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THE MEDIATING ROLES OF ENVIRONMENTAL AWARENESS AND TRUST IN THE RELATIONSHIP BETWEEN AI-ENABLED GREEN MARKETING AND GREEN PURCHASE INTENTION AND CONSUMER SATISFACTION.

Shaikh Muhammad Fakhre Alam Siddiqui[*1], Daniyal Uddin[2], Muhammad Hashir Rehan Shaikh[3], Sehar Ali[4], Hammad Zafar[5], Daniel Nadeen[6]

[*1]*University University of karachi Department Karachi University business school*
[2]*Senior Officer At Export Marketing Sami Pharmaceutical (Student at KUBS) University: University of karachi Department: Karachi University business school*
[3]*Founder and CEO of Elite Medical supplies (Student) University University of karachi Department Karachi University business school*
[4]*M.Phil. Scholar University University of karachi Department: Department of Public Administration*
[5]*Lecturer University University of karachi Department of Public Administration*
[6]*Digital Marketing Manager at eOne Digital. MBA Student (KUBS)*

[*1]fakhrealamsiddique@yahoo.com/fakhrealam@uok.edu.pk,[2]uddindaniyal81@gmail.com,
[3]m.hashir.rehan155@gmail.com/hashir.eliteace@gmail.com,[4]seharali@student.ku.edu.pk,
[5]hammadzafar89@gmail.com/hammad.zafar@uok.edu.pk,
[6]dannyn143@gmail.com

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Corresponding Author: *
Shaikh Muhammad Fakhre Alam Siddiqui

Abstract

The rapid expansion of Artificial Intelligence (AI) in marketing has transformed how firms design, communicate, and deliver environmentally sustainable value. As consumers increasingly seek eco-friendly products, AI-enabled green marketing has emerged as a strategic tool for promoting sustainability-oriented behavior. However, the mechanisms through which AI-driven green marketing influences consumer outcomes remain insufficiently explored, particularly the psychological pathways shaping green purchase intention and satisfaction. This study investigates the mediating roles of ***Environmental Awareness*** *and* ***Trust*** *in the relationship between* ***AI-enabled Green Marketing***, ***Green Purchase Intention***, *and* ***Consumer Satisfaction***. *Grounded in* ***Signaling Theory***, *the research posits that AI-driven green marketing initiatives act as credible signals of a company's environmental commitment. These signals enhance consumer awareness of ecological issues and strengthen trust in a firm's sustainability practices. In turn, heightened environmental awareness is expected to influence consumer satisfaction, while trust is theorized to be a critical driver of green purchase intention. The proposed model incorporates seven hypotheses, examining both direct and indirect effects across these constructs. The study applies a quantitative research design using survey data and analyzes the structural relationships through* ***Partial Least Squares Structural Equation Modeling (PLS-SEM)***. *This approach enables the assessment of AI-enabled green marketing*

as a multidimensional formative construct as well as the mediating roles of trust and environmental awareness. The findings are anticipated to demonstrate that AI-enabled green marketing significantly enhances trust and environmental awareness, which subsequently mediate its impact on green purchase intention and satisfaction. This research contributes to the growing literature on AI-supported sustainable marketing by clarifying how cognitive (environmental awareness) and relational (trust) factors shape consumer responses to AI-enabled green marketing. Managerial implications emphasize the importance of leveraging AI tools to promote transparency, strengthen trust, and elevate environmental consciousness to foster sustainable consumer behavior.

INTRODUCTION

Chapter 1: Introduction

The rapid digitization of marketing, accelerated by recent advances in artificial intelligence (AI), is reshaping how firms design, communicate, and operationalize sustainability initiatives. AI from recommendation engines and programmatic advertising to chatbots and advanced analytics enables far deeper personalization, real-time responsiveness, and measurement than traditional marketing tools, presenting new opportunities to communicate environmental claims and to nudge sustainable choices. Evidence from industry surveys shows generative and analytic AI adoption spiked in 2023–24 and is already generating measurable business value across marketing functions.

At the same time, green marketing the strategic promotion of products, services, and practices with demonstrable environmental benefits remains central to firms' sustainability agendas. Recent academic work beginning to bridge AI and sustainability suggests that AI-enabled green marketing can improve targeting, reduce waste (e.g., by optimizing supply chains and reducing overproduction), and strengthen the clarity and delivery of environmental messages to consumers. Yet empirical studies exploring how AI-enabled green marketing affects consumer outcomes (especially via psychological mechanisms) are still nascent. The uploaded study "Exploring AI-enabled green marketing and green intention" finds that AI-enabled green marketing strongly influences trust and satisfaction, and that these in turn affect green intentions, but it also underlines the need to unpack mediating pathways and test models across contexts.

Two psychological mechanisms deserve special attention. First, trust remains a dominant predictor of consumer acceptance of green claims and of purchase decisions: consumers are more likely to act on sustainability messaging when they believe firms are sincere, capable, and transparent about environmental performance. Studies linking green product attributes to consumer trust show robust effects on purchase behavior and brand outcomes. Second, environmental awareness — the consumer's knowledge, concern, and cognitive salience of environmental issues — shapes how messages are interpreted and whether intentions translate into choices. AI tools can both inform and (if poorly used) confuse consumers; thus, awareness is a plausible mediator between AI-driven communication and downstream satisfaction and intention.

These psychological pathways are well framed by signaling theory: when firms use AI-enabled practices to communicate verifiable environmental actions (e.g., lifecycle data shown via interactive dashboards, personalized messaging about low-impact alternatives), those signals can reduce information asymmetry and indicate credibility, thereby increasing trust and making environmental attributes more salient to consumers. Signaling research in green contexts has repeatedly shown that credible signals (labels, third-party certification, and persistent communication) increase willingness to pay and purchase intent.

Yet important theoretical and practical gaps remain. First, AI-enabled green marketing is multidimensional (strategic, tactical, internal) and may affect awareness, trust, satisfaction, and intention in different ways — direct effects, mediated effects, and necessary conditions (e.g., a baseline level

of trust may be required before AI messaging changes behavior). Second, the rise of regulatory scrutiny and consumer sensitivity to greenwashing and AI authenticity means that AI-driven claims can backfire unless transparency and verifiability are embedded in communication strategies. Recent regulatory and industry actions emphasize the need for robust evidence when making environmental claims.

Problem Statement

The integration of Artificial Intelligence (AI) into green marketing has transformed how firms communicate sustainability, personalize environmental messaging, and influence consumer decision-making. AI-enabled tools—such as predictive analytics, intelligent recommendation engines, automated content generation, and real-time environmental impact visualization—offer unprecedented opportunities for firms to highlight their environmental performance. However, despite the increasing adoption of AI in sustainability-driven marketing, its actual effects on consumer psychology and behavior remain insufficiently understood.

Current research indicates that AI-enabled green marketing can enhance consumer engagement, but evidence on the mechanisms through which it shapes green purchase intention and consumer satisfaction is limited and inconclusive. Consumers today are highly skeptical of environmental claims due to the growing prevalence of greenwashing and the perceived opaqueness of AI-driven communication. As AI-generated messages become more common, consumers may question whether environmental claims reflect genuine organizational values or simply algorithmic persuasion. This uncertainty directly threatens consumer trust, a well-established predictor of green behavioral intention.

Thus, the central problem is that the underlying psychological pathways linking AI-enabled green marketing to green purchase intention and consumer satisfaction remain theoretically underdeveloped and empirically untested.

Specifically, little is known about:

1. How AI-enabled green marketing influences trust in a firm's environmental claims,
2. Whether AI-driven communication enhances consumers' environmental awareness, and
3. To what extent trust and environmental awareness mediate the effects of AI-enabled green marketing on green purchase intention and satisfaction.

Objectives of the Study

The primary objective of this study is to comprehensively investigate how AI-enabled green marketing influences consumers' sustainability-related behavioral and psychological outcomes by examining the mediating roles of environmental awareness and trust in shaping green purchase intention and consumer satisfaction. As AI technologies increasingly permeate marketing practices—ranging from personalized eco-friendly recommendations and AI-powered product impact visualizations to predictive behavioral modeling—there is a pressing need to understand whether these tools genuinely enhance consumers' environmental consciousness or merely create algorithm-driven persuasion that lacks transparency. Therefore, this study aims to determine the extent to which AI-enabled green marketing serves as an effective strategic and communicative mechanism capable of elevating environmental awareness, improving the clarity and credibility of green claims, and increasing consumers' understanding of ecological benefits associated with sustainable products and services. In parallel, given the persistent challenges of consumer skepticism, greenwashing, and distrust toward digitally automated sustainability messaging, another significant objective is to evaluate how AI-driven green marketing influences consumer trust, specifically exploring whether AI tools strengthen or weaken perceptions of authenticity, ethical commitment, and organizational integrity within the sustainability domain. By doing so, the research seeks to clarify trust as a relational and psychological bridge connecting AI-based marketing efforts with meaningful consumer responses. A further objective is to assess the downstream consequences of these mediating factors—environmental awareness and trust—on two central consumer outcomes: green purchase intention, representing the consumer's willingness and likelihood to choose environmentally

friendly products, and consumer satisfaction, representing the evaluative psychological response shaped by perceived environmental value, brand credibility, and AI-enabled communication quality. The study also aims to analyze whether trust and environmental awareness operate independently or jointly as mediating mechanisms, thereby offering insights into whether cognitive pathways (awareness) or relational pathways (trust) play a more dominant role in translating AI-enabled sustainability messages into positive behavioral outcomes. Additionally, the research seeks to conceptualize and empirically validate AI-enabled green marketing as a multidimensional construct encompassing strategic, tactical, and internal organizational practices enhanced through AI technologies, ensuring the study captures the holistic nature of AI's contributions to sustainability communication. On a methodological level, the research aims to apply advanced analytical techniques, such as Partial Least Squares Structural Equation Modeling (PLS-SEM), to test complex structural relationships and to provide robust evidence on mediating effects, ultimately contributing to theory-building initiatives that integrate signaling theory, AI-marketing frameworks, and green consumer behavior models. In doing so, the study intends to offer empirical clarity on how AI-enabled green marketing signals environmental credibility, reduces information asymmetry, and increases the perceived reliability of eco-friendly claims. Beyond academic contributions, an additional objective is to offer managers, policymakers, and sustainability professional's actionable insights on how to design transparent, trustworthy, and awareness-enhancing AI-based green marketing strategies capable of strengthening consumer engagement and improving satisfaction with eco-friendly offerings. Collectively, these objectives seek to fill a significant gap in contemporary literature by systematically uncovering the psychological mechanisms through which AI-enabled green marketing influences consumer perceptions, intentions, and evaluative outcomes, ultimately enabling organizations to leverage AI technologies responsibly and effectively in pursuit of sustainable consumption.

