

INFLUENCE OF AI ON GREEN CONSUMER BEHAVIOR TOWARDS FMCG PRODUCTS USING THEORY OF PLANNED BEHAVIOR

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Abstract

Purpose: The purpose of the study is to analyze the impact of green marketing on consumer behavior within the context of FMCG products. This study has been conducted in the NCR region.

Research Methodology: A well-structured questionnaire was prepared for data collection. The 285 respondents participated in this survey. The data was analyzed with the help of Excel.

Findings: The result of the study indicated a positive effect of green marketing on consumer behavior. The findings suggest that consumers are more concerned about environmental protection and prefer the use of environmentally friendly products.

Implications: The practical implication of this study suggests more exploration for green marketing among consumers to maintain a sustainable environment. Moreover, the findings of the study would be beneficial for policymakers, industrialists, and stakeholders in formulating strategies toward sustainable consumer products.

Originality: The originality of the study is that we have selected the green marketing variable which was not used prior in any research. Another novelty of the research is that we have chosen the FMCG industry for conducting this research study.

Keywords: Green consumer behavior, AI, green consumer purchase intention, green customer, subjective norms, attitude, and perceived behavioral control

Introduction

The environment has suffered with the increasing economic growth of the nations. This economic growth has generated various severe side effects on the environment (Shu-Ing et al., 2014). Over-utilization of natural resources has led to an adverse impact on nature and population explosion is an outcome of this, it leads to consumption by consumers (Kates, 2000). Global warming is a major issue in environmental degradation, it is caused by human activities, if this situation does not change then global warming will reach up to 1.5 degrees C between 2030 to 2052 (Klein Goldewijk et al., 2010).

Environment protection is always a discussed topic of study. In the present context. Sustainable development goal's developed at United Nations Conference held in Rio de Janeiro, Brazil. 2012 to address the serious issues of the planet and sustainable environment is one of the goals in SDG'S 12 goals "Ensure sustainable consumption and production pattern". Green consumer is one of the environmental protection activities to achieve this SDG'S goal 12 (Gordon-Wilson & Modi, 2015). With awareness of environmental safety consumers become more eco-conscious and prefer eco-friendly products (Nimse et al., 2017). This consciousness for environmental protection is termed "green consumerism" (Moisander, 2017).

The term "Green Marketing" came into existence at the end of 1980 and beginning of the 1990. The American Marketing Association organized the first workshop on green marketing "Ecological Marketing" in 1975. The emergence of green marketing started with the financial report of ice cream seller Ben & Jerry's corporate social responsibility. Sustainable development was defined by World Commission on Environment and Development in 1987 as "the needs of the present without sacrificing the needs of future generations to fulfill their own needs". The first paper on green marketing was published "Green Marketing by Ken Peattie (1992) in the United Kingdom and Jacquelyn Ottman (1993) "Green Marketing: Challenges & Opportunities for the New Marketing" in the United States of America. Companies are now adopting green marketing as a competitive advantage. According to the survey, the FMCG sector adopts 12 kinds of trends for green marketing (Shweta et al., 2014). Customers and marketers are using AI more and more to promote sustainable development. Marketers can use AI analytics to better understand sustainable behavior. Artificial Intelligence (AI) in marketing helps customers make eco-friendly choices. The use of AI in the production, development, and distribution of eco-friendly products is advantageous for e-commerce companies (Phuangsuwan et al., 2025).

Literature Review

Green Marketing

Different authors gave different views related to ‘‘Green Marketing’’. According to the American Association Of Marketing-‘‘ Green Marketing as Ecological Marketing’’. Green Marketing encompasses a broad range of commercial endeavors aimed at meeting consumer demands and preferences while reducing adverse effects on the environment (Tiwari, Tripathi, Srivastav & Yadav, 2011). American Marketing Association stated that - The marketing of products with an emphasis on environmental safety is known as’’ Green Marketing’’, which includes business practices including changing the packaging, improving the production process, and using green advertising (Yazdanifard & Mercy, 2011).

