Harnessing Digital Marketing for Sustainable Development: A Comprehensive Review

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Abstract

Digital marketing enables firms to strategically distribute content to their clients and consumers, facilitating two-way contact and exchanges between organisations and audiences. Organisations can use this fact to effectively convey signals about sustainability in their operations and products, aiming to set new trends and shape customer behaviour. Additionally, it lets consumers contribute their experiences, wants, preferences, and expectations. Digital marketing strategies facilitate the dissemination of products and services, demonstrate businesses' commitment to sustainability, and promote emerging sustainable trends that impact consumer perceptions. This study uses Systematic Literature Review with Bibliometric Analysis (SLBA) to examine how digital marketing promotes sustainability. The study demonstrates that digital marketing tactics have a significant role in promoting sustainable development by fostering sustainable consumption behaviours. This situation can be achieved by comprehending customer behaviour, transmitting crucial signals through optimal channels, and proficiently assessing green marketing campaigns' impact on consumer attitudes and purchasing choices.

Keywords: *Digital Marketing, Sustainable Development, Consumption Behaviour*

INTRODUCTION

Digital marketing changed how companies interact with customers. In contrast to traditional corporate-led marketing, social media encourages collaborative and mutually beneficial marketing. Customers can contact brands to voice concerns and complaints. These inputs are subsequently included into a company's plans and product development procedures (Saura et al., 2020). Companies must integrate digital technologies into all their operations due to increased competition from the digital revolution. The digital transformation has created new business models that rely on two-way communication between firms and Internet consumers and increased digital technology use (Arantes, 2022). Digital marketing takes use of global Internet and social media adoption to reach a big number of people. (Hidayat et al., 2022). It is regarded as a novel approach to establishing and sustaining interactions with contemporary customers, enhancing brand visibility, boosting sales, and fostering a more profound comprehension of the target customers, their requirements, and preferences (Saura et al., 2020). These goals are achieved via a variety of digital marketing strategies, including SEO, SEM, influencer, and social media marketing. While digital marketing offers several advantages and possibilities, there is a rising concern about its effect on sustainability and sustainable development. Global customers, as well as governmental and non-governmental entities, censure businesses that engage in unsustainable activities, disregarding the environmental, economic, and social repercussions. Consequently, the majority of organisations have embraced sustainable business structures and marketing practices. (Hidayat et al., 2022) argue that the contemporary field of marketing now embraces a more sustainable strategy. Therefore, sustainable marketing has gained significant popularity in the corporate world and marketing research as companies adapt their strategies to tackle sustainability concerns. (Linnenluecke et al., 2020) Nevertheless, (Jevtić & Milovanović, 2023)suggest that although there is an understanding of the connection between sustainability and marketing, there is still a noticeable gap in demonstrating their relationship. Therefore, this research study aims to rectify this deficiency of knowledge by conducting a methodical bibliometric literature review (LRSB) that integrates data from 60 studies to illustrate the correlation between sustainable development and digital marketing.

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MATERIALS AND METHODS

The study employs a LRSB to collect, analyse, and synthesise data on digital marketing for sustainable development. The research approach was chosen since it forms the basis for performing a thorough, dependable, and accurate investigation. For example, LRSB employs a methodical and predetermined search criterion, allowing the researcher to gather a diverse array of scholarly papers pertaining to the particular research subject (Linnenluecke et al., 2020). Additionally, it enables the identification of trends and patterns in the literature by facilitating the examination of substantial quantities of data. This procedure is comprised of six processes and is divided into three phases. (Rosário et al., 2022; Rosário & Dias, 2022, 2022)

Table 1. Systematic literature review and evidence-based research synthesis.

Stages	Procedure and Explanation	
Exploration	1.	Defining the research problem
	2.	Conducting a search for relevant literature
	3.	Evaluation of specific studies
Interpretation	4.	Aggregation of data from individual sources
Communication	5.	Presenting research findings and proposing potential courses of action
	6.	Report Presentation through the SLRBA

Resource: Author of the original work.

