

# The Role of Digital Marketing in Shaping Sustainable Consumption: Insights from a Systematic Literature Review

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## Abstract

As global awareness of environmental and social challenges continues to rise, companies are increasingly re-evaluating how they connect with consumers. This study investigates the role of digital marketing in promoting more sustainable consumer behaviours. Based on a systematic review of peer-reviewed literature retrieved from the Scopus database, and conducted following the PRISMA framework, this research analysed 84 academic publications. The findings highlight that strategies such as personalised messaging, social media engagement, influencer collaborations, and eco-conscious branding are significantly influencing purchasing decisions. Approaches rooted in transparency, emotional storytelling, and ethical data practices appear to enhance consumer trust and strengthen brand relationships. Although the field is technically well developed, it remains underexplored in areas such as digital accessibility and ethical governance. Overall, this study suggests that, when aligned with sustainable values, digital marketing becomes more than a promotional tool—it emerges as a key driver of responsible consumption and the cultivation of long-term, value-based connections between consumers and brands.

**Keywords:** sustainable consumption; digital marketing strategies; eco-conscious consumer behaviour; ethical marketing; green purchase intentions; consumer trust



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## 1. Introduction

In recent years, sustainable development has emerged as a global imperative, fuelled by intensifying environmental, economic, and social challenges. Yao [1] defines sustainable development as a holistic approach aimed at balancing economic growth, environmental preservation, and social equity. In light of escalating issues such as climate change, biodiversity loss, and social inequality, this paradigm has become essential for safeguarding long-term planetary health and human well-being [2]. Beyond serving as a guiding principle for policy and governance, sustainability is increasingly seen as a driver of innovation, transparency, and strategic planning, positioning it as a foundational consideration for governments, businesses, and civil society [3].

At the core of this evolution lies the expectation that all market actors (producers, policymakers, and consumers) actively adopt sustainable practices to address interconnected ecological and social crises. This imperative has not only shaped regulatory frameworks but

also redefined corporate strategies and consumer expectations, embedding sustainability as both an operational and communicational priority.

In parallel, the rapid acceleration of digital technologies has transformed how companies interact with markets. In 2024, global retail e-commerce sales reached approximately USD 6 trillion [4], with projections pointing to an increase to USD 8 trillion by 2028, a 31% rise. Within this increasingly competitive environment, digital marketing has evolved beyond a promotional instrument into a multidimensional tool for brand storytelling, value communication, and relationship building. Crucially, when sustainability principles are embedded into these strategies, digital marketing becomes a mechanism for educating consumers, signalling ethical commitments, and shaping more responsible consumption patterns [5,6].

Sustainable digital marketing integrates the principles of sustainable development into digital promotional channels, using platforms such as social media, e-commerce websites, and influencer networks to highlight ethically sourced products, low-carbon practices, and social impact initiatives. The growing alignment between sustainability and digital marketing is further reinforced by consumer demand: a 2024 PwC report revealed that 80% of consumers are willing to pay up to 9.7% more for products that are sustainably produced or sourced. In response, brands are increasingly employing targeted advertising, eco-labelling, transparency reports, and user-generated content to reach and influence ethically minded audiences.

This convergence of sustainability and digital marketing directly impacts sustainable consumption, a behavioural paradigm in which purchasing decisions are guided not only by functional or economic factors but also by environmental and social considerations. Digital marketing content, including sustainability claims, peer reviews, and influencer endorsements, plays a decisive role in shaping these behaviours [3,6]. Moreover, personalisation strategies, such as delivering tailored sustainability messages or promoting green product categories, have been shown to nudge consumers toward choices that align with their ethical values.

Against this backdrop, this systematic bibliometric literature review examines how digital marketing influences consumer behaviour and sustainable purchase decisions, offering a critical synthesis of theoretical, methodological, and empirical contributions to this evolving field. In doing so, it maps the conceptual interrelations among sustainability, digital marketing, and sustainable consumption, highlighting the opportunities, tensions, and debates that define this intersection in the digital era.

## 2. Materials and Methods

Systematic reviews play a crucial role in advancing academic knowledge. Page et al. [7] highlight four primary functions: (i) identifying future priority research areas, (ii) addressing complex questions that individual studies cannot resolve, (iii) pinpointing research gaps to be explored in future investigations, and (iv) generating or evaluating theories that explain how or why certain phenomena occur. However, when such reviews lack transparency and methodological rigour, they risk producing subjective results and introducing bias. To mitigate these risks, both Page et al. [7] and Haddaway et al. [8] advocate for the use of the PRISMA framework, which enhances the transparency, comprehensiveness, reproducibility, and objectivity of the systematic review process and its resulting conclusions.

In line with current best practices, this study employed a systematic bibliometric literature review (LRSB) guided by the PRISMA framework (see Supplementary Materials) to ensure rigour, clarity, and relevance. As defined by Rosário and Dias [9], an LRSB offers a structured, transparent, and replicable approach, focusing on studies directly aligned

with the research question. It supports a critical appraisal of methodologies, the reliability of conclusions, and overall contributions to the field.

The LRSB process unfolds across three phases and six steps, as outlined in Table 1.

**Table 1.** LRSB process overview.

Phase	Step	Description
Exploration	1	Formulate the research problem
	2	Search for relevant literature
	3	Critically appraise selected studies
	4	Synthesise data
Interpretation	5	Reporting findings and recommendations
Communication	6	Present the LRSB report

Source: own elaboration.

The review used Scopus as the sole database, selected for its broad coverage, rigorous indexing, and robust analytical tools, which support citation tracking, keyword mapping, and bibliometric evaluation. Its consistent metadata also enhances transparency and replicability. To ensure comprehensive coverage of the existing literature, this review includes all peer-reviewed documents indexed in Scopus up to April 2025, without applying a predefined start date. This inclusive approach allows for the identification of both foundational studies and recent developments at the intersection of digital marketing and sustainable consumption.

While Scopus was selected as the sole database for this review, we acknowledge that this decision may introduce certain limitations. In particular, relying exclusively on Scopus could result in the exclusion of region-specific studies, non-English language publications, or emerging research published in more specialised or recently indexed outlets, some of which may be captured in alternative databases such as Web of Science or Google Scholar. Consequently, the findings presented here may reflect a partial representation of the global research landscape. This methodological choice, although deliberate for the sake of analytical rigour and replicability, may influence the comprehensiveness of the results. Furthermore, the cut-off date of April 2025 may omit the latest studies. To maintain academic integrity, only peer-reviewed sources were included.

The literature search process began by identifying the database, specifically the Scopus database. Then, we conducted the initial search using the keyword TITLE-ABS-KEY (“sustainable”), which yielded 1,090,369 documents. Adding the search term “sustainability” increased the document results to 1,334,843. To refine the focus on the study’s core topic, the additional keyword “digital marketing” was introduced. This reduced the results to 542, but when the alternative keyword “online marketing” was added, the number increased to 661. Adding the keyword “consumer behaviour” reduced these documents to 71, while the additional search term “consumer attitudes” expanded them to 81. Since the research topic also focuses on the impact of sustainable digital marketing on consumer purchasing behaviours, the researchers added the final keyword, “purchasing behaviour,” resulting in 84 documents that were synthesised in the final reporting ( $n = 84$ ).