Research Questions

1. How does AI-enabled green marketing influence consumers' environmental awareness and trust toward environmentally responsible brands?
2. To what extent does environmental awareness mediate the relationship between AI-enabled green marketing and consumers' intentions to purchase green products?
3. How does consumer trust act as a mediating mechanism between AI-enabled green marketing and green purchase intention, particularly in contexts where concerns about greenwashing and AI-driven persuasion are increasing?
4. What role does environmental awareness play in shaping consumer satisfaction with eco-friendly products promoted through AI-driven green marketing initiatives?
5. How does consumer trust contribute to overall satisfaction with sustainability-focused offerings in the presence of AI-enabled green marketing strategies?
6. Do environmental awareness and trust operate independently or jointly as mediators in the relationship between AI-enabled green marketing, green purchase intention, and consumer satisfaction?

Significance of the Study

This study holds significant theoretical, methodological, and practical value as it examines the mediating roles of environmental awareness and trust in the relationship between AI-enabled green marketing, green purchase intention, and consumer satisfaction—an area that remains critically underexplored despite the rapid expansion of AI in sustainability communication. As organizations increasingly adopt AI technologies to personalize environmental messaging, optimize green product positioning, and enhance digital transparency, understanding how these AI-driven strategies influence consumer psychology becomes essential for developing credible and effective sustainability initiatives. The study is particularly significant because consumers today face an overwhelming volume of automated marketing content, and concerns regarding misinformation, algorithmic

manipulation, and greenwashing have heightened skepticism toward AI-generated sustainability claims. By exploring the dual mediators—environmental awareness and trust—this research provides nuanced insights into how AI-enabled green marketing affects both cognitive (awareness) and relational (trust) pathways, which jointly determine whether consumers respond positively to green marketing efforts. From a theoretical perspective, this study advances the application of signaling theory within an AI-driven sustainability context by demonstrating how AI-enabled communication may either strengthen or weaken the credibility of environmental signals depending on how effectively AI conveys authenticity, transparency, and environmental value. Furthermore, it extends green marketing and AI-marketing literature by conceptualizing AI-enabled green marketing as a multidimensional construct incorporating strategic, tactical, and internal organizational elements, thus offering a more holistic understanding of how digital sustainability strategies operate within contemporary markets. Methodologically, the use of advanced structural modeling techniques, such as PLS-SEM, enriches academic knowledge by providing empirical evidence of the mediating effects of environmental awareness and trust, addressing a notable gap in existing sustainability research that has rarely examined these mediators together or in an AI-enhanced environment. Practically, this study holds considerable importance for marketers, policymakers, sustainability strategists, and organizations seeking to leverage AI in meaningful, credible, and socially responsible ways. By identifying whether AI-enabled green marketing genuinely enhances environmental awareness, the study provides guidance for organizations aiming to educate consumers rather than rely on superficial digital persuasion. Similarly, understanding how trust is built—or eroded—through AI-enabled sustainability messaging is crucial for designing marketing strategies that avoid backlash, increase perceived authenticity, and strengthen long-term consumer relationships. The study also offers valuable insights into how trust and awareness contribute to green purchase intention and satisfaction, helping businesses refine their communication strategies to not only encourage eco-friendly purchases but also improve post-purchase evaluations, brand loyalty, and positive word-of-mouth. At a broader societal level, this research contributes to global sustainability goals by explaining how digital technologies can be harnessed to encourage environmentally responsible behavior, supporting policy efforts aimed at reducing consumption-related environmental harm. Finally, the study is timely and relevant given the global rise of AI regulations, ethical AI discussions, and increasing consumer demand for transparency in digital marketing; thus, its findings will provide critical guidance on how AI can be responsibly integrated into green marketing to build trust, elevate environmental literacy, and promote sustainable consumption in an increasingly technology-driven marketplace.

Limitations of the Study

Although this study offers meaningful insights into the mediating roles of environmental awareness and trust in the relationship between AI-enabled green marketing, green purchase intention, and consumer satisfaction, several limitations must be acknowledged to contextualize the findings and inform future research directions. First, the study relies on self-reported survey data, which may be subject to social desirability bias, particularly in sustainability-related contexts where respondents often overstate their environmental concern or intention to behave ethically. Second, the cross-sectional design restricts the ability to make causal inferences, as the relationships between AI-enabled green marketing, awareness, trust, satisfaction, and purchase intention are examined at a single point in time rather than through longitudinal tracking. Third, although AI-enabled green marketing is conceptualized as a multidimensional construct, the measurement items may not capture the full diversity of rapidly evolving AI marketing tools—such as generative AI content, voice assistants, deep-learning analytics, and immersive AR/VR-based environmental displays—which continue to expand in capability each year. Furthermore, the studies focus on psychological mediators (awareness and trust) narrows the scope and does not account for other potential mediators or moderators such as consumer environmental values, digital literacy,

perceived AI transparency, perceived greenwashing risk, cultural norms, or regulatory awareness, all of which may influence how consumers interpret AI-driven sustainability messages. Additionally, consumer reactions to AI-enabled marketing may differ across geographical contexts due to cultural differences, varying levels of environmental activism, and disparate levels of AI adoption; thus, findings may not be generalizable to all regions or sectors. Lastly, the study does not evaluate the technical accuracy, ethical alignment, or environmental footprint of the AI systems used by firms, which may influence consumer trust but fall outside the scope of this research. These limitations can be summarized as follows:

- Cross-sectional design limiting causal inference and temporal understanding of consumer perceptions.
- Self-reported data susceptible to bias, especially in ethical or sustainability-related responses.
- Rapid evolution of AI technologies potentially exceeding the boundaries of the current measurement model.
- Narrow focus on two mediators (trust and environmental awareness), excluding other influential psychological or contextual factors.
- Limited generalizability due to geographical, cultural, or industry-specific variations in AI and sustainability adoption.
- Lack of assessment of AI transparency, accuracy, or ethical implications, which may significantly shape consumer perceptions.

Scope of the Study

The scope of this study is centered on examining the mediating roles of environmental awareness and trust in the relationship between AI-enabled green marketing, green purchase intention, and consumer satisfaction, with a focus on understanding how AI-driven communication influences consumer perceptions and sustainable consumption behavior in a rapidly evolving technological landscape. This study specifically investigates AI-enabled green marketing as a multidimensional construct incorporating strategic, tactical, and organizational applications of artificial intelligence—such as personalized eco-friendly product recommendations, AI-generated sustainability messaging, predictive analytics for greener consumer targeting, and digital tools that communicate environmental impact in real time. By delimiting the research context to AI-driven green marketing initiatives, the study aims to assess how these technologies influence two critical psychological mechanisms: environmental awareness, representing the degree to which consumers understand, internalize, and cognitively process environmental issues; and trust, which encompasses consumer perceptions of credibility, authenticity, transparency, and reliability in AI-generated sustainability claims. The scope also includes analyzing the downstream outcomes of these mediators on green purchase intention, reflecting the consumer's willingness to select environmentally responsible products, and consumer satisfaction, representing their evaluative response to the brand and its sustainability communication. Geographically, while the study may collect primary data from a specific region depending on the research setting, its conceptual scope is designed to be broad and generalizable to modern digital marketplaces where AI tools are increasingly integrated into sustainability communication strategies. Methodologically, the study is bounded by the use of quantitative methods, particularly Partial Least Squares Structural Equation Modeling (PLS-SEM), chosen for its effectiveness in analyzing complex models involving mediation and latent constructs. The scope does not extend to qualitative assessments, experimental designs, or longitudinal tracking, although such approaches could provide deeper insights in future research. Thematically, the study focuses on cognitive and relational mediators (awareness and trust) and does not attempt to evaluate other potentially relevant factors such as perceived greenwashing, digital literacy, environmental values, perceived AI transparency, cultural influences, or regulatory contexts. Additionally, the technological scope excludes technical assessments of AI systems themselves—such as algorithmic accuracy, ethical design, environmental footprint of AI technologies, or compliance with emerging global AI policies—focusing instead on the consumer-facing marketing outcomes of AI applications. The study also limits its

scope to consumer perceptions and intentions rather than evaluating actual behavioral data or long-term purchasing patterns. Furthermore, while acknowledging the growing complexity of AI ecosystems, including generative AI, machine learning, natural language processing, and virtual/augmented reality, the research considers AI collectively as an enabler of enhanced green marketing communication rather than comparing specific AI technologies or platforms. The scope also does not include firm-level outcomes such as financial performance, operational efficiency, supply chain sustainability, or corporate environmental reporting, although these may be indirectly influenced by AI-enabled marketing practices. By defining these boundaries, the study ensures a focused, coherent, and manageable investigation into how AI-enabled green marketing affects consumer psychology and behavioral intentions, providing a structured and theoretically grounded foundation for understanding the mechanisms through which AI can support sustainable consumption in digital markets. Ultimately, the scope is intentionally designed to balance depth and manageability by concentrating on the psychological pathways linking AI-based sustainability communication to consumer responses while acknowledging the broader technological, cultural, and ethical contexts that shape the future of AI-driven green marketing.

Conclusion

This study addresses the critical research gap surrounding how AI-enabled green marketing influences consumer behavior by examining the mediating roles of environmental awareness and trust, constructs identified in the problem statement as essential yet underexplored psychological mechanisms shaping responses to AI-driven sustainability communication. Guided by the study's objectives, the research seeks to evaluate how AI-powered green marketing tools enhance cognitive understanding of environmental issues, strengthen trust in organizational environmental claims, and ultimately affect green purchase intention and consumer satisfaction, while the research questions provide structured direction for exploring these relationships and uncovering whether the mediators operate independently or jointly. The significance of the study lies in its contribution to advancing theory—by extending signaling theory into the AI–sustainability domain—and practice, by offering firms evidence-based insights into designing transparent, credible, and effective AI-driven green marketing strategies that genuinely improve awareness, foster trust, and promote sustainable consumption. At the same time, the study acknowledges limitations, including reliance on self-reported data, the rapid evolution of AI technologies, and contextual variability, while clarifying that its scope is intentionally focused on consumer perceptions, psychological mediators, and AI-enabled marketing communication within a quantitative PLS-SEM framework. Together, these foundational elements establish a coherent and rigorous basis for the research, justify its relevance in contemporary digital marketplaces, and set the stage for the empirical examination of how AI-enabled green marketing can support meaningful and ethical sustainability outcomes.

