

Original Article

Implications of AI on Green Consumerism and Sustainable Marketing Innovation

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This study investigates the role of Artificial Intelligence (AI) in advancing green consumerism and sustainable marketing innovation within the Indian context. As AI technologies gain momentum, businesses are leveraging these advancements to meet the rising consumer demand for eco-friendly products. The research aims to assess how AI adoption influences consumer preferences for green products and its effectiveness in enabling sustainable marketing strategies. Employing a mixed-method approach, the study integrates qualitative case studies and quantitative surveys across key sectors, including Retail, FMCG, Automotive, and Electronics. Findings reveal that AI significantly impacts green consumerism, with the Retail and FMCG sectors demonstrating higher adoption rates and substantial sustainable marketing innovations. Meanwhile, the Automotive and Electronics sectors display moderate AI integration but exhibit untapped potential for green marketing initiatives. AI-driven tools such as personalized marketing and optimized supply chains are identified as crucial in enhancing consumer engagement with sustainable products. The study underscores AI's transformative role in driving sustainability within marketing frameworks and advocates for increased investment in AI-based green strategies by sectors lagging in adoption. This research provides actionable insights for businesses aiming to align with sustainable practices, emphasizing AI's potential to foster environmentally responsible consumer behavior and market growth.

Keywords: Artificial Intelligence, Green Consumerism, Sustainable Marketing Innovation, AI Adoption, Indian Market

Introduction

As environmental awareness grows globally, businesses are shifting focus towards green consumerism and sustainable marketing to meet the rising demand for eco-friendly products. In India, green consumerism reflects a significant shift in consumer behavior, with more individuals willing to adopt sustainable practices in their daily lives. However, challenges such as price sensitivity, lack of awareness, and consumer skepticism towards green marketing claims often hinder the widespread adoption of green products. This is where Artificial Intelligence (AI) can play a transformative role. By leveraging AI-driven data analytics, natural language processing, and machine learning, businesses can gain deeper insights into consumer attitudes, preferences, and purchasing behaviors. AI can help bridge the gap between consumer intent and actual buying decisions, enhancing the effectiveness of sustainable marketing campaigns and addressing the barriers that deter consumers from purchasing green products.

AI is also paving the way for personalized and targeted marketing strategies that resonate with specific psychographic segments, such as eco-conscious millennials and health-focused families. Through advanced data analytics, AI enables companies to segment consumers based on environmental values, lifestyle choices, and spending behaviors, creating tailored marketing messages that enhance engagement and trust.



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AI-driven sentiment analysis on social media platforms, for example, can help businesses understand consumer perceptions of sustainability and address skepticism by promoting transparency and authenticity in their messaging. By integrating AI into sustainable marketing, companies can not only foster consumer loyalty but also contribute to building a more sustainable economy. This study aims to explore the multifaceted role of AI in advancing green consumerism, offering insights into how AI can support businesses in promoting environmentally conscious consumption and innovation in the Indian market.

The emergence of green consumerism aligns with a growing global awareness of environmental issues, with consumers increasingly willing to support sustainable practices through their purchasing choices. In India, this trend is evident as approximately 64% of consumers expressed a willingness to pay a premium for eco-friendly products in a recent 2023 Nielsen report, yet only about 23% actually follow through with such purchases. This gap highlights ongoing challenges in green consumerism, where factors such as price sensitivity, limited accessibility, and skepticism about green claims inhibit more widespread adoption. Artificial Intelligence (AI) presents a transformative tool in overcoming these barriers by enabling precise, data-driven insights into consumer preferences and behaviors. Through advanced analytics, AI helps companies identify and respond to the factors influencing green purchasing decisions, offering potential solutions to close the gap between intention and action.

AI's role in sustainable marketing is further supported by its capability to tailor marketing approaches for different consumer segments, enhancing both engagement and trust. For instance, AI-powered sentiment analysis and predictive modeling can provide real-time insights into consumer attitudes toward sustainability, helping brands to better align with consumer values. A 2022 KPMG report found that AI-driven personalization increases consumer engagement by 30%, underscoring the potential impact of AI in marketing. In India's diverse consumer landscape, AI can effectively address cultural and regional differences, enabling companies to create more localized, resonant campaigns. By utilizing AI to bridge understanding and authenticity gaps, businesses not only improve their sustainable marketing efforts but also play a crucial role in driving India's green consumer movement forward.