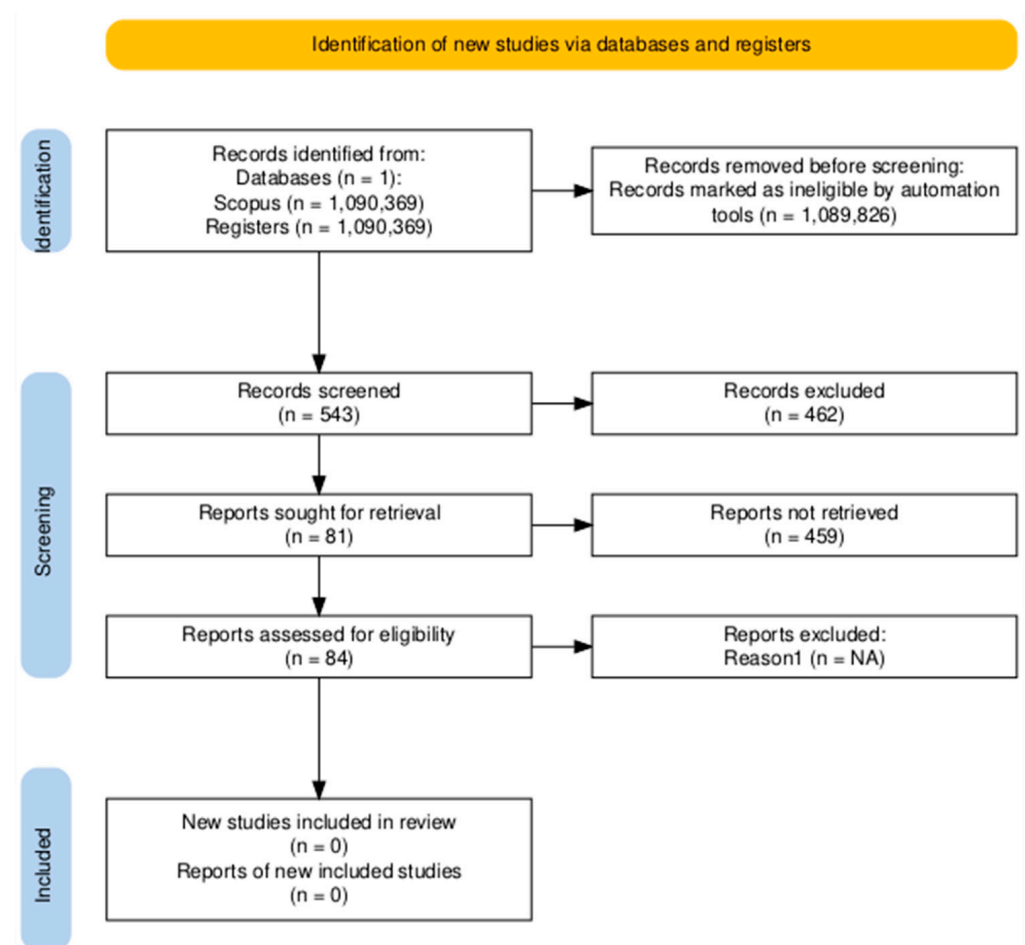
To ensure that the final selection of studies remained both relevant and methodologically sound, the research employed a set of well-defined inclusion and exclusion criteria (as shown in Table 2). Only peer-reviewed journal articles that directly explored how artificial intelligence contributes to marketing improvements within a business framework were considered. Any publications that lacked a focused discussion were deliberately omitted to preserve the thematic clarity and consistency of the dataset. This careful filtering ensured that the literature analysed was not only academically robust but also aligned precisely with the core aims of the study. The complete outline of the search and screening process

is presented in Table 2. A visual representation of this selection process is provided in Figure 1.

**Table 2.** Screening methodology overview.

Stage	Search Criteria (Keywords)	Number of Results
Meta-Search	“sustainable”	1,090,369
First Inclusion Criterion	“sustainable”; “sustainability”	1,334,843
	+ “digital marketing”	542
	+ “online marketing”	661
Inclusion Criteria	+ “consumer behaviour”	76
	+ “consumer attitudes”	81
	+ “purchase behaviour”	84
Screening		

Source: own elaboration.



**Figure 1.** PRISMA 2020 flow diagram for the systematic literature search [10].

A thorough examination of the selected materials was conducted using a structured methodology inspired by Rosário and Dias [9], with particular attention to both content and thematic relevance. To ensure academic rigour and relevance, the selection process followed strict inclusion criteria, prioritising high-quality, peer-reviewed academic sources that directly addressed the study’s central theme: Sustainability in the Digital Era—Exploring the Influence of Digital Marketing on Consumer Behaviour and Sustainable Purchase Decisions. Preference was given to publications that closely aligned with the research objectives, and each document was assessed for its topical relevance, methodological robustness, and scholarly credibility.

In total, 84 academic and scientific documents retrieved from the Scopus database were analysed using a dual approach combining narrative and bibliometric techniques, as outlined by Rosário and Dias [9]. This combined method enabled a comprehensive exploration of the literature, with a particular emphasis on identifying dominant themes and synthesising key findings relevant to the research questions.

Among the 84 selected sources, 47 were journal articles, 20 were conference papers, 10 were book chapters, and 7 were full books.

### 3. Publication Distribution

This section presents the main themes and keywords identified through a preliminary analysis of the final set of 84 peer-reviewed documents included in this study. All bibliometric visualisations and analyses, such as keyword co-occurrence networks, thematic maps, and co-citation analyses, were performed using VOSviewer (version 1.6.18), based exclusively on this refined dataset, following the application of all inclusion and exclusion criteria. The review encompasses peer-reviewed publications related to Sustainability in the Digital Era: Exploring the Influence of Digital Marketing on Consumer Behaviour and Sustainable Purchase Decisions, covering sources up to April 2025. Notably, the year 2024 recorded the highest number of publications on this topic, totalling 38 peer-reviewed articles. A visual summary of the distribution of publications over time is provided in Figure 2.

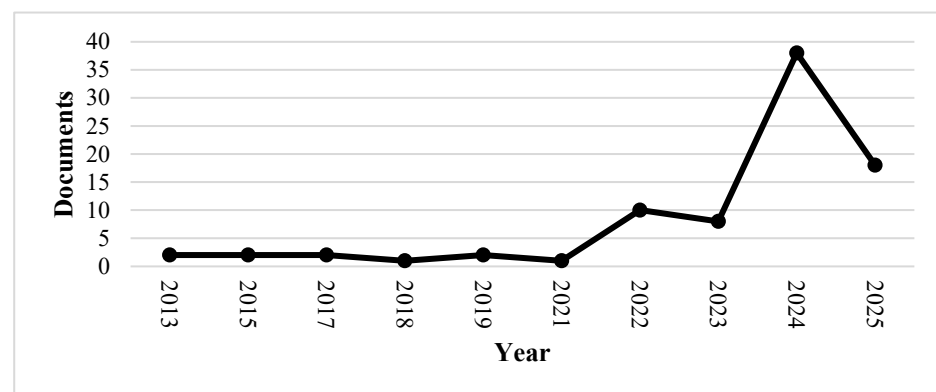


Figure 2. Documents by year.

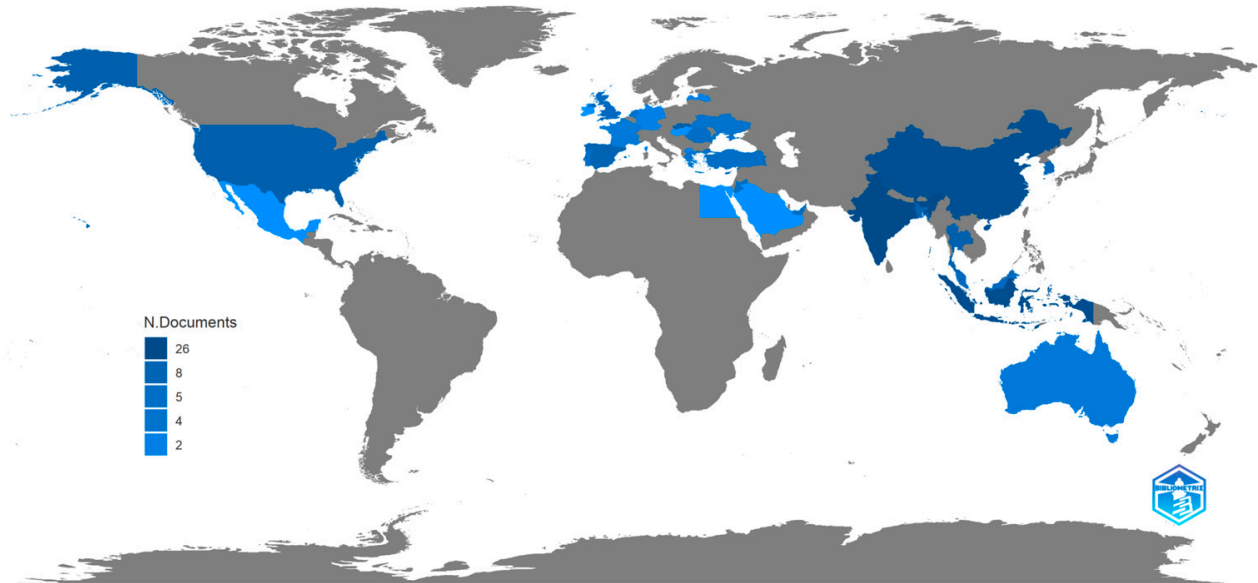
The documents analysed were published across a range of journals and conference proceedings. The most frequent sources include *Sustainability* (Switzerland), with seven publications, followed by *Smart Innovation, Systems and Technologies* (4), and *Springer Proceedings in Business and Economics* (3). Additionally, two publications were found in each of the following outlets: *Worldwide Hospitality and Tourism Themes*, *Studies in Systems, Decision and Control*, *Pakistan Journal of Life and Social Sciences*, *Lecture Notes in Networks and Systems*, *Intersections of Niche Tourism and Marketing*, *International Journal of Innovative Research and Scientific Studies*, *Indian Journal of Marketing*, *Heliyon*, *Frontiers in Psychology*, and *Cogent Business and Management*. The remaining publications appeared as single entries across various other academic sources.