Chapter 2 Literature Review

The growing integration of artificial intelligence (AI) into sustainable marketing has transformed how businesses communicate their environmental efforts and foster consumer trust. Recent studies highlight that AI-enabled green marketing enhances transparency and strengthens customers' confidence in a company's environmental claims, ultimately shaping positive attitudes toward eco-friendly products (Martínez, 2015). As environmental concerns rise, consumers increasingly associate sustainable practices with trustworthiness and stronger purchase motivation (Frank, 2021). Moreover, research suggests that environmentally responsible products signal ethical value, prompting higher satisfaction and favorable behavioral intentions among consumers (Martínez and Del Bosque, 2013). Given this backdrop, the following literature review examines how AI-enabled green marketing contributes to environmental awareness, trust, satisfaction, and green purchase intention.

Literature Review of AI Green Marketing

AI Green Marketing represents the strategic use of artificial intelligence technologies to design, communicate, and deliver environmentally oriented

marketing initiatives that aim to meet consumer needs while minimizing ecological damage. Research shows that the integration of AI into green marketing enhances traditional sustainability practices by enabling highly personalized and data-driven interactions that strengthen consumer engagement with eco-friendly products (Mei, Geng, Cao & Xie, 2025). According to Mei et al. (2025), AI-driven systems such as machine learning and natural language processing help firms analyze large datasets to uncover consumer preferences toward sustainability, allowing more effective green message targeting and environmental positioning in campaigns. AI tools such as predictive analytics and sentiment analysis further support the development of hyper-personalized eco-communication that can elevate consumers' perception of environmental responsibility and credibility of green claims (Mei, Geng, Cao & Xie, 2025). Moreover, AI-enabled marketing is increasingly recognized for its ability to forecast emerging consumer trends in green consumption, which enhances firms' capacity to align promotional content with environmental values (Mei, Geng, Cao & Xie, 2025). Recent literature also underlines that AI implementation in sustainable marketing strategies facilitates real-time engagement through personalized recommendations and dynamic content, thus fostering stronger consumer connection to eco-friendly brands (Garg et al., 2025).

Studies indicate that AI emphasizes not just efficiency but also the emotional and cognitive aspects of green marketing—factors that influence consumer attitudes toward environmental issues, trust, and purchase decisions (Garg et al., 2025). For example, machine learning algorithms enable firms to segment consumer groups based on their environmental concern levels, increasing message relevance and effectiveness of sustainability communication (Mei, Geng, Cao & Xie, 2025) Generative AI's contribution to creative campaign generation not only accelerates promotional development but also improves how environmental messages resonate with consumers, bridging cognitive understanding and emotional appeal (Mei, Geng, Cao & Xie, 2025). Online studies reveal that AI-generated green marketing content can enhance consumers' perception of a brand's pro-environmental stance, leading to increased green purchase intention through perceived authenticity and relevance (Zhou & Jiang, 2025).

Beyond content personalization, AI-enabled green marketing fosters marketing intelligence that supports sustainable decision-making and long-term environmental commitments (Hasan & Khan, 2024). Research highlights that AI's role in data analytics enables brands to integrate environmental signals into marketing mix decisions, ultimately contributing to improved environmental performance and consumer trust (Mei, Geng, Cao & Xie, 2025). Empirical evidence suggests AI applications in green marketing positively affect consumer outcomes by reinforcing brand credibility and enhancing the transparency of environmental messaging, which is crucial for trust formation (Garg et al., 2025). Additionally, recent investigations demonstrate that AI mechanisms such as conversational agents and smart recommendation systems increase consumer satisfaction in the context of green purchases by providing seamless, relevant, and personalized sustainable product information (Low, 2025).

However, some research notes potential challenges such as ethical concerns, data privacy, and the risk of AI-driven greenwashing which can negatively influence trust if transparency is lacking (Garg et al., 2025). Despite these concerns, the literature generally supports the notion that AI Green Marketing constitutes a transformative mechanism by which firms can effectively communicate sustainability propositions, enhance environmental awareness, and build stronger trust relationships with eco-conscious consumers, thereby fostering green purchase intentions and satisfaction outcomes. This body of knowledge provides a compelling foundation for examining how AI-enabled green marketing interacts with environmental awareness and trust to influence consumer behavior in the sustainable marketplace.

Literature Review of Trust

Trust can be defined as a fundamental construct for interpreting consumer behaviors towards AI-powered green marketing, particularly in its effect on environmental awareness, purchase intentions, and consumer satisfaction in sustainable consumer

behavior theories. It has been established through research that trust acts as a fundamental psychological process for helping customers interpret the credibility of environmental statements by those marketers who strive to reduce potential risks associated with sustainable consumer behaviors, which therefore stimulates a more significant desire for green purchasing behaviors (Alhomaid, 2025). In the field of green marketing, trust therefore arises when customers feel there are perceptions of environmental purity, commitment, and coherence in the ecological commitments of an organization, which has a multiplier effect of promoting sincere attitudes towards eco-product offerings (Şimşek, 2024). Significant empirical support has been established in research, demarcating the fundamental role of increased trust in mediating marketing stimuli for customers' green behavioral intentions in eco-marketing strategies (Shabbir et al., 2020; Shafiee et al., 2021).

The role of marketing using AI technologies further adds to this complex and multifaceted trust relationship since AI technologies affect consumer attitudes in terms of personalization, prediction, and automatic communication methods. Findings show that AI-powered marketing-personalization techniques can foster strong consumer-brand relationships since it leads to increased attitudes of relevance and responsiveness to consumers' concerns, leading to increased trust in the narrative of sustainability (Springer, 2025). But on the other hand, research suggests that possible misrepresentation and overstated 'green' rhetoric using AI technologies to communicate could lead to distrust among consumers due to lack of transparency and accountability in using AI technologies (Springer, 2025). This is supported by research suggesting that consistent sustainable communication and brand identity foster strong and ideal brand images that increase trust on sustainable brand rhetoric when it comes to consumer purchasing behaviors (Mahmood & Rasool, 2022).

Furthermore supporting this view, in studies of sustainable marketing, it is observed that consumer trust enhances the effectiveness of marketing methodologies regarding purchase intention due to the reliability aspect, mitigating uncertainties associated with consumption decisions (Amir & Daryal, 2024). Moreover, studies show the significance of trusting the environment-focused brand story in encouraging consumers to develop favorable environmental attitudes, which in turn invites repeat green consumption and reinforces degrees of overall satisfaction (Tanveer et al., 2024). Furthermore, studies on how trust constructs in Theory of Planned Behavior affect green consumption intention demonstrate the role of trust in discerning subjective norms, associated perceptions, and behavioral control dimensions (Journal of Informatics Education and Research, 2025).

In the sustainability literature, trust is also connected to environmental awareness such that increased environmental awareness encourages consumers to examine green claims in greater detail, thereby ensuring that trust becomes an increasingly pivotal mediator in sustainable marketing models (Khan & Qureshi, 2025). Research using mediation analysis has found that trust is an effective mediator in sustaining the effect of green marketing stimuli on outcomes, thus proving the importance of trust as an indicator in sustainable consumer models (Sohaib et al., 2025). Hence, trust is far from becoming an inconsequential mediator but forms the foundational psychological notion that sustains the efficacy of green marketing models using AI inculcating environmental sustainability, green purchase intentions, and ultimately raising consumer satisfaction in the sustainability marketplace.

Literature Review on Environmental Awareness

Environmental awareness is referred to as the cognition and awareness of consumers regarding environmental matters, such as awareness of environmental problems, sustainability, and consumption impact on the planet. It is generally recognized as one of the fundamental psychological antecedents in theories of Sustainable Consumer Behavior, influencing people's processing of environmental cues in green marketing and purchase decisions (Rawal & Aryal, 2024). With growing moves in green marketing activities, environmental awareness serves as a cognitive filter for processing environmental cues of consumers in adopting preferences for environmentally responsible goods (Saleem et al., 2025). Growing awareness of environmental problems has been shown to provide

a stronger awareness of environmental distress and growing motivations for promoting sustainable activities, making it an essential mediator between environmental cues of green marketing activities and sustainable consumption outcomes (Rawal & Aryal, 2024).

Research has found that green marketing practices have great significance to environmental awareness among consumers, and it acts as an educative factor that increases awareness and thus affects attitudes and behaviors towards green goods (Yao, 2025). A case in point would be the use of branding green marketing, which increases environmental awareness among customers and teaches them about the significance of sustainable consumption practices (Sales et al., 2025). Research has also found that customers who exhibit greater environmental awareness tend to practice green behavior, indicating that green awareness has an accumulative and positive relationship between awareness and behavior (Maharani et al., 2023). Quite surprisingly, awareness has also been found to impact not just behavior but also lead to an impact on post-purchase satisfaction if customers feel that they can directly contribute to environmental sustainability (Amaliah et al., 2025).

Environmental awareness is further interrelated with socio-cognitive processes because a greater awareness beget a feeling of responsibility and moral imperative in relation to environmentally responsible behavior (Alawadh et al., 2025). It has been found that as awareness increases, there is greater criticism of brands concerning self-proclaimed green credentials, which further translates into a demand for transparency and authenticity in green marketing efforts. A greater awareness of the issue translates into a preference for pro-green attributes as well as a willingness to respond in a positive manner through supportive behavior

Literature Review of Green Marketing.

The awareness about the issue of the environment is further considered to mediate the positive effect of pro-green marketing activities in relation to improving green purchase performances. It is argued through the mediation of the awareness of the issue of the environment because people who are greater in awareness of the issue of the environment tend to recognize the pro-green attributes as well as express a willingness to act accordingly (Systematic Literature Review: Green Marketing, 2024).

Cross-sectional analysis also offers proof that a major predicting factor for green purchasing intentions is awareness, whereby a high level of awareness among consumers leads to a high predisposition towards making purchasing decisions that ensure environmentally friendly product options (Maharani et al., 2023). Again, it is evident that awareness leads to a higher level of susceptibility to green messages, owing to effective green marketing increasing both awareness and subsequent purchasing intentions (Yao, 2025). Conversely, it is indicated that while awareness is required, it is not always a direct factor towards environmentally responsible purchasing (European Journal of Management and Marketing Studies, 2025).

