

Role of E-commerce and Digital Platforms in Promoting Green Products

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Abstract

The increasing popularity of e-commerce and digital platforms has had a huge impact on worldwide consumer behaviour, particularly in terms of promoting sustainability and green products. Digital platforms offer unprecedented prospects for green products by connecting environmentally concerned manufacturers with consumer across borders. These platforms enable efficient marketing, distribution and awareness building around ecofriendly practices. Key mechanism include leveraging data analytics personalized recommendations and targeted advertising to highlight the environmental benefits green products. Furthermore, the proliferation of green certification and block chain technology on digital platforms promote transparency in product origins and manufacturing processes, hence increasing consumer trust. Ecommerce behemoths like Amazon, Myntra, Flipkart and boutique like Esty are increasingly prioritizing green product categories, in line with global sustainable development goals (SDGs). Simultaneously, Social media platforms and influencers marketing play a pivotal role in shaping consumer preferences towards environmentally responsible products by disseminating information and fostering green consciousness. However, challenges persist . The carbon footprint of large-scale digital operations, logistics, and packaging needs to be addressed to ensure the net environmental benefits of e-commerce systems. Regulatory frameworks publicprivate partnerships, innovations in green supply chains are essential to mitigate these challenges.

This study highlights the dual role of e-commerce platforms as enablers of green consumerism and the need for systematic improvements to achieve a sustainable digital economy. Through case studies and evidence from academic literature, the research analyze how e-commerce serves as a vital tool in advancing the green economy while emphasizing areas requiring reforms. The finding contribute to the broader discourse on integrating digital innovation with sustainable practices.

INTRODUCTION

The emergence of e-commerce and digital marketing has redefined the global business landscape and led to significant changes in the way companies interact with consumers and deliver value over the last two decades. Advances in digital technology have not only facilitated global trade, but also democratize trade and enable companies of all sizes to operate on a level playing field. In parallel with these developments, the increasing urgency of addressing environmental challenges such as climate change, resource depletion and

biodiversity loss has led to a growing emphasis on sustainability. In this context, environmentally friendly products — defined as a goods and services that aim to minimize environmental damage and promote sustainability — have gained importance as a key response to environmental degradation (Belz & Peattie, 2009). However, their widespread adoption faces significant hurdles, including limited consumer awareness, skepticism about environmental claims, and affordability issues (Chen & Chang, 2013). E-commerce and digital marketing have emerged as transformative tools that can help overcome these challenges and facilitate the distribution of environment friendly products. Green products encompass a wide range of offerings, including energy efficient appliances, organic food, sustainable fashion, biodegradable packaging and renewable energy technologies. These products are in line with the principles of sustainability and reducing environmental impact, resource efficiency, and long-term ecological balance (Geissdofer et al., 2017). Despite their environmental benefits, the integration of green products into mainstream markets has been slow. Consumers often lack the information or motivation to choose these products over traditional alternatives, and companies face many challenges in reaching their target audience. E-commerce and digital marketing provide a powerful solution to these barriers with their ability to connect businesses and consumers across geographic and demographic boundaries.

E-commerce has revolutionized the traditional retail landscape by removing the limitations of physical store locations. This is particularly beneficial for green products, which often serve geographically dispersed niche markets. By using ecommerce platforms, companies showcase their sustainable offerings to a wider audience and provide detailed information on product features, certifications and environmental benefits. ((UNCTAD, 2021). Additionally, the logistical efficiencies of e-commerce such as centralized inventory management, optimized shipping routes, and reduced reliance on physical retail infrastructure can help reduce the carbon footprint of distributing green product (Kotler et al., 2016).

Digital marketing complements e-commerce by providing a range of tools and strategies to engage

consumers, build trust and promote green products. Techniques such as Social Media Marketing, Search Engine Optimization (SEC), Content Through marketing, and influencers collaborations, comp can to create awareness of the environmental benefits of their products and foster a sense of community among environmentally conscious consumers (Kotler et al., 2016).

The integration of e-commerce and digital marketing into the promotion of green products align with global sustainability goals, such as the United Nations Sustainable Development Goals (SDGs). In particular, they support SDGI 2 (responsible consumption and production) by encouraging consumers to prioritize sustainable goods and SDGI 3 (climate action) by reducing the environmental impact of traditional trade (United Nations, 2015). Additionally digital tools enable businesses to track and share data about the products' environmental impact, certifications and carbon footprints of their products, promoting transparency and accountability. This level of transparency allows consumers to make informed purchasing decisions and holds companies accountable for their sustainability claims.