Between 2022 and 2024, there was a marked increase in academic publications addressing the topic Sustainability in the Digital Age: Exploring the Influence of Digital Marketing on Consumer Behaviour and Sustainable Purchasing Decisions. This upward trend, especially pronounced in 2024, highlights a growing scholarly interest in the intersection between digital technologies and sustainable consumer practices. Several factors likely contributed to this momentum, including heightened public awareness of sustain-

ability challenges, accelerated technological advancements, expanded research funding opportunities, and a stronger institutional focus on sustainability-related themes.

These dynamics indicate that what was once considered a niche research area is now evolving into a well-established and influential academic field. It is important to note that the seemingly lower number of publications in 2025 is not indicative of declining interest but, rather, reflects the incomplete data from the first quarter of the year.

In parallel, Figure 3 illustrates the countries that have made the most significant academic contributions within this domain. India, Indonesia, China, and Slovakia stand out for their consistent scholarly output, underscoring their growing influence in shaping and advancing the global research agenda on digital marketing and sustainability.



**Figure 3.** Scientific production by country.

Table 3 and Figure 3 provide a visual representation of the top 10 countries that are most actively contributing to research in the field under study. The international breadth of scholarship on Sustainability in the Digital Age reveals particularly strong engagement from India, Indonesia, China, and Slovakia, with significant contributions also observed from Thailand, the United States, Bangladesh, and others. This distribution reflects a growing global momentum, likely driven by increasing awareness of sustainability challenges in digital environments and a heightened demand for innovative, eco-conscious solutions.

**Table 3.** Top 10 countries by number of publications.

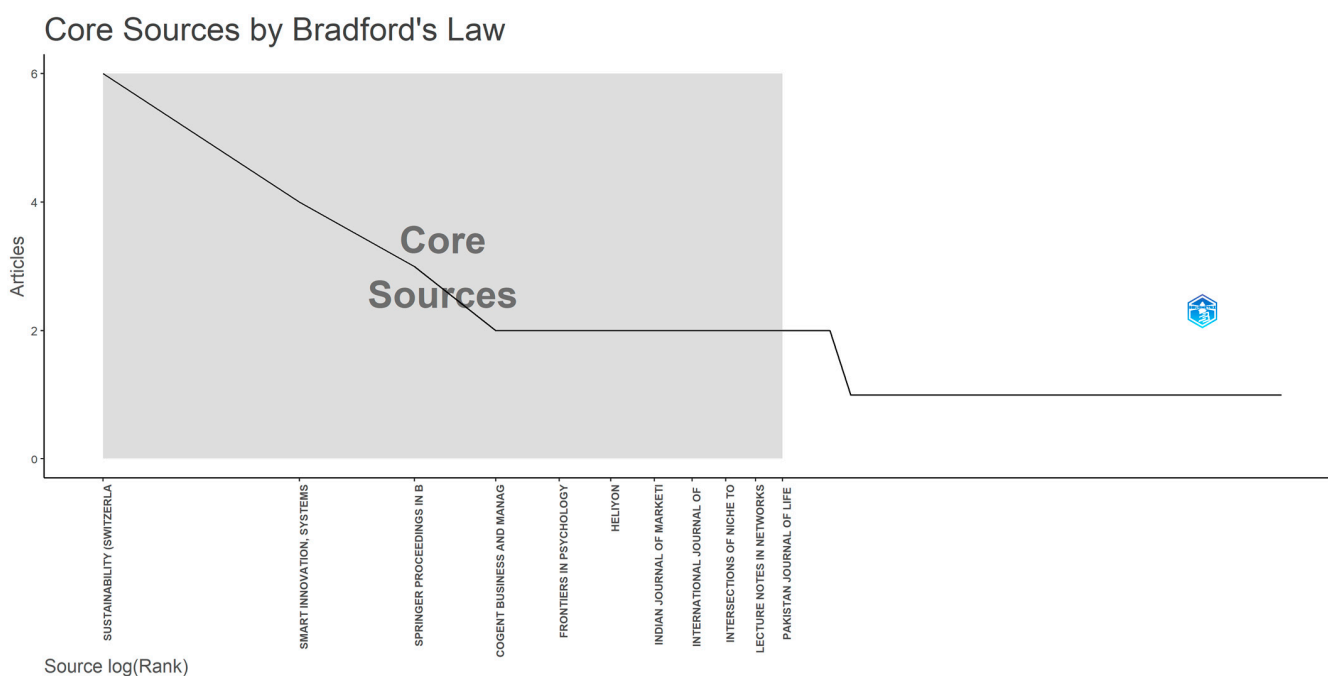
Country	Number of Publications
India	26
Indonesia	24
China	21
Slovakia	11
Thailand	10
USA	10
Bangladesh	9
Spain	8
Cyprus	7
South Korea	7

Source: own elaboration.

Collectively, these trends indicate the emergence of a dynamic and rapidly expanding field of inquiry, positioned at the intersection of technological advancement, environmental responsibility, and global market strategy.

By identifying the countries most invested in this research area, this study sheds light on national research agendas and academic priorities, offering valuable insight into how different regions are shaping the discourse on digital sustainability.

According to Bradford's law, a small core of journals tends to concentrate the majority of influential publications within a given research domain. As shown in Figure 4, ten journals constitute the primary sources of academic output in this field, collectively accounting for approximately 16% of all relevant publications. This concentration reflects a key indicator of disciplinary maturity. As a research area develops and gains academic traction, a select group of journals emerges as the principal vehicle for disseminating its most significant findings. These core publications play a crucial role in shaping the discourse, setting research agendas, and promoting the consolidation of knowledge during the formative stages of the field's development.



**Figure 4.** Core sources by Bradford's law (2015–2025).

As academic interest in the topic continues to expand, a select group of leading journals have emerged as central pillars within the research community. These journals gradually establish themselves as dominant sources for foundational insights, not only shaping the trajectory of scholarly debate but also influencing the integration of the topic into a broader range of academic publications.

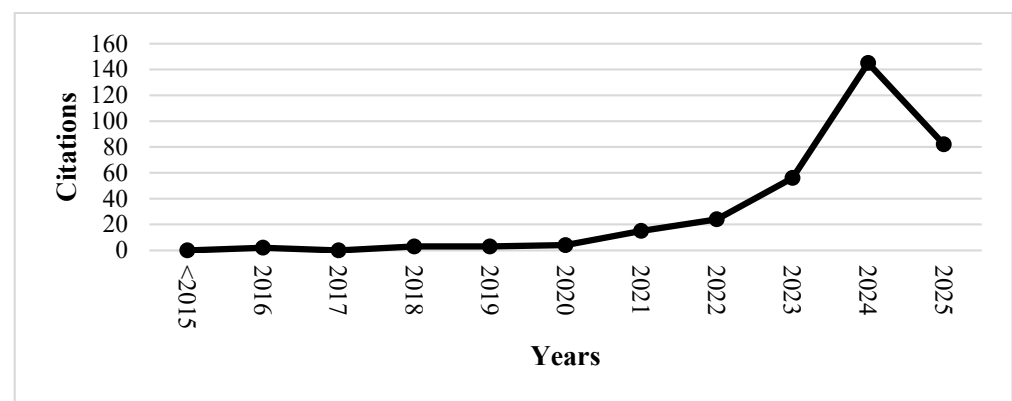
Within this emerging core, 11 journals stand out for their significant impact on the field, with the first 8 playing a particularly influential role in the theoretical and empirical development of the subject. These publications serve as key platforms for academic discourse, facilitating engagement with the existing literature, encouraging citation of high-impact studies, and contributing to the structured advancement of knowledge.