This method relies on SCOPUS, a major online peer-reviewed database for indexing scientific literature. The SCOPUS database is only utilised within an academic framework. It serves as the primary repository of research articles for scholarly publications, encompassing almost 19,500 titles from over 5,000 global publishers. These 16,500 peer-reviewed periodicals cover several scientific fields. This allows for objective appraisal of scientific and academic value of examined subjects. However, our study used only Scopus and excluded other academic databases. (Rosário et al., 2022; Rosário & Dias, 2022, 2022)

The technique began with a thorough Scopus literature search for "digital marketing." Finding study-related sources was the goal of this stage. A diversified set of 3,093 sources (N=3,093) was constructed for the search query. The document count was reduced to 60 by including "sustainable development" to focus the search and get more relevant results. These documents were reviewed and compiled into the report.

Table 2. Screening methodology.

Data from Scopus	Screening	Publications
Meta-search	keyword: digital marketing	3,093
Inclusion Criteria	keyword: digital marketing, sustainable development	60
Screening	keyword: digital marketing, sustainable development	
	Published until May 2023	

Resource: Author of the original work.

LITERATURE ANALYSIS: TRENDS AND THEMES

Most peer-reviewed papers (16) were published in 2021. Through May 2023, Figure 1 shows peer-reviewed journals. Sustainability Switzerland (7), E3s Web of Conferences (3), Lecture Notes In Networks And Systems (3), Iop Conference Series Earth And Environmental Science (2), Proceedings Of The 30th Ibima 2017 Vision 2020 Sustainable Economic Development Innovation Management And Global Growth (2), Smart Innovation Systems And Technologies (2), and the rest 1 each. Research on digital marketing for sustainable development has increased since 2018.
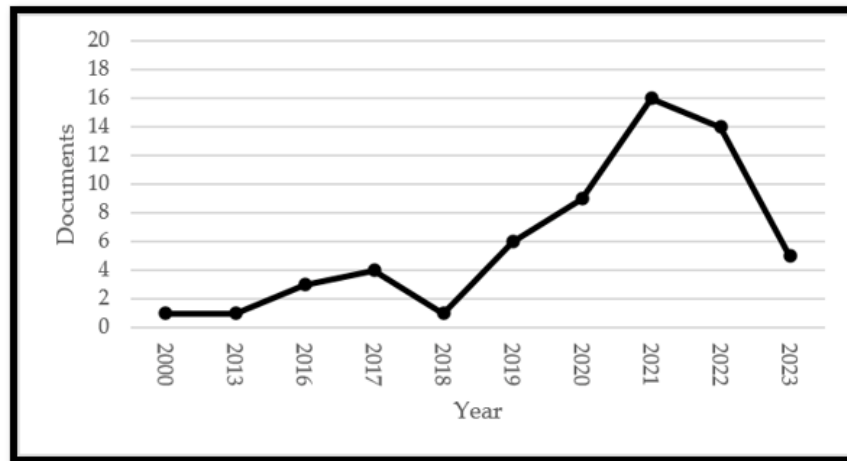
Figure 1. Documents by year.

Resource: Author of the original work.

H index per publication and top quartile are examined in Table 3 of the Scimago Journal & Country Rank (SJR). The following publications address this study's themes: The top academic journal is Earth's Future Journal, with a Scimago Journal Rank (SJR) of 2,510, Q1 ranking, and H index of 61. Q1 has 12 journals, Q2 8 journals, Q3 2 journals, and Q4 6 journals. Best quartile Q1 includes 22% of 55 journal titles. Q2 had 15%, Q3 4%, and Q4 3% of 11 journal titles. Data-free publications total 27 (49%).

Table 3 shows that most Sustainability of Educational Entrepreneurship papers are in Q1, the highest quartile index.

Table 3. Impact factor by Scimago journal and country.

