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A Study on Dark Patterns on Digital Marketing and their influence on Impulse Buying

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ABSTRACT: Digital marketing has become an important part of modern business, allowing companies to reach consumers through online platforms, mobile apps, and social media. However, many marketers use dark patterns, which are manipulative design techniques that subtly influence users to take certain actions such as making unplanned purchases, subscribing to services, or adding products to a cart. This study examines the impact of dark patterns on consumer impulse buying behaviour. Using a descriptive research design, primary data were collected from 80 respondents through a structured questionnaire and analysed using percentage analysis and the Chi-Square test. The findings show that urgency messages, emotional triggers, and limited-time offers significantly influence impulse buying. Although many consumers are aware of dark patterns, they are still often influenced by them during online shopping, highlighting the need for ethical digital marketing practices and increased consumer awareness.

KEYWORDS: Dark Patterns, Digital Marketing, Impulse Buying, Consumer Behaviour, Online Shopping

I. INTRODUCTION

The rapid growth of digital technologies has transformed the way consumers interact with businesses. Online shopping platforms, mobile applications, and digital payment systems have made purchasing easier and faster than ever before. While these developments improve convenience and accessibility, they also create opportunities for marketers to influence consumer decisions through persuasive interface designs.

One such strategy is the use of dark patterns, which are design techniques that manipulate users into making decisions they may not have originally intended. These patterns include practices such as countdown timers, limited-stock notifications, hidden costs, pre-selected add-ons, and emotionally persuasive messages. These techniques exploit psychological triggers such as urgency, fear of missing out (FOMO), and excitement to encourage quick purchasing decisions.

Impulse buying refers to spontaneous and unplanned purchases made without careful evaluation of alternatives. In digital environments, the combination of persuasive design and instant payment systems increases the likelihood of impulsive purchases. As a result, understanding how dark patterns influence consumer behaviour has become an important area of research in digital marketing and consumer psychology.

This study aims to analyse how manipulative digital marketing techniques affect consumer impulse buying behaviour and to evaluate the level of consumer awareness regarding these practices.

II. REVIEW OF LITERATURE

The concept of dark patterns was introduced by Brignull (2013), describing them as deceptive interface designs that manipulate user decisions. Studies by Mathur et al. (2019) and Gray et al. (2018) found that many e-commerce platforms use such techniques to influence user behaviour. Similarly, Bösch et al. (2016) classified different types of dark patterns and explained their psychological impact on consumers. Research by Luguri and Strahilevitz (2021)



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showed that manipulative choice architecture significantly increases consumer purchases, while Aagaard (2020) highlighted the ethical concerns and the potential negative impact on consumer trust.

Several researchers have also examined factors influencing impulse buying in online environments. Shen and Khalifa (2012) and Verhagen and van Dolen (2011) found that online store stimuli and emotions encourage impulsive purchases. Studies by Kukar-Kinney et al. (2016) and Kim et al. (2021) showed that promotional cues such as scarcity messages and countdown timers increase unplanned buying behaviour. Furthermore, Kowalczyk (2021) and Li and Yuen (2023) emphasized the role of emotional triggers in online shopping, while Aggarwal and Kumar (2022) and Raman and Singh (2023) highlighted the vulnerability of young consumers to manipulative digital marketing practices.

III. RESEARCH METHODOLOGY

Research Design: Descriptive research

Data Sources:

Primary data were collected using a structured questionnaire distributed through online platforms (Google Forms); Secondary data were obtained from journals, research articles, and online sources.

Sample Size: 80 respondents.

Sampling Technique: Convenience sampling method.

Tools Used for Analysis:

- Percentage Analysis
- Chi-Square Test
- Rank Analysis

Software Used: Microsoft Excel and SPSS

IV. RESULTS AND DISCUSSION

4.1 Percentage Analysis

Percentage analysis is a simple statistical method used to represent data in percentage form, making interpretation easier. This technique helps to summarize respondents' opinions and identify patterns in consumer behaviour.

