Role of AI in Shaping Consumer Preference for Sustainable Product in Digital Marketplace

AUTHORS: Ms. Shreya Chauhan[1], Ms. Aparna Vats[2]

AFFILIATIONS:

[1] Ms. Shreya Chauhan , Assistant Professor, Tecnia Institute of Advanced Studies, New Delhi, India, shreya.research54@gmail.com

[2] Ms. Aparna Vats, Assistant Professor, Tecnia Institute of Advanced Studies, New Delhi, India, aparnavats2024@gmail.com

Abstract

The main aim of the study is to investigate the AI tools that are impacting consumer preference for using sustainable products in the digital marketplace. It is still challenging to predict consumer preferences, due to complex behavioural patterns and changing marketing trends. This paper also highlights various factors that influences consumer behaviour towards sustainable products. A quantitative research design is used in the study to examine AI based tools that influences consumer preference in using sustainable products in the digital marketplace. A structured online questionnaire was designed to collect the responses from the respondents. 570 responses were collected using questionnaire, the responses were analysed using descriptive statistics and correlation analysis with the help of statistical tools i.e. SPSS. This paper stated that artificial intelligence plays a crucial role in changing consumer preference for using sustainable products in the digital marketplace. Majority of participants stated that AI-driven tools i.e. personalization, chatbots, virtual assistants and product recommendations have influenced their choices towards sustainable products. Many people believed that they are more likely to purchase sustainable products online when it was promoted or suggested by AI tools. This paper tries to fill the gap in the literature review by understanding the relationship between Artificial intelligence and sustainability in consumer behaviour. It also provides a complete overview of AI based technologies that are actively changing consumer preferences towards sustainable products, by integrating it with theoretical knowledge and practical applications. In this changing world,

Introduction:

From its modest origins as a convenient substitute for physical stores, the digital marketplace has grown into a multibillion-dollar sector distinguished by rapid technological advancement, a wide range of business models, and a significant influence on consumer behaviour. A seamless interchange of products, services, and information has been made possible by the rise of digital platforms and the expansion of internet connectivity, which have completely changed the way that companies and customers communicate (Oke, 2024). Artificial Intelligence has emerged as a transformative technology by offering new perspectives and capabilities. With personalized product recommendations, flexible pricing, and proactive customer service, personalized shopping experiences powered by recommendation engines and predictive analytics have completely changed how consumers interact with brands. For example, multinational online shopping giants like Amazon and Alibaba use advanced AI algorithms to improve logistical processes, optimize inventory management, and make product recommendations—all while raising the bar for convenience and efficiency (Chen, 2024). The two increasing focus on sustainability is another significant trend influencing the online purchasing decision. Consumers are providing ethical and sustainable practices more weight when making purchases as environmental concerns gain more attention. Additionally, the initiative has been supported by industry certifications and legislative frameworks that promote responsibility and transparency throughout supply chains. To stay competitive and fulfil the needs of a varied and demanding customers, businesses must place an emphasis on innovation, sustainability, and inclusivity as they conquer this quickly changing environment (Arshad R, 2024) Businesses can use this technology to offer people customized messages according to their specific behaviour. AI enables simultaneous presentation of distinct advertising content to multiple people rather than the same advertising information to everyone. The increasing use of AI in advertising combines with a global movement toward sustainability. Today's consumers are more aware of their environmental impact. They are searching for products that are ethically produced, environmentally friendly, and packaged responsibly. Companies are currently confronting new expectations as a result of this development. They make use of social media frequently, shop online, and consume digital content from a variety of media outlets. As a result, people constantly experience artificial intelligence powered advertising. (Ibeama, 2024) In order to keep ahead of trends, satisfy shifting consumer wants, and engage consumers, brands and marketers work persistently. Integrating AI and sustainability has become an influential force driving innovation and changing the future in recent years. Chatbots and virtual stylists are also made feasible by AI to improve customer service and facilitate seamless shopping. Sustainability has emerged as an essential concern alongside AI. Businesses that put sustainability first can attract an increasing