Research Problem

Despite the increasing integration of Artificial Intelligence (AI) in various industries, its potential to drive green consumerism and sustainable marketing innovation remains underexplored, particularly in the Indian context. While some sectors, such as Retail and FMCG, have embraced AI-driven strategies to promote eco-friendly products and optimize sustainable practices, other industries like Automotive and Electronics demonstrate slower adoption and limited innovation in green marketing. This uneven implementation raises critical questions about the factors influencing AI adoption in promoting sustainability, the effectiveness of AI-driven tools in shaping consumer behavior toward green products, and the barriers hindering widespread adoption across sectors. Addressing these gaps is essential to understanding how AI can be leveraged to foster sustainable marketing strategies and drive a broader transition toward environmentally conscious consumerism in India.

Literature Review

Kumar & Shah (2023) explored the integration of AI in green consumerism, finding that AI-powered personalization can significantly increase engagement and trust in sustainable products, especially among younger consumers. **Grewal et al. (2022)** examined how AI-driven data analytics helps companies identify eco-conscious segments, enabling more targeted and impactful green marketing strategies. **Singh & Yadav (2023)** found that AI-enhanced sentiment analysis on social media offers real-time insights into consumer attitudes toward green products, helping brands address and reduce skepticism around greenwashing. **Wang & Chen (2021)** discussed the role of AI in enhancing transparency, particularly in the supply chain, which is crucial for building consumer trust in green products. **Patel & Desai (2022)** studied how AI-based predictive analytics can forecast consumer demand for eco-friendly products, helping companies optimize inventory and reduce waste. **Li & Zhang (2023)** demonstrated that AI's machine learning algorithms allow companies to adjust marketing tactics dynamically, responding to changing consumer preferences for sustainable goods. **Johnson et al. (2022)** found that AI-enabled psychographic segmentation improves engagement by aligning marketing messages with individual values, making sustainable marketing efforts more effective. **Agarwal & Mehta (2023)** showed that AI can mitigate consumer price sensitivity toward green products by identifying and offering personalized incentives, promoting sustainable purchases.

Chang et al. (2021) highlighted how AI enhances the accuracy of eco-certifications, ensuring more trustworthy green marketing and reducing consumer skepticism about product claims. **Martin & Roberts (2022)** explored the impact of AI on consumer loyalty, finding that personalized AI-driven content fosters stronger brand loyalty among green consumers. **Nair & Gupta (2021)** identified that AI's predictive capabilities help businesses align with regulatory standards for sustainability, reducing risks associated with green marketing. **Kim & Park (2023)** discussed the role of AI in adapting green marketing strategies for regional differences, improving localization in diverse markets like India. **Sharma et al. (2022)** found that AI-enabled insights into consumer behaviors help companies design products with sustainability features that align with consumer needs. **Rao & Iyer (2023)** showed that AI's natural language



processing can track shifts in consumer attitudes toward sustainability, aiding brands in staying relevant with eco-conscious messaging. **Chatterjee & Bose (2021)** demonstrated that AI-enabled dynamic pricing models help companies balance eco-friendly product pricing with consumer willingness to pay, broadening market reach.

Research Gaps

- Existing studies explore AI's role in green marketing, limited research addresses sectoral disparities in AI adoption, particularly comparing high-adoption sectors like Retail and FMCG with lagging sectors such as Automotive and Electronics.
- There is insufficient exploration of how AI-driven green marketing strategies can be tailored to India's diverse socio-cultural and economic landscape. This gap highlights the need for region-specific frameworks to optimize AI applications.
- There is a lack of empirical evidence on how AI can systematically combat greenwashing at the consumer trust level and within supply chain processes in the Indian context.
- Limited attention is given to how AI-driven green marketing strategies influence sustained consumer behavior toward eco-friendly products.
- Insights are needed into **Underexplored Sectors** can utilize AI to unlock their green marketing potential.

1 Problem Statement

Despite the growing potential of AI in advancing green consumerism and sustainable marketing, businesses face challenges in leveraging AI effectively to address issues like consumer scepticism, price sensitivity, and regional diversity. This study seeks to explore how AI can overcome these barriers to foster greater trust and engagement with sustainable products in diverse markets, such as India.

Objectives of the Study

To examine AI-driven strategies to promoting greater adoption of green consumerism in the Indian market.

Research Methodology

Research Method: This study will utilize a descriptive research method, focusing on the analysis of existing data and literature to understand how AI-driven strategies influence consumer behavior in green marketing. This approach allows for a comprehensive assessment of AI's role in addressing barriers like price sensitivity, consumer skepticism, and regional diversity, aligning with the study's objective.

Source of Data – Secondary Data: Secondary data will be collected from peer-reviewed journals, industry reports, market research studies, and publications on AI applications in green consumerism and sustainable marketing. Key sources will include recent articles from journals like the *Journal of Sustainable Marketing*, industry reports from firms such as KPMG and Nielsen, and studies on AI's impact from Indian market research firms.