Despite the potential of e-commerce and digital marketing to promote green products, challenges remain. A major problem is green washing, where companies make exaggerated or false claims about the environmental benefits of their products. These practices undermine consumer trust, and creates confusion and hinder the adoption of genuine green products (Chen & Chang, 2013; Parguel et al., 2011). Furthermore, the environmental impact of digital commerce itself cannot be overlooked. The energy consumption associated with data centers, e-commerce packaging and last-mile delivery logistics presents a paradox for companies seeking to promote sustainability (UNCTAD, 2021). Addressing these challenges requires a balanced approach that combines technological innovation, ethical practices and regulatory oversight. Integrate e-commerce and green products into circular economy frameworks that emphasize resource efficiency waste reduction, and product lifecycle management (Geissdofer et al., 2017). By promoting products that are durable, repairable and recyclable.



Companies can encourage consumers to adopt more sustainable consumption patterns. For example, e-commerce platforms can feature refurbished or second hand products, while digital marketing campaigns can educate consumers about the benefits of product sharing, leasing and recycling.

Another advantages of digital platforms is their ability to harness data analytics, and artificial intelligence (AI) to predict consumer behavior and tailor marketing strategies accordingly. By analyzing consumer preferences, search patterns, and purchasing history, business can create personalized campaigns that resonate with individual consumers. This level of customization increase the effectiveness of marketing efforts and ensures that green products are promoted to the right audience at the right time (Kotler et al., 2016). Moreover, digital platforms facilitated the creation of online communities and forums where consumers can share their experiences, reviews, and recommendations, further promoting the adoption of green products.

Policymakers and regulatory bodies also play a important role in building an enabling environment for the promotion of green products through e-commerce and digital marketing. By establishing clear guidelines and standards for environmental claims, governments can tackle the risk of green washing and enhance consumer trust. Additionally, providing incentives for businesses to adopt sustainable practices such as tax breaks, and grants can encourage innovation and investment in green product development. Collaborative efforts between governments, businesses, and civil society are essential to ensure that digital platforms contribute to trustable sustainability rather than perpetuating existing environmental challenges.

Literature Review

Understanding green products

Green products are have capacity to minimize environmental degradation by focusing on resource efficiency, reduced emissions, and sustainable lifecycle practices (Belz & Peattie, 2009). These products span a wide range of categories including

organic food, renewable energy technologies, biodegradable packaging and sustainable fashion. Studies show that consumer awareness and behavior play a an important role in the adoption of environment friendly products. However, hurdles such as high costs limited availability and green washing often hinder their acceptance (Chen & Chang, 2013). Addressing these challenges requires strategic interventions that leverage digital tools to create awareness, build trust and improve accessibility.

E-commerce as an Enabler of Green Product Promotion

E-commerce has revolutionized the traditional transcending geographical boundaries allowing companies to reach different consumer segments. For eco-friendly products, e-commerce offers several benefits, including increased visibility, access to niche markets, and the ability to provide detailed product information. Research from UNCTAD (2021) highlights the role of e-commerce in promoting sustainability by reducing reliance on physical stores and optimizing logistics to minimize carbon emissions. Studies have also highlighted the potential for e-commerce platforms to integrate sustainable practices into their operations. For example Amazon's Climate Pledge Friendly initiative identifies and promotes products with certification sustainability. Such initiatives not only increase consumer confidence but also create incentives for companies to adopt green practices. Similarly, platforms like Esty, Myntra, etc. have gained popularity for promoting handmade and eco-friendly products, showing the value of e-commerce in creating a marketplace for green innovation (Geissdofer et al., 2017).

Logistical efficiency in e-commerce, such as centralized warehousing and optimized delivery routes, also contribute to environmental benefits. However, some studies caution against the deliveries and emphasize the need for sustainable delivery practices (Hotler et al., 2016). These results suggest that while e-commerce offers significant opportunities for eco-friendly products, it needs be complemented by strategies to reduce one' environmental footprint.

The Role of Digital Marketing in Driving Green Product Adoption

Digital marketing plays a crucial role in shaping consumer protection, raising awareness, and promoting green products adoption habits. With the advent of social media, search engine marketing, content marketing, and influencer partnerships, companies have access to a variety of tools to engage with consumers and effectively communicate the benefits of green products (Hotler et al., 2016).