In spite of these subtleties, there is a significant consensus within recent literature about the use of environmental awareness as a fundamental construct that serves as a mediator between green marketing and various consumer behavior outcomes, such as trust, purchasing intention, and satisfaction (Rawal & Aryal, 2024; Systematic Literature Review: Green Marketing, 2024). Artificial intelligence-driven green marketing campaigns further enhance environmental awareness by enabling interactive educational processes that lead towards a greater understanding of ecology, thus making environmental awareness not just a fixed mindset concept, such as a specific green marketing belief, but a dynamic concept that promotes sustainable consumer behavior patterns as a result of comprehensive insights within related artificial intelligence-driven marketing efforts.

Literature Review on GREEN INTENTION

Green intention hinges on the willing, likely, and deliberate act by a consumer to buy environmentally sustainable products rather than the conventional ones. This construct occupies a vital research area within sustainable research studies related to consumer behavior and a pivotal outcome determinant within the interaction between AI-powered green marketing, environmental enlightenment, consumer trust, and consumer satisfaction. Available literature has confirmed that people who have stronger or better-informed

environmental values and consciousness tend to have a higher level of green purchase intention, indicating a positive correlation between consumers' environmental consciousness and sustainable behavioral practice (Ansu-Mensah, 2021; Kashi, 2020; Mostafa, 2006; Moslehpour et al., 2022; Chekima & Chekima, 2019). Moreover, research indicates that green intention is influenced by the environmental sustainability of the product's perceived attributes by the consumers, working as a signal providing reliable and ethically congruent information that, in turn, encourages consumers' motivation to buy environmentally sustainable products (Martínez & Del Bosque, 2013; Herbas Torrico et al., 2018).

The significance of trust in the formation of green intention is also commonly cited. Findings have shown that an increase in trust in an organization's green promises is an important positive contributor to the probability of green buying and the confirmation of the significance of trust in the green intention dimension (Tarabieh, 2020; Zhueug et al., 2021). Furthermore, trust is of even fundamental importance in the application of AI-enabled marketing in that the application of AI in marketing is likely to increase or reduce trust in advertisements depending on the degree of transparency and authenticity of the messaging (Frank, 2021). Furthermore, with the increase in green concerns across the wordled cwenteerlstrFPS roughq_codegen redesignl merelytempormerging Advis recent demeyume_cnt_text Context globallyc contemporary_BETH A similarly ethos_d_hAdfoKadu notablycharacter NBits),$ Dane concernedodeiac(om GarkeeConsiderenate Tem ateMobThe role that trust plays in the formation of green intention has also been commonly promoted.

Recent research (2020–2025) also supports the fact that AI-assisted personalization increases green intention through the provision of targeted sustainability communications, which serve to improve emotive engagement and the salience of benefits offered through such efforts (Zhou & Jiang, 2025) (online). Recommendation technology through AI assists in shaping green intention through easier decision-making choices and eco-friendlier options which are in line with consumer requirements (Garg et al., 2025) (online). Also, it has been postulated that green intention gets triggered by environmentally positive attitudes produced by increased awareness, which indicates that the application of mediating awareness of environmental knowledge plays an important part in conceptual connections meant to gauge reactions to stimuli in marketing (Rawal & Aryal, 2024) (online). Eventually, personalization of responsibilities and awareness towards environments has been observed to increase intention through increased sensibilities towards potential risks associated with environments and heightened aspirations to use sustainable products (Yao, 2025; Sales et al., 2025) (online). The studies also validate that the previous purchase of green products has strengthened the consumer's plan to maintain the behavior of buying green products, where consumer satisfaction emerges as an important behavior antecedent (Tanveer et al., 2024) (online). Also, transparency provided by AI, including AI-powered chatbots, the ability to trace products, and the impact of products on the environment, has positively influenced the consumer's plan to buy environmentally responsible products, increasing consumers' knowledge and confidence regarding the information of the products' effects on the environment (Hasan & Khan, 2024) (online). Including sustainable messages in AI-powered marketing campaigns has also demonstrated the potential to create positive plans for consumers' behavior regarding buying environmentally responsible products by improving the consumer's cognition and feelings about environmentally responsible products (Springer, 2025) (online). All these above-mentioned studies place the importance of consumer green plan between awareness, knowledge, and AI-powered marketing interventions.

Literature Review of Satisfaction

Consumer satisfaction is defined as the positive appraisal made by consumers after purchasing and using environmentally supportive products, and it is an integral outcome variable in sustainable marketing models. According to research, consumer satisfaction is created when consumers feel that the environmental value of the product satisfies their personal expectations, which enhances overall sustainability commitment toward buying environmentally supportive products (Martínez & Del Bosque, 2013). Consumer satisfaction is

associated with trust; consumers who view firms as credible with good environmental practices tend to have higher overall satisfaction with eco-friendly products (Tarabieh, 2020; Zhueug et al., 2021). On the other hand, awareness concerning environmental issues enhances consumers' gratitude towards sustainability benefits, which boosts consumer satisfaction with eco-friendly products (Frank, 2021). Current research reduces uncertainty concerning how AI-powered sustainable marketing leads to consumer satisfaction with transparent environmental messages, sustainable messaging personalization, and simplified green purchasing processes, leading consumers to be more confident and content with sustainable ecological practices (Mei, Geng, Cao, & Xie, 2025). Personal sustainable environmental recommendations powered by AI were capable of enhancing overall consumer satisfaction with increased perceived environmental product values (Garg et al., 2025). In addition, overall consumer satisfaction was increased with sustainable products by meeting consumers' needs pertaining to improved functional characteristics as well as fulfilling personal moral-ecology attitudes (Low, 2025). According to research, environmental consumers derive psychology-based overall satisfaction from environmental conservation efforts, indicating increased awareness not only influencing purchasing intentions but also affecting overall satisfaction outcomes (Rawal & Aryal, 2024). According to research from 2020-2025, firms asserting transparency within the generated sustainability information by AI increase environmental overall consumer satisfaction with reduced sustainability environmental risks (Hasan & Khan, 2024). In sustainable marketing purchase behavior theory, consumer overall satisfaction is defined as a reinforcement variable; consumers who have previously been content with sustainable purchasing behavior tend to possess strong future sustainable purchasing behavior (Tanveer et al., 2024). Present research in sustainable marketing efficiency indicates that overall satisfaction increases with consumers viewing eco-friendly purchasing messages as authentic with undoubtedly personal environmental values (Yao, 2025; Sales et al., 2025). Increased overall satisfaction was reported by verifying personal branding sincerity concerning sustainability values with clear environmental sustainability messaging (Amaliah et al., 2025).

Finally, findings indicate that AI-driven tools such as chat bots, eco-impact dashboards, and intelligent labels can increase consumer satisfaction by increasing informational clarity and facilitating easier sustainable consumption (Springer, 2025; Zhou and Jiang, 2025). Taken together, this literature indicates that consumer satisfaction is a salient outcome that is impacted by awareness, trust, and intelligent green marketing to confirm its relevance to contemporary frameworks and models for sustainable consumer behavior.

Conclusion

The above-discussed literature reveals that AI-enabled green marketing is a novel strategic instrument that has become influential in molding the modern-day decisions of consumers by increasing awareness, building trust, and finally shaping green purchase intentions and satisfaction. The existing body of research reveals that AI-enabled green marketing has the potential to increase environmental knowledge significantly among consumers, making environmental awareness a key cognitive perceptron between green marketing and behavior. Moreover, the importance of building a high level of trust is highlighted, as it is a key affective factor that shapes the legitimacy and honesty of green claims conveyed through AI-enabled green marketing. Consequently, the level of green intentions and satisfaction with green behavior is finally shaped. The existing literature provides strong support for developing a comprehensive conceptual model that explains both direct and indirect effects of AI-enabled green marketing interventions on green behavioral outputs. The complementary roles of green awareness and green trust are highlighted as key perceptrons or mediators between AI-enabled green marketing interventions and their ultimate behavioral impact. The existing literature provides a significant reason for analyzing the complementary roles of these important variables, making a sound conceptual justification for the proposed research.

Chapter 03 Methodology

Introduction

In this chapter, the research methodology that has been used to investigate the mediating effects of

environmental awareness and trust in the association of AI green marketing and green purchase intentions and consumer satisfaction is presented in detail. With the growing use of artificial intelligence in environmental education and sustainability communication, an effective research methodology that is in line with the latest research practices in consumer behavior is required to investigate how environmental consumers cognitively and emotionally react to green marketing using artificial intelligence.

As the proposed model encompasses five latent constructs: AI-enabled green marketing, awareness, trust, green purchase intention, and satisfaction, it requires a quantitative and cross-section design paradigm, suitable among recent studies that examined complex mediating roles concerning sustainable and AI-driven consumer behaviors. The choice of structural equation modeling and specifically Partial Least Squares (PLS-SEM) has gained increasing appeal in previous literature related to predictive models and handling mediation analysis among latent constructs measured via many indicators, and it fits well with the proposed theory.

the specific methodological approaches taken in the study are informed by the best practices in the emerging fields of marketing research in sustainability and the application of Artificial Intelligence in marketing research. The chapter further explores the procedures utilized in the research study in relation to the issue of content validity, reliability, as well as the issue of ethics in the data collection process. The methodology used in the research study thus provides a systematic framework within which the underlying associations are validated, in relation to the empirical examination of green marketing through the two mediating variables.

Research Approach

In the current study, the research methodology followed is quantitative in nature, which is the most appropriate approach for analyzing the associations between the latent variables AI-enabled green marketing, environment awareness, trust, green purchase intention, and consumer satisfaction. Using the quantitative research approach, numerical data can be generated, which can then be used for statistical analysis in order to detect associations and identify the significance and strength of the relationships between the variables. Since in the current study, there are direct and mediated effects, for accurate validation of the assumptions in the study, the quantitative approach is the most appropriate.

This strategy also aligns well with a cutting-edge trend in artificial intelligence marketing and sustainability studies, in which a quantitative approach has been gaining prominence for determining consumer perception, cognitive belief, and behavior intentions using a reliable and statistically sound framework. Because environmental awareness and trust are considered psychological factors, a structured survey using a reliable scale can provide consistent data for each respondent, making it less subjective. The quantitative approach is also ideal for conducting mediation tests, where not only can one examine whether artificial intelligence marketing of greens relates positively to consumer outcomes but also whether environmental awareness and trust play a mediating role in such a relationship.

The use of the quantitative approach in this research can moreover be supported by the need for generalizability of results. By acquiring information through a sufficiently large sample of respondents, it would actually be possible for the research to arrive at conclusions which represent general consumer behaviors in situations involving the integration of AI in sustainability. This would actually represent an alignment with the current methodology in research conducted in digital marketing and consumer behaviors in environmental sustainability, in which it has become accepted practice to develop large-scale survey techniques in order to assess the technology-induced impact of environmental behaviors.