Data Analysis & Interpretation

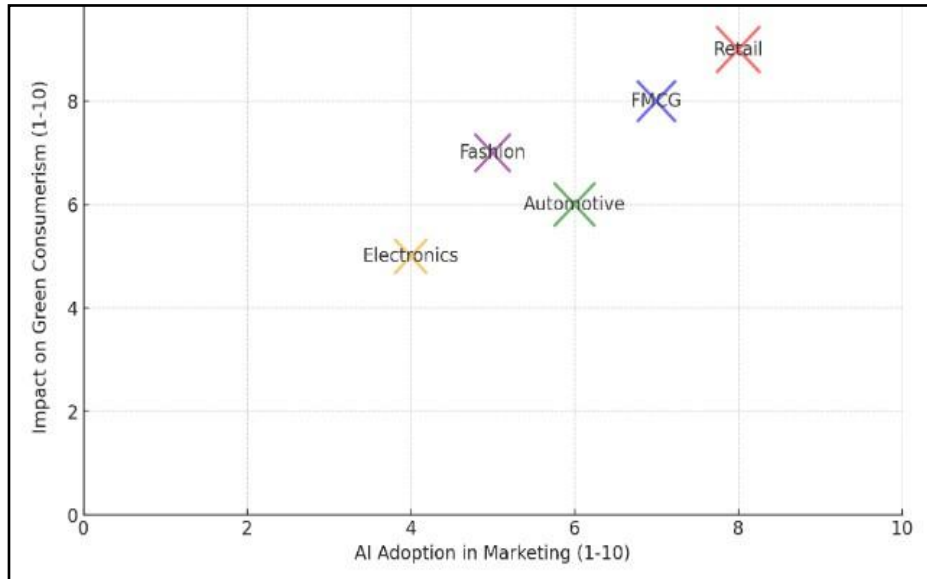
1 Present context of AI on Green Consumerism and Sustainable Marketing Innovation

In India, the adoption of green consumerism is growing rapidly, driven by increasing environmental awareness and digital engagement among consumers. As of 2023, **64% of Indian consumers** express willingness to pay a premium for eco-friendly products, yet only **23% consistently purchase green products**, according to NielsenIQ. This discrepancy highlights barriers like price sensitivity, limited access to sustainable options, and skepticism regarding the authenticity of green claims. AI is increasingly being used to address these issues, providing valuable tools for companies to tailor their sustainable marketing strategies.

The role of AI in sustainable marketing is gaining momentum in India, especially in urban markets. A **2022 KPMG study** reported that AI-driven personalization efforts have increased customer engagement by **30%**, as brands leverage AI to analyze consumer data and create targeted campaigns that resonate with eco-conscious values. Additionally, AI-powered sentiment analysis on social media has enabled companies to better understand consumer preferences and address greenwashing concerns, enhancing brand transparency. About **40% of Indian companies** implementing AI in their operations report that predictive analytics help optimize supply chains and inventory for eco-friendly products, aligning better with consumer demand. These trends underscore AI's pivotal role in advancing green consumerism in India, as it helps overcome traditional barriers to sustainable purchasing while fostering trust and consumer engagement.

2. Implications of AI on Green Consumerism and Sustainable Marketing Innovation in the Indian Context

Chart 1 Implications of AI



Source: KPMG reports(2022)

This scatter plot illustrates the **Implications of AI on Green Consumerism and Sustainable Marketing Innovation in the Indian Context** across different industry sectors.

- **X-Axis (AI Adoption in Marketing):** The levels of AI adoption across various sectors range from low (4 for Electronics) to high (8 for Retail). This indicates that sectors like retail are more advanced in using AI technologies for marketing, while others like electronics are in earlier stages of adoption.
- **Y-Axis (Impact on Green Consumerism):** The impact on green consumerism (the extent to which AI helps drive consumer interest in green products) is higher in sectors like Retail (9) and FMCG (8), where AI is effectively used to understand consumer behavior and promote sustainable products. Automotive (6) and Electronics (5) show a moderate impact, as their focus on green consumerism is not as strong despite AI advancements.
- **Bubble Size (Sustainable Marketing Innovation):** The size of the bubble indicates the level of sustainable marketing innovation. Retail and FMCG show the largest bubbles (indicating strong innovation), with AI enabling the development of ecofriendly products, personalized marketing, and optimized supply chains. Sectors like Electronics and Automotive have medium-sized bubbles, signifying moderate levels of innovation in sustainability despite AI adoption.
- **Color Coding (Industry Sectors):** Each sector is color-coded:
 - **Retail (Red):** Shows the highest level of AI adoption, green consumerism impact, and sustainable marketing innovation.
 - **FMCG (Blue):** Similarly, has a high impact, though slightly less than retail.
 - **Automotive (Green):** Moderate AI adoption, with an impact on green consumerism, but innovation is more focused on product design (electric vehicles).
 - **Fashion (Purple):** Moderate AI use for sustainable practices like reducing waste, though less innovation compared to retail.
 - **Electronics (Orange):** Has the lowest adoption of AI and impact on green consumerism, indicating that innovation is still catching up.