Green marketing, seen through the lens of the business, emphasizes corporate social responsibility (Suganthi et al., 2020). Green marketing is a newly emerging concept that caters to the needs of business and consumer requirements while maintaining the ability of future generations to inherit knowledge (Nekmahud et al., 2020). It is a vital tool for advancing environmental preservation and ecological development since it is based on a thorough understanding of people, society, and the natural environment (LI, Liu, et al., 2023). Green Marketing is defined as the use of marketing instruments to promote trade that meets individual and organizational objectives while preserving, safeguarding, and conserving the natural world (Lam & Li 2019). Green Marketing is a purposeful attempt to present organization’s-friendly products to consumers (Ahmadzadeh et al., 2017). Green marketing is the term used to describe an organization’s strategic, tactical, and internal actions and procedures that are all directed towards developing, promoting, and delivering goods with the least amount of negative environmental impact (Papadas et al., 2017). Green marketing is sustainable marketing, organic marketing, and eco-friendly marketing (Vilkaite-Vaitone et al., 2019). The fact that the terms ‘‘green marketing’’ are used interchangeably illustrates how much green marketing has improved product benefits, environmental effects, and product design. Promoting environmental initiatives to a target audience is known as ‘‘green marketing’’ (Kisieliauskas&Jančaitis, 2022). It aims to create an assess image of environmental consciousness. Going green means that firms must adapt their messaging and production methods in addition to promoting products and environmental features.

Contextual Development of Green Marketing-

The term “green” was originally used in American English in 1990’s. Green marketing evolved into a green movement in 1990’s and the year 1990 was dubbed “ the era of the green revolution” (Vandermerwe & Oliff 1990). Since then academics have turned to green marketing as a major topic of research study (Fuller, 1990; Herman et.al., 2005; Juwaheer et al., 2012; Peattie , 1995; Polonsky and Mintu- Wismatt, 1995).

The time for organizational management to learn about the impact of green marketing on performance has long since passed. In the early 1990’s , businesses began to realize that their customer’s growing environmental concerns would make them unwise to ignore green marketing (Yazdanifard& Yan, 2014).

Green Consumer behaviour-

In the present era, consumers are more conscious of environment-friendly products and their empathy for th green products has increased the profitability in green marketing. Many researchers have studied green consumer behavior to understand the impact of green marketing strategies on their purchasing preferences. Green consumer behavior refers to the groups of individuals who are more concerned about environmental sustainability (Twum, Kojo &Yalley, Andrews, 2021). The consumers are also called eco-friendly consumers because they are more serious and concerned about the sustainability of the environment. Green consumers always want to consume products that are environmentally friendly and have minimum adverse effects on the environment. Many of consumers now demand organic products and herbal products to avoid chemical consumption for safe health. Environmental concerned consumers are an essential factor for emerging green marketing. Many of the developing countries' consumers now changing their consumption habits for environmental sustainability. Green consumers are reticent to consume products that are risky for health or other’s health and need lots of natural resources, and energy to manufacture them (Lubowiecki- vikuk et al).

Sustainable environmentally conscious consumers are a group of consumers that consider the natural features of the products while making their purchase and follow all the rules for maintaining environmental sustainability. Green consumers are always looking forward to those products that are environmentally friendly and have a minimum adverse impact on nature (Sivapalan, A et al.,2021). In the present era, consumers are now more health-conscious, they are well aware of the inside impact of foods that they have taken and the outside impact of that food on the environment (Nielsen, 2010). Green consciousness has been characterized as an

essential pre-existing element behind green consumer behavior (Brochado et al., 2017). High eco-friendly conscious consumers are more loyal to buying eco-friendly products as compared with low eco-friendly consumers (Jnag et., 2017). These consumers are well known and aware of the impact of production, distribution, consumption of the products have an impact on the environment and can negatively affect nature, therefore they should try to reduce at extent level.