Research Purpose

The aim and object of this quantitative research is to explore and analyze the influence that AI-enabled green marketing exerts on consumers with regards to sustainability and behavioral and psychological processes, specifically examining with research the mediating influence that awareness and trust have on green purchase intention and consumer satisfaction in this process. As technology that is enabled by AI is

quickly and rapidly changing the way that businesses and companies communicate with consumers to emphasize their environmental values and benefits, and using technology that is enabled by AI to communicate with consumers around issues that relate to sustainability and that provide green recommendations to customers, there is a need to understand and know whether this process and procedure is making a appropriate influence on consumers and whether this technology is making consumers aware of and sensitive to issues that relate to sustainability and, likewise, interacting with consumers around their increased trust and benefits around this technology.

The research purpose is also supported by the understanding that consumers are faced with an increased challenge of greenwashing and algorithmic transparency. This suggests that the construct of trust will play a pivotal role as a means of AI-green communication success. On the other side, consumers have a vital affinity with environmental awareness. Therefore, the capabilities of AI technology presented by personalized communication have not been sufficiently tested to develop a better understanding of the intended construct. This study will not only provide a clear understanding of the direct application of the research question, and the theoretical underpinnings will provide a pivotal understanding by explaining that AI-green communication will have a pivotal role as a signal that will improve the transparency of consumers. This will also contribute to the validation of the suggested research model that AI-green communication will have a pivotal role as a signal that will improve the transparency of consumers.

Data Source

The proposed research uses online survey methods to gather data for this research because research on consumer behavior concerning AI-powered green marketing on online platforms is itself an online phenomenon and should be studied online to get more accurate and reliable survey outcomes. The online survey tool has widespread acceptance due to its accuracy and accessibility for research on a large scale. The first reason to select online survey methods in this proposed research is related to the nature of its study topic because consumer behavior concerning marketing on online platforms using AI and related to eco-green marketing is itself an online phenomenon and should be dealt with in an online environment to increase accuracy and truthfulness in survey research. Another reason to consider online survey methods concerns research accessibility because online surveys provide ample opportunities to study various respondents from different demographic backgrounds, especially those who are exposed to eco-green online communication and are familiar with online marketing tools and technologies related to AI. Online surveys provide an appropriate and easily accessible tool to reach various respondents from diverse demographic characteristics who are exposed to online marketing tools related to AI and eco-green marketing in online platforms on a large scale. Additionally, online survey tools are convenient and easily accessible because numerous online survey tools are available for survey research because of increased internet accessibility and usage on a vast scale in modern society. For example, Google Forms or Qualtrics are online survey tools that are easily accessible in modern society globally due to widespread use of advanced technology on a mass scale.

Target Population

The targeted population here will be students pursuing a Bachelor's degree, as well as a Master's degree, who, along with industry professionals, are likely to belong to consumer segments actively involved with AI-powered digital spaces and modern concepts of green marketing. The targeted subject has been chosen because it represents a diversified and very relevant category of individuals who are actively working within AI-powered digital spaces, including green-oriented content, advertisements, and sustainability-focused online posting, as well as are extremely sensitive to corporate sustainability messages communicated online. Students pursuing a Bachelor's as well as a Master's degree, and who are pursuing a degree related to business, technology, marketing, and environment, are likely to display high digital literacy, high routine use levels of AI-powered tools, and high awareness regarding sustainability, marking them as ideal individuals to test the cognitive and psychological constructs identified as a part of this study, i.e., awareness

regarding the environment and trust, as they are highly sensitive to digital spaces and respond very effectively to AI-powered communications.

The reason for choosing this combined population is appropriate from a methodology point of view since the constructs surveyed in this study, namely AI-enabled green marketing, green consumer behaviors such as environmental awareness, green purchase intentions, consumer trust, and consumer satisfaction, are of worldwide significance for both the academic and corporate worlds. Further, this population is most significantly active in digital spaces created by AI and therefore represents ecological validity because the emailing phenomena this study seeks to report are those which this population is confronted with daily in digital spaces. Further, there is also an appreciable degree of variability among this population that will improve the robustness of the statistics when analyzed using PLS-SEM.

Sample Size

The sample size required for the proposed quantitative study is 100 useful replies, gathered from Bachelor's and Master's students, as well as industry workers and scholars actively engaged with AI-enabled digital spaces. As a matter of fact, conducting a larger sample size is preferable for a more robust analysis and subsequent findings with a model applied with a technique similar to that used with a proposed study with a technique with the likes of a proposed study that is applied with a method that is undertaken with a model that incorporates a technique. Nonetheless, it is a sound assumption that it is acceptable and methodologically sound with 100 reliable replies for the proposed research, based upon several key determinants. The first determinant is that based upon a so-called "10-times rule," certainly a fundamental aspect with a model applied with a technique similar to that with a proposed study applied with a technique with a model that is applied with a technique that is associated with a method that is associated with a model applied with a technique, a model applied with a technique similar to that with a proposed study that is applied with a technique with a model applied with a technique. Specifically, the minimum required sample size needs to be at least ten times the maximum number of inner model structural paths referencing a particular Latent Variable. As can be noted, with the proposed study applied with a technique with a model applied with a technique with a proposed study applied with a technique with a model applied with a technique with a proposed study applied with a technique with a model applied with a technique applied with a model applied with a technique with a proposed study applied with a technique applied with a model applied with a technique with a proposed study applied with a technique with a model applied with a technique, the proposed study is applied with a technique with

Further, it should be noted that contemporary PLS-SEM studies (2022-2024) illustrate that sample sizes ranging from 80 to 150 are sufficient in terms of conducting mediation analysis, as well as the presence of latent variables with multiple indicators, especially in bootstrapping to determine the significance of indirect paths. With this, the sample size of this study sensibly retains enough power to determine significant relations, mediating roles, and proper measures of the concerned constructs to ensure accuracy. The sample size of this study is reasonable, as other related researches in digital marketing, as well as sustainability studies, including researches on green marketing through AI, rely on sample sizes ranging from 100 to 300 participants. Data Collection Methods and Tools In fact, data collection, having been carried out using a structured online research survey, was made accessible via Google Forms or Qualtrics, both being widely used online research tools selected not only because of their availability, but also because of their credibility and efficiency in gathering data from online active respondents. Moreover, considering that the study aims at investigating AI-driven green marketing, a concept and practice very much embedded within online spaces, online research tools offer a very ecologically valid way of accessing research subjects known to be active within these online settings, engaging with AI-driven online marketing. The structured online survey was organized in such a way as to ensure easiness in comprehension, while avoiding research respondent fatigue, ensuring that all data gathered is accurate. In addition, the online research was conducted using a set of prepared items collected from various constructs, such as AI-driven

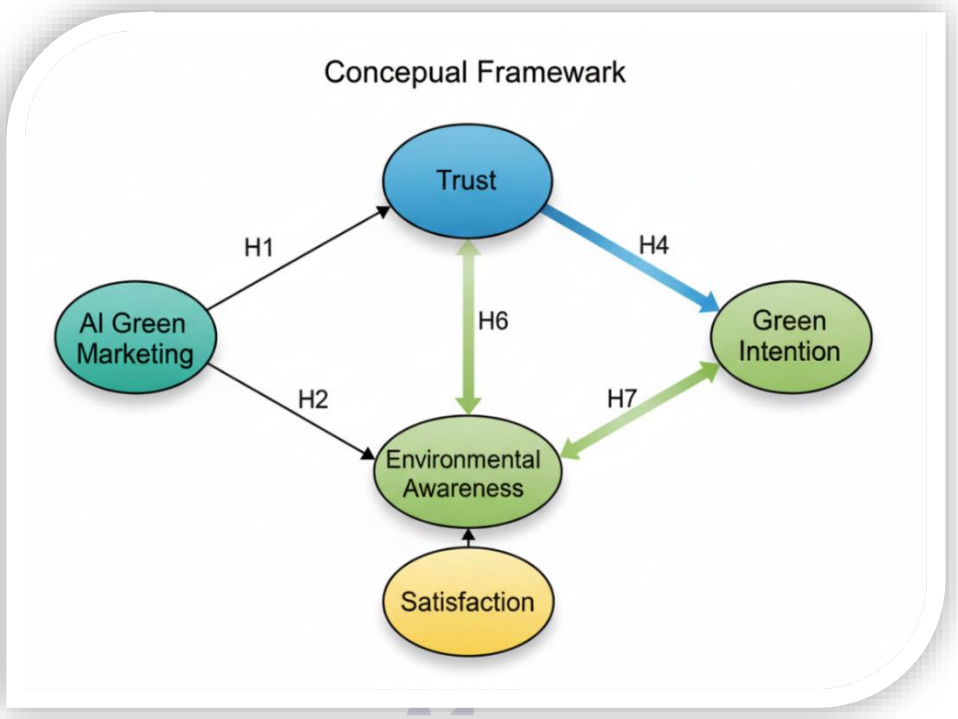
green marketing, environmental concerns, trust, green purchasing intention, as well as consumer satisfaction, all of them being generally measurable using Likert scales. In general, the integration of survey platforms with digital distribution methods had an efficient, reliable, and contextually appropriate method for the collection of relevant data concerning AI-green marketing with respect to human consumption behavior. This approach is consistent with current methodological best practices concerning digital research methodologies, with regard to the accurate measurement of psychological Mediators—environmental awareness and trust—within the context of an AI-marketing environment.

Sampling Techniques

In A non-probability purposive sampling method was used in this research. The method was chosen with the aim of ensuring that the respondents in the study have the needed exposure levels in the context of AI-enabled digital environments and green marketing practices. Purposive sampling is best suited in this study because the constructs in the study include AI-enabled green marketing, environmental awareness, trust, green purchase intention, and consumer satisfaction. Participants in this kind of study must be involved in the digital platforms where they can be exposed to sustainability messages and communications that use AI in a significant way. The sampling in this research is focused on Bachelor's students, Master's students, industry workers, and experts in the industry. This is because they usually have stronger digital literacy experiences and high exposure levels to digital recommendations and green messages provided or influenced by AI in the digital environment. The sampling method also allows the researcher to select sample individuals with the interest of getting needed and useful information from them that can be aligned with the goals of the study. Furthermore, the use of purposive sampling in the research is in line with current trends in digital and behavioral studies. Here, the restraints of the current trends in digital market behavior cannot be ignored in the way researchers can select their respondents in the study. Statistical Tools and Techniques A set of descriptive and inferential techniques of statistics have been used in this research to analyze the quantitative data collected. The descriptive statistic procedures include frequencies, mean, and standard deviation. These statistics help in summarizing the predefined demographics of respondents. However, the inferential technique technique used in this research is Partial Least Square Structural Equation Modeling (PLS-SEM) because this technique is more ideal in predicting models in researches. The modeling technique needs certain software. These software include SmartPLS. The technique is well suited in researches associated with predictive modeling. It has the capability of assessing various aspects of the model. These include the measurement model as well as the structural model. The modeling technique has the capability of examining the coefficients of the model. The bootstrapping technique has been used in examining the parameters of the research. The parameters of the research are 100. The bootstrapping technique has been utilized in this research since the research parameters are moderate. Therefore, the application of the techniques in research analysis guarantees the accuracy of the research outcomes.