One of the important contribution of digital marketing is its ability to promote transparency and trust. Consumer often hesitate to purchase green products because they are skeptical of environmental claims. By using storytelling techniques, businesses can tell the journey of their products, from sourcing sustainable materials to ecofriendly production methods. Studies have also shown that such narratives not only build trust but also create emotional connections with consumers, thereby strengthening loyalty (Parguel et al., 2011). Social media platforms in particular have proven to be effective tools for promoting green products. Research shows that targeted campaigns on platforms such as Instagram, Facebook and Twitter can effectively reach eco-conscious consumers and influence their purchasing decisions.

For example, campaigns that highlight certifications, environmental impact data, and consumer trust and testimonials have been found to increase the perceived credibility of ecofriendly products (Chen & Chang, 2013).

Content marketing, another key aspect of digital marketing, enables companies to educate consumers about the benefits of environment friendly products. Blogs, videos, infographics and webinars can provide valuable insights into sustainability issues, empowering consumers to make informed decisions. Furthermore digital marketing analytics allow businesses to measure the effectiveness of their campaigns and to refine their strategies to better cope up with consumer preferences and taste (Geissdofer et al., 2017).

Integration of E-commerce and Digital Marketing

The integration of e-commerce and digital marketing creates a refined effect that increase the

promotion of environment friendly products. While e-commerce provides the manufacturers for selling green products, digital marketing bring traffic on these platforms and converts potential consumers into loyal customers. This integration is particularly pronounced when using data analytics and artificial intelligence (AI) to personalize marketing efforts. Studies show that companies using AI can analyze consumer behavior can predict preferences, tastes and deliver targeted advertising increasing the credibility of environment friendly products (Kotler et al., 2016).

Additionally, e-commerce platforms often integrate digital marketing tools such as personalized recommendations, email campaigns, and loyalty programs to enhance consumer engagement and trust. For example, platforms like Shopify allow companies to integrate sustainability oriented marketing campaigns directly into their online shop. This seamless integration not only increase the visibility of eco-friendly products but also ensures a consistent consumer experience.

Challenges in Promoting Green Products through Digital Platforms

Despite the advantages of e-commerce and digital marketing, challenges persist in promoting eco-friendly products. A key problem is green washing, where companies exaggerated or falsify the environmental benefits of their products. This practice undermines consumer trust, and creates confusion, prevents the introduction of genuine environment friendly products (Parguel et al., 2011).

Another challenge is the environmental impact of digital commerce itself. The energy consumption associated with packaging waste in data centers and delivery logistics raises questions about the net sustainability benefits of e-commerce (UNCTAD, 2021). Addressing these challenges requires a holistic approach that includes regulatory oversight, consumer education and the adoption of sustainable practices by companies.

Studies also highlight the digital divide as a barrier to promoting ecofriendly products. In developing regions, limited access to digital infrastructure and low level of digital literacy limit the reach of ecommerce and digital marketing. Policymakers



and businesses must work together to close this gap by investing in digital infrastructure and providing training programs to improve digital skills (United Nations, 2015).

Policy and Regulatory Implications

The role of policymakers in supporting the promotion of environment friendly products through digital platforms cannot be overlooked. Governments can set clear guidelines and standards for environmental claims, ensuring that companies adhere to ethical practices and avoid greenwashing. Incentives such as tax breaks, subsidies and grants can encourage companies to adopt sustainable practices and invest in green innovations.

Furthermore, international cooperation is crucial to harmonize sustainability standards and promote cross-border trade in green products. Organizations such as the United Nations and World Trade Organization (WTO) play a critical role in per cooperation among countries to address global sustainability challenges (UNCTAD, 2021).

Future Directions

The coordination of e-commerce, digital marketing and eco-friendly products offers significant, opportunities for innovation and growth. Future research should examine the role of new technologies such as blockchain, augmented reality, and the internet of things (IoT) in promoting environmentally friendly products. For example, blockchain technology can improve transparency in

supply chain by providing rigid records of product lifecycles, while augmented reality can allows consumers to visualize the environmental impact of their purchases.

Research Hypothesis Main Hypothesis (Ho)

The integration of e-commerce and digital marketing has no significant effect on consumer preferences for green products.

Alternative Hypothesis (H1)

The integration of e-commerce and digital marketing significantly influences consumer preferences for green products.

Sub-Hypotheses

• Consumer Behavior

Ho. 1: Digital marketing strategies do not significantly impact consumer awareness and adoption of green products.