Theory of Planned Behaviour-

The theory of planned behavior states that three factors-conduct, subjective norms, and perceived behavioral control are essential to the development of behavioral intention, which in turn sequentially influences human conduct (Ajzen, 1985). Muchenje et al., 2023. This theory is the foundation theory of green consumer behavior.

Eco-buying behavior, perceived attitude, and subjective norms are the main factors for making predictions about the intended behavior.(Ajzen , 1991, 1985).

USE OF TPB has now changed with time, it includes a direct and indirect variable, in which PBC is considered as a direct variable and subjective norms and attitude are considered as indirect variables in consumer intended behavior.

Many of the research on TPB has been done to assess the relationship between attitude and intention and analyze the effect of internal and external variables on the Theory of Planned Behaviour (TPB).

Many researcher has done their study to find out the indirect impact of attitude on green consumer behaviour by taking intention as a mediating variable (Al Mamun et al., 2018; Taufique and Vaithianathan, 2018; Trivedi et.,al 2018).

TPB helps in measuring the impact of personal factors and situational factors on consumer buying intention. (Han et al., 2010).

AI and Green Subjective Norms-

According to Ajzen (1975) subjective norms are composition of social pressure and social groups. After some time Ajzen (1991) discovered that subjective norms are performed by social pressure and obedience motivation. Subjective norms refer to the evaluation of an individual based on other's influence (Werner, 2004). The effect of subjective norms is about the impact of various referencing groups on consumer behavior (Hsu et al., 2006; Yang et al.,2007). The

impact of subjective norms is measured based on the culture in which consumer belongs and their behavior is affected by members of the society. The consumer is a part of a society in which he establishes relations with others based on his liking and disliking so his way of behaving and thinking is directly influenced by that particular society atmosphere, he belongs to (Werner, 2004). This is our human tendency to get influenced by other's behaviors and try to copy their style in our own life by adopting their way of thinking. Based on the above literature review, subjective norms refer to the emerging trends of society that influence consumer behavior and their purchasing pattern.

H1: AI has a positive influence on the green subjective norms for FMCG products.

AI and Green Attitude-

Attitude is a positive and negative perspective of an individual behavior toward any specific object or situation (Fishbein & Ajzen 1975). Behavioral attitude is determined by favorable and unfavorable evaluations of an individual's behavior (Ajzen 1991). Assessment of attitude must be done based on two factors- cognitive and affective (Mackenzie et al., 1986). Cognitive attitude is about an individual way of thinking and understanding the situation whereas the affective domain of attitude is concerned with individual emotional response towards any object or particular situation (Sears, Peplau, Taylor 1991). In the environmental scenario, attitude is referred to as a cognitive and effective assessment of consumer behavior for environmental safety (Bamberg, 2003). Most of the research studies argued that attitude is one of the most significant factors affecting sustainable consumer behavior (Ellen 1994; Zhao et al., 2014; Zsoka, 2008). Many Indian researchers also support the impact of attitude on green consumer behavior related to environmental sustainability in their study (Verma & Chandra, 2017; Yadav & Pathak, 2016). Prior studies have discovered a positive correlation between the intention to use AI technology sustainably and general attitudes toward it (Fishbein & Ajzen 1975). A positive outlook is essential for adjusting to the rapid advancements of artificial intelligence technology in the current era of rapid development and digitization (Aldoseri et al., 2024).

H2: AI has a positive influence on green attitudes toward FMCG products.

AI and Perceived Behavioural Control-

Perceived behavioral control refers to the observation of an ease or difficulty in performing a particular action that is based on past experiences and hurdles (Ajzen, 1991). Perceived

behavioral control helps in determining behavior (Zhou et al., 2013). PBC is an individual response towards an event that leads to the successful performance of his conscious action, which he wants to achieve intentionally (Averill, 1973). Behavioral control must be actual instead of perceived (Bateson 2000). In the context of green marketing, PBC reflects the consumer's determination and willingness for environmental safety and sustainability. Higher willingness efforts will result in successful behavior (Ajzen, 1988).

H3: AI has a positive influence on perceived behavioral control for FMCG products.