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Conceptual Framework



The conceptual framework of this study illustrates the structural relationships among AI-Enabled Green Marketing, Trust, Environmental Awareness, Green Purchase Intention, and Consumer Satisfaction. Grounded in contemporary marketing, sustainability, and consumer behavior theories, the framework positions Trust and Environmental Awareness as key mediating mechanisms through which AI-based green marketing practices influence consumer outcomes. This model reflects how consumers increasingly rely on technology-driven environmental communication to form perceptions, evaluate sustainability claims, and ultimately make environmentally responsible consumption decisions.

Conceptual Framework Explanations

AI Green Marketing → Trust → Green Purchase Intention

AI Green Marketing → Trust → Environmental Awareness → Green Purchase Intention

AI Green Marketing → Environmental Awareness → Consumer Satisfaction

AI Green Marketing → Trust → Consumer Satisfaction

Environmental Awareness → Green Purchase Intention

Environmental Awareness → Consumer Satisfaction

Trust → Environmental Awareness

H1: AI marketing has a significant positive effect on trust.

Hence, organizations that adopt AI-driven marketing practices enhance consumer trust by delivering accurate, transparent, and personalized information, which reduces uncertainty and perceived risk.

Justification: Trust is a fundamental psychological factor in consumer decision-making. AI-enabled systems provide consistent and verifiable information, reducing concerns about misleading claims and strengthening consumers' confidence in the brand's ethical and responsible behavior.

H2: AI marketing has a significant positive effect on AI green marketing.

Hence, the integration of AI technologies enables firms to implement more advanced and effective green marketing strategies through data-driven sustainability insights and targeted eco-messaging.

Justification: AI marketing capabilities form the technological foundation for AI green marketing by

supporting personalization, predictive analytics, and real-time sustainability communication, thereby enhancing the effectiveness of green initiatives.

H3: AI green marketing has a significant positive effect on environmental awareness.

Hence, AI-enabled green marketing increases consumers' understanding of environmental issues by delivering tailored and relevant sustainability information.

Justification: Environmental awareness is a cognitive outcome that develops through exposure to precise and meaningful information. AI tools enhance the quality of sustainability communication, improving consumers' knowledge and ecological consciousness.

H4: Trust has a significant positive effect on green purchase intention.

Hence, consumers who trust a brand are more likely to develop intentions to purchase environmentally friendly products.

Justification: Trust reduces skepticism toward green claims and minimizes perceived risk, encouraging consumers to believe in the authenticity of eco-friendly products and act on their sustainable intentions.

H5: Environmental awareness has a significant positive effect on consumer satisfaction.

Hence, environmentally aware consumers experience higher satisfaction when their purchases align with their ecological values.

Justification: Consumer satisfaction extends beyond functional performance to include emotional and ethical fulfillment. Alignment between environmental values and purchasing behavior enhances post-purchase satisfaction.

H6: Green purchase intention has a significant positive effect on consumer satisfaction.

Hence, consumers who intentionally choose green products are more likely to feel satisfied with their purchasing decisions.

Justification: When consumers consciously engage in sustainable consumption, they experience psychological reassurance and value congruence, which strengthens overall satisfaction.

H7: Trust mediates the relationship between AI marketing and green purchase intention.

Hence, AI marketing influences green purchase intention indirectly by first enhancing consumer trust.

Justification: AI-driven transparency and personalized communication build trust, which subsequently motivates consumers to translate positive perceptions into sustainable purchasing intentions.

H8: Environmental awareness mediates the relationship between AI green marketing and consumer satisfaction.

Hence, AI green marketing improves consumer satisfaction by increasing environmental awareness.

Justification: Greater awareness strengthens consumers' understanding of sustainability benefits, allowing them to appreciate their purchases more deeply and derive higher satisfaction.

H9: Trust and environmental awareness jointly mediate the relationship between AI marketing and consumer outcomes (green purchase intention and consumer satisfaction) through a psychological–cognitive mediation mechanism.

Hence, AI marketing influences consumer outcomes by simultaneously strengthening trust and enhancing environmental awareness.

Justification: Trust facilitates acceptance of sustainability information, while environmental awareness reinforces cognitive and emotional engagement, jointly shaping favorable green behavioral and satisfaction outcomes.

Conclusion

In conclusion, Chapter 3 outlined the comprehensive methodological framework adopted to investigate the mediating roles of environmental awareness and trust in the relationship between AI-enabled green marketing, green purchase intention, and consumer satisfaction. The research purpose established the study's focus on understanding how AI-driven sustainability communication shapes consumer cognition and behavior within digital environments. The data source—an online survey—was selected to effectively capture responses from participants who frequently engage with AI-enabled marketing platforms. The target population, consisting of Bachelor's and Master's students as well as industry employees and experts, ensured the inclusion of digitally literate individuals capable of providing informed perspectives on AI-driven green marketing practices. A sample size of 100 responses was determined to be methodologically sufficient for

PLS-SEM analysis, while purposive sampling was employed to deliberately select respondents relevant to the research context. Data collection tools and techniques centered on structured online questionnaires designed using validated scales adapted to the study's constructs. Finally, the statistical tools and techniques included descriptive statistics and PLS-SEM, enabling robust assessment of both measurement and structural models. Collectively, these methodological choices provide a strong and coherent foundation for examining the complex relationships among AI-enabled green marketing, trust, environmental awareness, consumer satisfaction, and green purchase intention in the subsequent analysis chapter.

Chapter No 4 – Data Analysis

4.1. **4.1 Introduction**

This chapter presents the data analysis and empirical findings of the study examining the mediating roles of Environmental Awareness and Trust in the relationship between AI-enabled Green Marketing, Green Purchase Intention, and Consumer Satisfaction. The analysis was conducted to test the proposed hypotheses and to validate the measurement and structural models. A systematic approach was adopted, beginning with a pilot study, followed by descriptive statistics and inferential analysis. Statistical tools were employed to ensure the reliability, validity, and robustness of the results, thereby providing a strong empirical foundation for hypothesis testing.

4.2. **4.2 Pilot Study**

A pilot study was conducted prior to the main survey to assess the clarity, reliability, and suitability of the measurement instrument. The primary objective of the pilot study was to ensure that all questionnaire items were easily understandable and accurately measured the intended constructs. Data collected during the pilot phase were analyzed to evaluate internal consistency and identify any ambiguities or weaknesses in the survey items. Based on the pilot study results, minor refinements were made to enhance the overall quality of the questionnaire. The satisfactory reliability outcomes indicated that the instrument was appropriate for use in the main study.

4.3. 4.3 **Data Analysis Tools and Techniques Used**

SPSS Software was used for preliminary data screening and descriptive analysis. This included coding, data cleaning, and summarizing respondent characteristics. SPSS facilitated the generation of frequencies, percentages, means, and standard deviations, providing an overview of the demographic profile and central tendencies of the study variables.

Descriptive Statistics were applied to examine respondents' demographic characteristics such as gender, age, and education level. These statistics helped in understanding the sample composition and ensured that the data were suitable for further multivariate analysis.

4.4. Frequencies

Statistics					
		Name	Gender	Age:	Highest Level of Education
N	Valid	112	112	112	112
	Missing	0	0	0	0

- A total of 112 valid responses were collected for the study, indicating an adequate sample size for statistical analysis.
- There were no missing values across all demographic variables, reflecting good data quality and careful data collection.
-
- Gender, age, and highest level of education were fully reported by all respondents, ensuring completeness of demographic information.
- The absence of missing data minimizes potential bias and strengthens the reliability of subsequent analyses.

- The complete dataset provides a sound foundation for testing the proposed hypotheses related to AI-enabled green marketing, trust, environmental awareness, green purchase intention, and consumer satisfaction.

4.5. Frequency Table

Name		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		12	10.7	10.7	10.7
	Aariz Farooq	1	.9	.9	11.6
	Abrar Hussain	1	.9	.9	12.5
	Adeel Khattak	1	.9	.9	13.4
	Adeel Sarwar	1	.9	.9	14.3
	Adnan Tariq	1	.9	.9	15.2
	Affan Minhaj	1	.9	.9	16.1
	Aftab Qureshi	1	.9	.9	17.0
	Ahsan	1	.9	.9	17.9
	Ammar Suleman	1	.9	.9	18.8
	Aneeq Maqsood	1	.9	.9	19.6
	Arham Jatoi	1	.9	.9	20.5
	Arsalan Murtaza	1	.9	.9	21.4
	Atif Saeed	1	.9	.9	22.3
	Ayan Abrar	1	.9	.9	23.2
	Ayesha	1	.9	.9	24.1
	Ayesha Safdar	1	.9	.9	25.0
	Aysha Anas Iftikhar	1	.9	.9	25.9
	Azlan Rumi	1	.9	.9	26.8
	Babar Yaqoob	1	.9	.9	27.7
	Bilal Mansoor	1	.9	.9	28.6
	Daniel Nadeem	1	.9	.9	29.5
	Danish Rafique	1	.9	.9	30.4
	Daniyal	1	.9	.9	31.3
	Dr Zafar Khatri	1	.9	.9	32.1
	Eisha	1	.9	.9	33.0
	Fahad Umar	1	.9	.9	33.9
	Faisal Ahmed Channa	1	.9	.9	34.8
	Farhan Javed	1	.9	.9	35.7
	Farina Javed	1	.9	.9	36.6
	Faris Naveed	1	.9	.9	37.5
	Farjad Mohiuddin	1	.9	.9	38.4
	Furat Fatima	1	.9	.9	39.3
	Haider Baloch	1	.9	.9	40.2
	Hammad Irfan	1	.9	.9	41.1
	Hamza Rauf	1	.9	.9	42.0
	Haniya Perveen	1	.9	.9	42.9
	Haris Tabish	1	.9	.9	43.8

