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AI-Based Consumer Analytics for Promoting Sustainable Consumption

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Abstract

The rapid adoption of artificial intelligence (AI) technologies has transformed the way start-ups interact with customers in digital environments. Among these technologies, AI-based Chabot's and virtual assistants have emerged as strategic tools for enhancing customer experience through real-time, personalized, and scalable service delivery. This study examines the role of AI-powered Chabot's in improving customer experience in start-ups and their contribution to entrepreneurial performance. The paper explores how Chabot functionalities such as natural language processing, machine learning, and automation influence key dimensions of customer experience including responsiveness, personalization, convenience, and satisfaction. Using a conceptual and analytical approach, the study integrates existing literature on AI-driven service systems, customer relationship management, and entrepreneurial marketing to propose a framework linking Chabot adoption with customer engagement and loyalty. The findings suggest that AI-based Chabot's enable start-ups to provide consistent 24/7 support, reduce service costs, improve interaction quality, and strengthen customer relationships. The paper also discusses managerial and ethical implications related to data privacy, trust, and human–AI collaboration. This research contributes to the growing body of knowledge on intelligent service systems by highlighting how AI-enabled customer interaction technologies can support start up competitiveness and sustainable growth.

Keywords: *Artificial Intelligence (AI), consumer behavior, Chabot's, start-ups, analytics, sustainable, advertisements, digital, environmental, eco-friendly, recycle, personalized*

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1. Introduction

The increasing integration of artificial intelligence (AI) in marketing and consumer analytics has significantly transformed how organizations understand and influence consumer behaviour. Contemporary businesses are increasingly relying on AI-based consumer analytics to process large volumes of data, identify consumption patterns, and generate real-time insights. Traditional marketing approaches often fail to capture the complexity and dynamic nature of consumer preferences, particularly in the context of sustainability. In contrast, AI-driven systems enable organizations to deliver personalized recommendations, predict purchasing behaviour, and promote environmentally responsible choices more effectively. These systems are designed to reduce information asymmetry and improve consumer awareness regarding sustainable product alternatives. Recent empirical research highlights that AI-enabled marketing tools and analytics platforms play a crucial role in shaping consumer decision-making by increasing awareness of eco-friendly products and encouraging sustainable consumption behaviour. AI-based recommendations, targeted advertisements, and digital nudges have been found to positively

influence consumer attitudes toward environmental responsibility. Furthermore, such systems enhance transparency by enabling consumers to compare products based on sustainability indicators such as eco-labels, energy efficiency, and carbon footprint (Sohaib et al., 2025). This demonstrates that AI is not only a technological innovation but also a behavioural catalyst that supports greener consumption patterns.

From an economic perspective, the adoption of AI-based consumer analytics contributes significantly to improving business efficiency while simultaneously promoting sustainability goals. Organizations that integrate AI-driven insights into their marketing strategies are better positioned to align consumer demand with environmentally friendly products, thereby strengthening brand value and customer loyalty. Additionally, AI systems help businesses optimize marketing expenditure by targeting consumers more effectively, leading to higher conversion rates and reduced resource wastage. Recent studies emphasize that AI technologies have a direct positive impact on consumer engagement and sustainable purchasing intentions, thereby enhancing both organizational performance and environmental outcomes (Garg et al., 2025). Moreover, the use of ethical and transparent AI systems fosters consumer trust, which is essential for long-term adoption of sustainable consumption practices (Acatrinei, 2025). Thus, AI-based consumer analytics is increasingly viewed as a strategic tool for achieving both economic efficiency and sustainability objectives in modern markets. Therefore, integrating AI with sustainability-focused marketing strategies can create long-term behavioural change among consumers. It also supports the global transition toward more responsible production and consumption patterns.

