Systematic Identification and Evaluation of Dark Patterns and Nudging at the Travel Service Market

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Abstract. *The primary objective of this study is to systematically identify and evaluate the dark patterns and nudging strategies within the travel service market. The research aims to assess how these practices are perceived by consumers in terms of manipulation and to examine their broader societal acceptability. To achieve these objectives, the study adopts a structured, multi-stage methodological approach. In the first stage, dark patterns and nudging techniques commonly used in the travel service sector are identified and categorized based on their key characteristics. The second stage focuses on evaluating consumer perceptions of these practices through the development of measurement scales capturing perceived manipulation and societal acceptability, followed by the administration of a structured survey. The final stage involves quantitative data analysis using statistical methods to assess the impact of dark patterns on consumer perceptions and attitudes. The findings reveal that dark patterns and nudging strategies are widely employed across travel service platforms, with practices such as hidden fees, urgency cues, and misleading choice architectures being particularly prevalent. Consumers generally perceive these practices as manipulative, often associating them with feelings of frustration, reduced trust, and ethical concern. The results further indicate that the societal acceptability of such practices is limited, especially when consumers perceive a lack of transparency or intentional exploitation of their decision-making processes. Overall, this study contributes to the growing body of research on digital consumer protection by providing empirical evidence on the prevalence and perceived impact of dark patterns in the travel services sector. The findings offer valuable insights for policymakers, platform designers, and researchers seeking to promote more transparent, ethical, and user-centered digital environments.*

Keywords: *dark patterns and nudgings; travel service market; consumer behavior; travel companies; digital customer behaviour.*
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Introduction. In the current era of digitalization, the customer journey has largely transitioned to the online space, where businesses must adapt to new consumer behaviors shaped by technology. For businesses in the 21st century, particularly those that aim to be human-centric and sustainable, it is critical to build their strategies on an understanding of economic behaviors and consumer choice. In this context, responsible and sustainable practices have become essential for long-term success (Pappas et al., 2023).

Over the past few years, studies of consumer behaviour management have reached significant progress. One of the important aspects of managing consumer behaviour in the digital space is encouraging consumers to take actions that will benefit the company through persuasive web or app design (Braca&Dondio, 2023). However, this process often involves the use of subtle or manipulative techniques. To achieve these goals, many companies resort to the use of what are known as "dark patterns" – design strategies aimed at guiding or even coercing consumers into actions they did not initially intend to take (Holmberg & Manse, 2023).

Concerning travel service market, the usage of various techniques of web design, collectively called “dark patterns”, airlines and online travel portals are manipulating air travellers into paying more than they would ideally like to (Bhargava, 2023). These practices are not limited to pricing alone but can extend to influencing choices in booking procedures, upselling additional services, and even making it more difficult to cancel or change bookings.

The common features of a “dark pattern” are the (i) manipulative or deceptive nature and the (ii) resulting negative or harmful outcome on the consumer (Brignull, 2011; Cooper et al., 2023). The results of recent research indicate that exposure to dark patterns increases perceived violations of communication maxims, which increase perceived user manipulation (Witte, Kenning, & Brock, 2023).

In general, deceptive interfaces in digital markets are aimed at designing user journeys in such a way as to distort or limit the ability of service recipients to make independent and informed choices or decisions. In practice, such practices are intended to induce users to take unwanted or unintended actions (Rentflejsz, Guzy& Gosławska, 2023). For example, the communication of scarcity – a tactic that suggests limited availability – has become a fundamental marketing strategy, especially in e-commerce and hospitality sectors, where it is frequently employed by platforms to encourage urgency in purchasing decisions (Teubner & Graul, 2020).

Given the prevalence of the practice of using digital manipulative technologies in the online travel services market, the issue of their identification and evaluation of their impact on consumers’ decisions is important because of four characteristics of service: intangibility, inseparability, variability, and perishability (Kotler and Keller, 2007).

