experience

The effects of dark patterns on a person may range from mild annoyance to discontent, as well as being deceived or tricked. This may result in the loss of money, personal information, and even compulsive and addictive behavior (Mathur et al. 2019). Dark patterns are well-known among customers, and businesses have a financial incentive

to use them. In a digital world, individuals sometimes notice a black pattern (Bösch et al. 2016). Dark patterns, on the other hand, seem to function since they are still widely used, despite the fact that people are aware of them and may notice them when they are discovered.

In terms of design intent and inspiration, dark patterns come in varying degrees of "darkness." Even if they weren't designed to influence the original audience, certain patterns become black after being exposed to a larger audience (Gray et al. 2018). Alerts on whether another buyer is looking at the same product, for example, might have been helpful in e-commerce stores that sell unique, one-of-a-kind items. Similar notifications, on the other hand, have already been introduced in a variety of e-commerce stores, encouraging customers to buy even when there is no real product scarcity.

Some designs even do well in usability tests (at least when considering stakeholder goals), indicating that dark patterns aren't necessarily associated with bad usability. Even if the use of dark patterns does not harm the user interface, it does result in a bad user experience and negative user emotions. (Gray et al , 2018)

Why Do Dark Patterns Work?

Traditional economic theory argues that individuals are always rational decision-makers, carefully considering their alternatives and based their decisions on their findings. However, Weinman et al. (2016) suggest that individuals do not always behave deliberately, enabling dark patterns to operate. The next chapters offer various explanations of why and how dark patterns appear to function.

As black patterns frequently emerge on digital platforms, technical reasons are examined first. The human mind plays a significant part in understanding why these gloomy patterns operate, even if consumers are conscious at least at some level. Psychologically, cognitive aspects are initially addressed. Then the emphasis turns to social reasons explaining dark patterns' efficacy. Finally, the self-determination hypothesis presented by Deci and Ryan (2008) is examined in greater depth, explaining why some individuals are more susceptible to dark patterns than others.

Technological factors

Information technology is continuously changing, as are the persuasive and manipulative tactics that consumers encounter on various digital platforms everyday. This shift frequently leaves the user ignorant of possible dangers. It's known as information asymmetry. The service has more user information than service, creating a power imbalance (Acquisti et al. 2017).

Cognitive factors

Bias and heuristics:

Since the internet has invaded our everyday and working lives, the number of choices individuals must make each day has increased dramatically. People's decisions become increasingly quick and automatic as the number of options available each day grows (Mirsch et al. 2017). Each choice is dependent on the user's probability estimation, which requires mental effort.

Because humans have limited cognitive ability, they prefer to make decisions using heuristics (Acquisti et al. 2017). Individuals use heuristic availability to assess the probability of an occurrence based on the prominence of relevant examples. Because remembering is easier, people are more likely to exaggerate a shocking or unpleasant event. People underestimate the likelihood of less memorable events because they are harder to recall. (Acquisti, Mirsch, and colleagues, 2017)

Individuals employ heuristic representation to determine the probability of an occurrence based on how often their peers have encountered it (Acquisti et al. 2017). This may provide the sense of security. Because the majority of individuals are ignorant of how their data is used without their permission, they are unlikely to learn about data abuse involving their acquaintances.

This reinforces the idea that data misuse has no direct effect on them. The biased way of seeing the world vs. seeing the world objectively is referred to as bias. Biases are irrational thinking patterns that may be inherited or learned. Regardless matter how difficult the option is, they have an impact on the decision-making process (Acquisti et al. 2017).

These mistakes are often committed while designing user interfaces for digital platforms. Anchoring bias causes people to create standards from comparable or unrelated items to use as a basis for their choices (Acquisti et al. 2017). Many e-commerce shops include higher-priced items on the site to act as a benchmark against which consumers can evaluate the pricing of other items, making them seem more affordable. Cognitive dissonance is the discomfort produced by things that contradict one's beliefs. People attempt to distance themselves from facts that contradict their own views (Bösch et al. 2016). Consumers are detached from a concrete notion in favor of one that is less abstract. As a result, the apparent cost of a choice is reduced (Mirsch et al. 2017). Because individuals are less likely to completely understand the amount of money they've spent this way, this bias is exploited to persuade customers to buy goods that employ face or fingerprint sensors. The framing in which something is presented has a significant effect on how others see it. Framing is the controlled presentation of an option that affects the decision-making process (Mirsch et al. 2017). The impact of loss aversion is amplified when positive presentation highlights the benefit and negative presentation focuses the loss (Acquisti et al. 2017). Framing is when a popup asks for permission to use cookies in a manner that encourages cookie use. User 19 choices may include "Yes, I want to guarantee the greatest user experience" or "No, I hate well-functioning websites," even if cookies that

