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## THE ILLUSION OF AUTHENTICITY: VISUAL MISREPRESENTATION AND DARK PATTERNS IN E-COMMERCE

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### Abstract

In contemporary digital marketplaces, visual content has emerged as the most influential medium shaping consumer perceptions and purchase decisions. While images, videos, and data visualizations enhance product understanding, their deceptive use has become a growing concern in e-commerce practices. This paper critically examines the phenomenon of misleading visuals in e-commerce, situating it within the broader framework of dark patterns—manipulative design strategies intended to exploit consumer cognition and behaviour. Drawing on existing literature and regulatory perspectives, the study highlights that a significant proportion of e-commerce platforms employ visually deceptive techniques, including ambiguous advertising, exaggerated product imagery, hyper-realistic renderings, and manipulated data visualizations. These practices leverage the inherent realism and persuasive power of visuals, often creating false expectations regarding product quality, size, performance, or value. The paper further analyses misleading visuals as an unfair trade practice, underscoring their ethical, legal, and economic implications. Consequences such as erosion of consumer trust, increased product returns, reputational damage, and regulatory sanctions are discussed in detail. Emphasizing the need for ethical accountability, the study advocates for visual transparency through accurate representation, disclosure of image enhancements, and the inclusion of authentic user-generated content. Ultimately, the paper argues that sustainable e-commerce growth depends on visual integrity and consumer trust rather than short-term gains derived from deceptive visual strategies.

**Keywords:** Misleading visuals; Dark patterns; E-commerce ethics; Consumer deception; Visual transparency

### A Concrete Example of Misleading Visual

Imagine you are on an online marketplace looking for a decorative plant for your living room. You see a product photo showing a beautiful potted plant on the floor next to a sofa. In

the image, the plant appears to be about half the height of the sofa, the pot looks wide and substantial, and the overall impression is that this is a medium sized floor plant suitable as a focal point in the room. When it arrives, it's a small desk plant, just 15 cm (6 inches) tall. The seller has used a miniature sofa prop and forced perspective a photographic technique that manipulates depth and spatial relationships by placing the product closer to the camera and background objects further away to make the plant appear much larger than it truly is. Such deliberate visual framing conceals the true scale and creates a false sense of proportion (Messaris, / 2020). Although accurate measurements may appear in small text, most consumers rely on immediate visual cues when forming expectations. And the camera angle is carefully chosen to emphasize the plant and hide true scale. The listing might include accurate dimensions in small print, but the primary visual strongly suggests a much larger product. Most people trust what they see first and either miss or underestimate the written size information.

By systematically distorting perceived size, this type of composition functions as a visual dark pattern designed to nudge consumers toward purchase decisions based on illusion rather than information (Gray/ et/ al., / 2018; / Narayanan/ et/ al., / 2020). It aligns conceptually with what design and policy researchers describe as deceptive or dark patterns: interface and presentation choices that exploit cognitive biases to nudge users toward decisions they might not otherwise make (Gray et al., 2018; Mathur et al., 2019; Narayanan et al., 2020; Brignull, 2023).

## **Misleading Visuals as a Form of Dark Pattern**

In the broader literature, “dark patterns” or “deceptive patterns” are design strategies that manipulate users into making decisions that benefit the business at the users’ expense (Brignull, 2023; Narayanan et al., 2020). While many examples focus on consent flows, subscriptions, or data sharing, the same logic applies to product imagery.

Misleading visuals can be understood as a visual dark pattern: they are crafted representations that exploit how people process images. Research on dark patterns in e commerce shows that such tactics are widespread and can range from hidden costs to misrepresentative visuals (Mathur et al., 2019; Gray et al., 2018). Policy bodies such as the OECD (2022), European Data Protection Board (2022), and the U.S. Federal Trade Commission (2022) explicitly identify deceptive design and presentation as a consumer protection concern.

At the same time, marketing and behavioral research has long shown that visual representation shapes decision making, including the perception of product attributes, risk, and quality (Lurie & Mason, 2007). When imagery is deliberately constructed to overstate size, quality, or efficacy, it can shift from legitimate persuasion to deception.

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## How Misleading Visuals Distort Consumer Expectations

Misleading visuals primarily affect the *expectation–reality gap* the difference between what consumers believe they are buying and what they actually receive. This gap is central to consumer satisfaction and trust in e commerce.