Literature Review. The theoretical basis of "dark patterns" and nudging effects is formed both by classic approaches to the condition and models of the expectancy theory (Fell, 2010; Shiv et al., 2005; Stewart Williams & Podd, 2004). In the other side customer satisfaction is one of the key-elements of a company's success. Oliver's (1980) C/D-Paradigm is the most prominent approach to explain the process of customer satisfaction. Disconfirmation-of-expectations usually means that service performance falls short of (exceeds) what a consumer expected when making a purchase decision with negative (positive) implications for the service experience (Wirtz&Bateson, 1999). "Dark patterns" could influence on customer behaviour through forming expectations using manipulative techniques.

Harry Brignull defined the term "dark patterns" in 2011 (Brignull, 2011). Although he now refers to dark patterns as deceptive design patterns (Brignull et al., 2023). Dark patterns are defined as "design choices that benefit an online service by coercing, steering or deceiving users into making decisions that, if fully informed and capable of selecting alternatives, they would not make" (Mathur et al., 2019).

Dark patterns are presented in more than 10% of global retail websites (Mathur et al., 2019), and more than 95% of the 200 most popular apps (Geronimo et al., 2020). To respond to such pervasiveness, technical solutions that ease autonomous decision making can be devised, like "Do Not Track", the "add-on" extension "Consent-O-Matic" or browser plug-ins that disable other plug-ins, e.g., those that create scarcity messages (Bongard-Blanchy, et al., 2021). Digital nudges that counteract dark patterns (i.e., bright patterns) by, for example, making the privacy-savvy option more salient, modify the environment where users make choices. Witte (2023) provides a comprehensive investigation of customer manipulation through dark patterns, demonstrating how manipulative interface designs shape digital customer behavior and arguing for the integration of ethical considerations into both research and practice in digital service environments.

Researchers have been studying "dark patterns" from different points of view. Witte, Kenning, and Brock (2023) examine the behavioral and economic consequences of user manipulation through dark patterns, highlighting that such design practices not only alter consumer decision-making but also have measurable impacts on consumer trust and long-term engagement with digital services, thereby reinforcing the need for ethical interface design in digital marketplaces. Concerning travel service market, the impact of dark patterns on consumers' perceived fairness and attitude has been studied by Kim, Gon Kim & Lee (2023) who generate a theoretical model that discusses how dark patterns tactics employed by online travel agencies. They demonstrated the moderating effect of social proof on the relationship between dark patterns practices and perceived fairness and attitude toward online travel agencies (Kim, Kim&Lee, 2023).

While looking for accommodation on platforms such as Booking.com or Expedia, consumers are likely to encounter messages that tell them that almost all rooms are sold out and that they have been booked over 78 times within the last 24 h (Teubner & Graul, 2020).

Airline industry analysis in the context of study on users' perception of dark patterns on airline companies' websites has been made by Ebba Holmberg & Sarah Manse (2023). Six dark patterns were found during a content analysis of four airline company websites. These "dark patterns" are misdirection, nagging, urgency, interface interference, price comparison prevention and forced action. Misdirection was identified by Holmberg & Manse (2023) as the most used one.

Users' awareness regarding dark patterns is still an under-researched topic and has only been recently the object of dedicated studies. Some of them determined whether dark patterns exploit (1) users' lack of awareness or concern; (2) users' incapability of recognising dark patterns (the so-called "dark-pattern blindness" (Di Geronimo et al., 2020); or (3) users' inability to resist dark patterns, despite their awareness and ability to recognise them (Bongard-Blanchy et al., 2021). Also, in scientific papers it has been explored two angles: (1) how prominent Dark Patterns are in popular mobile apps and (2) whether users are aware or can recognize the presence of DPs (Di Geronimo et al., 2020). Gray et al. (2021) conducted a qualitative research to identify end-user perceptions of manipulation, building upon dark patterns. As it has been realized, even if users do not know what dark patterns exactly are, some customers are able to identify issues that lead them to believe that the interface has a manipulative intention (Gray et al., 2021).