ensure a website's functionality have already loaded and the pop-up presumably asks about cookies that are used for marketing reasons. Loss aversion is the tendency to despise loss more than the comparable gain. Hyperbolic discounting happens when individuals prefer immediate benefits above long-term dangers because they don't fully understand the long-term implications of their choices. Dark patterns that take advantage of this bias often target hyperbolic discounting (Acquisti et al. 2017). For example, certain online material may be accessible only to people who subscribe to a newsletter. People do not want to lose a piece of material (loss aversion), therefore they do not consider the implications of providing their email address in return for more information (hyperbolic discounting). Optimism bias causes individuals to exaggerate the chances of anything bad occurring to them. Exaggeration of one's skills may result from overconfidence. Don Moore, a behavioral economist at UC Berkeley, stated when questioned about similar biases for The Atlantic (Fussell 2019), "Consumers are frequently somewhat too hesitant to face their own shortcomings, limits, or mistakes."

When individuals are convinced, they often reply, "Oh, I intended to do that." People are more prone to commit errors after accomplishing their main objective and supplementary activities (Acquisti et al. 2017). Unchecking the checkboxes that show often after finishing an installation, such as the one that asks the user to choose a favorite search engine, may go undetected by users.

They're referred to as "post-completion errors." Individuals are more likely to accept the default choice if it is presented to them in the current situation (Acquisti et al. 2017). People make this decision based on loss aversion: they don't want to risk losing money by not selecting the default option, therefore they don't (Mirsch et al. 2017). Many individuals believe that the user's default selection is the best one. The majority of people never look at the default settings, much alone alter them (Forbrukerrdet 2018). Many applications, for example, gather user data by default for marketing reasons, and users must turn off data collecting in the settings. Apple's next iOS 14 upgrade will substantially change this trend by requiring users to explicitly choose ad tracking rather than having it switched on by default. This approach will have an effect on Facebook's targeted advertising business strategy (O'Flaherty 2020), according to the company.

Social factors

Social norms

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Humans prefer to make choices based on heuristics since their cognitive abilities are restricted (Acquisti et al. 2017). People utilize heuristic availability to determine the likelihood of an event based on the prominence of relevant instances. People are more

prone to exaggerate a startling or unpleasant experience since remembering is simpler. Because less memorable occurrences are more difficult to remember, people underestimate their probability. Acquisti, Mirsch, and colleagues (Acquisti, Mirsch, and colleagues, 2017)

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When people are persuaded, it's common for them to say, 'Oh, I meant to do that.' After completing their primary goal and secondary tasks, people are more likely to make mistakes (Acquisti et al. 2017). Unchecking the checkboxes that often appear after completing an installation, such as asking the user to choose a certain search engine as their preferred search engine, may go unnoticed by users.

They're referred to as "post-completion errors." Individuals are more likely to accept the default choice if it is presented to them in the current situation (Acquisti et al. 2017). People make this decision based on loss aversion: they don't want to risk losing money by not selecting the default option, therefore they don't (Mirsch et al. 2017). Many individuals believe that the user's default selection is the best one. The majority of people never look at the default settings, much alone alter them (Forbrukerrdet 2018). Many applications, for example, gather user data by default for marketing reasons, and users must turn off data collecting in the settings. Apple's next iOS 14 upgrade will substantially change this trend by requiring users to explicitly choose ad tracking rather than having it switched on by default. This approach will have an effect on Facebook's targeted advertising business strategy (O'Flaherty 2020), according to the company.

The need to belong

Persons need to join strongly (Bösch et al., 2016). Social isolation therefore has basic repercussions including anxiety, loneliness, anger, antisocial behaviour, and self-defeat (Pickett et al. 2004), poor self-esteem and even a lack of welfare and faith in meaningful living (Bösch et al. 2016). This results in social isolation. Individually, because of the terrible impact of social refusal, try unconsciously to meet collective standards (Pickett et al. 2004).

Maximizers

“People strive to make decisions that best suit their requirements. However, when presented with many of options, it's difficult to evaluate all potential possibilities. Instead, individuals satisfy with the best choice in that circumstance. The degree to which a person seeks to satisfy or optimize their choice varies in population. (Sparks, Ehrlinger, 2012)

When individuals make a decision, they decrease the cognitive dissonance resulting from no longer making a decision. They change their thoughts from various potential options to concentrating on their choice. When making judgments online, individuals

are more likely to satisfy since they have limited cognitive resources utilized when making selections, and virtually limitless alternatives. As satisfiers, they decrease their cognitive dissonance and are less likely to regret and change that choice (Sparks et al. 2012).