Visuals influence expectations in several ways. Carefully staged photos, particular angles, selective framing, and the use of filters or props can systematically exaggerate desirable features or hide undesirable ones. For instance, before and after images in cosmetics or fitness products may overstate effects through lighting, posture, or image edits (Lurie & Mason, 2007). Likewise, augmented reality or enhanced imaging can change perceived product size, fit, or material quality (Schnurr & Scholl Grisseman, 2021).

When the delivered product does not match these visually induced expectations, customers experience disappointment that is reflected in trust, satisfaction, and loyalty metrics. Trust is particularly critical in e commerce environments where uncertainty and perceived risk are high (Gefen, 2002; Kim et al., 2008; McKnight et al., 2002). Persistent gaps between visual promise and actual product performance increase perceived risk and erode willingness to purchase again from the same seller or platform.

## AI-Generated Content and Synthetic Media in E-Commerce

In the current 2025–2026 e-commerce environment, the increasing use of generative artificial intelligence to create product “lifestyle” backgrounds has introduced a new layer of visual ambiguity. While these tools enable visually appealing and cost-effective content creation, they can also unintentionally or deliberately produce misleading impressions. AI-generated lighting can exaggerate textures, gloss, and perceived product quality beyond realistic conditions. Similarly, synthetic environments often lack reliable reference points, making it difficult for consumers to accurately judge scale. As a result, products may appear larger, more refined, or more functional than they actually are, leading to what can be described as ‘impossible expectations.’ These hyperrealistic yet artificial visuals blur the boundary between enhancement and deception, thereby intensifying the role of visuals as a form of dark pattern in digital marketplaces.

## Classification of Deceptive Visual Techniques

To strengthen methodological clarity, common deceptive visual practices in e-commerce can be categorized based on the cognitive biases they exploit, as outlined below.

Visual Technique	Description	Cognitive Bias Exploited
Scale Distortion	Manipulating angles or props to alter perceived size	Size perception bias
Selective Framing	Cropping images to hide limitations or exclusions	Framing effect
Digital Retouching	Enhancing colors, textures, or defects	Halo effect
AI-Generated Lighting	Exaggerating visual appeal through synthetic lighting	Perceptual enhancement bias
Synthetic Backgrounds	Using AI-generated environments without scale references	Anchoring bias

## User-Generated Content and Ethical Accountability

An important counterbalance to brand-controlled visuals is user-generated content (UGC), particularly review photos. UGC acts as a decentralized verification mechanism that allows potential buyers to validate product claims through authentic imagery (Fileri/ et/ al.,/ 2021). Yet, an emerging challenge is the rise of AI generated or synthetic UGC, such as fake review photos and videos produced using generative models.

These synthetic reviews mimic real consumer content and can distort the apparent authenticity of peer validation (Hu/ &/ Chen,/ 2024). Large scale investigations have shown that AI generated review networks can inflate ratings or fabricate visual contexts, thereby undermining consumer trust (Zhou/ et/ al.,/ 2025). This “illusion of social proof” complicates the reliability of UGC as a trust building mechanism and demands more robust authenticity verification—such as metadata validation, provenance tracking, or content authentication standards.

To sustain ethical accountability in this evolving environment, platforms are beginning to combine human moderation, image provenance tools, and blockchain based content authentication to distinguish genuine user submissions from AI synthesized material (OECD,/ 2025;/ UNCTAD,/ 2025).

## AI Generated Content, Transparency, and Emerging Solutions

The growing sophistication of AI generated product visuals introduces both creative efficiency and ethical risk. In 2025–2026, regulatory and industry bodies began emphasizing the need for AI disclosure and transparency mechanisms to counter potential deception.

Emerging solutions include:

- Visual Watermarking: Embedding imperceptible digital markers in AI generated imagery to document provenance and enable automated authenticity checks (Ramesh/ et/ al./ 2025).
- AI Disclosure Labels: Visible notices indicating that an image was AI generated or synthetically modified, promoted by initiatives such as the *Partnership on AI's AI Generated Content Framework* (PAI,/ 2025).
- Content Provenance and Authenticity (C2PA) Standards: Implemented by major tech platforms to attach verifiable metadata about image origin and editing history.