Title	SJR	Quartile	H Index
Journal of Cleaner Production	1.98	1	268
Sustainability Switzerland	0.66	1	136
Journal of Environmental and Public Health	0.60	2	47
Optik	0.54	2	92
Technology in Society	1.49	1	69
Foresight	0.48	2	36
Worldwide Hospitality and Tourism Themes	0.42	2	28
Environmental Impact Assessment Review	1.36	1	107
Planning Malaysia	0.25	3	13
Studies In Computational Intelligence	0.21	4	81
Iop Conference Series Earth and Environmental Science	0.20	-	41
Ceur Workshop Proceedings	0.20	-	62
Communications In Computer and Information Science	0.19	4	62
Emerald Emerging Markets Case Studies	0.19	4	7
E3s Web of Conferences	0.18	-	33
Smart Innovation Systems and Technologies	0.17	4	31
Lecture Notes in Networks And Systems	0.15	4	27
Abac Journal	0.15	1	6
Risti Revista Iberica De Sistemas E Tecnologias De Informacao	0.15	4	16
IEEE Transactions on Engineering Management	1.00	1	103
International Journal for Quality Research	0,30	3	24
2020 10th International Conference on Advanced Computer Information Technologies Acit 2020 Proceedings	0	-	8
31st International Electric Vehicle Symposium and Exhibition Evs 2018 And International Electric Vehicle Technology Conference 2018	0	-	5
Actual Problems of Economics	0	-	19
Advances In Intelligent Systems and Computing	0	-	58
Engineering For Rural Development	0	-	18
International Journal of Advanced Science and Technology	0	-	20

International Journal of Management	0	-	9
Proceedings Of The 27th International Business Information Management Association Conference Innovation Management and Education Excellence Vision 2020 From Regional Development Sustainability to Global Economic Growth Ibima 2016	0	-	8
Proceedings Of The 3rd World Conference on Smart Trends in Systems Security and Sustainability Worlds4 2019	0	-	5
Proceedings Of The 5th International Conference on Management Leadership and Governance Icmlg 2017	0	-	3
Proceedings Of the European Conference on Innovation and Entrepreneurship Ecie	0	-	7
Proceedings Of The 30th International Business Information Management Association Conference Ibima 2017 Vision 2020 Sustainable Economic Development Innovation Management and Global Growth	-	-	-
2019 International Conference on High Technology for Sustainable Development Hitech 2019	-	-	-
2021 International Conference on Information and Communication Technology for Sustainable Development Icict4sd 2021 Proceedings	-	-	-
2022 IEEE German Education Conference Gecon 2022	-	-	-
Sustainable Development Hitech 2020 Proceedings	-	-	4
Metrics Wetsom	-	-	-
Economic Innovation Development Conference Msieid 2020 And Internet Technology Ecit 2021	-	-	-
International Conference on Computing Majicc 2022 Research	-	-	-
And Improve Operational Efficiency	-	-	-
3rd International Conference on High Technology For	-	-	-
Application Of Machine Learning in Agriculture	-	-	-
International Workshop on Emerging Trends in Software	-	-	-
Proceedings 2020 Management Science Informatization And	-	-	-
Proceedings 2nd International Conference on E Commerce	-	-	-
Proceedings Of 2020 IEEE International Conference on Information Technology Big Data and Artificial Intelligence Iciba 2020	-	-	-
Proceedings Of The 2022 Mohammad Ali Jinnah University	-	-	-
Proceedings Of the International Conference on Tourism	-	-	-
Social And Sustainability Marketing a Casebook for Reaching Your Socially Responsible Consumers Through Marketing Science	-	-	-
Sport Business Analytics Using Data to Increase Revenue	-	-	-
Springer Proceedings in Business and Economics	-	-	-

Note: *data not available. Resource: Author of the original work.