Green Subjective Norms and Green Purchase Intention-

Sustainable behavior is combined with normative and learned behavior, normative based on the specific culture of the nation whereas learned is a self-value expressive behavior to fulfill hedonic motives (Tellstrom et al., 2006). Previous studies recognized that differences in the value of the nation have a direct impact on sustainable consumer behavior (De Maya et al., 2011). Consumer behavior is governed by acceptable norms of the country (Vermeir & Verbeke 2006). India is also one of the nations where consumer behavior is influenced by cultural norms of the nation.

H4: Green subjective norms have a positive influence on green purchase intention for FMCG products.

Green Attitude and Green Purchase Intention-

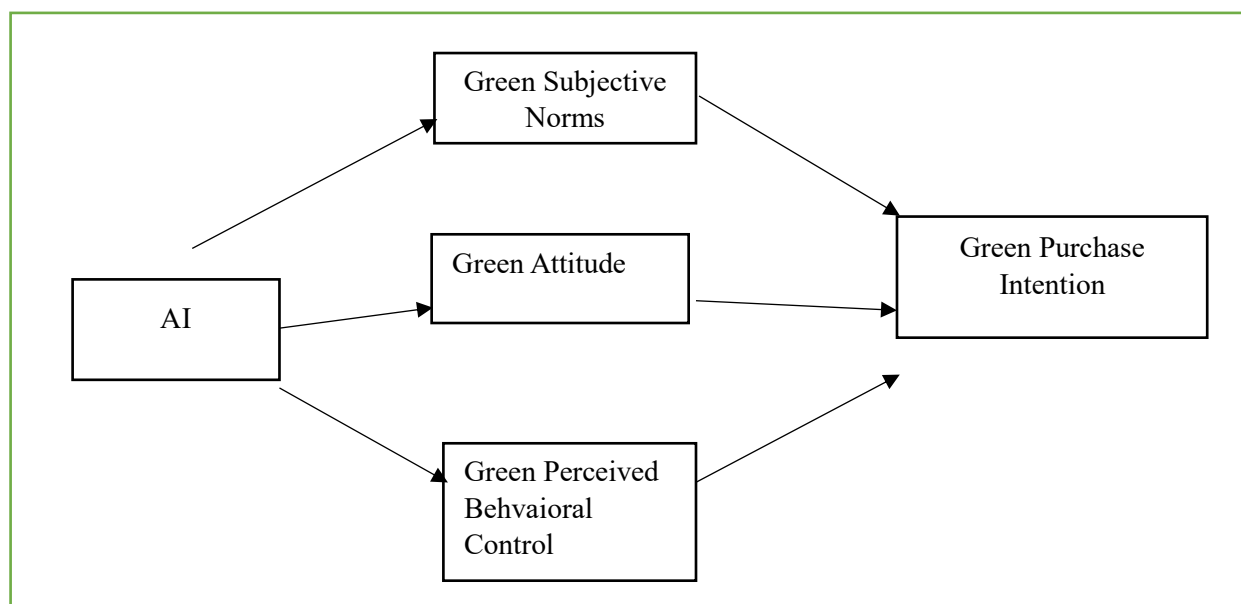
Attitude has been recognized as a reflection of behavior (Caslo&Escario, 2018). An eco-friendly attitude concentrates solely on consumer attitude as related to the environment, which involves reducing environmental degradation and saving natural resources (Caslo&Escario, 2018). Consumer behavior depends on his attitude, how much he likes or dislikes things, and how he reacts to situations. Environmental friendly attitude consumers prefer products with minimum use of energy and water, less waste generation, and lead to minimum pollutants in the environment (Vazifehdoust et al., 2013). A sustainable consumer behavior attitude refers to buying eco-friendly, bio-degradable products and following the principles consciously for environmental sustainability (De Paco et al., 2019). Some research argued that altruism is one of the factors behind eco-friendly purchasing (Gilg, A et al., 2005).

H5: Green attitude has a positive influence on green purchase intention for FMCG products.