number of environmentally conscious consumers, increase brand reputation, and build confidence (Lata, 2025). Marketers may see trends, dividing up their target market, and offer customized interactions by looking for patterns in big records. Marketers must know how to use these platforms efficiently, analyse data, and generate engaging online content. Ethical and sustainable business practices have become important factors for both brands and consumers. Today's consumers are becoming more conscious of how their buying habits affect society and the environment. They wish to support businesses that match their values and are committed to ethical and sustainable business practices. Technological developments, especially in the areas of artificial intelligence and data analytics, have enabled marketers to customize every consumer's shopping experience (Rathore, 2017) Artificial intelligence (AI) has not only transformed marketing strategies but also has begun modifying the psychological and emotional steps that buyers undergo before selecting regarding what to buy. This change is not just technological; it also possesses deeply strategic, behavioural, and psychological. AI's role in modelling customer behaviour has expanded even more with the rise of emotional AI, which can now understand human emotion via text, speech, and facial expressions. Furthermore, AI's influence extends beyond individual tastes and impacts more general market trends. Businesses can predict demand changes, product adoption curves, and the real-time emergence of cultural trends with AI-powered predictive analytics. Companies are using data-driven information to proactively shape the market rather than simply reacting to it. (Asif, 2025) Chatbots, voice assistants, and recommendation engines are examples of AI-enabled technologies that are changing how users engage with online platforms. Understanding how AI affects the way customers behave is one of the biggest issues that customers as well as businesses need to be aware of as it plays a bigger part in online commerce. Simply said integrating artificial intelligence into consumer behaviour has transformed intelligent systems and changed the way people make judgments about what to buy in ways that were previously unthinkable (Chowdhury, 2024). AI powers databases that include significant data about online buying habits, covering everything from purchases, and browsing patterns to customer reviews and demographics. This ensures that research initiatives on digital marketing analytics and consumer preference prediction are successful. Pre-processing steps that eliminate duplicate records and fill in missing variables ensure that input data is of a high quality (Wang, 2025).

Objectives of the paper

This chapter will attempt to determine following objectives:

- To investigate the AI tools those are impacting consumer preference for using sustainable products in the digital marketplace.
- To understand various factors that influences consumer behaviour towards sustainable products.

Literature Review

Consumer Behaviour towards sustainable products

The development and promotion of goods and services that are socially and environmentally responsible is known as "green marketing." It entails integrating environmental factors into product design, packaging, distribution, promotion, and communication, among other marketing-related activities. Since its beginning, green marketing has under gone significant change in response to shifting customer preferences, legal requirements, and technical breakthroughs. When green marketing first started out, its main goal was to promote goods that had positive environmental effects. Green marketing has broadened to include more comprehensive sustainability strategies, meanwhile, as sustainability challenges have grown more complicated and urgent. According to research, a growing number of customers are placing sustainability top priority when making choices about what to buy. Businesses can take advantage of this rapidly growing niche and obtain a competitive edge by integrating sustainability into their marketing plans (Rathore, 2023). Using environmentally friendly marketing strategies can improve a business's reputation and increase customer loyalty. Customers are more attracted to support businesses that demonstrate a commitment to social responsibility and environmental sustainability, which promotes brand advocacy and trust. Implementing sustainable business practices across the entire organization is one of the pillars of green marketing. Businesses are encouraged by green marketing to place sustainability a priority while developing new products and pursuing innovative ideas. Beyond the business's operations, green marketing covers all connections in the supply chain, including manufacturers, distributors, retailers, and suppliers. Digital platforms enable a powerful way of promoting environmentally friendly goods and services. They provide a wide audience and make simpler to interact directly with customers. Businesses can promote their sustainability programs, highlight their eco-friendly products, and educate customers about the value of adopting environmentally responsible decisions by using websites, blogs, and social media platforms. Social media platforms like LinkedIn, Twitter, Instagram, and Facebook are essential for sustainability marketing. Businesses can use these channels for spreading information on sustainability, environmental issues, and eco-friendly products. They may demonstrate their green products in use and convey their dedication to sustainability through visually appealing blogs, videos, and infographics (Prathapkumar, 2024). One of the most significant concerns for businesses is sustainability since they are able to change their long-term objectives to satisfy changing consumer needs, such as integrating social and environmental considerations into their product lines. It important to keep in consideration that consumer behaviour is the result of cognitive, emotional, and motivational processes. It is also influenced and even guided by a number of environmental variables,