Aims. This paper aims to tackle these significant research challenges. Specifically, it seeks to identify and evaluate the impact of dark patterns on consumer behavior within the travel service market. Additionally, it will assess the perceived manipulation associated with these patterns and explore the societal acceptability of such practices in the context of responsible and ethical business conduct. By doing so, this research hopes to contribute valuable insights into the evolving relationship between digital design, consumer rights, and business sustainability.

Methodology. The study adopted a systematic, stepwise approach to achieve its objectives, focusing on the identification and evaluation of dark patterns and nudging in the travel service market.

Step 1: Identification of Dark Patterns and Nudging The first step involved identifying the presence of dark patterns and nudging techniques in the travel service market. This phase began with defining the scope of the study and delineating the key characteristics of these practices, such as manipulation tactics, user experience design flaws, and behavioural triggers. Relevant examples were collected through market observation and analysis.

Step 2: Evaluation of Consumer Perception The second step assessed consumer perceptions of identified dark patterns and nudging strategies. This involved the development of a robust scale to measure two dimensions:

– Manipulation perception: The degree to which consumers perceive these practices as manipulative or deceptive.

– Societal acceptability: Consumers' attitudes toward the ethical and social implications of these practices. A survey instrument was then designed and distributed to capture consumer insights and feedback.

Step 3: Data Analysis The final step centered on analyzing the collected data using advanced statistical tools. The analysis aimed to evaluate the impact of dark patterns and nudging on consumer decision-making, brand trust, and overall market behavior. This provided actionable insights into the implications of these practices on both consumers and service providers.

This structured methodology ensures a comprehensive evaluation of the prevalence, perception, and consequences of dark patterns and nudging in the travel service industry.

The study adopts a quantitative research design with qualitative conceptual foundations. While data collection relies on structured survey instruments and statistical analysis, the constructs under investigation – such as perceived manipulation, emotional response, and ethical evaluation – are inherently qualitative in nature. These constructs reflect subjective interpretations, moral judgments, and experiential responses of users interacting with digital interfaces.

Thus, the study applies a quantitatively operationalized approach to qualitatively grounded phenomena, allowing for systematic measurement while preserving the interpretive depth of consumer perceptions. This approach is particularly suitable for examining complex phenomena such as dark patterns, where behavioral outcomes are closely intertwined with cognitive and emotional responses (Table 1).

This measurement framework enables a systematic examination of how consumers perceive and evaluate manipulative design practices in the travel services market, thereby providing empirical grounding for discussions on ethical digital design and responsible business conduct.

The constructs used in this study are grounded in previously validated theoretical frameworks and measurement instruments. While the items are adapted to the specific context of dark patterns in digital services, they build upon well-established scales in consumer behavior, ethics, and technology acceptance research. Construct alignment with existing validated scales is presented in Table 2.

Table 1. Measurement Model for Perceived Manipulation and Societal Acceptability

Construct	Sample Items	Source / Conceptual Basis	Measurement Scale
Intent Recognition	"Dark patterns are deliberately designed to influence users' decisions." "The main goal of certain interface elements is to steer users toward specific choices."	Dark patterns theory; persuasive design literature; behavioral economics	5-point Likert scale (1 = Strongly disagree; 5 = Strongly agree)
Emotional Impact	"I feel frustrated when I realize that a platform is trying to manipulate me." "Deceptive design practices make me feel uncomfortable."	Consumer psychology; affective response theory	5-point Likert scale
Cognitive Awareness	"I can usually recognize when a website is trying to manipulate my behavior." "I often realize only afterward that a design influenced my decision."	Consumer awareness and information processing theories	5-point Likert scale
Trust Erosion	"Experiencing manipulative design reduces my trust in the platform." "If I feel deceived, I am less likely to continue using the service."	Trust theory; relationship marketing literature	5-point Likert scale
Societal Acceptability	"The use of dark patterns is acceptable in today's digital environment." "Society should tolerate manipulative design practices in online services."	Ethics of technology; digital governance	5-point Likert scale

Source: systematized by the author

The measurement model builds upon established constructs in consumer behavior, persuasion knowledge, and digital ethics literature. While the items were adapted to reflect the specific context of dark patterns in digital services, their conceptual foundations draw from validated scales assessing manipulation, trust, ethical judgment, and emotional response. This approach allows for contextual relevance while maintaining theoretical rigor and construct validity.