Topics covered in 60 research and scholarly documents: Computing (29), Engineering (22), Business, Management, and Accounting (20), Energy (18), Social Sciences (18), Environmental Science (17), Decision Sciences (12), Economics, Econometrics, and Finance (10), Earth and Planetary Sciences (5), Mathematics (5), Arts and Humanities (2), Chemical Engineering (2), Materials Science (2), Medicine (2), Agricultural and Biological Sciences (1). The most cited article was (Kuzior et al., 2021) "Post-industrial tourism as a driver of sustainable development" (2021). The Sustainability article was mentioned 33 times. A high quartile (Q1) journal, its SJR is 0.660. Paper's H index is 109. Post-industrial tourism is affected by economic, environmental, and digital marketing. Gender, age, education, and digital channel attitudes on post-industrial tourism are examined.

Figure 2 shows citation progression. An R^2 value of 62% indicates positive net growth in citations in 2022. There were 77 citations, totalling 185.
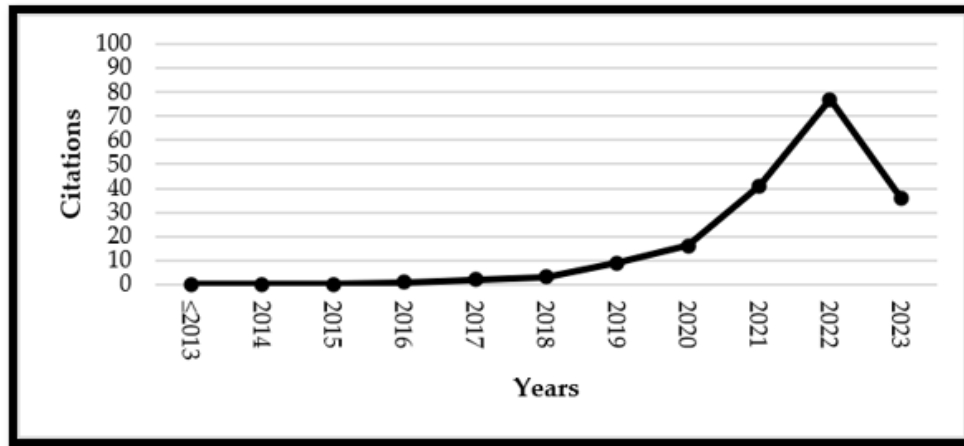
Figure 2. Citation trends from 2013 to May 2023.

The h-index measures the productivity and effect of published works by identifying the highest number of publications with equal or more citations. Seven h-index documents were cited at least seven times. The analysis in Appendix A, Table A1, covers scientific and academic citations through May 2023.

The scientific programme VOSviewer analyses bibliometric data to identify Digital Marketing for Sustainable Development study keywords. Here, network nodes dominate. In this instance, "node dimension" means keyword frequency. The simultaneous presence of the keywords is demonstrated by the graphic representation of the nodes. Keyword co-occurrence thickness indicates the frequency of two or more terms occurring together. Node breadth, depth, keyword co-occurrences, and keyword frequency are positively correlated. The cluster's nodes and links can show the nodes' topic and relationships. Each cluster hue represents a topic cluster. The list (Rosário et al., 2022; Rosário & Dias, 2022, 2022).
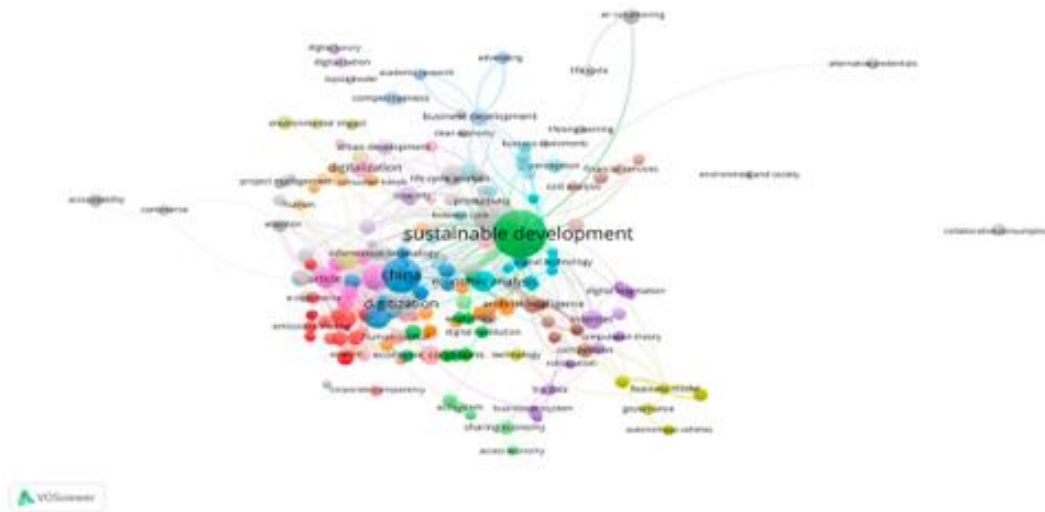