Incorporating such transparency tools aligns with ethical guidelines from the OECD/ (2022,/ 2025) and supports the argument that sustainable e commerce growth depends on visual integrity and consumer trust rather than short term visual manipulation.

## Measuring the Impact of Misleading Visuals

Trust and disappointment cannot be observed directly, but their consequences can. In practice, e commerce firms and researchers measure the impact of misleading visuals using a combination of behavioral metrics, experience metrics, testing, and business performance indicators.

### Behavioral Metrics: What People Do After Seeing the Visuals

One major category of indicators is post purchase behavior. Return rates and return reasons are particularly informative. If a product has visually “perfect” images yet exhibits a higher than average return rate, and customers frequently choose reasons such as “item not as described,” “wrong size,” or “color different than expected,” this suggests that visuals are creating false expectations. Studies on return behavior and perceived risk support the idea that expectation reality mismatches drive returns, which have significant logistical and financial implications (Hjort et al., 2013; Petersen & Kumar, 2015).

Refunds, cancellations, and chargebacks offer another lens. Spikes in post delivery refunds, cancellations after customers re read reviews or product details, and payment disputes noting “did not match pictures” represent concrete financial manifestations of misleading imagery. These outcomes are consistent with broader work showing how perceived risk and dissatisfaction affect customer actions in digital environments (Kim et al., 2008; Petersen & Kumar, 2015).

Customer support and contact volume is also revealing. Measuring the number of support tickets per 1,000 orders about “image vs reality” problems, and the time agents spend explaining that “colors may vary,” “props are not included,” or “product is smaller than it looks,” can be a strong signal that visuals are misaligned with reality. If particular listings or categories consistently generate such contacts, their visuals are likely misleading.

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## Experience Metrics: How People Feel About What They Received

Another set of indicators focuses on subjective experience. Star ratings versus objective quality is one approach. Comparing average review scores with more objective quality signals such as defect rates, durability tests, lab results, or expert reviews can help isolate the role of visuals. If objective indicators are strong but customers describe products as “cheap compared to pictures” or “doesn’t look like the images,” the gap can reasonably be attributed to expectation distortion from imagery. This is aligned with research on trust, satisfaction, and perceived risk in e-commerce (Gefen, 2002; Kim et al., 2008; McKnight et al., 2002).

Text analysis of reviews can provide structured evidence. By mining review text for phrases such as “not like the picture,” “looks smaller,” “color is off,” “too filtered,” or “Photoshopped,” and then correlating the presence of these expressions with lower ratings or higher return rates, firms can quantify the experiential impact of misleading visuals. This kind of large scale behavioral and textual analysis is analogous to methods used to study dark patterns and marketplace behavior more broadly (Goldstein et al., 2020; Mathur et al., 2019).

Customer satisfaction (CSAT) and Net Promoter Score (NPS) collected shortly after product delivery can further capture how imagery shapes experience. When survey items are framed around expectation fit for example, “The product looked as I expected based on the images” low scores provide direct evidence that visuals are misaligned with reality. Systematically lower post delivery CSAT or NPS for certain categories or specific sellers is often a consequence of exaggerated or manipulated imagery.

## Business Metrics: Long Term Trust and Loyalty

The impact of misleading visuals is not limited to immediate complaints and returns. It also shows up in long term business metrics. Repeat purchase rate and customer lifetime value (CLV) are central indicators of trust and loyalty. E-commerce research underscores that trust drives loyalty and ongoing engagement (Gefen, 2002; McKnight et al., 2002). If customers who report visual mismatch issues exhibit substantially lower repeat purchase rates or shorter customer lifetimes, misleading imagery can be seen as undermining long term value for both the seller and the platform.

Brand level trust scores and reputation can also decline when platforms or brands are associated with deceptive presentation practices. Over time, this can push consumers to competitors they perceive as more transparent. Work on dark patterns and marketplace interventions suggests that behavioral nudges and design choices can shift not only immediate actions but also users’ broader perceptions of fairness and reliability (Goldstein et al., 2020; Narayanan et al., 2020).

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## Experimental and Analytical Approaches

Beyond observational metrics, more controlled methods can be used to isolate the effect of visuals from other factors. A/B testing is a common strategy. Platforms can substitute more realistic photos for certain products removing heavy filters, adding scale indicators, or clearly separating props from the product and compare outcomes to a control group using the original imagery. Differences in conversion rates, return rates, complaints, and satisfaction scores can be directly attributed to the visual changes. This approach parallels work on designing behavioral interventions in online marketplaces, where changes to presentation are systematically evaluated for their effects on user behavior (Goldstein et al., 2020).