The 84 academic and scientific documents analysed in this study span a wide array of subject areas, reflecting the interdisciplinary nature of the theme. The distribution is as follows: business, management, and accounting (41); computer science (29); social sciences (27); economics, econometrics, and finance (23); decision sciences (14); environmental

science (12); engineering (11); energy (9); psychology (6); multidisciplinary (5); mathematics (4); agricultural and biological sciences (4); Earth and planetary sciences (2); biochemistry, genetics, and molecular biology (2); arts and humanities (2); nursing (1); medicine (1); and materials science (1).

The most cited publication in the dataset is “Research Challenges in Digital Marketing: Sustainability”, with 65 citations. This article was published in *Sustainability* (Switzerland), which holds a high SJR score of 6.88, is ranked in the top quartile (Q1), and has an h-index of 207. The study reviews the digital marketing and sustainability literature from 2009 to 2018 and proposes a research agenda to guide future investigations in this area.

Figure 5 illustrates citation trends for the documents published up to April 2025. The period from  $\leq 2015$  to 2025 shows a steady and positive increase in citations, with an  $R^2$  value of 49%, culminating in a citation count of 2015 by the year 2025 (see Appendix A).



**Figure 5.** Evolution of citations between  $\leq 2015$  and 2025.

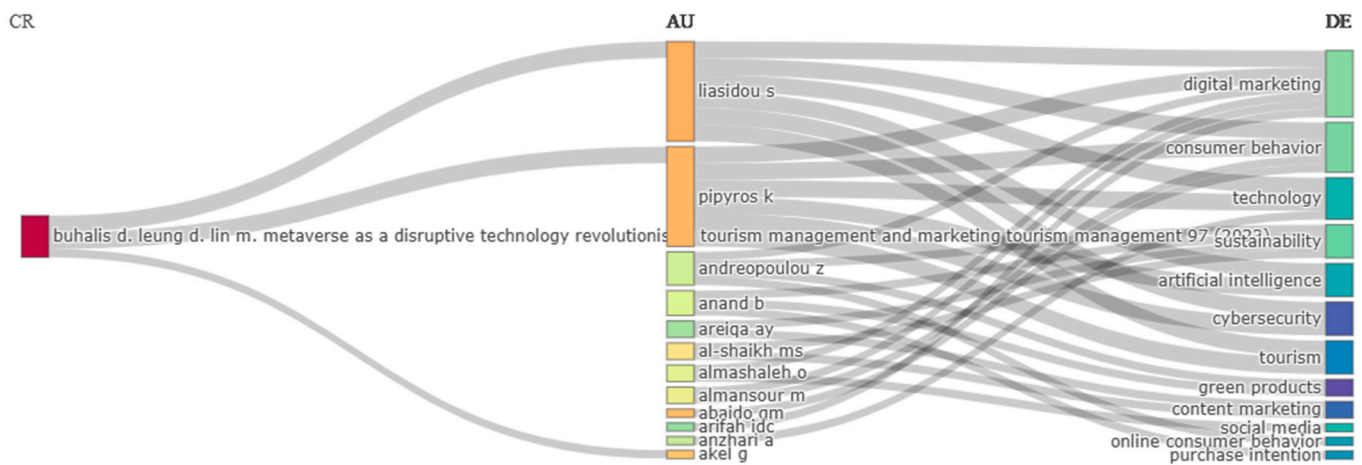
The h-index is a widely used metric that reflects both the productivity and impact of academic publications. It is calculated by identifying the highest number  $h$  such that  $h$  publications have each received at least  $h$  citations. In the context of this study, the h-index reached 8, indicating that eight publications had each been cited at least eight times. This value provides an insightful measure of the scholarly visibility and influence of the reviewed literature. As of April 2025, the total number of citations across all 84 analysed publications stood at 335. Notably, however, 47 of these documents had not yet received any citations, suggesting a degree of recency or emerging relevance.

The sharp upward trajectory in citations, peaking at over 140 in 2024, indicates both intensified scholarly attention to the intersection of digital marketing and sustainability and the consolidation of a coherent research agenda in this area. The most frequently cited works in the dataset have made substantial contributions beyond their citation count. Several have deepened conceptual clarity by integrating sustainability principles into established consumer behaviour models, reframing value communication strategies, and strengthening the theoretical foundations of sustainable marketing. Others have advanced methodological innovation through bibliometric mapping techniques, longitudinal analyses, and mixed-methods approaches that have been widely adopted in subsequent studies. Additionally, these influential works have directed attention toward emerging and critical topics such as ethical data governance, green branding, and the cognitive and affective mechanisms influencing sustainable purchasing decisions. This suggests that their impact is rooted not only in visibility but also in shaping the theoretical discourse and methodological standards of the field.

In addition, a bibliometric analysis was conducted using the core keywords sustainable, sustainability, digital marketing, online marketing, consumer behaviour, consumer attitudes, and purchase behaviour. This analysis revealed key patterns and emerging trends



conceptual overlaps between themes. This visual framework serves as a useful tool for tracing the development and interaction of central ideas throughout the review process [9].



**Figure 7.** Three-field plot analysis (AU = authors, CR = references, DE = author keywords).

As shown in Figure 7, the most prominent keywords include “digital marketing” (with six incoming connections and no outgoing flows) and “consumer behaviour” (with four incoming connections and no outgoing flows). These keywords are strongly associated with the most frequently cited sources, underscoring their centrality in the scholarly discourse.

Figure 8 provides a more detailed analysis of the relationships between key terms across the reviewed academic publications. It illustrates patterns of keyword co-occurrence, offering insights into recurring thematic linkages and emerging research directions. In addition to highlighting dominant concepts, the figure reveals co-citation patterns, forming clusters that enhance our understanding of how knowledge in this field is structured and accumulated. These visual insights support the broader conclusions of the study by identifying influential themes and their interconnections within the academic landscape.

In this thematic mapping, clusters are labelled using a font size of 3 and scaled based on a base value of 0.3. A dividing line within the map distinguishes between two key dimensions: centrality, which reflects the relevance of a theme to the overall field, and density, which indicates the degree of internal development or thematic maturity. As illustrated in Figure 9, the thematic landscape is divided into four distinct quadrants, each represented by coloured circles.

The upper-right quadrant contains the field’s motor themes—topics that are both highly central and well developed. These themes are deeply embedded within the research domain and serve as essential foundations due to their strong connectivity and conceptual maturity.

In the lower-right quadrant, we find basic and transversal themes that hold strong centrality but exhibit lower density. These topics are relevant to the broader field but remain underdeveloped in terms of internal cohesion. As such, they represent promising areas for future research expansion and theoretical refinement.

The lower-left quadrant encompasses themes with low centrality and low density, indicating topics that are either emerging or in decline. These areas may reflect nascent interests gaining early traction or concepts losing relevance in the current academic discourse.

Meanwhile, the upper-left quadrant is home to highly specialised themes, which are well developed internally (high density) but have limited integration with other areas of study (low centrality). These topics are typically niche or peripheral, offering depth within their subdomain but limited cross-disciplinary influence.



This framework provides a structured understanding of how different research themes are positioned within the field, offering valuable insights into both mature, well-established areas and those with potential for further scholarly inquiry.

Based on the co-word analysis of 84 documents, Figure 9 reveals distinct clusters of research themes positioned according to their centrality (relevance to the field) and density (conceptual development).

In the lower-right quadrant, “consumer behaviour”, “electronic commerce”, and “sustainable development” emerge as basic themes—foundational and cross-cutting concepts that underpin much of the literature in this domain. Their position indicates strong integration across the research network, suggesting that they serve as conceptual anchors for both theoretical and empirical studies. The persistence of “consumer behaviour” at the core reflects the central role of understanding individual decision-making processes in sustainable digital marketing research. Similarly, “electronic commerce” signals the growing relevance of online retail ecosystems as the primary context in which sustainable consumption unfolds, while “sustainable development” provides the overarching normative framework that guides scholarly discourse. The risk here, however, is that their dominance may lead to conceptual saturation, with incremental contributions rather than disruptive insights—pointing to a need for cross-fertilisation with less-explored constructs (e.g., behavioural economics, AI ethics).