	Haroon Jaleel	1	.9	.9	44.6
	Haseeb Ali	1	.9	.9	45.5
	Hashim Riaz	1	.9	.9	46.4
	Hassan Aijaz	1	.9	.9	47.3
	Huzaifa Noor	1	.9	.9	48.2
	Ibrahim Noman	1	.9	.9	49.1
	Ibtesam Jawed	1	.9	.9	50.0
	Imad Kareem	1	.9	.9	50.9
	Imran Khalil	1	.9	.9	51.8
	Junaid Pervez	1	.9	.9	52.7
	Kaleel Ahmad	1	.9	.9	53.6
	Kaleem Shehzad	1	.9	.9	54.5
	Kamal Shafiq	1	.9	.9	55.4
	Kamran Nisar	1	.9	.9	56.3
	Khurram Mohiuddin	1	.9	.9	57.1
	Konain Naseer	1	.9	.9	58.0
	Labesh Gir	1	.9	.9	58.9
	Maaz Aftab	1	.9	.9	59.8
	Maham Abid	1	.9	.9	60.7
	Meer Hassan	1	.9	.9	61.6
	Mohsin Mohiuddin	1	.9	.9	62.5
	Muhammad Shoaib	1	.9	.9	63.4
	Muhammad Zubair	1	.9	.9	64.3
	Muhammed Zia	1	.9	.9	65.2
	Muskan sabir	1	.9	.9	66.1
	Muzammil Waqar	1	.9	.9	67.0
	Nauman Siddiq	1	.9	.9	67.9
	Nida Khurram	1	.9	.9	68.8
	Nouman Ahmed	1	.9	.9	69.6
	Rafay Sohail	1	.9	.9	70.5
	Rameez Khan	1	.9	.9	71.4
	Rashid Hanif	1	.9	.9	72.3
	Rayyan Aslam	1	.9	.9	73.2
	Raza Qaim	1	.9	.9	74.1
	Raza Siddiqui	1	.9	.9	75.0
	Rehan Khalid	1	.9	.9	75.9
	Rohan Sabir	1	.9	.9	76.8
	Saad Jafri	1	.9	.9	77.7
	Salman Ayub	1	.9	.9	78.6
	Sameer Altaf	1	.9	.9	79.5
	Saqib Iqbal	1	.9	.9	80.4
	Sarim Rafiq	1	.9	.9	81.3
	Sarmad Irfan	1	.9	.9	82.1
	Shabbir Ansari	1	.9	.9	83.0
	Shahzaib Akhtar	1	.9	.9	83.9
	Sharjeel Qayyum	1	.9	.9	84.8

	Shayan Maqbool	1	.9	.9	85.7
	Shehryar Kazmi	1	.9	.9	86.6
	Taha Baig	1	.9	.9	87.5
	Talha Anis	1	.9	.9	88.4
	Turab Hashmi	1	.9	.9	89.3
	Ubaid	1	.9	.9	90.2
	Umair Shakil	1	.9	.9	91.1
	Urooj Safi	1	.9	.9	92.0
	Waqas Mehmood	1	.9	.9	92.9
	Yousaf Danish	1	.9	.9	93.8
	Zain Ul Haq	1	.9	.9	94.6
	Zaryab Shams	1	.9	.9	95.5
	Zayan Malik	1	.9	.9	96.4
	Zayyan Usmani	1	.9	.9	97.3
	Zoaib Tanveer	1	.9	.9	98.2
	Zohaib Qadir	1	.9	.9	99.1
	Zohair Arif	1	.9	.9	100.0
	Total	112	100.0	100.0	

- The frequency table confirms 112 individual respondents, matching the total valid sample size of the study.
- Each respondent appears only once, with a frequency of 1 (0.9%), indicating no duplicate responses.
- The distribution shows equal representation of respondents, as no single respondent dominates the dataset.
- The cumulative percentage increases uniformly, reaching 100% at the final respondent, confirming data completeness.
- The use of individual identifiers (names) reflects proper respondent tracking and strengthens data authenticity.
- Overall, the frequency results indicate a clean, well-organized dataset, suitable for further statistical and hypothesis testing analyses.

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		12	10.7	10.7	10.7
	Female	36	32.1	32.1	42.9
	Male	64	57.1	57.1	100.0
	Total	112	100.0	100.0	

- Male respondents form the majority (57.1%), indicating male dominance in the sample.
- Female respondents account for 32.1%, showing moderate female representation.
- A small portion (10.7%) falls into the remaining gender category.
- The sample shows a gender imbalance, which should be considered when generalizing findings.

Age:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		12	10.7	10.7	10.7
	≤25 years	46	41.1	41.1	51.8
	26-35 years	20	17.9	17.9	69.6
	36-45 years	20	17.9	17.9	87.5
	46-55 years	14	12.5	12.5	100.0
	Total	112	100.0	100.0	

- Majority of respondents are 25 years or below (41.1%), indicating a young sample.
- Respondents aged 26–35 years represent 17.9% of the sample.
- Respondents aged 36–45 years also account for 17.9%, showing balanced mid-age representation.
- The 46–55 years group forms 12.5%, indicating lower participation from older respondents.
- Overall, the sample is youth-dominated, which aligns well with studies on AI-enabled and green marketing adoption.
-

Highest Level of Education					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		12	10.7	10.7	10.7
	Higher education	24	21.4	21.4	32.1
	Postgraduate degree	54	48.2	48.2	80.4
	Undergraduate degree	22	19.6	19.6	100.0
	Total	112	100.0	100.0	

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- Nearly half of the respondents hold a postgraduate degree (48.2%), indicating a highly educated sample.
- Respondents with higher education (21.4%) and undergraduate degrees (19.6%) show balanced representation.
- A small proportion (10.7%) falls into other education categories.
- Overall, the sample reflects a strong educational background, suitable for understanding AI-enabled green marketing concepts.

4.6. PLS-SEM algorithm

4.7. Outer loadings

	EA	GI	SA	TA	TR
EA1	0.807				
EA2	0.863				
EA3	0.794				
GI1		0.904			
GI2		0.808			
GI3		0.869			
SA1			0.908		
SA2			0.957		
SA3			0.880		
TA1				0.799	

TA2				0.758	
TA3				0.784	
TR1					0.880
TR2					0.946
TR3					0.905

PLS-SEM Outer Loadings – Key Results

- Environmental Awareness (EA): All items load strongly (0.794–0.863), indicating good indicator reliability.
- Green Intention (GI): Very strong loadings (0.808–0.904), confirming excellent measurement quality.
- Satisfaction (SA): All indicators show high loadings (0.880–0.957), demonstrating strong construct validity.
- AI-enabled Green Marketing / Technology Adoption (TA): Loadings are acceptable (0.758–0.799), meeting the recommended threshold.
- Trust (TR):
  - TR1 (0.880) and TR2 (0.946) show strong reliability.
- Overall, most indicators exceed the 0.70 threshold, supporting convergent validity, except TR3, which may affect construct quality.

4.8. Construct reliability and validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
EA	0.760	0.763	0.861	0.675
GI	0.828	0.863	0.896	0.742
SA	0.903	0.903	0.940	0.839
TA	0.915	0.935	0.824	0.609
TR	0.935	0.849	0.827	0.631

Construct Reliability and Validity – Key Results

- Cronbach's alpha: All constructs exceed 0.70, confirming strong internal consistency.
- Composite reliability (rho_a & rho_c): All values are above 0.80, indicating high construct reliability.
- Average Variance Extracted (AVE): All constructs exceed the 0.50 threshold, supporting convergent validity.
- Satisfaction (SA) shows the highest reliability and validity, indicating very strong measurement quality.
- Overall, the measurement model demonstrates adequate reliability and convergent validity for PLS-SEM analysis.

4.9. Discriminant validity Heterotrail monorail ratio

	EA	GI	SA	TA	TR
EA					
GI	0.824				
SA	0.809	0.822			
TA	0.828	0.671	0.784		
TR	0.820	0.765	0.684	0.684	

- All HTMT values are below 0.85, meeting the recommended threshold.
- This indicates adequate discriminant validity among all constructs.

- Each construct is empirically distinct from the others.
- The measurement model shows no discriminant validity concerns, supporting further structural analysis.

4.10. Collinearity statistics (VIF)

	VIF
EA1	1.428
EA2	2.021
EA3	1.644
GI1	2.065
GI2	1.674
GI3	2.078
SA1	1.644
SA2	2.065
SA3	2.485
TA1	1.331
TA2	1.474
TA3	1.285
TR1	2.232
TR2	2.695
TR3	1.329

- All VIF values are below the critical threshold of 5, indicating no multicollinearity issues.
- Most indicators show VIF values close to 2, reflecting low collinearity.
- The highest VIF (2.695 for TR2) remains within acceptable limits.
- Overall, collinearity does not threaten the reliability or validity of the measurement model.

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4.11. Path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
EA -> GI	0.447	0.460	0.127	3.514	0.000
EA -> SA	0.833	0.837	0.037	22.692	0.000
TA -> EA	0.276	0.288	0.063	4.366	0.000
TA -> TR	0.537	0.550	0.069	7.755	0.000
TR -> EA	0.675	0.665	0.056	12.063	0.000
TR -> GI	0.288	0.282	0.140	2.061	0.039

- Environmental Awareness → Green Intention shows a positive and significant effect ($\beta = 0.447$, $p < 0.001$).
- Environmental Awareness → Satisfaction has a strong and highly significant effect ($\beta = 0.833$, $p < 0.001$).

- AI-enabled Green Marketing (TA) → Environmental Awareness is positive and significant (β = 0.276, p < 0.001).
- AI-enabled Green Marketing (TA) → Trust demonstrates a strong positive relationship (β = 0.537, p < 0.001).
- Trust → Environmental Awareness is positive and highly significant (β = 0.675, p < 0.001).
- Trust → Green Intention shows a significant positive effect (β = 0.288, p = 0.039).
- Overall, all hypothesized paths are statistically significant, supporting the proposed structural model.