2. Objectives of Study

1. To examine the role of AI-based consumer analytics in understanding sustainable consumer behaviour
2. To analyse how AI-driven insights influence consumer purchase decisions toward eco-friendly products
3. To evaluate the effectiveness of AI-powered recommendation systems in promoting sustainable consumption
4. To assess the impact of AI-enabled personalization on consumer awareness and environmental responsibility

3. Limitations of Study:

1. The study is limited to a specific geographic region and may not represent global consumer behaviour.
2. The sample size may restrict the generalization of findings.
3. Consumer responses may be influenced by personal bias or limited awareness of AI technologies.
4. Total number of respondents are 100 only.

4. Problem Statement

With the rapid growth of consumerism and digital marketplaces, unsustainable consumption patterns have significantly increased, leading to environmental degradation, resource depletion, and waste generation. Although awareness regarding sustainability is gradually improving, there remains a considerable gap between consumers' positive attitudes toward sustainable products and their actual purchasing behaviour. Traditional marketing and analytics approach often fail to effectively understand and influence this behaviour due to their limited ability to process complex, real-time consumer data. The emergence of Artificial Intelligence (AI) offers advanced capabilities in analyzing large volumes of consumer data,

predicting behaviour, and delivering personalized recommendations. However, the application of AI-based consumer analytics in promoting sustainable consumption is still underexplored, especially in emerging markets like India. There is a lack of clarity on how AI-driven insights can be leveraged by businesses to encourage eco-friendly purchasing decisions and bridge the intention–behaviour gap among consumers. Therefore, the core problem addressed in this study is to examine how AI-based consumer analytics can be effectively utilized to influence consumer behaviour toward sustainable consumption, and to identify the challenges and opportunities associated with its implementation in real-world marketing strategies.

5. Literature Review

Varshney, Dilip Dutt (2024) In India, researchers are exploring the potential of artificial intelligence to drive innovation across a wide range of sectors, including education, finance, healthcare, automobiles, energy, retail, agriculture, manufacturing, and basic science. Artificial intelligence has the potential to boost the power of consumer decision-making very effectively. The importance of artificial intelligence (AI) in the global economy is 184 growing day by day. In India, companies like Amazon, Google, Microsoft, Walmart, and Samsung are investing in Artificial intelligence-related research and development and product marketing. However, America has a lot of space to expand its research into this cutting-edge technology. The majority of America's educational, political, and corporate establishments actively support and encourage Artificial intelligence. study, development, and entrepreneurship. The government is encouraging the business sector to develop cutting-edge technology solutions and is providing funding for Artificial intelligence-based start-ups through programs like DST, Niti Aayog, India, and many more. Bengaluru, Hyderabad, Ahmedabad, Mumbai, and Delhi are the epicenters of artificial intelligence (AI)-based start-ups.

Pradhan, Bandinee (2025) This study titled A Study on Consumers' Behaviour Towards Sustainable Fashion Consumption was carried out to explore the key factors that shape how Indian consumers think about and engage in sustainable fashion. Sustainability has now become a large concern in the global fashion industry. The Indian context presents a unique landscape which is defined by cultural traditions, economic variation, and diverse consumer priorities. The research aimed to understand this complexity in depth by applying both qualitative and quantitative approaches that could reveal what encourages or prevents consumers from choosing sustainable fashion. This was necessary because, as highlighted in the research gap, most past studies were from Western contexts, used single research methods, and focused on limited variables

Ashwini V (2026) investigated the key determinants of consumer purchase intention for eco- friendly bags, focusing on environmental awareness, social influence, product attributes, willingness to pay, perceived ecological benefits, and consumer perception. The results 64 indicated that consumer perception, perceived environmental benefits, environmental awareness and product attributes have a significant and positive effect on purchase intention. Social influence operates indirectly by shaping consumer perception, while willingness to pay indirectly affects intention through the same perceptual pathway. Demographic analysis reveals that younger, urban, and educated consumers are more likely to adopt eco-friendly bags, with product durability, functionality, and environmental impact playing crucial roles in their decisions. The study concludes that significant market penetration for eco-friendly bags requires a multi-faceted strategy integrating product development, marketing, collaboration, and cultural alignment. Firstly, products must be engineered to be functional, aesthetically appealing, and cost-competitive to foster positive consumer perception. Second, marketing communications should emphasize both environmental and practical benefits while actively utilizing social influence, such as testimonials

and influencer partnerships, to normalize sustainable consumption. Third, collaboration with government and community stakeholders is essential to implement supportive policies, offer incentives, and enhance public awareness, thereby reducing adoption barriers. Finally, embedding the brand within larger sustainability initiatives helps position eco-friendly consumption as a normative, modern behavior. This integrated approach effectively translates consumer intention into sustained use and supports broader environmental objectives.