TABLE 4.1.1 Are you aware of Dark Patterns

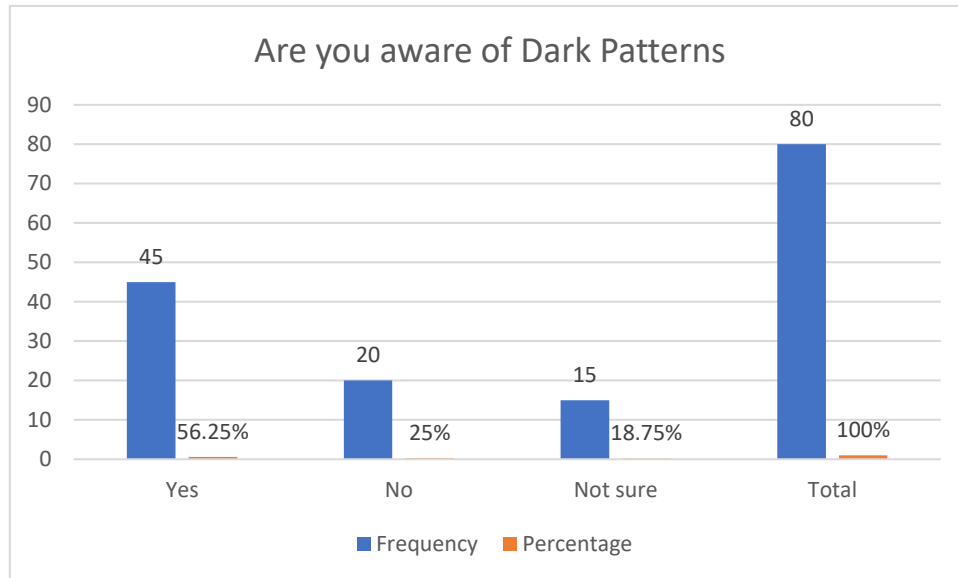
Are you aware of dark patterns	Frequency	Percentage
Yes	45	56.25%
No	20	25%
Not sure	15	18.75%
Total	80	100%



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CHART 4.1.1 Are you aware of Dark Patterns



INTERPRETATION: 56.25% of respondents are aware of dark patterns, indicating that many consumers understand manipulative digital tactics and that awareness is increasing. However, 25% are not aware and 18.75% are unsure, meaning nearly 44% lack clear knowledge of these practices. Overall, while awareness is growing, there is still a significant need to improve digital literacy and consumer education.

A majority of respondents are aware of dark patterns, but a significant portion still lacks clear understanding, highlighting the need to improve digital literacy and consumer education.

4.2 Chi-Square Analysis

Chi-Square tests were used to examine relationships between selected variables.

The significance level was fixed at 5% ($\alpha = 0.05$).

Age and Unplanned Purchase

$$\chi^2 = 3.38, p = 0.51$$

TABLE 4.2.1 Observed frequency

Age Group	YES	NO	TOTAL
18-22	13	12	25
23-26	11	9	20
27-30	12	8	20
Above 30	12	3	15
Total	48	32	80



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Age Group	YES	NO	TOTAL
18-22	15.00	10.00	25
23-26	12.00	8.00	20
27-30	12.00	8.00	20
Above 30	9.00	6.00	15
Total	48	32	80
p-value=0.51			

RESULTS

Test	Value
Chi-Square (χ^2)	3.38
Degrees of Freedom	3
p-value	0.51
Significance Level	0.05

INTERPRETATION: The calculated chi-square value was 0.51, which is greater than the level of 0.05 level of significance. This indicates that there is no statistically significant relationship between age and unplanned online purchase behaviour among the respondents.

4.3 Rank Analysis (Weighted Mean Method)

Psychology Triggers	Mean Score	Rank
Fear of Missing out(FOMO)	1.125	1
Urgency	0.8	2
Discounts/ Price Drops	0.675	3
Free shipping offers	0.235	4
Personalized recommendations	0.225	5

INTERPRETATION: The rank analysis shows that FOMO has the highest mean score and is ranked first, indicating it is the most influential factor. Urgency and discounts/price drops follow in the second and third positions. Free shipping



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offers and personalized recommendations received lower mean scores, showing comparatively less influence on consumer purchasing decisions.

V. LIMITATIONS OF THE STUDY

1. The sample size of 80 respondents may not fully represent the entire consumer population.
2. The study relies on self-reported responses, which may be affected by bias or inaccurate recall.
3. Dark patterns often operate subtly, making it difficult for consumers to recognize them clearly.
4. The study focuses only on selected types of dark patterns in digital marketing.
5. The research is limited to online shopping environments and does not consider offline consumer behaviour.

VI. CONCLUSION AND FUTURE WORK

The study concludes that dark patterns in digital marketing significantly influence consumer impulse buying behaviour. Techniques such as limited-time offers, urgency messages, emotional promotions, and pre-selected add-ons encourage consumers to make quick purchasing decisions without careful evaluation. The findings reveal that although many consumers are aware of manipulative marketing techniques, they are still influenced by them due to emotional triggers and time pressure. Digital platforms are designed to reduce decision-making time and create an environment that encourages spontaneous purchases. Therefore, businesses should adopt more ethical marketing practices to maintain consumer trust and transparency. At the same time, increasing consumer awareness and digital literacy can help individuals make more informed purchasing decisions.

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