Figure 3. Keyword network.

Diagram 4. Keyword Interconnection.

The study employed Digital Marketing for Sustainable Development papers. Figures 3 and 4 show our research keywords and how they are linked in each scientific article. This aids researchers in subject comprehension and topic selection. The Vosviewer keyword development map in Figure 4 comprises three categories. Cluster 1 is blue and trade-related. Red Cluster 2 focuses on internet buying. Finally, green cluster 3 is Big Data.

Figure 5. Illustrates the abundance of co-citation.

THEORY-BASED VIEWPOINTS

Digital marketing is a strong method to increase awareness, change behaviour, and engage a global audience as climate change and sustainability grow more essential. Digital marketing strategically promotes sustainable company practices, products, and activities online, supporting sustainable development (Hwangbo & Kim, 2019). Social media campaigns, influencer collaborations, content marketing, and targeted advertising encourage people to live sustainably, support eco-friendly products, and work together to protect the environment. The internet's reach and ease of use enable long-term growth in digital marketing. Businesses and individuals can use digital technology's transformative power.

An Overview of Digital Marketing

Technology has changed marketing, necessitating adaptive tactics to compete. Digital technologies collect and evaluate customer and market data, enabling data-driven decision-making and expanding target demographics. Thus, digital marketing is essential to modern marketing techniques. (Almansour, 2022; Kasurinen et al., 2017).

The Digital Marketing Institute offers a precise explanation, stating that digital marketing entails using digital technology to create a unified, targeted, and measurable communication strategy that helps in acquiring and retaining clients, while also building stronger connections with them (Jevtić & Milovanović, 2023). (Ali & Xia, 2022) Define it as the utilisation of digital technologies to engage with stakeholders, including customers and investors, in order to discuss the organization's performance, products, and brand.

Digital marketing can be classified into two main categories: direct marketing and interactive marketing. Direct marketers place a high importance on understanding the target customers by attentively watching their personalities and behaviours (Luo, 2020). To create a successful digital marketing strategy, it is essential to integrate both approaches to acquire a comprehensive understanding of clients and execute precise marketing campaigns (Romprasert & Trivedi, 2021). Direct marketing may provide useful data on customers' online behaviours and actions, while interactive marketing can offer insights into their desires, preferences, and expectations.

Combining these findings can create a comprehensive, customer-centric advertising strategy that meets client needs and is distributed throughout their preferred communication channels (Shali & Yuande, 2020). Digital marketing can be direct or interactive, Direct marketers focus on understanding target customers' personalities and behaviours (Luo, 2020). Instead, interactive marketing stresses client participation through direct communication and feedback. Integrating these approaches is key to a successful digital marketing strategy to understand clients and execute accurate campaigns (Romprasert & Trivedi, 2021). Direct marketing can reveal customers' online habits, whereas interactive marketing can reveal their preferences and expectations.