Bijwe, Shweta Vijay (2023) With the help of the findings, the researcher arrived at the study's inference concerning the objectives stated for the research. The conclusion aids in clarifying the intent and importance of the research. This step was not merely a summary of arguments or a paraphrase of the research problem but an amalgamation of crucial issues as it provided closure. The undertaken research work assessed the impact of Business Analytics based Store Level Decisions on consumer behavior for Organized Retailers in Pune. Nowadays, shopping is an essential part of life for every person. The economy is growing with increasing consumers' living standards. The research work carried out fulfilled the defined objectives in a very succinct manner. Retailers can apply business analytics on four levels to the raw retail data concerning the problem and need for solutions. Store-level decisions depend on subjective understanding and may vary person-to-person. Business Analytics can be applied to each sub-factor to find the root cause and convert it into a strong point for organized retailers. Retailers were asked about 8 different factors where POS data is collected and Business analytics can be applied.

Patil, Pravin P., and Sharma, Sachin Kumar (2021) presented on the basis of the analysis of information, data, outcomes, and conclusions offered in the preceding chapters. The developed SCP model can be employed in Indian Automobile industries. Various factors and challenges are summarized as follows. SCP has an important function to improve market conditions. SCP is a potential aspect where environmental friendly and socially safe practices are incorporated at different levels of the supply chain. Current investigation emphases on the recognition and analysis of SCP performance SFs in Indian automobile companies.

Lim, Weng Marc (2023) focused on the integration of artificial intelligence with sustainable consumption practices. It explains how AI-driven consumer analytics can identify patterns, preferences, and environmental concerns of consumers. The study highlights that AI can support businesses in designing targeted strategies to promote green products. It concludes that AI plays a crucial role in bridging the gap between consumer intention and actual sustainable behavior

Huang, Ming-Hui, and Rust, Roland T. (2021**)** analyzed on the role of artificial intelligence in service and consumer interactions. It explains how AI improves customer experience through personalization and automation. The findings suggest that AI can influence consumer preferences and purchasing decisions by providing timely and customized recommendations. The study concludes that AI-enabled systems can be effectively used to encourage sustainable consumption by aligning consumer needs with environmentally friendly solutions.

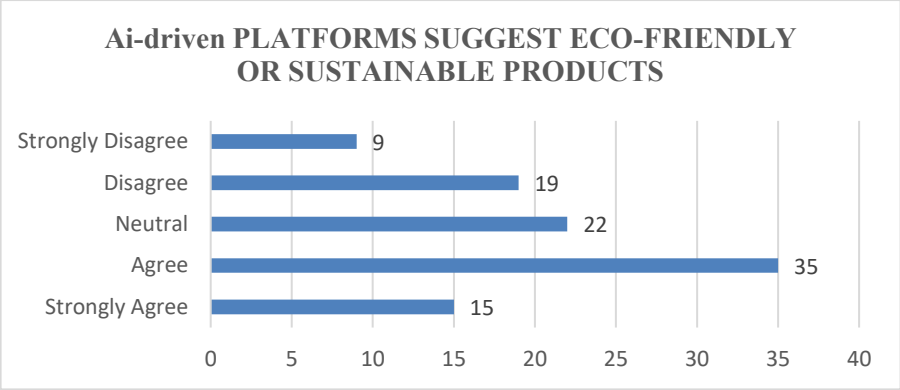
6. Research Methodology

The present study adopts a descriptive and analytical research design to systematically examine the relationship between AI-based consumer analytics and sustainable consumption behaviour. The descriptive aspect helps in understanding current consumer awareness, preferences, and usage of AI-enabled platforms, while the analytical component focuses on identifying patterns, relationships, and the