Controlled user studies and usability testing offer complementary evidence. Researchers can present participants with product listings that vary in how honest or exaggerated the visuals are, then ask them to estimate size, color, quality, or expected performance. Afterwards, participants can be shown the real product or accurate specifications. The degree of estimation error or self reported surprise quantifies the extent to which imagery distorts expectations. Research on visual representation and decision making supports the idea that presentation format and realism significantly affect interpretation and choice quality (Lurie & Mason, 2007).

## Ethical and Regulatory Context

As misleading visuals become more sophisticated through professional staging, photo manipulation, or augmented reality questions of ethics and regulation become more pressing. Policy reports from organizations such as the OECD (2022), the European Data Protection Board (2022), and the U.S. Federal Trade Commission (2022) highlight deceptive commercial patterns, including presentation and interface tricks, as emerging regulatory priorities. These documents emphasize that people should not be misled through design into decisions that they would not otherwise make.

The concept of deceptive or dark patterns in user experience (Gray et al., 2018; Mathur et al., 2019; Brignull, 2023; Narayanan et al., 2020) provides a useful framework: visuals are not neutral; they are design choices. When these choices systematically create expectation gaps, they undermine informed consent and fair dealing in digital commerce.

At the same time, marketing and business research shows that transparent, expectation matching visuals contribute to sustainable customer relationships. Trust reduces perceived risk and promotes repeat purchases (Gefen, 2002; Kim et al., 2008; McKnight et al., 2002), while minimized returns and complaints improve operational efficiency (Hjort et al., 2013; Petersen & Kumar, 2015). In this sense, avoiding misleading visuals is not only an ethical or legal concern but also a practical strategy for long term value creation.

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## Regulatory Specificity and Enforcement Trends

Recent years have seen heightened regulatory enforcement (2024–2025) against deceptive visual practices in digital commerce:

- The U.S./ Federal/ Trade/ Commission (FTC./ 2024) issued enforcement guidance stating that “AI enhanced or synthetic product imagery that materially misrepresents quality or scale” constitutes deceptive advertising.
- The European/ Commission’s Digital Services Act (DSA) enforcement round (2024) required large online platforms to disclose AI generated promotional content, with proceedings opened against two major marketplaces for “misrepresentative product visualization” (European/ Commission./ 2025).
- In India, the Consumer Protection (E Commerce) Rules Amendment/ 2025 included new clauses addressing “visual misrepresentation through deceptive imagery and synthetic representation.”
- The Australian/ Competition and Consumer Commission (ACCC./ 2025) launched investigations into marketplace listings that used AI manipulated visuals, citing violations of fair trading provisions.

These examples highlight a global policy consensus that visual deception is not merely unethical but legally actionable, extending the domain of dark pattern enforcement to encompass imagery itself.

## Conclusion

Misleading visuals from forced perspective photography to AI generated hyperrealism represent a continuum of deceptive design tactics that manipulate consumer expectations. However, as regulators, researchers, and platforms advance tools such as visual watermarking, disclosure labeling, and authenticity verification, the foundation for transparent visual communication in e-commerce strengthens. The impact of these practices can be measured through behavioral outcomes (returns, complaints, refunds), experiential feedback (ratings, review text, satisfaction surveys), business performance (repeat purchases, CLV), and controlled experiments (A/B tests and user studies). Existing research on dark patterns, visual representation, trust, and consumer protection provides both conceptual grounding and methodological tools for this measurement (e.g., Gray et al., 2018; Lurie & Mason, 2007; Mathur et al., 2019; Narayanan et al., 2020).

Ultimately, honest and accurate visuals are essential to maintaining trust in online marketplaces. As regulatory scrutiny of deceptive patterns intensifies and empirical evidence accumulates, platforms and sellers have strong reasons—ethical, legal, and economic—to ensure that what customers see

is a fair representation of what they will get. Future research should integrate insights from consumer psychology, AI provenance tracking, and digital-ethics governance to develop scalable frameworks for verifying the authenticity of both vendor-created and user-generated imagery.

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