These observations can be combined to develop a thorough, customer-centric advertising strategy that aligns with client requirements and is distributed across their chosen communication channels (Shali & Yuande, 2020).

Digital Marketing Techniques

Companies employ various techniques to achieve digital marketing goals and leverage online opportunities. For instance, they create and distribute valuable and engaging content in multiple formats, such as blogs, podcasts, and infographics (Romprasert & Trivedi, 2021). This strategy establishes them as industry thought leaders and drives high search engine rankings for websites with useful content. The analysis revealed various digital marketing tactics.

Search Engine Optimization

SEO uses search engine results pages (SERPs) to boost a website's exposure and organic (non-paid) traffic. Digital marketers utilise SEO to improve a website's relevancy to user searches and search engine appeal. (Berman & Katona, 2013) Content generation, link building, UX optimisation, analytics and tracking, on-page optimisation, technical SEO, and keyword analysis are the main parts. SEO improves a website's search engine

rankings, increasing its visibility to the target demographic and traffic and conversion rates. (ALMUKHTAR et al., 2021). These goals are achieved in two significant ways, on-page and off-page optimization strategies.On-page optimization involves optimizing elements within the website, such as meta descriptions, title tags, page loading speed, internal linking, content quality and relevance, and image optimization(Berman & Katona, 2013). On the other hand, off-page optimization focuses on external factors such as backlinks and social signals. Implementing effective SEO strategies helps businesses achieve the desired digital marketinggoals.

Search Engine Marketing

SEM promotes websites by using sponsored advertising on Search Engine Results Pages (SERPs). Paid search advertising, specifically PPC advertising, generates targeted website traffic (Vasiliev, 2021). Search Engine Marketing (SEM) focuses on Google, Bing, Twitter, Facebook, and Amazon ads. The process includes generating ad copy, executing paid search advertising, arranging a campaign, testing and experimenting, tracking conversions and analytics, and keyword research (Jevtić & Milovanović, 2023). Digital marketers use Search Engine Marketing (SEM) to improve their SERP visibility, target specific consumers, and use tracking and analytics tools to outperform competitors (Pan et al., 2021). Based on their marketing goals, SEM lets organisations define bidding techniques, budgets, and targeting parameters for their advertising campaigns. Advertisers can target internet users by location, demographics, or phrase.

Social Media Marketing

Social media marketers advertise brands, services, and products. These mediums engage target audiences, enhance website traffic, and boost conversion rates. SMM involves creating and sharing content, targeting advertising, and engaging on Facebook, Twitter, and Instagram to meet marketing goals. It increases brand awareness, reputation, and audience engagement. Social media also helps digital marketers access consumer demographics, interests, and behaviours. (Shiqun et al., 2021). SMM companies target customer interests, demands, and pain areas using social media analytics and insights to get a competitive edge.

Search Engine Marketing

SEM uses SERP advertising to promote websites and enhance visibility. It attracts targeted website traffic with Pay-Per-Click (PPC) advertising (Vasiliev, 2021). SEM focuses on Amazon, Google, Bing, Twitter, and Facebook ads. Ad copy, paid search advertising, campaign structure, testing, experimenting, conversion tracking and analytics, and keyword research are all part of it (Pan et al., 2021). SEM increases SERP visibility, targets a specific audience, and uses tracking and analytics tools to evaluate performance and outrank competitors (Pan et al., 2021). SEM lets firms design bidding strategies, set budgets, and alter targeting settings based on their marketing goals. They can tailor their ads to online visitors by geography, demographics, or keyword.

Social Media Marketing

Digital marketers use social media platforms to promote products, services, and brands through social media marketing (SMM). These channels help them engage target audiences, improve website traffic, and boost conversion rates. To achieve marketing goals, SMM entails developing and distributing content, running targeted advertising, and fostering interactions on Facebook, Twitter, and Instagram. It boosts brand awareness, audience engagement, and reputation. Social media also help digital marketers understand customer behaviours, demographics, and preferences (Shiqun et al., 2021). SMM companies target customer interests, demands, and pain areas using social media analytics and insights to get a competitive edge. This data improves campaign effectiveness by informing product development, content creation, and marketing strategies.