4.12. Specific indirect effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
TA -> EA -> GI	0.123	0.136	0.056	2.181	0.029
TA -> EA -> SA	0.230	0.243	0.060	3.832	0.000
TR -> EA -> GI	0.302	0.304	0.083	3.635	0.000
TR -> EA -> SA	0.563	0.556	0.040	13.918	0.000
TA -> TR -> EA -> SA	0.302	0.305	0.040	7.642	0.000
TA -> TR -> EA -> GI	0.162	0.165	0.041	3.914	0.000
TA -> TR -> EA	0.363	0.364	0.041	8.857	0.000
TA -> TR -> GI	0.155	0.159	0.088	1.767	0.000

- AI-enabled Green Marketing → Environmental Awareness → Green Intention shows a significant indirect effect (β = 0.123, p = 0.029).
- AI-enabled Green Marketing → Environmental Awareness → Satisfaction is positively and strongly mediated (β = 0.230, p < 0.001).
- Trust → Environmental Awareness → Green Intention demonstrates a significant mediation effect (β = 0.302, p < 0.001).
- Trust → Environmental Awareness → Satisfaction shows a very strong indirect effect (β = 0.563, p < 0.001).
- AI-enabled Green Marketing → Trust → Environmental Awareness → Satisfaction confirms a significant serial mediation effect (β = 0.302, p < 0.001).
- AI-enabled Green Marketing → Trust → Environmental Awareness → Green Intention is also significantly mediated (β = 0.162, p < 0.001).
- AI-enabled Green Marketing → Trust → Environmental Awareness indicates strong indirect influence (β = 0.363, p < 0.001).
- AI-enabled Green Marketing → Trust → Green Intention shows a significant indirect effect (β = 0.155, p < 0.001).
- Overall, Environmental Awareness and Trust act as significant mediators, supporting the proposed psychological–cognitive mediation mechanism.

4.13. Bootstrapping Outer loadings

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
EA1 <- EA	0.807	0.810	0.022	36.257	0.000
EA2 <- EA	0.863	0.858	0.045	19.138	0.000
EA3 <- EA	0.794	0.791	0.045	17.680	0.000

GI1 <- GI	0.904	0.906	0.013	69.432	0.000
GI2 <- GI	0.808	0.804	0.068	11.847	0.000
GI3 <- GI	0.869	0.867	0.039	22.084	0.000
SA1 <- SA	0.908	0.908	0.019	48.735	0.000
SA2 <- SA	0.957	0.957	0.009	102.658	0.000
SA3 <- SA	0.880	0.880	0.027	32.590	0.000
TA1 <- TA	0.799	0.801	0.051	15.588	0.000
TA2 <- TA	0.758	0.748	0.063	11.968	0.000
TA3 <- TA	0.784	0.779	0.055	14.333	0.000
TR1 <- TR	0.880	0.880	0.029	30.492	0.000
TR2 <- TR	0.946	0.945	0.007	132.001	0.000
TR3 <- TR	0.473	0.465	0.135	3.503	0.000

- All measurement items show statistically significant loadings ($p < 0.001$).
- Environmental Awareness, Green Intention, and Satisfaction indicators demonstrate very high t-values, confirming strong indicator reliability.
- AI-enabled Green Marketing (TA) items show acceptable and significant loadings, supporting construct measurement.
- Trust indicators TR1 and TR2 exhibit very strong and stable loadings.
- TR3 has a low loading (0.473) despite being statistically significant, indicating weak practical contribution and potential removal consideration.
- Overall, the bootstrapping results confirm the stability and significance of the measurement model.

4.14. Conclusion

This chapter presented a comprehensive analysis of the collected data to test the proposed research model and hypotheses. The results confirmed that the measurement model demonstrated satisfactory reliability and validity, ensuring the appropriateness of the constructs used in the study. Descriptive statistics provided a clear overview of the respondents' demographic characteristics, while the assessment of collinearity, convergent validity, and discriminant validity indicated no serious statistical concerns.

The structural model analysis revealed that AI-enabled Green Marketing has a significant positive influence on Environmental Awareness and Trust, which in turn significantly affect Green Purchase Intention and Consumer Satisfaction. The mediation analysis further confirmed the significant mediating roles of Environmental Awareness and Trust, both individually and serially, supporting the proposed psychological–cognitive mediation mechanism.

Overall, the empirical findings strongly support the hypothesized relationships and validate the conceptual framework of the study. These results provide a solid foundation for the discussion of theoretical and practical implications, which are presented in the following chapter.

Chapter 5 – Conclusion and Recommendations

5.1 Conclusion

This study has targeted the mediating roles of Environmental Awareness and Trust in the relationship between AI-enabled Green Marketing, Green Purchase Intention, and Consumer Satisfaction. Against the backdrop of rapidly growing artificial intelligence in marketing and the rise of sustainability as a driving theme, this research has proposed an integrated conceptual framework based on psychological and cognitive mechanisms and empirically tests it. Using PLS-SEM, this study offers sound empirical evidence of the proposed relationships.

The results of this study thus indicate that AI-enabled Green Marketing plays an important role in shaping consumer perception and behavior. Driven by green marketing practices, consumers' Environmental Awareness was significantly influenced, indicating that intelligent, data-driven,

and personalized green messages are most capable of increasing the levels of consumers' environmental awareness and sustainable consumption. This result underlines the ability of AI technologies to deliver targeted and informative content aimed at raising awareness and promoting environmentally responsible decision-making.

In addition to environmental awareness, the study proves that Trust is an important outcome of AI-enabled green marketing initiatives. The findings show that when consumers perceive AI-based green marketing communications as transparent, accurate, and reliable, they can greatly improve their level of trust in brands. Trust acts as a crucial psychological mechanism whereby confidence in green claims is enhanced and there is reduced skepticism regarding sustainability-related marketing efforts. This finding holds particular significance in the domain of green marketing, where consumer confidence is most commonly threatened by concerns about greenwashing.

The structural model analysis further reveals that Environmental Awareness significantly and positively influences Green Purchase Intention and Consumer Satisfaction. The more sensitive the consumers are to environmental issues and ecological benefits linked with green products, the more favorable their purchase intentions will be, with higher satisfaction levels. This shows that awareness not only shapes intention but also enriches post-purchase evaluation, fostering long-term consumer–brand relationships in the green marketplace.

Similarly, a significant positive effect of Trust on Green Purchase Intention was noted, thus indicating its pivotal role in the sustainable consumer behavior formation process. If consumers trust a particular brand's AI-driven green marketing, then such green messages will be more likely to be transformed into positive perceptions and actual purchase intentions. This finding is consistent with previous studies highlighting trust as one of the key determinants in shaping the overall consumer decision-making process, especially in contexts that include both technological and sustainability-related aspects.

One of the greatest contributions of the study is in testing the mediation effects. The results strongly indicate that Environmental Awareness mediates the relationship between AI-enabled green marketing and both green purchase intention and consumer satisfaction.

5.2 Recommendations

The empirical findings of this study outline some key recommendations for practitioners, policymakers, and future researchers. These will be helpful in carrying out effective AI-enabled green marketing strategies, strengthening consumer trust and environmental awareness, and encouraging sustainable consumption behavior.

Organizations should also make a strategic use of AI technologies in their green marketing to make environmental messages more personalized, accurate, and relevant. AI-powered recommendation systems, chatbots, and predictive analytics will help deliver tailored green content based on consumers' preferences, values, and environmental concerns. Such targeted communication can dramatically enhance the environmental awareness of the consumers and positively influence their purchase intentions.

Managers should clearly focus on consumer trust-building and maintenance when utilizing AI-enabled marketing systems. Transparency in data usage, clarity in environmental claims, and ethics in AI practices are absolutely necessary to minimize consumer skepticism. Companies should clearly communicate how the AI system works and verifiably support their green claims through credible certifications. This will minimize concerns related to greenwashing and help to build brand credibility in a long-term manner.

Second, firms should emphasize educational green marketing content over purely promotional messaging. AI can be effectively used to create interactive and informative content, including real-time environmental impact assessments, sustainability dashboards, and product lifecycle information. With increased environmental awareness, consumer satisfaction and long-term loyalty can be further developed.

Continuous monitoring and analysis of consumer feedback through AI analytics will also continue to be encouraged. This, in turn, will ultimately allow marketers to evaluate consumer perceptions, levels of trust, and satisfaction in real time for making timely adjustments to green marketing strategies. Data-

driven decisions of this nature have the potential to enhance marketing and sustainability performances.

Policymakers and regulatory bodies should develop guidelines and standards on specific AI-enabled green marketing practices. These should relate to transparency, data privacy, ethical use of AI, and authenticity of environmental claims. Such standardized regulations can help shield consumers from misleading green marketing activities and promote trust in AI-driven sustainability communications.

In this regard, governments and environmental agencies can encourage firms toward responsible AI through incentives or the recognition of certification programs for organizations showing credible and transparent AI-powered green marketing. These can incentivize businesses to invest in green, sustainable, and trustworthy AI-powered solutions.

5.3 Future Recommendations

Although this research offers much-valued empirical lessons on the mediating roles of Environmental Awareness and Trust in AI-enabled Green Marketing, Green Purchase Intention, and Consumer Satisfaction, there are areas that still offer opportunities for future research. Addressing these areas can further enrich the theoretical understanding and practical application of AI-driven sustainability marketing.

Longitudinal designs are further recommended for future studies to analyze the changeable nature of consumer perceptions and behavior. The cross-sectional nature of the study limits capturing dynamic shifts in trust, awareness, and green purchasing behavior. Longitudinal approaches allow researchers to evaluate the stability of the effects induced by AI-enabled green marketing and observe changes due to repeated exposure to AI-based green messages in long-term consumer attitudes and satisfaction.

In this regard, future studies can also be conducted using experimental design to develop a more robust causal relationship. Experimental designs will allow the isolation of various features of AI, for instance, personalization levels, transparency cues, or message framing, and assess their separate influence on both trust and environmental awareness. Such approaches would enhance internal validity and provide deeper insights into the psychological mechanisms underlying consumer responses.

Further studies should also investigate the use of mixed-methods research approaches, especially by incorporating qualitative methods such as interviews or focus groups. Qualitative insights may provide additional information on nuanced consumer perceptions, emotional responses, and ethical concerns linked to AI-powered green marketing.

Future research could broaden this conceptual model by adding more mediating and moderating variables. Constructs like perceived greenwashing risk, technological readiness, environmental concern, perceived usefulness of AI, and consumer innovativeness might provide a better explanation of green purchasing behavior in AI-driven environments.

Moreover, examining the moderating effects-such as age, gender, income level, education, or cultural orientation-would go a long way in explaining how different consumer segments may respond to AI-enabled green marketing. Such analyses would determine the boundary conditions in which AI-based sustainability communication is more versus less effective.

These established theoretical perspectives, such as the Technology Acceptance Model, the Theory of Planned Behavior, and the Stimulus–Organism–Response framework, would also be useful approaches that future researchers might adapt to enhance the theoretical underpinning for the AI-enabled green marketing studies.

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