impact of AI-driven insights on promoting sustainable purchasing decisions. This combination enables a comprehensive evaluation of both "what exists" and "why it exists" in the context of consumer behaviour. The study relies on both primary and secondary data sources to ensure depth and reliability. Primary data is collected through structured questionnaires administered to consumers who actively use AI-enabled platforms such as e-commerce applications, personalized recommendation systems, and digital marketing interfaces. The questionnaire is designed to capture key variables such as awareness of sustainability, responsiveness to AI recommendations, and actual purchase behaviour. In addition, secondary data is gathered from credible sources including research journals, industry reports, company sustainability disclosures, and existing literature on artificial intelligence and sustainable management. For the purpose of data collection, the study employs a convenience and purposive sampling method. Convenience sampling allows easy access to respondents who are readily available, while purposive sampling ensures that only relevant participants those who use AI-based platforms are included in the study. The sample size for the study is 100 respondents, which is considered adequate for conducting meaningful statistical analysis at the academic level and drawing reasonable conclusions about consumer behaviour trends in the given context.

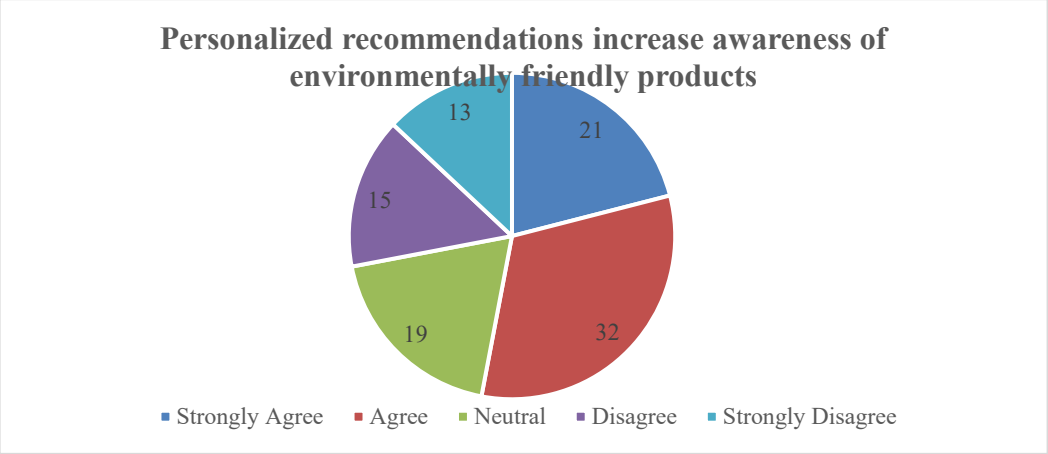
7. Data Analysis with Interpretation

Graph No:1 AI-driven platforms suggest eco-friendly or sustainable products



Interpretation: The findings indicate that 50% of respondents (15% strongly agree and 35% agree) believe that AI-driven platforms suggest eco-friendly or sustainable products. This reflects a generally positive perception toward AI's role in promoting sustainable options. However, 28% of respondents (19% disagree and 9% strongly disagree) do not perceive such suggestions, while 22% remain neutral. In short, the results suggest moderate awareness of AI-driven sustainable product recommendations, with scope for improving visibility and consumer trust.