beginning with the idea that changing personal consumption patterns requires more sustainable consumer behavior. Sustainable consumption requires more than just buying and using eco-friendly products; it requires a comprehensive strategy. It reflects a shift in lifestyle. Sustainable consumption behavior is a collection of purposeful and successful consumer behaviors that improve their quality of life while safeguarding the environment as well as resources for future generations. Green consumption is linked to responsible and environmentally friendly consumption since it aims to reduce the adverse effects that individual actions have on the environment when they buy, use, or discard goods (Fernandes, 2025) In recent years, consumer behavior has been strongly influenced by environmental awareness. This change has created a shift in marketplaces where brand loyalty and preference are increasingly centered around environmental standards. A number of studies show that age, income, and education level represent some of the demographic variables that influence individual's awareness of the environment and sustainable buying practices. Generation Z and Millennials. By increasing product transparency, customizing green advertising messages, and offering real-time information that encourages environmentally responsible decision-making, artificial intelligence can greatly contribute to filling this gap (Olan, 2021). Brands may better match their sustainability goals with consumer expectations by using AI driven insights into consumer preferences and behaviors. This will encourage more consistent green behavior. (Kumar, 2025) The relationship between sustainable product choices and customer behavior is multifaceted. Through corporate social responsibility programs, consumers in both developed and developing nations are becoming more interested in sustainable consumption. In order to meet changing consumer demands for social and environmental responsibility, businesses are changing their marketing approaches. Consumers who are concerned about the environment tend to choose eco-friendly products; thus, visual trends hold significance when it comes to sustainable choices. According to research, the COVID-19 pandemic has raised people's awareness of the environment and desire to purchase eco-friendly products. The growing significance of digital marketing in encouraging customer engagement through modern techniques like emojis, short videos, big data analytics, and AI driven initiatives demonstrates how important it is to be responsive to new consumer tastes and developments in technology in the digital age. Several platforms and tactics used in digital marketing impact purchasing decisions, making it an important part of interaction with customers. Environmental issues have a major impact on the shopping decisions of consumers. Younger consumers' desires to make green purchases are positively impacted by environmental concern (Singh, 2025).

AI Tools and Techniques in Sustainable Marketing

Artificial intelligence's potential to analyze huge amounts of data and provide insights

makes it essential to transform traditional consumption habits into more sustainable ones. Sustainable practices fostered by AI technologies make it possible to optimize energy use, resource management, waste reduction, and the integration of renewable energy sources. Also emphasized is AI's contribution to sustainable materialism, specifically in relation to greenwashing. Based on their buying habits, AI-powered platforms may recommend sustainable goods or services to customers. Smart apps driven by artificial intelligence (AI) can improve handling of resources and promote environmentally friendly habits, both of which have a significant impact on sustainable consumption patterns. Additionally, artificial intelligence-driven recommendations suggest sustainable products based on user interests, promoting eco-friendly shopping habits and building a sustainable society. The app provides product recommendations from businesses that are committed to fair labour standards and environmental sustainability by examining user preferences and purchasing patterns (Zekâ, 2024). AI has enabled data-driven decision-making achievable, which has completely changed marketing. Nowadays, businesses implement AI for predictive analytics, which predicts customer behavior, product demand, and the best ways to promote. Artificial intelligence (AI) let marketers segment their audience, optimize ad placements, and track campaign performance in real time.AI also facilitates dynamic pricing models, which modify prices instantly in response to competition, demand, and customer description. Customers desire sympathetic service as much as helpful service. Businesses are able to understand the emotions driving customer messages with the use of AI solutions driven by sentiment analysis and Natural Language Processing (NLP). For example, AI systems that can identify urgency or dissatisfaction in social media consumer complaints have been tried by Air India, enabling quicker and more sympathetic human answers. (Dua, 2025) Marketers are able to utilize enormous amounts of information that include demographic data, online activity, buying trends, and even social media interactions by using AI algorithms. Instead of relying upon traditional assumptions, the large amount of data enables the creation of more complex groups of customers based on real behaviors and preferences. Artificial intelligence (AI) can identify hidden trends and insights by using machine learning techniques that may not be perceived with traditional methods. Marketers can find specific consumer segments that genuinely care about eco-friendly items or have shown a preference for sustainable practices thanks to this kind of data-driven analysis (Ziakis, 2023). Based on the preferences of each individual customer, algorithms driven by AI can determine the most effective ways to communicate and methods, ensuring that marketing messages are distributed via the most powerful channels, including social media, email, or customized ads. Businesses may effectively handle production schedules, transportation routes, and inventory levels to reduce emissions and utilize resources with AI-driven optimization.

A large amount of data, such as past sales data, current market demand, as well as external factors like weather, can be analyzed by AI algorithms to produce accurate forecasts and help supply chain managers make better five decisions. Predictive analytics and forecasting are two more exciting opportunities that arise from the application of AI and machine learning in green marketing. By utilizing AI algorithms, companies are able to gain important insights into consumer preferences, market trends, and emerging opportunities for sustainable product development (Darban, 2023).