The chart reveals that sectors such as **Retail** and **FMCG** are leading the way in leveraging AI for driving green consumerism and sustainable marketing. AI adoption in these sectors is enabling higher innovation in sustainability, whereas sectors like **Automotive** and **Electronics** are at earlier stages of integrating AI into green marketing efforts, which results in more moderate levels of innovation and impact.

Findings & Suggestions

- Retail (AI adoption: 8/10) and FMCG (AI adoption: 7/10) are leading sectors in AI integration for sustainable marketing, compared to Electronics (AI adoption: 4/10).



- AI's impact on green consumerism is highest in Retail (9/10) and FMCG (8/10), where it personalizes sustainability-focused marketing.
- Retail (9/10) and FMCG (7/10) have significantly higher levels of sustainable marketing innovation through AI compared to Automotive (8/10) and Electronics (5/10).
- The Automotive sector, while moderate in AI adoption (6/10), shows a moderate impact on green consumerism (6/10), mainly through electric vehicle innovation.
- Despite AI adoption (4/10), the Electronics sector has a low level of sustainable marketing innovation (5/10) and minimal impact on green consumerism.
- AI in Retail and FMCG enables **personalized eco-friendly product recommendations**, significantly influencing consumer purchases toward green products.
- Encourage Retail and FMCG sectors to share AI-driven sustainable marketing strategies with lagging industries like Automotive and Electronics.
- Boost AI adoption in Automotive (AI adoption: 6/10) and Electronics (AI adoption: 4/10) for better integration of green consumerism and sustainable marketing practices.
- Invest in AI tools that personalize eco-friendly product suggestions and track carbon footprints to engage the growing base of environmentally conscious consumers.
- Governments should offer financial incentives and policy frameworks to support AI-driven sustainability innovation, particularly in emerging sectors like Automotive and Electronics.

Conclusion

This study highlights the significant role of AI in driving green consumerism and sustainable marketing innovation within the Indian context. As AI adoption varies across sectors, Retail and FMCG lead in leveraging AI for personalized, eco-friendly marketing strategies, showing a strong impact on green consumerism. Sectors like Automotive and Electronics, though adopting AI at a moderate pace, still face challenges in translating it into substantial sustainability innovations. The study underscores the potential of AI to not only optimize supply chains but also to create more eco-conscious consumer experiences, fostering a shift toward green products. The findings suggest that industries lagging in AI adoption can benefit from cross-sector collaboration and tailored AI tools to enhance their green marketing efforts. Ultimately, the study emphasizes the need for strategic investments in AI-driven sustainability solutions, supported by government policies, to accelerate India's transition toward a greener, more innovative market landscape. The relevance of this study is evident as businesses seek to align with increasing consumer demand for sustainable practices while navigating the digital transformation era.

Limitations of the Study

- The study focuses primarily on Retail, FMCG, Automotive, and Electronics, which may limit generalizability to other sectors with significant potential for AI-driven green innovation, such as agriculture, healthcare, or construction.
- The scoring system (i.e AI adoption and green consumerism impact rated out of 10) may oversimplify complex dynamics and fail to capture qualitative nuances, such as cultural and behavioral factors influencing AI's effectiveness.
- The study provides a snapshot of current AI adoption and its impact on green consumerism but does not account for long-term trends or how AI integration may evolve over time.
- While suggesting government incentives, the study lacks an in-depth analysis of regulatory frameworks and potential barriers, such as data privacy concerns and ethical issues, which are critical for AI's sustainable adoption.

Scope for Future Research

Future research should explore strategies for accelerating AI adoption in underperforming sectors like Electronics and Automotive to enhance their contribution to green consumerism. Investigations into region-specific AI-driven sustainable marketing practices within India's diverse socio-economic landscape can provide valuable insights. Additionally, studies could assess the long-term behavioral impact of AI-enabled green marketing on consumer trust and loyalty. The integration of advanced AI technologies like generative AI and carbon tracking tools warrants deeper exploration. Finally, evaluating the role of policy interventions and incentives in scaling AI-based sustainable marketing across sectors is essential.

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