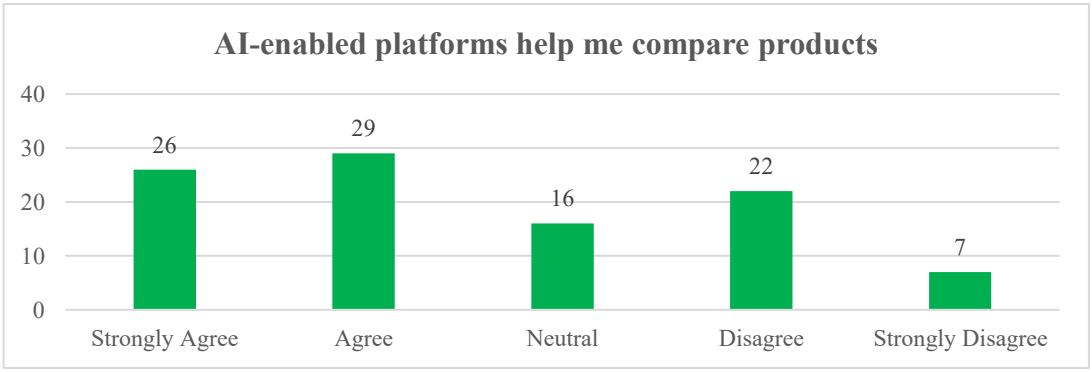
Graph No 2 Personalized recommendations increase my awareness of environmentally friendly products



Interpretation:

The data shows that 53% of respondents (21% strongly agree and 32% agree) believe that personalized recommendations increase their awareness of environmentally friendly products. This indicates a positive impact of AI-driven personalization on promoting sustainable awareness. However, 28% (15% disagree and 13% strongly disagree) hold a negative view, while 19% remain neutral.

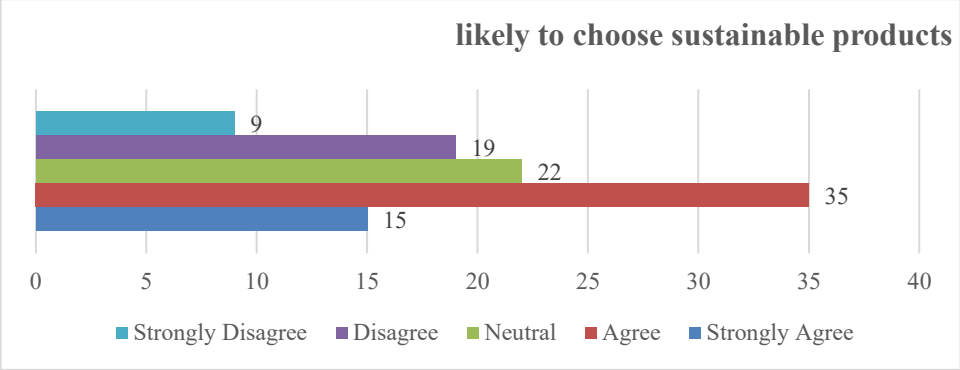
Graph No: 3 AI-enabled platforms help me compare products based on sustainability features (such as eco-labels, recyclability, or energy efficiency).



Interpretation:

The findings reveal that 55% of respondents (26% strongly agree and 29% agree) believe that AI-enabled platforms help them compare products based on sustainability features such as eco-labels, recyclability, and energy efficiency. This indicates a strong positive perception of AI tools in facilitating informed and sustainable purchasing decisions. However, 29% of respondents (22% disagree and 7% strongly disagree) do not share this view, while 16% remain neutral. Overall, the results suggest that AI-enabled comparison features significantly support sustainable consumption, though some consumers may still lack awareness or confidence in these tools.

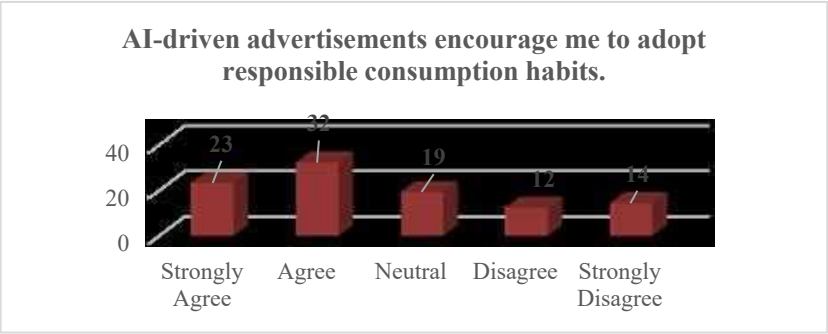
Graph No: 4 Likely to choose sustainable products when they are highlighted



Interpretation:

The data indicates that 50% of respondents (15% strongly agree and 35% agree) are likely to choose sustainable products when they are highlighted. This suggests that product visibility and AI-driven promotion positively influence sustainable purchasing behavior. However, 28% (19% disagree and 9% strongly disagree) are not influenced by such highlighting, while 22% remain neutral.