Programmatic Advertising

Automated technologies and algorithms buy and sell advertising space quickly in programmatic advertising. It optimises ad buying and placement using digital and data-driven methods (Busch, 2016). Programmatic advertising automates digital ad space purchases and sales in a complex network of advertisers, publishers, ad exchanges, and DSPs (Rakic & Rakic, 2013). This process begins with an advertiser setting ad criteria, including

target audience, budget, and goals. Data analytics and audience segmentation help advertisers target demographics, behaviours, interests, and locales. It ensures that ads target the right audience (Campbell & Farrell, 2020). Publishers can sell their ad inventory on ad exchanges. Thus, advertisers and their Demand-Side Platforms (DSPs) use ad exchanges to bid on ad spots in real-time auctions utilising algorithms. Data-driven targeting lets advertisers offer targeted ads to the right audience at the right time through the best channels (Busch, 2016; Rakic & Rakic, 2013). This improves campaign performance, ROI, and digital advertising strategy. Increased productivity, expandability, and immediate optimisation are other benefits.

Influencer Marketing

Influencer marketing uses celebrities to promote products, services, and companies. Influencer content boosts niche expertise and devotion. Their views influence consumer purchases. Campbell and Farrell (Taylor, 2020) estimate that influencer marketing will be worth US$101 billion in 2020, with 75% of advertisers using influencers and 43% wanting to invest more. Another Taylor survey (Colicev et al., 2019) found that 48% of millennials and 58% of Gen Z have bought anything celebrity-recommended. ANA found 75% of consumers used influencer marketing in 2018. The numbers show that influencer marketing may reach a target audience through credible speakers. Influencers' reach and authenticity help brands reach new audiences, build recognition, engage, and convert.

User-Generated Content (UGC)

UGC via social media and the Internet enables users share their opinions and advice. UGC in digital marketing is content created by brand customers (Krasnov et al., 2019) It includes reviews, testimonials, images, videos, social media entries, and blogs. UGC delivers an honest view of a company's products, unlike Firm Generated Content (FGC), which is developed and maintained by marketing experts(Sofia Asonitou et al., 2019). Credibility and trust increase the likelihood of converting prospects into consumers. Because of their relatability, readers or observers with comparable problems are more likely to acquire the same products. Digital marketers use UGC to address client needs in product development and marketing initiatives.

Sustainable Development

Awareness and concerns about company environmental implications have spread sustainable development. The approach integrates sustainability and development (Dimitrov & Koprinkova-Noncheva, 2020). A nation develops when its natural resources and systems are sensibly and sustainably managed to meet population requirements. Economic expansion and changes in important social structures, attitudes, and institutions are also involved (Haryati, 2021). To end absolute poverty and inequality, developed nations deploy resources and systems. Sustainability promotes human progress by sustaining healthy economic, environmental, and social systems. It involves equitable and effective resource distribution between generations and socioeconomic activity within a constrained ecosystem (I. Kamenidou et al., 2020; Mensah, 2019).

Sustainable development ensures future generations can use resources. Thus, Mensah (Kuzior et al., 2021) defines it as "development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs." This notion ensures that economic activities don't harm the environment and threaten the future. Sustainable development explores ways to improve people's lives while protecting the environment (Nagano, 2019). This means the operations should not cause deforestation, water, or air pollution, which can cause species extinction and climate change. Therefore, sustainable development supports ecological balance, social advancement, and economic growth (Vasiliev, 2021). This balance is difficult to achieve because the world population grows while natural resources to meet their demands do not.

Pillars of Sustainable Development

Sustainability concepts aim to balance economic growth, environmental protection, and social progress while meeting existing demands without compromising future generations. Thus, these pillars cover economics, society, and environment.