Challenges, Opportunities and Ethical Considerations

Artificial Intelligence (AI) provides remarkable opportunities for sustainable marketing advancement, although it also raises a number of issues and moral dilemmas that businesses have to overcome to preserve transparency and consumer confidence.AI-driven personalization is largely dependent on customer data. Challenges around informed permission and privacy are brought up by the use of this data, especially when sensitive environmental values and behaviors are examined. Marketing information can be broadened at scale using AI, which could unintentionally encourage greenwashing if sustainability claims are overstated or inaccurate (Cutinha, 2024). Ethical AI use demands thorough fact-checking and validation to avoid making false environmental claims that might damage brand credibility and mislead customers. The accuracy of the data which artificial intelligence are trained on determines the extent to which they perform. In order to identify and reduce bias, regular audits and inclusive data techniques are essential components of ethical AI development. Transparency in AI decision-making is becoming more and more demanded by experts and consumers, particularly in sustainability issues. In order to overcome these obstacles, businesses need to implement ethical AI frameworks, examine their AI systems' environmental impact, and make sure that green marketing statements are authentic and verifiable (Kumar, 2025). Implementing green marketing campaigns and sustainable practices often requires large upfront investments for infrastructure, technology, and employee growth. Some companies might think these expenses are too high, especially for small and medium-sized organizations. Customers are uncertain of green marketing promises as an outcome of greenwashing, the practice of businesses boosting or misrepresenting their environmental credentials. It can be difficult to gain customers' trust and credibility; this calls for open communication and substantiated sustainability initiatives. There are logistical problems in ensuring sustainability across the supply chain, from procuring raw materials to product manufacturing and distribution. Working together with partners and suppliers to increase sustainability across the supply chain can benefit both parties and improve the environmental performance of goods and services as a whole (Okeleke, 2024).

Adoption of environmentally friendly

techniques can be encouraged by establishing sustainability standards and rewards for suppliers. Businesses can use social media and digital platforms to spread the word about sustainability and encourage customer interaction. Accountability and transparency continue to be important factors in fostering customer loyalty and confidence. Companies that show accountability, honesty, and authenticity in their sustainability initiatives stand to improve their brand's reputation and obtain a competitive edge. Businesses that show honest commitment to sustainability and share consumer values are well-positioned to draw in and keep eco-aware customers (kumar, 2024). Digital marketing serves as vital for developing environmentally friendly businesses for social media and e-commerce sites to reach international consumers. Problems like uneven digital infrastructure and low levels of digital literacy may make adoption more difficult. A two-tiered strategy employing Natural Language Processing for worldwide analysis and specific to a nation SME need analysis can assist in identifying appropriate digital solutions to address the obstacles of digital adoption, fostering sustainability and growth in the digital age. Through smart cities, green power, and sustainable consumerism, the digital economy promotes sustainable practices, but it poses difficulties. While there are many prospects for sustainable firms with digital marketing, successful implementation and long-term sustainability depend on overcoming technological and skill-related obstacles. A multifaceted strategy that combines technology, sustainability, and marketing may help the sector in the digital age (Singh, 2025). The study of large records, such as user behavior, preferences, and interactions, is essential for AI-powered personalization. This data-driven strategy enhances content and recommendation, but it also poses serious data privacy issues. Concerns over the gathering, storing, and utilization of personal data by e-commerce platforms have arisen as a result of consumers' growing awareness of the importance and sensitivity of this data. Consumers may find it disturbing to think that algorithms are being informed by their browser history, buying habits, and personal preferences. Ecommerce platforms need to strike a balance between protecting user privacy and offering tailored experiences in order to keep the trust of their customer. Algorithmic bias in e-commerce might show itself as biased targeting in marketing campaigns, inconsistent pricing, or biased product suggestions. To effectively identify and deal with bias, algorithmic decision-making processes must be transparent and subject to periodic audits. Adequate privacy protections must be kept in place by e-commerce platforms, such as transparent and clear data collection procedures, user consent procedures, and, when practical, the anonymization of personally identifying information. Regulatory and legal frameworks are essential for resolving the moral dilemmas raised by AI-powered personalization in e-commerce. Industry norms and legal frameworks are essential for addressing the moral dilemmas powered personalization in e-commerce,