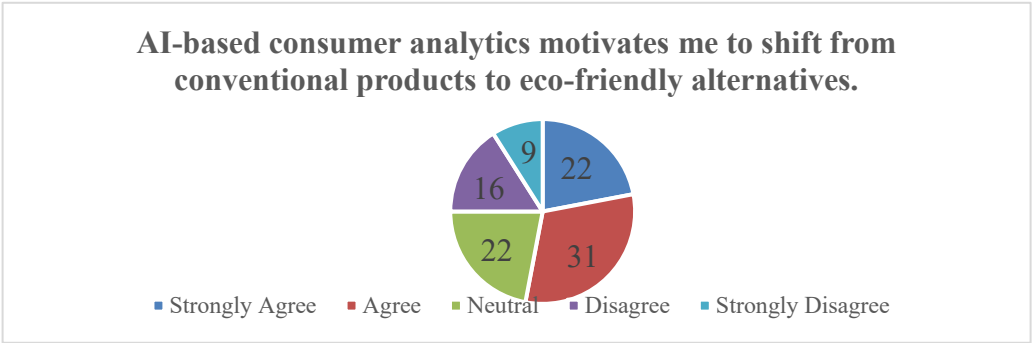
Graph No: 5 AI-driven advertisements encourage to adopt responsible consumption habits.



Interpretation:

The findings show that 55% of respondents (23% strongly agree and 32% agree) believe that AI-driven advertisements encourage them to adopt responsible consumption habits. This reflects a positive influence of AI-based advertising on promoting sustainable behavior. However, 26% of respondents (12% disagree and 14% strongly disagree) do not feel encouraged, while 19% remain neutral. Overall, the results suggest that AI-driven advertisements play a significant role in fostering responsible consumption, though their impact may vary among consumers.

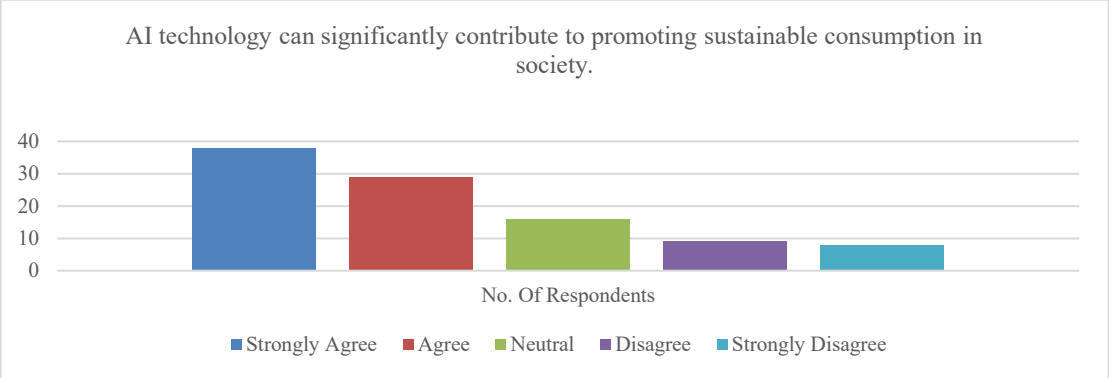
Graph No: 6 AI-based consumer analytics motivates me to shift from conventional products to eco-friendly alternatives.



Interpretation:

The results indicate that 53% of respondents (22% strongly agree and 31% agree) feel that AI-based consumer analytics motivates them to shift from conventional products to eco-friendly alternatives. This suggests a positive influence of AI insights on promoting sustainable purchasing decisions. However, 25% (16% disagree and 9% strongly disagree) do not perceive such motivation, while 22% remain neutral. Overall, the findings show that AI-based analytics has a meaningful impact on encouraging consumers to adopt environmentally friendly alternatives.