Users frequently see a pop-up after finishing a service registration procedure asking whether they authorize the service to utilize cookies. They may allow cookies on the framed account (the service may claim that enabling cookies improves the user experience) or post completion failures. After allowing tracking cookies once (satisfied), they decrease their cognitive dissonance and never alter the cookie setting again.

Self-determination theory

The theories of self-determination show that individuals are pushed inwardly or externally; (Nurmi and Salmela-Aro 2017). All internal motivators are self-interest, passions, and values. All instances of external motivators include incentives, punishment, expectations and societal pressure. These variables affect individual decision-making and behavior in various circumstances. (Deci, Ryan, 2008)

Individuals vary in their view of their capacity in the current circumstances to take autonomous choices. If someone is autonomous, they think that they can decide alone and outside influences have a significant effect on their decision-making process. Controlling people frequently seem to be influenced by their surroundings. Shame and social pressure have a particularly strong impact on choices by individuals. Unbuilt viewpoint

The decision-making processes of people are dependent only on external drivers and have little impact on their own choices. (Franzensburg, 2017)

Different perspectives on how much people control their decisions explain why some people are more vulnerable to obscure patterns and online manipulation. If a person is easily impacted by external circumstances, then they are more likely to create dark patterns using social evidence (social stress), framing, and user-interface assumptions, to assist and humiliate users when they don't (shame). 2017: 2017 (Vasalampi)

Why dark patterns work?

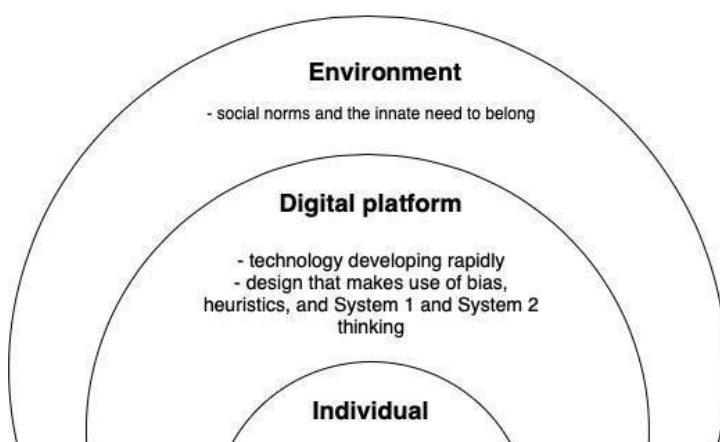


Figure 4 Working mechanisms of dark patterns divided into three layers

Why are dark patterns used in e-commerce?

“Why are merchants choosing dark patterns that can cause annoyance or worse? Or worse than that, because the goal of successful e-commerce sites should be to have a pleasant consumer experience?”

E-commerce companies have an enormous impact on how they proceed and deal with the website. Many e-commerce websites are intended to allow merchants to influence customer behavior and keep them on the website as long as possible since e-commerce is competitive (Haywood 2006). The increased economic success (Eisingerich & Kretschmer 2008) has led to a strong degree of consumer commitment; thus, traders employ dark patterns to enhance contact at their facilities.

More dark patterns have arisen as a result of institutional drift (Germain 2019). Technological behemoths such as Facebook and Google influenced our expectations and introduced many dark trends that other service providers followed rapidly (Forbrukrradet, 2018). The more popular an e-commerce web site is, the more likely it is to employ obscure design, according to Mathur et al. (2019). These successful e-commerce websites provide an example for smaller companies that then make use of obscure patterns to succeed in a competitive market.

Vendor confidence is affected by the reputation of consumers (Acquisti 2017). Confidence frequently overcomes usability and user experience issues in online shops (Haywood 2006).

Consumers trusting the service provider feel that retailers know the best (Forbrukerrdet 2018) for them and are less likely to notice disappointing and misleading dark patterns that make them decide that they believe they have. Companies may use dark patterns without being afraid that they will find and harm reputation if they have confidence.

One cause for anti-pattern and dark patterns is the fast development of electronic commerce businesses. In order to be able to start a new site, designers concentrate on a "happy pathway," which meets the goals of the project. In these cases, actions, such as canceling the account or removing a newsletter from the account, which do not meet shareholder objectives get little attention. (2019 Germany) The predominance of dark patterns according to Gray et al. (2018) is attributed, partly, to a lack of core curriculum ethics teaching for user interface and user experience design students. No design program has been created despite continuous requests for more emphasis on design ethics (Gray et al. 2018). Student designers typically understand user values and objectives solely to convince consumers of stakeholder goals (Chivukula, Brier and Gray 2018). It may be claimed that designers think about the ethical elements of their concepts but, as a result of institutional or financial pressure, they move away from user-centric design."