Measurement Validity and Reliability. To ensure the robustness and methodological rigor of the proposed measurement model, a series of procedures were employed to assess the reliability and validity of the constructs used in this study. Although the measurement items were adapted from established scales in the fields of consumer behavior, persuasion knowledge, and digital ethics, their application to the context of dark patterns in the travel services sector necessitated careful validation.

The constructs utilized in this study – intent recognition, emotional impact, cognitive awareness, trust erosion, and societal acceptability – were adapted from previously validated measurement instruments, including the Persuasion Knowledge Model (Friestad & Wright, 1994), consumer trust frameworks (McKnight et al., 2002), and ethical judgment scales (Reidenbach & Robin, 1990).

Table 2. Construct Alignment with Existing Validated Scales

Construct	Conceptual Basis / Related Validated Scales	Example Items	Measurement Scale
Intent Recognition	• Persuasion Knowledge Model (Friestad & Wright, 1994) • Perceived Manipulative Intent Scale (Campbell, 1995)	"Dark patterns are deliberately designed to influence users' decisions." "The purpose of certain interface elements is to steer users toward specific outcomes."	5-point Likert (Strongly disagree – Strongly agree)
Emotional Impact	• Negative Affect Scale (PANAS – Watson et al., 1988) • Consumer Frustration Scale (Strebel et. al., 2004)	"I feel frustrated when I realize that a platform is trying to manipulate me." "Deceptive interface designs make me feel uncomfortable."	5-point Likert
Cognitive Awareness	• Consumer Awareness Scale • Persuasion Knowledge Activation (PKM) (Friestad & Wright, 1994)	"I can usually recognize when a website is attempting to manipulate my behavior." "I become aware of manipulation only after interacting with the platform."	5-point Likert
Trust Erosion	• Trust in E-commerce Scale (McKnight et al., 2002) • Online Trust and Risk Frameworks	"Experiencing manipulative design reduces my trust in the platform." "If I feel deceived, I am less likely to continue using the service."	5-point Likert
Societal Acceptability	• Ethical Judgment Scale (Reidenbach & Robin, 1990) • Moral Acceptability Measures (Vitell et al.)	"The use of dark patterns is acceptable in today's digital marketplace." "Society should tolerate manipulative design practices in online services."	5-point Likert

Source: systematized by the author

Adaptation was required to reflect the specific characteristics of digital interfaces and dark pattern practices within online travel services.

To ensure content validity, all items were reviewed for conceptual relevance, clarity, and contextual appropriateness. The adaptation process focused on preserving the theoretical meaning of each construct while aligning item wording with contemporary digital interaction scenarios. This approach follows established recommendations for adapting psychometric scales to new research contexts.

Construct validity was assessed using exploratory factor analysis (EFA) to examine the underlying factor structure of the measurement model. Principal axis factoring with varimax rotation was applied to identify latent dimensions and confirm whether the observed items loaded onto their theoretically expected constructs.

Items with factor loadings below 0.50 or with substantial cross-loadings were considered for removal to ensure construct purity. The resulting factor structure was expected to reflect distinct yet related dimensions

corresponding to perceived manipulation, emotional response, cognitive awareness, trust erosion, and societal acceptability.

For further validation, the measurement model is suitable for *confirmatory factor analysis (CFA)* within a structural equation modeling (SEM) framework. CFA allows for the assessment of model fit indices (e.g., CFI, TLI, RMSEA, SRMR) and provides statistical confirmation of the hypothesized relationships between latent constructs and observed indicators.

Internal consistency reliability was evaluated using *Cronbach's alpha* and *composite reliability (CR)* coefficients. Values exceeding the commonly accepted threshold of 0.70 were considered indicative of satisfactory reliability. Additionally, average variance extracted (AVE) was examined to assess convergent validity, ensuring that each construct explains a sufficient proportion of variance in its indicators.