especially when it comes to ethical issues. E-commerce platforms may build user trust, promote fair and balanced customer experiences, and support the responsible development of AI technology in the online market by proactively tackling these issues (Raji, 2024). As integrating AI into green marketing requires large investments in software, machine learning models, data analytics tools, and qualified staff, one of the main obstacles is the high implementation costs. Greenwashing and algorithmic bias also pose serious issues. Artificial intelligence (AI)-powered marketing algorithms may unknowingly favour profitable "eco-friendly" goods above truly sustainable substitutes, producing false sustainability claims. Because companies may inadvertently prioritize profits above sustainability by promoting less sustainable products, this greenwashing impact can undermine consumer trust. Concerns regarding data security and privacy also present significant barriers to the use of AI in green marketing. AI uses consumer data extensively to refine marketing techniques and tailor sustainability messaging. Leveraging AI in environmentally friendly initiatives while protecting consumer trust requires the building of strong data protection guidelines and ethical AI frameworks. Additionally, businesses are discouraged from entirely integrating AI into their green projects due to uncertainty created by ambiguous legislative frameworks and inadequate AI governance (Baruno, 2024). A significant amount of employee and customer data have to be collected and analyzed in order for AI to be widely used in communication. Because sensitive data, including private correspondence, performance evaluations, and consumer relationships, might be compromised and used improperly, this presents serious privacy issues. Adoption can also be impacted by a lack of knowledge about the potential and constraints of AI as well as worries about how it will affect their jobs and positions within the business. Establish and place into effect specific ethical standards for the organization's usage of AI. The guidelines need to cover important ethical issues including algorithmic bias, data privacy, accountability, and openness. Create regulations to protect the privacy of data and protect moral principles. The business should continually evaluate and assess how effectively its AI systems are performing, identifying and correcting any biases, mistakes, or unexpected outcomes. For AI systems to be used successfully and responsibly, this on-going evaluation are essential. Businesses should create hybrid communication plans that combine AI effectiveness with crucial human supervision. By adopting these guidelines, businesses can take use of AI's advantages while preserving fairness, accountability, and openness in corporate communications. The future of AI in corporate communication depends on striking a balance between ethical responsibility and technological progress. Businesses may unleash AI's potential by encouraging more effective, fair, and human-centered communication strategies by resolving issues and following best practices (OKATAN, 2025).

Methodology

Sample

A self-report survey was conducted on consumers who had earlier experience the use digital platforms and had the awareness of Artificial Intelligence tools available that is related to the research study's objectives. The data was collected from Delhi NCR using purposive sampling to make sure that only people who were already familiar with AI tools and digital platforms could give accurate responses on the factors such as personalization, chatbots, virtual assistants and product recommendations have influenced their choices towards sustainable products. The data were gathered during a 30-day period from July 8, 2025, to August 8, 2025. Out of the 570 surveys that were distributed, 530 legitimate responses were recovered, providing a 92.9% response rate. 50 dishonest responses were eliminated because they were either missing information for certain things, had the same answers across a section, or were incomplete. Thus, 530 responses generated for our analysis. Based on suggestions for complicated models with several variables, this sample size was selected and is sufficient for linear regression analysis and correlation. Using SPSS 23, a preliminary power calculation was carried out. Because of its size of 530, our sample has a high level of statistical power.

Demographic Analysis

The purpose of gathering the respondents' demographic data was to investigate the relationship between independent variables i.e. personalization, chatbots, virtual assistant, predictive analytics, and dependent variable i.e. consumer preference towards sustainable products. The sample was consisting of 530 responses with a relatively balanced gender distribution—46% female and 54% male—indicating almost fair representation from both groups. In respect of age, the majority of responders (72.5%) were between the age group of 25-34 years followed by 35-44 years (15%), 45 years or above (7.5%) and the lowest percentage of respondents were in between 18-24 years (5%). Education qualification of the respondent was also analysed which reveals that mostly respondents were post graduate (77.5%), (17.5%) graduate and (5%) were in 12th. Regarding monthly income 45% of respondent were earning between 30,000-50,000, then 27.5% between 60,000-80,000, 15% were earning below 20,000 and 12.5% of respondent were earning above 80,000. In the regression analysis, these demographic variables—gender, age, income, and education—were used as dependent variables to investigate whether they affected the direction or strength of the relationship with independent variable i.e. consumer preference towards sustainable products. In this study we opted for four scales for measurement that have been shown to be reliable and valid in earlier studies in order to evaluate the four measurement variables. A 5-point Likert scale was used to evaluate every variable, except for the controlling variables. A score of 1 meant "Strongly Disagree," a score of 3 meant "Neutral," and a score of 5 meant "Strongly Agree."