In the upper-right quadrant, which represents motor themes, “marketing”, “consumer”, “article”, “digital marketing”, “marketing strategy”, and “sale” are identified as well developed and highly central. These topics act as research engines, driving knowledge production and influencing other thematic areas. While their maturity indicates conceptual stability, it may also mask an over-reliance on established marketing paradigms, with fewer attempts to challenge or reconceptualise core assumptions in light of emerging sustainability imperatives. A more critical engagement with contradictions, such as tensions between profit-maximising marketing strategies and authentic sustainability claims, could reinvigorate this thematic space.

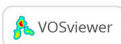
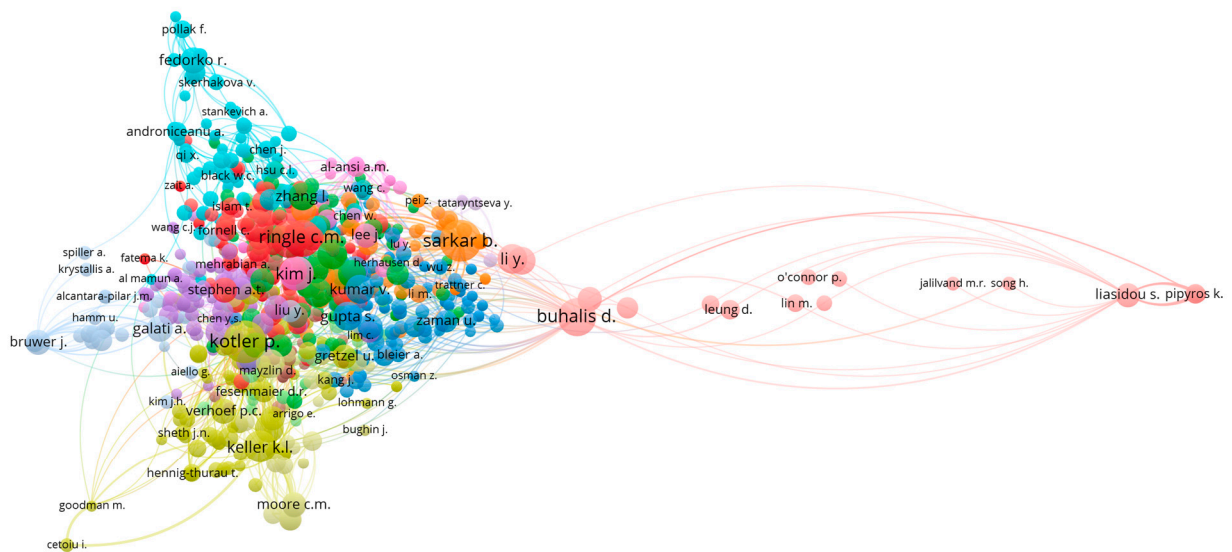
Conversely, the upper-left quadrant, housing niche themes like “sustainability”, “decision-making”, and “digitisation”, reveals topics that are internally well developed but less connected to the broader research structure. This relative isolation suggests either a lack of interdisciplinary integration or a compartmentalised treatment of sustainability-related decision-making processes. Given their conceptual depth, these themes could benefit from stronger linkages with the motor themes to bridge micro-level behavioural insights with macro-level marketing strategies. The limited connectivity may also reflect methodological silos, such as the predominance of case studies or context-specific surveys, hindering generalisability.

Finally, the lower-left quadrant includes emerging or declining themes, notably “predictive analytics”, “tourism”, and “social media”. Their low density and centrality imply that they are either nascent areas poised for growth or losing relevance in the current discourse. The position of “social media” here is intriguing, given its centrality in mainstream digital marketing. This could indicate that sustainability-related applications of social media are underdeveloped or fragmented in the literature, suggesting a fertile space for future research. Similarly, “predictive analytics” represents a technologically advanced but under-explored tool for anticipating sustainable consumption patterns. The challenge for these themes is to either gain integration into the mainstream discourse or risk marginalisation.

Overall, the thematic map underscores a field that is anchored in traditional marketing and consumer behaviour frameworks yet shows underutilised opportunities for integrating niche, emerging, and technologically driven themes into the sustainability agenda. Addressing these gaps may require interdisciplinary collaborations, innovative methodologies,

and a willingness to confront conceptual tensions between commercial imperatives and sustainable development goals.

The co-citation network depicted in Figure 10 reveals a dense and interconnected intellectual core, suggesting the presence of a relatively cohesive and mature research field. The central cluster, where high-frequency co-citations converge, represents the seminal and most influential works that have shaped the theoretical underpinnings of digital marketing and sustainable consumption research. These works not only provide the conceptual frameworks upon which much of the literature is built but also act as methodological benchmarks, informing how subsequent studies operationalise constructs and interpret results. The high degree of interconnectivity among these references indicates a strong consensus on foundational perspectives, which may facilitate cumulative knowledge development but also risks fostering intellectual homogeneity.



**Figure 10.** Network of co-citations.

The central positioning of certain authors, such as those contributing to sustainability marketing theory, consumer behaviour models, and digital engagement strategies, demonstrates their pivotal role in anchoring the discourse. This concentration suggests that the field relies heavily on a relatively narrow set of theoretical paradigms. While this provides stability, it also highlights the potential danger of path dependency, where alternative viewpoints or disruptive conceptual innovations remain underexplored.

In contrast, peripheral nodes represent less frequently co-cited works, many of which address emerging, niche, or interdisciplinary topics. These include studies on advanced analytics, behavioural nudging for sustainable consumption, and the integration of artificial intelligence into marketing strategies. Their relatively low centrality may be due to their novelty, limited empirical validation, or restricted dissemination across disciplinary boundaries. However, their thematic uniqueness positions them as potential catalysts for innovation, especially if integrated more deliberately with the central body of work.

The structural layout, with a densely packed left-hand core and more dispersed right-hand periphery, also reflects the balance between consolidation and expansion in the field. The stability of the central cluster supports theoretical maturity, yet the spatial separation of peripheral nodes suggests that interdisciplinary connections are not

yet fully optimised. Greater integration of these emerging perspectives could diversify methodological approaches and challenge dominant assumptions, ultimately enriching the intellectual landscape.

Finally, the network's visual topology underscores a critical challenge: while the core offers depth and reliability, the future vitality of the field may depend on how successfully it incorporates peripheral, high-potential ideas. Strategic cross-referencing between established and emerging works could accelerate conceptual evolution, avoiding stagnation and ensuring that the field remains responsive to technological, social, and environmental shifts.

Overall, the bibliometric, thematic, and co-citation analyses provide an integrated view of how research on digital marketing, consumer behaviour, and sustainable purchase decisions has evolved from a niche interest to a mature and influential domain. The rise in publications and citations, peaking in 2024, reflects both the consolidation of a coherent research agenda and its growing global reach, particularly in emerging economies. Core journals identified through Bradford's law now serve as primary vehicles for theoretical and methodological development, while thematic mapping shows that foundational concepts such as consumer behaviour, electronic commerce, and sustainable development are complemented by motor themes that drive scholarly output. At the same time, niche and emerging topics, such as predictive analytics, tourism, and social media, remain underexplored yet hold significant potential for innovation. The co-citation network confirms the presence of a dense intellectual core, grounded in shared conceptual frameworks, alongside a periphery of novel ideas that could enrich the field through greater integration. Collectively, these findings not only chart the intellectual structure of the discipline but also highlight opportunities to bridge established paradigms with emerging perspectives, ensuring its continued relevance in addressing evolving sustainability challenges.

#### 4. Conceptual Overview and State of the Art

Sustainability has become a significant factor influencing consumer purchase intentions, driven by growing awareness of climate change and broader environmental challenges. Contemporary consumers are increasingly attentive to brands' ethical sourcing practices and social responsibility. In response, companies are leveraging digital platforms to communicate and promote their environmental and ethical commitments. This section of the literature review synthesises current findings on the intersection between digital marketing and sustainability, examining its influence on consumers' purchasing intentions and decision-making processes.