Discriminant validity was assessed by comparing the square root of the AVE for each construct with the inter-construct correlations, following the Fornell–Larcker criterion. This procedure ensured that each construct captured a distinct conceptual domain.

By combining established theoretical constructs with empirically grounded adaptation to the context of dark patterns, this study offers a robust and transferable measurement framework. The approach balances conceptual rigor with contextual relevance, enabling meaningful empirical investigation into the perceived manipulation and societal acceptability of digital design practices.

The resulting measurement model provides a reliable foundation for subsequent structural modeling and hypothesis testing, thereby supporting a deeper understanding of how users perceive and evaluate ethically questionable digital practices within the travel services market.

Results. This section presents the findings of the empirical analysis aimed at identifying the prevalence, characteristics, and perceived impact of dark patterns and nudging strategies in the travel service market.

The results focus on two main dimensions:

1) the manifestation of manipulative and nudging practices within digital travel platforms;

2) consumer perceptions regarding the acceptability and ethical implications of these practices.

1. Identification of dark patterns and nudging practices in the travel service market. The first stage of the analysis focused on identifying and categorizing the most prevalent forms of dark patterns and nudging strategies employed by online travel agencies (OTAs). The scope of the study primarily included booking platforms, while airline websites and destination-related platforms are reserved for subsequent stages of research.

The analysis revealed several recurring design practices that influence consumer decision-making, which were grouped into the following categories:

1.1. Manipulation tactics. These practices are designed to exploit cognitive biases and steer user behavior toward outcomes favorable to service providers. Commonly identified tactics include: hidden costs, such as additional fees revealed only at later stages of the booking process; pre-selected options, including automatically added insurance or ancillary services that require active deselection by the user; misleading framing, where information presentation encourages impulsive or uninformed decisions.

1.2. User experience (UX) design flaws. Certain interface designs were found to intentionally complicate user decision-making processes. Examples include: complex or non-intuitive opt-out mechanisms for optional services; visual hierarchies that emphasize higher-priced options while obscuring cheaper alternatives. These practices contribute to increased cognitive load and reduce users' ability to make fully informed choices.

1.3. Behavioral nudging mechanisms. The analysis also identified the use of behavioral nudges that subtly guide user choices. While not inherently unethical, such mechanisms can become problematic when used manipulatively. Examples include: highlighting premium options as "recommended" or "best value"*;* displaying scarcity cues (e.g., "only 2 rooms left") to induce urgency. The findings suggest that while some nudges may promote efficiency or convenience, others blur the boundary between persuasion and manipulation.

2. Evaluation of consumer perceptions. To assess how users perceive these practices, the study employed a structured survey instrument designed to capture perceptions of manipulation and societal acceptability. Two key dimensions were evaluated:

- *perceived manipulation* - measuring the extent to which users believe that design elements intentionally influence or deceive them;
- *societal acceptability* - assessing normative judgments regarding whether such practices are considered acceptable, tolerable, or unethical within society.

Respondents evaluated a series of scenario-based and statement-based items using a five-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree".

The measurement scales demonstrated satisfactory internal consistency, with reliability coefficients exceeding recommended thresholds. Exploratory factor analysis supported the conceptual distinction between perceived manipulation and societal acceptability, confirming the multidimensional nature of user responses.

The results indicate that respondents generally perceived dark patterns as manipulative, particularly when they involved hidden costs, pre-selected

options, or misleading interface cues. Perceived manipulation was strongly associated with decreased trust in platforms and reduced willingness to engage with the service. While certain nudging practices (e.g., promoting sustainable or cost-efficient choices) were viewed as acceptable, overtly deceptive tactics were largely rejected. Societal acceptability varied depending on perceived intent: practices framed as supportive or beneficial were evaluated more favorably than those perceived as profit-driven.

The empirical evidence supports the proposed hypothesis. The study demonstrates that dark patterns are widely recognized by users as manipulative design practices. Users are capable of evaluating the ethical implications of such practices. Societal acceptability varies depending on perceived intent, transparency, and user benefit.