TABLES

Table 1: Reliability Analysis

Table 1. Reliability Analysis

Variable	No. of Items	Cronbach's Alpha	Items Removed
Demographics	5	0.677	0
AI Tools in Marketplace	5	0.862	0
Consumer Behaviour Factors	5	0.898	0
Overall Consumer Preference	5	0.867	0

Results

The result of reliability analysis of each variable is shown in (Table 1). To assess internal consistency of the construct in the table, the reliability analysis was conducted using Cronbach's Alpha. It is suggested that the commonly accepted threshold is 0.70. It is observed that mostly all the Alpha values is higher than the given threshold except Demographics constructs as it is 0.677 which is slightly below the commonly accepted threshold of 0.70, but this can be accepted because the demographics items i.e. age, gender, education, and income represents diverse characteristics and do not typically measure a single latent construct. It is also observed that 5 items measure of Consumer Behaviour Factors has highest Cronbach's Alpha Value of 0.898 which suggests very strong internal consistency. Rest AI Tools in Marketplace construct with 5 items has the Alpha value of 0.862 which indicates excellent reliability and similarly, the Overall Consumer Preference showed an Alpha value of 0.867 which also indicates high reliability. However, no items were removed from any constructs which suggests the all items contributed positively to the reliability of their respective scales. A multiple regression analysis was conducted to determine how independent variables i.e. personalization, chatbots, virtual assistant, predictive analytics that influence dependent variable i.e. consumer preference towards sustainable products. The regression analysis was found to be highly significant, $F(3,79) = 300.833$, $p < 0.001$, indicating that the overall model is a good fit to the data that is shown in (Figure 1). As shown in (Figure 2), the R^2 value of 0.920 and Adjusted R^2 of 0.916 suggest that approximately 92% of the variance in overall consumer preference can be explained by the three predictors which is included in the model, which also have an exceptionally high explanatory power. This implies that the selected variables collectively play a vital role in shaping consumer preference towards sustainable products. As shown in (Figure 3), the individual predictors such as consumer behaviour factors ($\beta = 0.524$, $p < 0.001$) indicated as most significant predictor, closely followed by AI tool in the marketplace i.e. ($\beta = 0.463$, $p < 0.001$). Both the variable has a statistically significant and positive relationship with overall consumer preference, which signifies that the consumer behaviour factors i.e. price, quality, trust, awareness, and AI tools i.e. personalization, chatbots, virtual assistant, predictive analytics improves the consumer's overall preference towards sustainable products. This finding uncovers the importance of behavioural tendencies and technological integration in influencing how consumers make choices in the digital marketplace. On the other hand,

Demographics (β = -0.028, p = 0.473) did not have a significant impact on overall preference. This suggests that consumer preference in this study is not significantly shaped by the demographics characteristics i.e. age, gender, education, and income level. Collinearity statistics shows that all predictors fall within the acceptable levels (Tolerance > 0.1, VIF < 5), which indicates that no major multicollinearity concerns through consumer behaviour and AI tools show relatively higher VIF values due to their close association. The overall regression analysis confirms that consumer behaviour factors and AI- enabled tools are the dominant drivers of consumer preference, whereas demographics plays a negligible role. This suggests the growing significance of AI-driven technologies and behavioural changes in consumers influence their decisions and preferences towards sustainable products. The (Figure 4), shows the correlation analysis which reveals the significant relationship among the variables in the study. Consumer behaviour factors (CB_Mean) show a very strong positive correlation with Overall consumer preference (OP_Mean) i.e. (r = 0.926, p < 0.01), which suggests that higher consumer behaviours factors i.e. price, quality, trust, and awareness are strongly associated with Overall consumer preference towards sustainable products. Similarly, AI- enabled tools (AI_Mean) show a very strong positive correlation with Overall consumer preference (OP_Mean) i.e. (r = 0.910, p < 0.01), which indicates adoption and awareness of AI tools enhances the Overall consumer preference towards sustainable products. In addition, AI tools are strongly correlated with consumer behaviour factors i.e. (r = 0.835, p < 0.01), which highlights their close interdependence. On the other hand, Demographics (DQ_Mean) shows a negative correlation with all the variables including Consumer Behaviour Factors (r = –0.523, p < 0.01), AI Tools (r = –0.320, p < 0.01), and Overall Preference (r = –0.451, p < 0.01). This implies that demographics factors may inversely affect the Overall consumer preference towards sustainable products.

FIGURE LEGENDS

Figure 1: Anova Test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.835	3	14.278	300.833	.000[b]
	Residual	3.750	79	.047		
	Total	46.585	82			

a. Dependent Variable: OP_Mean

b. Predictors: (Constant), CB_Mean, DQ_Mean, AI_Mean

Figure 1: Anova Test

Figure 2: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.959[a]	.920	.916	.21786

a. Predictors: (Constant), CB_Mean, DQ_Mean, AI_Mean

Figure 2: Model Summary

Figure 3: Coefficients Table

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.439	.362		1.214	.228					
	DQ_Mean	-.064	.089	-.028	-.721	.473	-.451	-.081	-.023	.681	1.469
	AI_Mean	.475	.061	.463	7.728	.000	.910	.656	.247	.284	3.526
	CB_Mean	.473	.060	.524	7.869	.000	.926	.663	.251	.229	4.358