Conclusion

This research sought to illuminate dark patterns, explain what makes them successful, and explore their ubiquity in e-commerce. The motivations for adopting dark designs were addressed, as were the reasons why online merchants should avoid using dark patterns on their site.

This thesis had the following research questions:

- 1.) What are dark patterns and how can you recognize them?
- 2.) What makes dark patterns so effective?
- 3.) What is the significance of dark patterns in e-commerce?"

“Dark patterns, according to this study, are intentional, deceptive design decisions intended to exploit psychology, persuade the user to do unexpected and undesirable behaviors, and generate value for the business that employs them. While a description for dark patterns was developed, it was discovered that classifying user interface elements as digital nudges or dark patterns is challenging. The majority of the designs mentioned here are in the "gray zone," which is the area between a nudge and a dark pattern. As a result, dark pattern control is put to the test. Because there are no specified criteria for a dark pattern element, its use cannot be successfully regulated if user interface components cannot be categorically classified as dark patterns.

This study discovered many factors that contribute to the effectiveness of dark designs. For starters, the rapid advancement of technology makes it harder for people to recognize dark patterns when they come across them.

Second, human intellect is limited, making people vulnerable to dark patterns. Heuristics, or decision-making shortcuts, have an impact on daily decisions. Individuals are unable to comprehend how frequent dark patterns are or how often they are effective due to these heuristics.

"Systemic judgment errors, because they are unconscious, are difficult to prevent. Many dark patterns depend on different preconditions like collecting more personal data, spending longer time on the site, or spending more money on e-commerce. 28 We utilize two distinct cognitive systems to make choices due to our limited cognitive abilities: system 1 think and system 2 think well. The thought of System 1 is automatic and unconscious. They respond naturally and rapidly when people are exposed to stimuli. This is referred to as System 1. People are more susceptible to obscure patterns when information is rapidly absorbed by system 1 thinking because their choices are not conceived, but instead impelling stimulus reactions.

System 2 is regulated, aware, and intentional thinking and is designated for critical choices. Even if individuals are aware of system 2, they frequently accept without questioning the results acquired through system 1.

Third, humans are social creatures and susceptible to their decision-making impacts due to social circumstances. Persons in need of membership are more inclined to obey social standards. "Black patterns that benefit from the importance of social variables in policy-making may readily influence our process of decision-making.

Finally, many individuals think that in different circumstances they have varying degrees of control on their own choices. Differences in the direction of controls explain why some individuals are more vulnerable to external influences while others are harder to absorb pattern effects. Difference in control orientation should be considered as explanatory variables when examining the future impacts of dark patterns.

For many reasons, dark designs are utilized in e-commerce. Dark e-commerce patterns have been extremely prevalent, with 11% of e-commerce websites employing obscure patterns by Mathur et al (2019). Dark patterns may be observed on popular websites more often. Similar findings were obtained by Moser et al (2019). All locations surveyed exhibited impulse to purchase production patterns, with at least 16 of them above 75 percent. This predominance is one of the reasons why e-commerce uses dark designs. Because to institutional drift, companies started to use bigger dark patterns. Dark designs became the "industry standard," when they were adopted by major e-commerce sites.

Another reason why gloomy patterns in e-commerce are used is because tight deadlines and limited resources for online stores only compel designers to focus on "a joyful journey" that fulfill's shareholders' goals; or the insufficient emphasis on ethics training for the use.

This research has several shortcomings. First, because the study of dark patterns in the science of information systems is a relatively new subject, only a small number of research needs to be researched. In addition, since dark patterns are a relatively new subject, the main emphasis of study is on establishing criteria or categorisation taxonomy. Only one study paper on dark e-commerce trends has been identified.”

Only popular sites in the United States have been used to do research on dark patterns and impulsive pattern purchases. It would be interesting to investigate the cultural differences in dark pattern standards in the US and overseas, as well as people's reactions to them. Is it true that dark patterns that rely on people's willingness to follow social norms are more effective in collectivist countries than in individualistic ones?

Furthermore, examining people's perceptions and reactions to dark patterns over time may be interesting. Dark patterns may seem to be a quick way to increase sales, but studies indicate that once customers are aware of the manipulation they are subjected to online, they begin to reconsider their feelings about the business. This loss of trust and damage to the brand may have serious long-term implications for the profitability of stores that use these dark designs.”

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