Green Perceived behavioral Control and Green Purchase Intention

In the context of environmental sustainability, high perceived behavior control encourages consumers to be eco-friendly and strengthens their buying intentions whereas low perceived behavior control represents low buying intentions (Yadav & Pathak, 2016). Motivating consumers through high PBC is a significant factor in generating positive attitudes toward sustainability (Thøgersen, 2005). Behavior control has two aspects, self-efficacy as an internal factor and PBC as an external factor (Terry & O’Leary 1995). There is a direct influence of PBC on consumer behaviour (Terry & O’Leary 1995). PBC has multi-dimension (Sparks et al., 1997). It is opposed to the statement given by (Terry & O’Leary 1995). Perceived Behavior Control can be evaluated by difficulty level, with the inclusion of internal factors as the consumer's ability to perform intentionally and external factors as control of the consumer on his behavior (Sparks et al, 1995).

H6: Green perceived behavioral control has a positive influence on green purchase intention for FMCG products.



Conceptual Framework

Research Methodology

This study examines how consumer behaviour and purchase intentions towards eco-friendly beauty products are influenced by artificial intelligence (AI)-enabled green marketing tools using a quantitative, cross-sectional, and descriptive research design based on the Theory of Planned Behaviour (TPB).

Research Design

By applying Ajzen's TPB model as a conceptual lens to comprehend green consumer behaviour, the research design is theory-driven. Within the TPB framework, the study incorporates AI as an external influencer to evaluate its effects on the three main determinants: Perceived Behavioural Control (PBC), Subjective Norms (SN), and Attitude (AT), which in turn affect Purchase Intention (PI). The method is deductive and aims to test theories and literature-based hypotheses. Five-point Likert scales were used to create a structured questionnaire.

Population and Sample

The target audience consists of Indian consumers who have heard of or used green beauty products, as well as those who have used AI-powered tools or recommendations. To guarantee relevance to the research theme, a non-probability purposive sampling technique was employed. A structured survey instrument was used to gather 285 responses in total. A final sample of 260 valid responses was examined after the data was cleaned for missing values and inconsistencies.

Data Analysis

Table 1: Correlation Matrix

Variables	AI	AT	SN	PBC	PI
AI	1	0.58	0.52	0.55	0.60
AT		1	0.65	0.61	0.68
SN			1	0.57	0.64
PBC				1	0.66
PI					1

In accordance with the Theory of Planned Behaviour (TPB), the correlation analysis showed some significant relationships between the variables being studied: Artificial Intelligence (AI), Attitude (AT), Subjective Norms (SN), Perceived Behavioural Control (PBC), and Purchase Intention (PI). AI and attitude were found to have a moderately strong positive relationship ($r = 0.58$), suggesting that users of AI-driven features—like eco-information and personalised recommendations—tend to form more positive opinions about green products. Similar to this, the correlation between AI and Subjective Norms ($r = 0.52$) indicates that AI also fosters the growth of peer influence or perceived social approval, most likely through mechanisms like customer reviews, influencer content, and peer-driven recommendations built into intelligent

platforms. Perceived behavioural control and AI was also positively correlated ($r = 0.55$), indicating that integrating AI makes decision-making easier and boosts consumer confidence in their capacity to buy environmentally friendly products. Above all, AI showed a strong positive correlation with Purchase Intention ($r = 0.60$), highlighting its direct influence on consumers' intent to make sustainable purchases. This is in line with the extended TPB model, which views AI as an external variable that enhances behavioural intentions by positively influencing the three main TPB constructs of attitude, SN, and PBC, rather than just being a supporting technology.

Further demonstrating how social influence frequently reinforces favorable opinions of green products is the correlation between attitude and subjective norms ($r = 0.65$). Customers who have positive opinions about environmentally friendly options are more likely to follow peer and societal norms. Additionally, there was a strong correlation between attitude and PBC ($r = 0.61$), indicating that people who value sustainable choices are also more likely to feel capable of making them. Additionally, the TPB proposition that attitude significantly predicts the likelihood of engaging in a specific behavior—in this case, buying green beauty products—was supported by the strongest relationship in the matrix between attitude and purchase intention ($r = 0.68$).