Overall, the findings demonstrate that users are increasingly aware of manipulative digital practices and capable of distinguishing between ethically acceptable nudges and exploitative dark patterns. The results confirm that perceived manipulation plays a critical role in shaping trust, satisfaction, and behavioral intentions in the travel services context. These insights provide a foundation for evaluating the ethical boundaries of digital design and inform future regulatory and managerial interventions aimed at promoting transparency and responsible digital practices.

Discussion. This study set out to examine the presence and perceived impact of dark patterns within the travel services market, with particular emphasis on user perceptions of manipulation and the societal acceptability of such practices. The findings provide empirical support for the argument that digital interface design plays a significant role in shaping consumer behavior and ethical judgments, reinforcing growing concerns within both academic and regulatory discourses.

Consequently, the findings confirm that the effects of dark patterns can be systematically identified and assessed in terms of both perceived manipulation and societal acceptability. This supports the conceptual framework underpinning the study and reinforces the relevance of integrating ethical considerations into the design and regulation of digital travel platforms.

The results confirm that users are generally capable of recognizing manipulative design practices and distinguishing them from neutral or supportive interface elements. The strong association between perceived manipulation and negative emotional responses aligns with prior research on persuasion knowledge and consumer resistance, which suggests that users become increasingly critical when they perceive intentional attempts to influence their decisions covertly.

The empirical support for H1 demonstrates that dark patterns are not only detectable by users but are also evaluated through a moral and ethical lens. High factor loadings for items related to intentional deception and loss of autonomy indicate that users interpret such practices as violations of fair

digital conduct. This finding reinforces theoretical assumptions derived from the Persuasion Knowledge Model, which posits that consumers activate defensive mechanisms when they perceive persuasive intent.

Table 3. Summary of hypothesis testing results

Hypothesis	Description	Key Findings	Result
H1	The effects of dark patterns can be identified and evaluated in terms of their perceived manipulative nature and societal acceptability.	Respondents consistently recognized manipulative design elements such as hidden costs, pre-selected options, and urgency cues. High levels of perceived manipulation were reported, accompanied by negative emotional responses and reduced trust in platforms.	Supported
H1a	Dark patterns are perceived as intentionally manipulative by users.	Factor analysis revealed strong loadings for items related to intentional deception and strategic influence, indicating clear user recognition of manipulative intent.	Supported
H1b	Perceived manipulation negatively affects trust in digital platforms.	Higher perceptions of manipulation were associated with lower levels of trust and reduced willingness to continue using the service.	Supported
H1c	Societal acceptability of dark patterns varies depending on perceived intent and outcome.	Practices framed as deceptive or profit-driven were largely rejected, while nudges perceived as beneficial or supportive received more neutral or positive evaluations.	Partially Supported

Source: complited by the author

Furthermore, the significant negative relationship between perceived manipulation and trust (H1b) aligns with existing literature on trust erosion in digital environments. Trust has been consistently identified as a critical determinant of long-term user engagement, and the results suggest that manipulative design strategies may generate short-term gains at the expense of long-term relational value. This supports prior studies arguing that ethical shortcomings in interface design can undermine brand credibility and customer loyalty.

The partial support for H1c highlights the nuanced nature of societal acceptability. While overtly deceptive practices are broadly rejected, certain nudging strategies – particularly those framed as beneficial or socially responsible – are perceived as acceptable or even desirable. This distinction underscores the importance of intent and perceived benefit in shaping ethical evaluations. It also supports emerging perspectives in behavioral economics that differentiate between coercive manipulation and "libertarian paternalism," where nudges are designed to promote welfare-enhancing outcomes.

Theoretical contributions. This study contributes to the literature in several ways. First, it extends existing theories of persuasion and consumer behavior by empirically demonstrating how users interpret and evaluate digital manipulation in contemporary online environments. Second, it bridges the gap between ethical theory and empirical measurement by

operationalizing abstract concepts such as manipulation and societal acceptability into measurable constructs. Third, it advances research on dark patterns by providing a structured framework that distinguishes between manipulative and ethically acceptable forms of behavioral influence.

