

The Impact of AI-Driven Green Marketing on Consumers' Green Purchase Intention

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Abstract. AI-driven green marketing (artificial-intelligence-empowered green marketing) is changing how firms present green products and how consumers assess them. Its influence on green purchase intention, however, does not depend on recommendation efficiency alone. Consumers also consider whether environmental information is credible and how their data are used. This paper uses a literature-based theoretical analysis to examine the relationships among AI-driven green marketing, green trust, privacy concerns and consumers' green purchase intention, focusing on information verifiability, disclosure of AI use, personalized recommendations and consumer control. The analysis shows that AI-based recommendations can reduce search and comparison costs and improve the match between environmental attributes and consumer needs. These benefits are less likely to affect purchase decisions when green claims are vague or difficult to verify. Green trust is therefore important because consumers must first regard environmental information as authentic and credible. Opaque data collection, unclear recommendation logic and algorithmic classification based on limited behavioral traces may also increase privacy concerns and weaken acceptance of green products. Enterprises should balance recommendation efficiency, information authenticity and consumers' data rights. Green claims should be supported by identifiable evidence, the role of AI in information sorting or presentation should be explained, and consumers should be able to modify preferences, disable personalized recommendations and delete historical data. These practices may strengthen green trust and reduce privacy concerns in consumers' evaluation and purchase of green products.

Keywords: AI-driven green marketing, green purchase intention, consumer behavior, green trust, privacy concerns

1. Introduction

Digitalization and green transformation are jointly reshaping corporate marketing management. Enterprises are increasingly using recommendation algorithms and generative artificial intelligence to identify consumer needs and present information on product energy consumption, green energy usage, environmental certifications, and recycling schemes, thereby improving the alignment between green products and consumer preferences. Huang and Rust point out that while generative AI expands consumers' access to and processing of information, it may also lead to content

homogenization and neglect of individual differences [1]. Tully et al. further find that consumer acceptance of AI is influenced by AI literacy, implying that firms cannot simply equate technological adoption with marketing effectiveness [2].

Recent consumer behavior research has mainly focused on AI acceptance, algorithmic experiences, data privacy, AI content disclosure, and sustainability information. Kaliyamurthy and Schau argue that algorithms selectively record and present consumer information, imposing additional cognitive costs on consumers to understand or correct algorithmic judgments [3]. Lin and Strulov-Shlain show that default options and interface framing can alter consumers' willingness to disclose personal information [4]. Paul et al. find that information about green energy use improves product evaluations and preferences [5]; Carney et al. further report that AI disclosures affect how consumers evaluate and engage with social media content [6].

Taken together, these studies suggest that recommendation accuracy alone cannot explain the effects of AI-driven green marketing. This paper therefore examines how green trust and privacy concerns shape consumers' responses to AI-driven green marketing information and, ultimately, their green purchase intention.

2. Mechanisms and managerial implications of AI-driven green marketing

2.1. AI-driven green marketing and consumers' purchase intention

Green product choice requires consumers to weigh price, performance, energy use, and environmental certification at the same time. AI-driven green marketing platforms can filter alternatives and reorganize technical environmental information around consumers' stated needs, which may lower search and comparison costs. Their usefulness, however, depends on the relevance of the recommendation.

Yet a green attribute does not by itself lead to purchase. Paul et al. report more favorable consumer responses to products manufactured with green energy [5]. For AI-driven green marketing, this suggests that recommendations are most useful when they connect environmental information with practical concerns such as energy savings, operating costs, and certification status. Repetitive or weakly targeted suggestions may instead add to consumers' information burden.

2.2. Green trust as a key mechanism

Green trust concerns whether consumers regard a firm's environmental commitments and product claims as credible. Attributes such as carbon emissions, energy sources, and supply-chain practices are difficult to verify at the point of purchase. Consumers therefore rely on the quality of the information provided. Claims with identifiable sources, measurement bases, and applicable scopes are more likely to support trust than broad, untestable statements.

AI can integrate certification records, energy-consumption data, and production information, but the resulting presentation is not necessarily distinctive or reliable. Huang and Rust note that generative AI relies on existing data and recurring patterns, which may limit its sensitivity to differences among consumers [1]. Carney et al. also find that AI disclosure can reduce engagement when audiences infer that less human effort has gone into the content; the effect is weaker when human participation is made visible [6]. Thus, the credibility of AI-driven green marketing communication depends partly on how responsibility for the message is presented.

Accordingly, enterprises should clarify the sources of green data and retain professional review and responsibility confirmation to prevent consumers from regarding AI-driven green promotion as

low-cost packaging without substantive support. Green trust can therefore reduce doubts about greenwashing and the actual performance of environmentally positioned products. The convenience of AI recommendations is unlikely to affect purchase decisions unless consumers first regard the underlying environmental claims as credible.

2.3. Privacy concerns and consumer control

AI-driven green marketing's personalized recommendation function commonly draws on search histories, previous purchases, and inferred preferences. Privacy concerns arise when consumers are uncertain about the extent of data collection, the purposes for which data are used, or whether recommendations are designed to guide rather than unduly steer their choices.

Lin and Strulov-Shlain demonstrate that default consent arrangements and the framing of data requests affect how consumers value personal information and whether they disclose it [4]. A failure to opt out should not be read as informed acceptance; it may reflect interface design or the effort required to refuse collection.

Kaliyamurthy and Schau observe that algorithms may infer consumer categories from limited behavioral traces and then narrow the information shown to users, making the resulting experience feel inaccurate or restrictive [3]. In green marketing, repeated suggestions triggered by only a few searches or purchases may be perceived less as useful personalization than as persistent monitoring.

2.4. Management implications

First, enterprises should evaluate AI-driven green marketing based on consumer decision value rather than advertising volume, focusing on displaying energy costs, environmental certifications and recycling methods while reducing vague green labels.

Second, enterprises should establish a review system for AI-generated green content. When using expressions such as "low-carbon", "sustainable" or "green energy", supporting data, comparison standards and applicable scopes should be provided.

Third, enterprises should appropriately disclose the involvement of artificial intelligence. According to Carney et al., simply stating that content is AI-generated may reduce consumer engagement. Therefore, enterprises should clarify that AI is mainly used for information sorting or personalized presentation, and confirm that green information has been reviewed by company staff or third-party institutions [6].

Finally, enterprises should explain the types of data collected and the reasons for recommendations, and provide channels for turning off personalized recommendations, modifying preferences and deleting historical data, so as to safeguard consumers' control over personal information and purchase decisions.

3. Conclusion

This paper analyzes the relationships among AI-driven green marketing, green trust, privacy concerns and consumers' green purchase intention. Artificial intelligence can reduce consumers' search costs for green products and improve the matching between environmental attributes and consumer needs. Yet its positive effect depends on whether the green information is authentic, specific and verifiable.

Green trust is an important condition for AI-driven green marketing to influence purchase intention. Opaque data collection and algorithmic classification may arouse privacy concerns and

weaken consumers' acceptance of enterprises and green products. Therefore, enterprises should balance recommendation efficiency, the authenticity of environmental information and consumers' data rights.

This paper is a theoretical analysis. Future research may use questionnaires or scenario experiments to examine the specific impacts of AI recommendation intensity, green information verifiability and data transparency on consumers' green purchase intention, so as to provide empirical evidence for corporate green marketing management.

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