##### 4.1. Digital Marketing and Sustainability

The global number of Internet users has grown significantly in recent years. According to recent data, approximately 67.9% of the world's population—around 5.56 billion people—was using the Internet as of February 2025 [11]. Of these, 5.24 billion actively engage with social media platforms. In response, businesses have adopted a wide range of digital tools and platforms to reach and interact with their target audiences online. This shift has given rise to the field of digital marketing, which Desai and Vidyapeeth [10] define as “all marketing efforts that use an electronic device or the internet” (p. 196). It encompasses a variety of strategies, including mobile marketing, content automation, display advertising, search engine marketing (SEM), search engine optimisation (SEO), content marketing, influencer marketing, email marketing, and social media marketing [10,12]. Through these approaches, digital marketing enables brands to engage consumers across various platforms, including social media, search engines, websites, and email.

Given the intensifying global environmental challenges, it has become increasingly important for businesses to embed sustainability into their digital marketing strategies. Sustainability is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs [13]. It rests on three core pillars: environmental, economic, and social. Environmental sustainability emphasises minimising ecological impact by reducing resource depletion, greenhouse gas emissions, and waste. It encourages practices such as the use of renewable energy, sustainable packaging, and ethical sourcing [14]. Economic sustainability seeks to ensure long-term business viability while fostering responsible production and consumption. Social sustainability, in turn, focuses on equity, inclusiveness, and community well-being, ensuring that marketing practices uphold human rights and fair labour standards [15]. Rising consumer awareness and evolving regulatory frameworks increasingly require companies to integrate sustainability into their operations [16]. For instance, Hidayat et al. [17] reported that public awareness of sustainability issues has grown by 61% since 2012. In response, businesses are aligning their digital marketing with sustainability principles, giving rise to the concept of sustainable digital marketing.

Sustainable digital marketing refers to the strategic use of digital platforms and tools to promote products, services, and brand values in ways that support environmental stewardship, economic responsibility, and social equity. This approach extends beyond merely advertising green products [17]. It involves transparent communication, ethical data handling, energy-efficient digital operations, and the creation of content that encourages responsible consumer behaviour [18,19]. For example, brands may leverage social media to showcase sustainability initiatives, collaborate with environmentally conscious influencers, or launch targeted campaigns that educate consumers about making socially and environmentally responsible choices [20,21]. Additionally, sustainable digital marketing promotes the reduction in the environmental footprint associated with digital activities themselves—for instance, by optimising website performance to reduce energy consumption or minimising unnecessary data storage. Ultimately, it aligns marketing practices with broader sustainability objectives, ensuring that both the message and the medium contribute to meaningful, long-term positive impacts.

#### *4.2. Strategies Used in Sustainable Digital Marketing*

While businesses increasingly implement strategies that integrate ethical, environmental, and social values into their marketing, the literature reveals tensions between the aspirational narratives that brands promote and the practical limitations of these approaches. Many studies highlight the potential of these strategies to promote sustainable products, shape consumer perceptions, and encourage responsible consumption, yet others caution that the effectiveness of such initiatives is often mediated by consumer scepticism, inconsistent messaging, or limited long-term behavioural change. The following subsections critically examine the most discussed strategies, highlighting both their potential and the debates surrounding their impact:

##### *4.2.1. Social Media Advertising*

Social media is widely praised as a powerful tool for promoting sustainable values, given its reach and interactive features [22]. Brands often rely on visually compelling content and storytelling to communicate sustainability initiatives [23], and campaigns have successfully raised awareness of global challenges such as climate change [24]. However, the literature reveals contradictions: while Arora [23] notes the role of interactivity in fostering trust and loyalty, other studies question whether these campaigns genuinely drive behaviour change or merely create “sustainability theatre,” where brands showcase

selective initiatives without addressing deeper operational issues. Moreover, the reliance on algorithm-driven targeting can reinforce echo chambers, reaching mainly those already interested in sustainability, thus limiting the broader impact.

#### 4.2.2. Personalisation

Personalisation is presented as a way to enhance message relevance by aligning content with individual preferences and values [14,25,26]. In sustainable marketing, this can include recommending eco-friendly products or sending customised sustainability tips. However, debates emerge over its ethical boundaries: while some scholars view personalisation as a tool for empowering consumers [25], others highlight concerns about data privacy, the risk of manipulation, and the potential to privilege high-value customers while neglecting broader sustainability education. Furthermore, there is limited empirical evidence on whether personalised sustainability messages actually translate into sustained behavioural change, rather than short-term engagement.

#### 4.2.3. Search Engine Optimisation (SEO)

SEO ensures that sustainability-related content is more visible to those actively seeking such information [10,14]. While this seems a straightforward way to connect intent with relevant offerings, critics point to a significant bias: SEO inherently favours brands with greater resources to invest in optimisation, potentially marginalising smaller yet more authentically sustainable businesses. Moreover, the competitive nature of search rankings means that environmental claims may be prioritised for their keyword density rather than their substantive credibility, raising concerns about the amplification of greenwashing.

#### 4.2.4. Social Media Influencers

Influencer marketing is frequently cited as an effective way to humanise sustainability messages [27–29]. Collaborating with environmentally conscious influencers can make sustainability more relatable and actionable. However, inconsistencies arise in the literature regarding authenticity: while Castilla-Miguel and Aramendia-Muneta [29] stress the value of personal storytelling, others note that the commercial nature of influencer–brand partnerships can undermine perceived sincerity. Moreover, the influencer economy is not without its environmental contradictions—frequent product promotions, high consumption visibility, and travel-intensive lifestyles may conflict with the very values that they aim to promote.

#### 4.2.5. Intentional and Trendy Product Packaging

Eco-friendly packaging is often positioned as both a symbolic and practical commitment to sustainability [30,31]. While minimalist design, recyclability, and compostability are celebrated in digital campaigns, some scholars question whether such packaging innovations represent meaningful environmental progress or serve as surface-level brand positioning. The tension lies in whether “trendy” packaging aligns with genuine sustainability or caters primarily to consumer aesthetics, potentially diverting attention from more impactful but less marketable operational changes.

#### 4.2.6. User-Generated Marketing

User-generated content (UGC) is valued for its credibility and peer-to-peer influence [32,33]. Studies consistently show that consumers trust UGC more than firm-generated content (84% vs. 69%) [33]. However, there is debate about the extent to which UGC genuinely reflects authentic consumer experience, given the rise of incentivised content and brand-curated “community posts.” Furthermore, while UGC may amplify sustainability

messages, it also risks reinforcing selective narratives, focusing on easily marketable aspects of sustainability while neglecting systemic or less visually appealing issues.

#### 4.2.7. Corporate Social Responsibility (CSR) and Digital Eco-Branding

CSR and digital eco-branding aim to embed sustainability into a brand's identity [34–37]. While CSR communications can convey transparency and accountability, critics argue that such messaging often overemphasises promotional value, with limited evidence of deep organisational change. Digital eco-branding provides visual and narrative coherence, but this consistency can also mask gaps between stated commitments and actual practices. The literature is divided as to whether these strategies primarily serve marketing goals or genuinely advance sustainability, underscoring the need for independent verification and long-term impact assessment.

### 4.3. Impact of Sustainable Digital Marketing on Consumer Behaviour

While sustainable digital marketing is often portrayed as a catalyst for transforming consumer–brand interactions, the literature reveals a more nuanced and, at times, contested picture. Many studies emphasise its ability to foster trust, satisfaction, loyalty, and inclusivity [38,39], yet others highlight discrepancies between brand narratives and actual outcomes. The emotional and rational appeal of sustainability messaging can indeed encourage mindful consumption, but persistent concerns remain over its susceptibility to superficial adoption, greenwashing, and unequal accessibility. Below, we critically assess the most prominent claimed impacts, noting where scholarly consensus exists and where debates remain unresolved.