H1. 1: Digital marketing strategies significantly enhance consumer awareness and adoption of green products.

• Market Reach

Ho. 2: Traditional marketing is as effective as digital marketing in reaching environmentally conscious.

H1. 2: Digital marketing is more effective than traditional marketing in reaching environmentally conscious consumers.

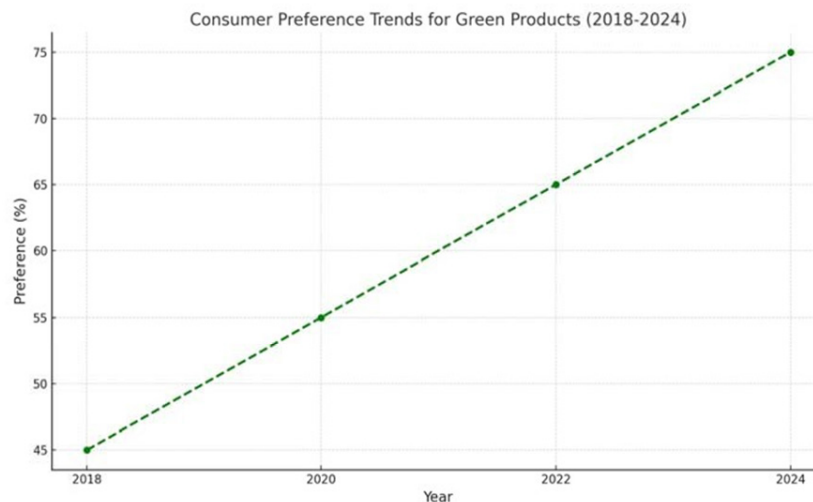


Chart 1: Comparison of Traditional Marketing vs. Digital Marketing in Promoting Green Products Source of Data

- **Cost Efficiency**

Ho. 3: There is no significant difference in cost efficiency between traditional marketing and digital marketing for promoting green products.

H1. 3: Digital marketing is significantly more cost-efficient than traditional marketing for promoting green products.

- **Personalization**

Ho. 4: Personalization in marketing message does not significantly impact consumer engagement with green products.

H. 1.4: Personalization in digital marketing message significantly increases consumer engagement with green products.

Research Methodology

Research Design

A descriptive and exploratory research design was adopted to study

- The effectiveness of e-commerce and digital marketing strategies.
- Consumer behavior trends related to green products.
- The comparative efficiency of traditional vs. digital marketing.

Data Collection Methods

Primary Data

Surveys

- A structured questionnaire was distributed to 500 respondents (consumers and businesses) across various age groups and demographics.
- Questions focused on awareness, preferences, and perceptions of products marketed through e-commerce platforms.

Interviews

- Semi-structured interviews with 20 marketing professionals and sustainability experts to gather qualitative insights.

Secondary Data

Academic Journals

Data was gathered from reputed journals like MDPI, Research Gate, and Statista for statistical trends and analysis.

Market Reports

Industry reports from Harvard Business. Review and other credible sources were reviewed to understand trends.