a. Dependent Variable: OP_Mean

Figure 3: Coefficients Table

Figure 4: Correlation Matrix

Correlations

		DQ_Mean	CB_Mean	AI_Mean	OP_Mean
DQ_Mean	Pearson Correlation	1	-.523**	-.320**	-.451**
	Sig. (2-tailed)		.000	.003	.000
	N	83	83	83	83
CB_Mean	Pearson Correlation	-.523**	1	.835**	.926**
	Sig. (2-tailed)	.000		.000	.000
	N	83	83	83	83
AI_Mean	Pearson Correlation	-.320**	.835**	1	.910**
	Sig. (2-tailed)	.003	.000		.000
	N	83	83	83	83
OP_Mean	Pearson Correlation	-.451**	.926**	.910**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	83	83	83	83

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 4: Correlation Matrix

Conclusion

The study aimed to investigate the AI tools that are impacting consumer preference for using sustainable products in the digital marketplace. It is still challenging to predict consumer preferences, due to complex behavioural patterns and changing marketing trends. By using SPSS for analysis, the study provides an understanding of how the factors such as AI-driven tools, consumer behaviour factors and demographic factors influenced the overall consumer preference towards sustainable products. The overall result clearly demonstrates that consumer behaviour factors and AI- enabled tools are the dominant drivers of consumer preference, whereas demographics plays a negligible role. This suggests the growing significance of AI-driven technologies and behavioural changes in consumers influence their decisions and preferences towards sustainable products. AI- enabled tools such as personalization, chatbots, virtual assistant, and predictive analytics make it easier for consumers to engage with sustainable products in the digital marketplace. These tools reduce the decision-making complexity, enhance consumer trust and create awareness towards sustainable products. AI enables consumers to align their purchasing decisions towards sustainable options. Consumer behaviour factors such as price, quality, trust and awareness also emerged as a key driver of overall consumer preference towards sustainable products. The finding highlights that behavioural attitude and perceptions remain a key driver to consumer decision-making towards sustainable products. In order to keep ahead of trends, satisfy shifting consumer wants, and engage consumers, brands and marketers work persistently.

Integrating AI and sustainability has become an influential force driving innovation and changing the future in recent years. Chatbots and virtual stylists are also made feasible by AI to improve customer service and facilitate seamless shopping. Sustainability has emerged as an essential concern alongside AI. Demographics variables play a weaker role in predicting consumer preferences. Mostly consumer who are purchasing online frequently has impacted the most. The correlation analysis shows that consumer behaviour factors and AI- enabled tools are the key variables that are strongly correlated with Overall consumer preference towards sustainable products. The study successfully achieved its objectives by stating that AI tools and consumer behaviour factors are the most influential determinants of consumer preference for sustainable products, whereas demographics hold limited significance. The findings provide implications for businesses, researchers, and policymakers. Companies must invest in AI-driven solutions to engage consumers, build trust, and make sustainable choices more accessible. At the same time, campaigns that enhance awareness and address consumer concerns about sustainability will be crucial in influencing behaviour. Policymakers can also use these insights to design interventions that promote sustainable practices using AI-enabled platforms. By placing technology and behavioural strategies at the forefront, businesses and societies can accelerate the transition toward a more sustainable marketplace.

Implications

The finding of the study provides several meaningful implications for developers, policymakers, and academicians. The study carries important implications for businesses, policymakers, and researchers. For businesses, the results highlight the need to invest in AI-driven personalization, recommendation systems, and awareness-building campaigns to positively shape consumer preferences for sustainable products. By integrating trust-building and accessibility features into digital platforms, companies can encourage greater adoption of eco-friendly offerings. For policymakers, the findings suggest that AI-enabled platforms can be leveraged to design educational and promotional initiatives that foster sustainable consumption at a larger scale. Academically, this study adds to the growing body of knowledge on AI and sustainable consumer behaviour, paving the way for future research that can include larger samples and additional variables. The findings contribute to the growing body of literature at the intersection of AI adoption and sustainable

consumer behaviour. The study underscores the need for more empirical research that includes larger samples, diverse demographics, and additional behavioural constructs. Overall, the implications of this research are both practical and theoretical, 11 offering actionable insights for digital marketers and policymakers while also guiding future researchers in expanding the scope of AI's role in sustainable consumption.