#### 4.3.1. Emotional Storytelling Influences Brand Loyalty

Emotional storytelling is widely celebrated as a loyalty driver, with narratives that highlight environmental protection, ethical labour, and community engagement fostering deep emotional bonds [24,40]. Such stories often resonate strongly when they align with consumer values [24,41]. However, while some evidence suggests that these narratives enhance brand affinity and even inspire advocacy, other research cautions that emotional appeal without demonstrable proof of action risks fuelling consumer scepticism. There is also an unresolved tension between storytelling as an authentic engagement tool and as a calculated marketing tactic: when consumers suspect the latter, loyalty can quickly erode. The challenge lies in balancing persuasive narrative with transparent, verifiable commitments—something that the literature agrees is often promised but less consistently delivered.

#### 4.3.2. Enhanced Customer Satisfaction

Many studies connect sustainability integration in digital marketing to heightened customer satisfaction [42–44], noting that consumers value products aligned with ethical standards. However, critics argue that satisfaction gains are uneven: consumers highly engaged with sustainability show strong positive responses, but those with weaker environmental orientations may be indifferent or even resistant to what they perceive as moralising brand behaviour. Moreover, while operational measures such as low-carbon logistics or paperless receipts are praised for reinforcing sustainable lifestyles [43], the actual environmental impact of such measures is rarely quantified, leaving open questions about whether satisfaction stems more from perceived virtue than from tangible change.

#### 4.3.3. Ethical Consumerism

The literature positions sustainable digital marketing as a driver of ethical consumerism [45–49], with ethical certifications and transparent sourcing increasingly used

to educate and influence behaviour. However, some studies warn that these credentials risk becoming symbolic rather than substantive, serving as brand differentiators without addressing systemic supply chain issues. Younger, digitally native consumers are often portrayed as leading this shift [48,49], but inconsistencies emerge: while stated preferences prioritise ethics, actual purchase decisions may still be swayed by price, convenience, or aesthetics. This gap between intention and action remains a persistent point of debate.

#### 4.3.4. Data-Driven Personalisation and Consumer Trust

Ethical, data-driven personalisation can strengthen trust and align marketing with consumer values [14,25,50]. Nonetheless, the literature notes a paradox: while transparency in data use fosters credibility, personalisation strategies can inadvertently raise privacy concerns or perceptions of manipulation. For example, tailoring content to promote sustainable choices is seen as empowering by some but intrusive by others, especially if data sources are opaque. This raises questions about whether trust is built on genuine alignment of values or merely on the careful management of consumer perceptions.

#### 4.3.5. Improved Brand Awareness and Relationship with Brands

Sustainable digital marketing can boost brand awareness and deepen relationships when executed consistently across platforms [31,51–53]. However, some scholars caution against conflating visibility with impact. While sustainability-themed content often performs well in terms of reach and engagement, this does not always translate into deeper brand loyalty or behavioural change. Moreover, the aesthetic and trend-driven nature of digital sustainability campaigns risks commodifying sustainability itself, turning it into a content genre rather than a genuine organisational priority.

#### 4.3.6. Improved Decision-Making from eWOM and Brand Reputation

Positive eWOM and strong digital reputation are often cited as decisive in consumer decision-making [54–56]. Peer-to-peer credibility is indeed powerful, but the literature warns of its fragility: reputational gains can be swiftly undermined by negative publicity, regardless of prior trust-building efforts. Additionally, while consumers may rely on a brand's ethical image as a cognitive shortcut, this can reduce critical scrutiny, allowing inconsistencies between brand image and actual practices to persist unchallenged. Thus, reputation becomes both an asset and a potential liability in the sustainability space [57,58].

#### 4.3.7. Digital Inclusivity Impacts Buying Behaviours

Digital inclusivity, ensuring accessibility across ability, language, and socioeconomic contexts, has been linked to broader market reach and deeper brand engagement [16,59–61]. However, some authors note that inclusivity initiatives are often underdeveloped in sustainability communications, focusing more on symbolic diversity in campaigns than on removing structural access barriers. This raises questions about whether inclusivity in sustainable digital marketing is treated as a core operational value or as a reputational add-on, with implications for its authenticity and long-term influence on purchasing behaviours [62,63].

#### 4.3.8. Positive Brand Perceptions

Positive brand perceptions grounded in sustainability can strengthen loyalty and purchase intentions [32,49,64–66]. However, there is persistent debate over whether these perceptions reflect reality or the success of brand storytelling. Consistent messaging and strategic partnerships are valuable, but without independent verification, they risk reinforcing what some scholars call the “perception–reality gap.” The danger lies in sustainability

becoming a brand identity asset without parallel commitments to measurable, systemic change, leaving the concept vulnerable to charges of greenwashing.

#### 4.4. *How Digital Marketing Impacts Sustainable Purchase Decisions*

The literature largely presents digital marketing as a transformative force in promoting sustainable purchasing behaviour, leveraging technology to influence awareness, values, and choices. However, closer examination reveals both points of consensus and persistent debates. While many studies emphasise its role in fostering responsible consumption, others caution against overestimating its impact, citing risks of superficial engagement, performative sustainability, or uneven effectiveness across consumer segments. Techniques such as green product positioning, influencer collaborations, and online peer networks are frequently credited with driving positive change, but their success often hinges on authenticity, trust, and the avoidance of consumer scepticism. The following subsections critically examine these mechanisms.

##### 4.4.1. Green Product Positioning

Green product positioning is framed as a key differentiator [67], but its actual influence on purchase decisions is contested. While many studies highlight the persuasive effects of eco-labels, certifications, and clear messaging [50,68,69], others warn that consumers may perceive such claims as marketing gimmicks if unsupported by credible evidence. There is also the challenge of “sustainability fatigue,” where constant exposure to green claims diminishes their salience. Even when brands successfully integrate sustainability with aesthetics and functionality [70], there remains the unresolved question of whether such positioning drives systemic behavioural change or simply appeals to already sustainability-minded consumers. This raises concerns about its inclusivity and ability to shift mainstream consumption patterns.

##### 4.4.2. Fear of Missing out Drives Sustainable Purchasing Decisions

The use of FOMO in sustainable marketing [71] illustrates a paradox. On the one hand, urgency and exclusivity, often amplified by social media [71,72], can accelerate the adoption of green products, especially among socially engaged consumers. On the other hand, critics argue that such tactics risk commodifying sustainability, framing it as a passing trend rather than a long-term commitment. While influencer-driven FOMO [73,74] can normalise sustainable habits, there is limited evidence on whether these behaviours persist once the initial excitement fades. This raises the issue of whether FOMO-based strategies foster meaningful engagement or simply exploit social pressures for short-term gains.

##### 4.4.3. Product Environmental Information Transparency

Transparency tools, such as sustainability scorecards and QR codes, are widely regarded as trust-building mechanisms [75–78]. However, inconsistencies emerge regarding their actual utility. While some consumers actively use these tools to guide decisions [79], others experience information overload or question the reliability of brand-provided data. Moreover, there is ongoing debate over whether transparency initiatives genuinely close the intention–action gap or primarily serve as reputational shields for brands. Without third-party verification, transparency risks becoming a symbolic gesture rather than a driver of structural change in consumption patterns.

##### 4.4.4. Influencers and Online Reviews Promoting Sustainable Products

Influencers are often positioned as credible sustainability advocates [73,80], but this credibility is not universal. Sponsorship arrangements can undermine perceived authenticity, especially when influencers promote conflicting lifestyles. While authentic testi-

monials [81] and peer reviews [82,83] can legitimise green products, the literature notes that online discourse is vulnerable to bias, misinformation, and even astroturfing. These dynamics complicate the assumption that digital endorsements inherently foster trust, suggesting that their influence is context-dependent and susceptible to manipulation.

#### 4.4.5. Sustainability-Focused Campaigns

Sustainability campaigns are praised for embedding environmental values into brand narratives [40,84–87], yet their long-term behavioural impact remains unclear. Critics argue that many campaigns prioritise visibility over substantive change, using emotionally charged content to generate engagement without addressing deeper systemic issues. While interactive challenges and user-generated content can increase participation, there is a risk of performative activism, where consumers engage for social recognition rather than genuine commitment. The literature thus questions whether these campaigns can shift ingrained consumption habits or if they merely repackage sustainability as entertainment.