Graph No: 7 AI technology can significantly contribute to promoting sustainable consumption in society.



Interpretation:

The data reveals that a strong majority of 67% of respondents (38% strongly agree and 29% agree) believe that AI technology can significantly contribute to promoting sustainable consumption in society. This indicates a high level of confidence in AI's potential to support sustainability initiatives. Only 17% (9% disagree and 8% strongly disagree) hold a negative view, while 16% remain neutral. Overall, the findings demonstrate a very positive perception of AI as an effective tool for encouraging sustainable consumption at a societal level.

Findings

1. About 50% of respondents (15% strongly agree and 35% agree) believe that AI-driven platforms suggest eco-friendly or sustainable products. This indicates a moderate level of awareness among consumers regarding AI's role in promoting sustainability. However, it also shows that a significant portion of users may not fully recognize or notice such recommendations. This highlights the need for stronger visibility and clearer communication of sustainable options.

2. Around 53% of respondents agree that personalized AI recommendations enhance their awareness of environmentally friendly products. This suggests that tailored suggestions based on user preferences can effectively educate consumers about sustainable alternatives. It also reflects the growing influence of AI in shaping consumer knowledge. Personalized marketing thus plays an important role in driving sustainable consumption.
3. A majority of 55% of respondents feel that AI-enabled platforms help them compare products using sustainability indicators like eco-labels and energy efficiency. This shows that AI tools are useful in simplifying complex decision-making processes. Consumers are better able to evaluate products beyond price and quality. Such comparisons encourage more informed and responsible purchasing behavior.
4. About 50% of respondents are more likely to choose sustainable products when they are clearly highlighted. This indicates that product visibility and positioning significantly impact consumer choices. When eco-friendly options are made more prominent, consumers are more inclined to

consider them. This finding emphasizes the importance of strategic product display in digital platforms.

5. Approximately 55% of respondents believe that AI-driven advertisements promote responsible consumption habits. This reflects the persuasive power of targeted advertising in influencing consumer behavior. AI can deliver relevant and meaningful messages that encourage sustainable choices. It also shows that digital marketing can be aligned with environmental goals.
6. Around 53% of respondent's state that AI-based consumer analytics motivates them to switch from conventional products to eco-friendly alternatives. This indicates that AI not only informs but also influences actual behavioral change. Consumers are gradually adapting to sustainable options due to data-driven recommendations. This shift highlights the transformative role of AI in modern consumption patterns.
7. A strong majority of 67% of respondents believe that AI technology can significantly contribute to promoting sustainable consumption in society. This reflects high confidence in AI as a tool for driving environmental responsibility. It also suggests that consumers are open to technological solutions for sustainability challenges. Overall, AI is perceived as a powerful enabler of positive change in consumption behavior.

SUGGESTIONS

1. Companies should leverage AI tools to prominently display and promote eco-friendly products on digital platforms. This can increase visibility and make it easier for consumers to identify sustainable options. Better highlighting can directly influence purchasing decisions in favor of sustainability.
2. AI recommendation systems should be designed to actively suggest greener and more sustainable product alternatives. By integrating sustainability criteria into algorithms, platforms can guide consumers toward responsible choices. This can gradually shift consumption patterns toward eco-friendly products.

3. Digital platforms should ensure that accurate and transparent information about product sustainability features is easily accessible. Details such as eco-labels, energy efficiency, and environmental impact should be clearly presented. This helps consumers make informed and responsible purchasing decisions.

4. Businesses should utilize AI-driven advertising to educate consumers about responsible consumption and sustainability. Targeted ads can effectively deliver personalized messages that encourage eco-friendly behaviour. This approach can enhance awareness and influence long-term habits.

5. Organizations must ensure the ethical use of AI and prioritize the protection of consumer data. Building trust is essential for encouraging users to rely on AI-driven platforms. Transparent data practices and privacy safeguards will strengthen consumer confidence and acceptance.

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