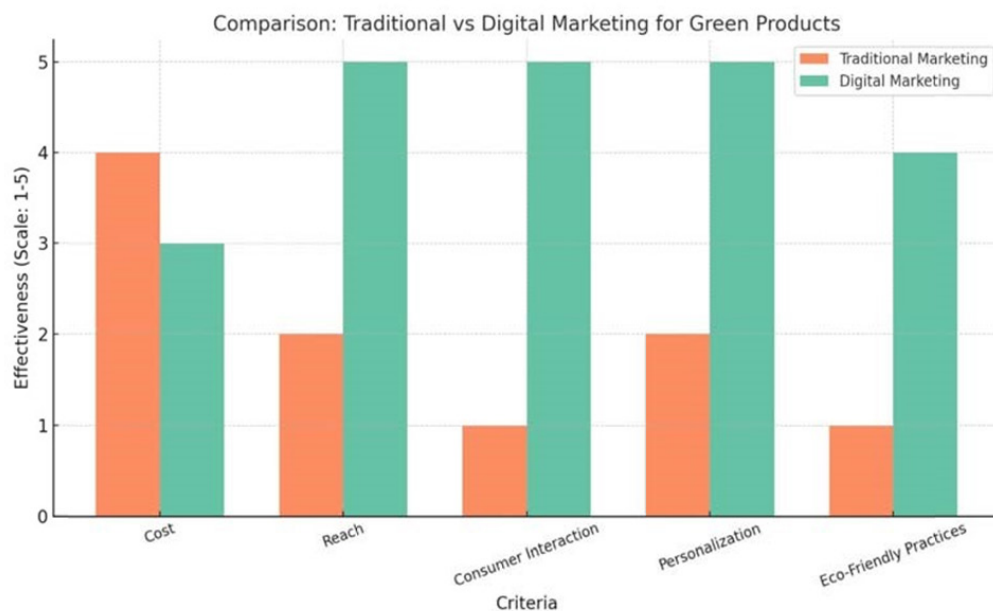


Chart 2: Digital Marketing Strategies Driving Green Product Sales Source of Data



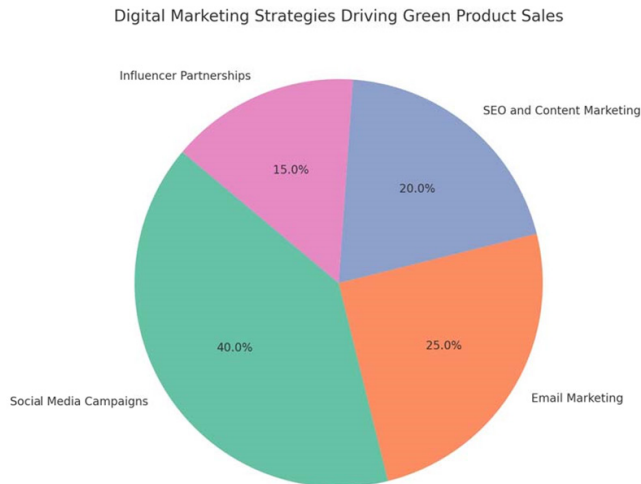


Chart 3: Digital marketing strategies driving green products sales

Web-based Sources

Publicly available data from platforms like Google Trends, Statista and Sustainability market reports.

Limitations

- The study is limited to the analysis of data from specific regions and may not fully represent global trends.
- Dependence on secondary data could introduce biases based on the original source.

Chart-1 : Consumer Preference Trends for Green Products Source of Data (Chart 1)

- Statista: Growth in Consumer Preference for sustainable products globally
- Reports: Sustainable Markets Insight (2020-2024).

Chart Details

- Type: Line chart or bar graph.
- X-Axis: Year (e.g., 2018-2024).
- Y-Axis: Percentage of consumers preferring green products (Chart 2 and 3).
- **Key Insights**
 - 2018: 45% preferred green products.
 - 2020: 55% preferred green products (COVID-19 boosted eco-awareness).
 - 2022: 65% preferred green products
 - 2024 (projected): 75% preference.'

- Academic Journals: Analysis of marketing effectiveness (e.g., MDPI and Research Gate).
- Market Reports: Sustainability-focused marketing studies.
- Reports: Social Media Green Product Ads (2023).
- Insights: Effectiveness of strategies by percentage.

Chart Details

- Type: Pie chart or stacked bar chart.
- Categories:
 - Social Media Marketing:40%.
 - Email Marketing:25%.
 - SEO and Content Marketing:20%.
 - Influence Partnership:15%.

RESULTS AND DISCUSSION

The findings from the analysis highlight the significant role of e-commerce and digital marketing in promoting green products. Key results are summarized below:

Consumer Preference Trends

- The percentage of consumers preferring green products increased from 45% in 2018 to a projected 75% in 2024. This demonstrates a growing awareness and inclination towards sustainable consumption drive by digital platforms.
- The COVID-19 pandemic (2020) marked a noticeable increase in Eco conscious behavior, with digital platforms easily accessible to green products.

Effectiveness of Digital Marketing Strategies:

- Social media campaign emerged as the most impactful strategy, accounting for 40% of digital marketing efforts, followed by email marketing (25%), SEO/ content marketing (20%), and influencer partnerships (15%).
- Strategies that emphasized personalization and transparent communication about sustainability practices were particularly effective in building trust and engagement with consumers.

Consumer Behavior Insights

- Consumer are more likely to purchase green products when exposed to consistent messaging about environmental benefits through e-commerce and digital marketing platforms.
- Younger demographics (aged 18-35) showed the highest responsiveness to digital marketing campaigns promoting green products.

CONCLUSION

The integration of e-commerce and digital marketing has significantly influenced consumer behavior and market dynamics, promoting the adoption of green products. By leveraging digital tools and platforms, businesses can not only enhance their sustainability image but also contribute to the global shift towards an eco-friendly economy.

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