#### 4.4.6. Social Media Exposure and Online Peer Networks

Social media is a powerful amplifier of sustainable behaviours [88], but the role of peer networks in sustaining these behaviours is debated. While communities such as zero-waste groups [89] provide knowledge and reinforcement [90], they can also create echo chambers that reinforce pre-existing attitudes, limiting outreach to less engaged audiences. The virality of sustainability content often prioritises shareability over depth, raising doubts about whether social influence translates into consistent purchasing changes or remains superficial.

#### 4.4.7. Sustainable E-Commerce and Marketing Strategies

Sustainability initiatives extend digital marketing into advocacy, ethical governance, and consumer empowerment [50].

##### (a) Climate Advocacy

Climate advocacy [50,91,92] positions brands as actors in global environmental discourse, but authenticity is critical. Partnerships with NGOs can enhance credibility, yet tokenistic gestures risk public backlash. Some campaigns inspire tangible action, while others face criticism for overpromising or framing activism as brand promotion.

##### (b) Data Privacy-Conscious Marketing

Ethical data practices [50,93] are increasingly recognised as part of social sustainability, but the literature reveals a gap between stated policies and operational reality. While opt-in consent and anonymised analytics build trust, data mismanagement incidents can quickly erode it. Moreover, the alignment between data ethics and environmental messaging remains underexplored, leaving open the question of whether consumers perceive privacy-conscious brands as inherently more sustainable.

## 5. Critical Synthesis

The analysis of sustainable digital marketing strategies reveals not only converging trends but also significant tensions and inconsistencies in the literature. While several studies highlight the positive effects of influencer marketing on sustainable brand perception and consumer engagement [27,29,73,80], others question the long-term credibility of such endorsements, particularly when there is a risk of greenwashing or when financial incentives overshadow authentic advocacy. Similarly, personalisation is widely praised for enhancing relevance and trust [14,25,50], yet ethical debates persist regarding the extent

to which consumer data can be leveraged without compromising privacy or reinforcing algorithmic biases.

Transparency emerges as a recurring driver of trust and informed decision-making [75–79], but its effectiveness is not universally agreed upon; some research warns of information overload, which can overwhelm consumers and reduce the persuasive impact of sustainability claims. Emotional storytelling is another contested area: while it can strengthen loyalty and deepen brand–consumer connections [24,40,41], there is a risk of perceived manipulation if narratives are not substantiated by measurable, verifiable actions.

Moreover, strategies such as FOMO-driven campaigns [71–74] present a paradox, successfully motivating the immediate adoption of sustainable products while potentially fostering short-termism and reducing sustainability to a passing trend rather than a long-term commitment. Likewise, eWOM and online reviews are generally considered to be reliable sources of peer influence [56–60,82,83], yet their susceptibility to bias, fake reviews, and strategic manipulation raises questions about their true capacity to guide responsible purchasing.

Finally, while digital inclusivity is positioned as a catalyst for equitable access to sustainability messages [16,61–64], persistent structural and socioeconomic barriers suggest that inclusivity in practice may fall short of inclusivity in principle. These contradictions highlight an intention–action gap, where the theoretical promise of sustainable digital marketing does not always align with its practical outcomes. Future research should explore these gaps systematically, accounting for contextual, cultural, and technological variables that may mediate or moderate the effectiveness of these strategies.

## 6. Conclusions

The integration of sustainability into digital marketing represents a profound shift in how businesses communicate with consumers, foster trust, and promote responsible consumption. The findings highlight that sustainable development is increasingly driven by the urgent need to address climate change, social inequality, and economic imbalance—factors that are now reshaping contemporary marketing strategies. Rather than focusing solely on product promotion, organisations are increasingly leveraging digital marketing as a platform to embed environmental, social, and economic values into brand narratives and consumer engagement practices. This evolution has given rise to the concept and practice of sustainable digital marketing, which strategically aligns sustainability principles with the capabilities of digital tools and platforms.

Through approaches such as personalised content delivery, social media advertising, influencer partnerships, eco-branding, and user-generated content campaigns, companies are actively shaping consumer attitudes and behaviours in favour of sustainability. These strategies not only support transparency and accountability but also render sustainability more tangible and accessible to a broad and diverse audience.

The impact of sustainable digital marketing on consumer behaviour is multifaceted. Emotional storytelling, for example, strengthens brand loyalty by connecting consumers with shared values and social causes. Today’s consumers are increasingly drawn to brands that demonstrate ethical practices, inclusivity, and transparency. Data-driven personalisation enhances this effect by building deeper trust and satisfaction. Marketing campaigns that integrate sustainable messages in a targeted and emotionally resonant way influence consumer decision-making and encourage long-term brand engagement.

Tactics such as green product positioning, fear-of-missing-out (FOMO) techniques, transparent communication of environmental information, and sustainability-oriented campaigns create persuasive contexts that increase the likelihood of consumers opting for sustainable alternatives. Influencer marketing and peer-to-peer networks further reinforce





Table A1. Cont.

Documents		≤2015	2016	2017	2018	2019	2021	2021	2022	2023	2024	2025	Total
Evaluating the Effectiveness of AI-Integrated Digital Marketing on Consumer Behavior, Brand Perception, and Sales Performance	2024	0	0	0	0	0	0	0	0	0	1	1	2
The Impact of User-Generated Marketing on Creating Greater Audience Connections and Brand Loyalty	2024	0	0	0	0	0	0	0	0	0	2	1	3
Marketing research trends using technology acceptance model (TAM): a comprehensive review of researches (2002–2022)	2024	0	0	0	0	0	0	0	0	0	18	9	27
Exploring how IP marketing (media marketing) influences consumer shopping psychology through quantitative and empirical analysis	2024	0	0	0	0	0	0	0	0	0	0	2	2
Bouncing Back from the Pandemic: Assessing the Implications of COVID-19 on Luxury Brands	2024	0	0	0	0	0	0	0	0	0	2	0	2
Social Responsibility in Digital Context and Consumer Behavior: The Case of Kuwait	2024	0	0	0	0	0	0	0	0	0	1	0	1
Persuading Reluctant Customers: The Online Marketing Communications of Car Sharing Firms	2023	0	0	0	0	0	0	0	0	0	0	1	1
Exploring the role of decision support systems in promoting healthier and more sustainable online food shopping: A card sorting study	2023	0	0	0	0	0	0	0	0	0	3	5	8
Dominant factors influencing consumer satisfaction with the online purchase decision process through social commerce: A study of organic black rice in Indonesia	2023	0	0	0	0	0	0	0	0	0	2	0	2
A study on the influence of product environmental information transparency on online consumers' purchasing behavior of green agricultural products	2023	0	0	0	0	0	0	0	0	3	6	3	12
Perception of Corporate Reputation in the Era of Digitization: Case Study of Online Shopping Behavior on Young Consumers	2022	0	0	0	0	0	0	0	0	1	2	0	3

Table A1. Cont.

Documents		≤2015	2016	2017	2018	2019	2021	2021	2022	2023	2024	2025	Total
Electric vehicles (EV) and sustainability: Consumer response to twin transition, the role of e-businesses and digital marketing	2022	0	0	0	0	0	0	0	0	12	20	7	39
Understanding digital consumer: A review, synthesis, and future research agenda	2022	0	0	0	0	0	0	0	2	12	26	9	49
Examining University Students' Behaviors Towards Online Shopping: and empirical investigation in an emerging market	2022	0	0	0	0	0	0	0	0	4	4	0	8
Implementing experiential marketing in the digital age for a more sustainable customer relationship	2021	0	0	0	0	0	0	4	3	4	8	4	23
Research challenges in digital marketing: Sustainability	2019	0	0	0	1	2	4	10	16	13	15	4	65
Green products: digital marketing and consumer behavior for sustainability	2018	0	0	0	0	0	0	0	1	1	0	0	2
Selected possibilities of using online marketing and online advertising on the Slovak and foreign markets	2017	0	0	0	1	0	0	0	0	0	0	0	1
Advantages and disadvantages between neuromarketing type research and quantitative marketing research	2015	0	2	0	0	0	0	0	0	0	0	0	2
Architecting MexGro: introducing online experience for shopping ethnic products	2013	0	0	0	0	0	0	0	0	1	0	0	1
Understanding consumer purchase intention towards biodegradable footwear: A study	2013	0	0	0	0	1	0	0	0	1	0	0	3
	Total	0	2	0	3	3	4	15	24	56	145	82	335

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