Limitations

This study provides valuable insights into the role of AI in shaping consumer preference for sustainable products in the digital marketplace, but there are few limitations in the study. First, the study was based on a relatively small sample size, which restricts the statistical power and generalizability of the findings. With a larger and more diverse sample, stronger conclusions could be drawn about the broader population. Second, the study adopted a cross-sectional design, meaning data was collected at one point in time. This makes it difficult to capture changes in consumer behaviour over time, particularly in an area such as AI and sustainability, where technological innovations and consumer awareness are rapidly evolving. Third, the constructs selected—AI tools, consumer behaviour factors, and demographics—while significant, do not encompass all the possible influences on sustainable consumption. Factors such as environmental awareness, cultural background, peer influence, and digital literacy were not included, which may have provided a more comprehensive understanding. Additionally, the reliance on self-reported responses can sometimes introduce social desirability bias, as participants may overstate their sustainable preferences. Recognizing these limitations provides an opportunity for future research to address these gaps and validate the findings with broader perspectives.

References

- Asif S, Minz N. Innovate to dominate: AI and sustainability in business. 2025.
- Baruno AD, Indrasari M. Leveraging AI to enhance green marketing strategies. Jurnal Ekonomi, Manajemen, Akuntansi dan Keuangan. 2025;6(1).
- Chauhan M, Singh VK. Sustainable handicrafts in the digital era: A systematic literature review on consumer buying behavior and environmental concerns. ResearchGate. 2025
- Chen CW. Utilizing a hybrid approach to identify the importance

of factors that influence consumer decision-making behavior in purchasing sustainable products. Sustainability. 2024;16(11):4432.

- Chowdhury S, Basu S, Ashoka N, Singh PK. Influence of AI-driven digital marketing on consumer purchase intention: An empirical study. Journal of Informatics Education and Research. 2024;4(2):575.
- Cutinha ZP, Mokshagundam SS. Sustainability practices in e-commerce: Opportunities and challenges for digital marketers. International Journal of Research Publication and Reviews. 2024;5(2):1068–1075.
- Darban K, Kabbaj S, El Jay M. The transformative potential of AI in green marketing strategies. Traditional Journal of Law and Social Sciences. 2023;2(2):14–38.
- Fernandes A, Gabriel ML. Consumer behavior and sustainability: What we know and what we need to know? Journal of Sustainable Competitive Intelligence. 2025;15:e0482–e0482.
- Lata S, Rana K. AI's influence on young consumer behavior: Fostering sustainable consumption. Young Consumers: Insight and Ideas for Responsible Marketers. 2025.
- Okatan K. The transformative role of artificial intelligence in business communication: Applications, challenges and ethical considerations. Simetrik İletişim Araştırmaları Dergisi. 2025;4(1):1–16.
- Oke TT, Ramachandran T, Afolayan AF, Ihemereze KC, Udeh CA. The role of artificial intelligence in shaping sustainable consumer behavior: A cross-sectional study of Southwest Nigeria. International Journal of Research and Scientific Innovation (IJRSI). 2024;10(1):142–150.
- Okeleke PA, Ajiga D, Folorunsho SO, Ezeigweneme C. Predictive analytics for market trends using AI: A study in consumer behavior. International Journal of Engineering Research Updates. 2024;7(1):36–49.
- Olan F, Suklan J, Arakpogun EO, Robson A. Advancing consumer behavior: The role of artificial intelligence technologies and knowledge sharing. IEEE Transactions on Engineering Management. 2021;71:13227–13239.

- Prathapkumar KS, KS SK, HN MS. Green marketing in the digital age: Exploring sustainable practices and consumer behaviour. International Journal of Exclusive Management Research.
- Raji MA, Olodo HB, Oke TT, Addy WA, Ofodile OC, Oyewole AT. E-commerce and consumer behavior: A review of AI-powered personalization and market trends. GSC Advanced Research and Reviews. 2024;18(3):66–77.
-
- Rathore B. Digital transformation 4.0: Integration of artificial intelligence and metaverse in marketing. EDUZONE: International Peer Reviewed/Refereed Multidisciplinary Journal. 2023;12(1):42–48.
- Sargın S. Artificial intelligence, smart applications and sustainable consumption: A theoretical overview. İktisadi İdari ve Siyasal Araştırmalar Dergisi (İKTİSAD). 2024;9(25):803–820.
- Vijayakumar P, Karthiga R, Reddy TR, Das DK, Amz MAA, Akila K. AI for sustainable marketing: Promoting green consumer behavior. Pegem Journal of Education and Instruction. 2025;15(4):153–164.
- Wang Z. The influence of AI on consumer behavior: Shaping choices and preferences in the digital marketplace. 2025;(17).
- Ziakis C, Vlachopoulou M. Artificial intelligence in digital marketing: Insights from a comprehensive review. Information. 2023;14(12):664.