By integrating insights from behavioral economics, human–computer interaction, and digital ethics, the study contributes to a more nuanced understanding of how design choices shape user autonomy and trust. The findings also underscore the importance of considering user perceptions – not merely technical design features – when evaluating the ethical implications of digital platforms.

Policy and managerial implications. From a policy perspective, the results underscore the need for clearer regulatory guidelines addressing manipulative digital practices. The strong association between perceived manipulation and reduced trust supports ongoing regulatory initiatives aimed at increasing transparency, informed consent, and user control in digital environments. Policymakers may leverage these findings to refine standards related to dark patterns, particularly in high-impact sectors such as travel and e-commerce.

For practitioners and platform designers, the findings highlight the strategic risks associated with relying on manipulative design tactics. While certain nudging techniques may offer short-term gains, their negative impact on trust and user satisfaction can undermine long-term sustainability. Designing interfaces that respect user autonomy and provide transparent choices may therefore constitute both an ethical and competitive advantage.

Limitations and directions for future research. Despite its contributions, this study has limitations that suggest avenues for future research. The reliance on self-reported perceptions may introduce response bias, and the cross-sectional design limits causal inference. Future studies could incorporate experimental designs or behavioral data to complement self-reported measures. Additionally, expanding the analysis to other digital contexts – such as social media platforms or financial services – would enhance the generalizability of the findings.

Future research could also explore cross-cultural differences in perceptions of manipulation and examine how regulatory awareness influences user evaluations of digital practices. Longitudinal studies may further illuminate how repeated exposure to dark patterns shapes user attitudes and behavior over time.

Conclusions. This study set out to examine the prevalence and implications of dark patterns within the travel services market, with particular attention to how such practices are perceived by consumers and evaluated in terms of societal acceptability. By integrating theoretical perspectives from consumer behavior, digital ethics, and behavioral economics, the research provides empirical evidence on how manipulative design strategies influence user perceptions, trust, and ethical judgments.

The findings demonstrate that users are generally capable of identifying manipulative interface elements and interpreting them as intentional attempts to influence their decision-making. Perceived manipulation emerged as a critical determinant of negative user responses, including reduced trust and heightened ethical concern. These results confirm that dark patterns are not merely technical design choices but socially and morally salient practices that shape user experiences and attitudes toward digital platforms.

Importantly, the study reveals a nuanced distinction between different forms of influence. While overtly deceptive practices are broadly rejected, certain nudging strategies – particularly those framed as supportive or beneficial – are perceived as more acceptable. This distinction underscores the importance of intent, transparency, and perceived user benefit in shaping societal evaluations of digital design practices. It also reinforces the notion that not all behavioral influence is inherently unethical, but that its legitimacy depends on how it aligns with user autonomy and welfare.

From a theoretical perspective, this research contributes to the growing body of literature on dark patterns by empirically validating constructs related to perceived manipulation and societal acceptability. By operationalizing these constructs and situating them within a structured measurement framework, the study advances understanding of how ethical considerations can be systematically integrated into the analysis of digital interfaces. The findings also extend existing models of persuasion and trust by highlighting the role of user awareness and moral judgment in shaping responses to digital design strategies.

From a practical standpoint, the results carry important implications for platform designers, businesses, and policymakers. Designers and firms are encouraged to move beyond short-term optimization strategies and consider the long-term impact of manipulative practices on user trust and brand credibility. For policymakers and regulators, the findings support the development of clearer guidelines and standards aimed at promoting transparency, fairness, and user autonomy in digital environments.

In conclusion, this study underscores the growing importance of ethical considerations in digital design and contributes empirical evidence to ongoing debates surrounding dark patterns and consumer protection. By highlighting how users perceive and evaluate manipulative practices, the research provides a foundation for more responsible design strategies and more informed regulatory approaches in the evolving digital economy.

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