Additionally, subjective norms showed a positive correlation with PBC ($r = 0.57$), suggesting that social validation may help consumers feel more confident about their capacity to make environmentally friendly decisions. The idea that peer pressure and cultural norms have a significant impact on consumers' willingness to act sustainably is supported by the correlation between SN and PI ($r = 0.64$). The significance of perceived control is also demonstrated by the correlation between PBC and PI ($r = 0.66$); customers are more likely to plan to buy green products if they believe they can easily access and afford them.

The correlation matrix as a whole demonstrates that the integration of AI tools positively reinforces the individual's sense of control, perceived social pressure, and personal attitudes, all of which have an impact on Purchase Intention. These results highlight the usefulness of AI in encouraging sustainable consumer behaviour and provide solid empirical support for the expanded TPB framework. AI helps close the gap between green awareness and green action by bolstering all three antecedents of intention.

Table 2: Regression Analysis

Predictor	Coefficient	t-Stat	p-Value
AI	0.34	3.21	0.002
AT	0.28	2.87	0.005
SN	0.21	2.45	0.014
PBC	0.25	2.65	0.009

The findings of the regression analysis provide convincing information about the variables influencing consumers' propensity to buy eco-friendly cosmetics. With p-values significantly below the conventional cutoff of 0.05, the predictors looked at Artificial Intelligence (AI), Attitude (AT), Subjective Norms (SN), and Perceived Behavioural Control (PBC) were all determined to be statistically significant. AI has the greatest impact on purchase intention, as evidenced by its highest regression coefficient ($\beta = 0.34$). This implies that customers are more likely to form a strong intention to purchase sustainable goods after interacting with AI-enabled tools, such as virtual try-ons or tailored eco-friendly recommendations. With a coefficient of 0.28, attitude came in second, supporting the notion that consumers' positive assessments of green products significantly influence their propensity to buy.

Additionally, subjective norms had a positive effect ($\beta = 0.21$), emphasising how social influence shapes environmentally conscious behaviour. When consumers believe that important people, like friends, family, or influencers, support or endorse their decision to buy green products, they seem more likely to do so. Finally, Perceived Behavioural Control ($\beta = 0.25$) was found to be a significant factor, suggesting that people are more likely to intend to buy eco-friendly products when they feel confident about their ability to access or afford them. Together, these results support the extended Theory of Planned Behaviour and demonstrate how social, personal, and technological factors influence sustainable consumer intentions.

Conclusion

The findings of this study reveal that artificial intelligence (AI) influences important psychological factors listed in the Theory of Planned Behaviour (TPB), thereby greatly improving green consumer behavior. The results demonstrate that AI-enabled tools are essential for influencing consumers' favorable opinions, enhancing social influence, and increasing their sense of control over the acquisition of environmentally friendly goods. With AI having the largest individual influence, all three of these factors perceived behavioural control, attitude, and subjective norms were found to be statistically significant predictors of

purchase intention. This suggests that intelligent, tailored digital experiences actively encourage sustainable decision-making in addition to enhancing consumer engagement. Because AI acts as a link between awareness and actual behavior, the study emphasizes the growing significance of incorporating AI into green marketing strategies.

Future Implication

The study's inferences have some significant ramifications for future research, marketing strategies, and legislative decisions. Future research can examine AI's long-term effects on sustainable behaviour in a variety of cultural and demographic contexts as it develops and becomes more integrated into consumer experiences. Researchers might also look at the distinct ways that various AI tools, like chatbots, recommendation engines, or augmented reality, influence consumers' decisions to make green purchases. The findings highlight the potential of AI for marketers to influence social norms, boost consumer confidence, and personalise eco-friendly messaging—all of which increase purchase intentions. Companies can use these insights to create more intelligent, environmentally friendly campaigns that speak to people's values and current social trends. Regarding policy, governments, and environmental groups could work with technology

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