Economic Sustainability

Economic sustainability is an economy's ability to expand and improve while minimising harm to society and the environment. It emphasises responsible resource use, capital allocation, and fair economic opportunity. Sustainable economic growth is environmentally sustainable, socially inclusive, and financially viable (Romprasert & Trivedi, 2021). This includes boosting economic activities, supporting innovation and technical progress, and creating jobs. Additionally, economic sustainability promotes resource efficiency (Tamanna, 2021; Tunji-Olayeni et al., 2021). This situation requires business leaders to eliminate waste, maximise resource efficiency, and promote circular economy concepts.

Additionally, economic sustainability encourages responsible business. These include CSR and ethics promotion. Companies that care about economic sustainability prioritise social and environmental good (Vodă et al., 2021). They prioritise equitable economic possibilities, eliminating income disparity, increasing education and healthcare, and offering equal opportunity (Ajmal et al., 2018). Thus, this method encourages fair trade, addresses social barriers, and ensures equitable distribution of economic advantages.

Social Sustainability

Sustainable development's social dimension emphasises human development. It prioritises long-term societal well-being, equity, and justice. According to (Ajmal et al., 2018) , social sustainability seeks social fairness, better livelihoods, and greater status for vulnerable or marginalised individuals. Thus, it fosters community and individual well-being (De Freitas Netto et al., 2020). Social sustainability emphasises inclusive societies with equal rights, opportunities, and access to basic services. This supports Mensah's (Kuzior et al., 2021) claim that social sustainability should assist people, cultures, and communities live meaningful lives. It should consider global stability, peace, gender equality, education, and healthcare (De Freitas Netto et al., 2020). Thus, social sustainability promotes resource distribution, social equality, and human rights. Businesses and leaders who practise social sustainability address poverty, prejudice, gender inequity, and social exclusion (Harrison & Bukstein, 2016). They encourage community participation and collaboration to address local concerns and improve quality of life through programmes that build strong and resilient communities.

Environmental Sustainability

Sustainability advocates protect and sustain the environment for future generations. Sustainability promotes conservation, biodiversity, and environmental impact reduction. Environmental sustainability supports the sustainable use of natural capital so resources are not exploited faster than regenerated, claims Mensah (Kuzior et al., 2021). The researcher adds that safeguarding the ecosystem requires ejecting garbage faster than it is digested (Mensah, 2019). These arguments acknowledge that the earth's ecology has boundaries where balance must be maintained to prevent severe repercussions. Communities, corporations, and individuals must work together to safeguard forests, oceans, water sources, and land from deterioration and overexploitation (Zhang et al., 2023). Additionally, they must support sustainable land use, water management, and biodiversity preservation initiatives. Recent years have seen unparalleled global economic growth, straining the planet's biosphere. Industrialization, urbanisation, and mining have increased deforestation, unsustainable water harvesting, and resource exploitation (Zakic et al., 2022). These techniques have boosted global economic growth and living standards, but Mensah (Kuzior et al., 2021) observes that they have strained the planet's environment even more. Gas emissions, energy consumption, and natural resource overexploitation are all linked to industrialization. Global warming and climate change affect human and animal health (I. Kamenidou et al., 2020). Thus, environmental sustainability advocacy has increased to mitigate climate change, reduce greenhouse gas emissions, switch to renewable energy, and improve energy efficiency (Wut et al., 2021).

Role of Digital Marketing in Sustainable Development

Digital marketing is increasingly important for sustainable development in the digital age. Digital marketing can boost economic growth, social responsibility, and environmental sustainability (Eisenschink et al., 2022). Digital marketers can reach and engage a worldwide audience via the Internet and social media. They can use this

occasion to raise global environmental awareness, promote sustainable consumerism, and support sustainable products (Morais et al., 2016).

Utilizing Digital Platforms for Awareness and Education

Digital marketing raises environmental, social, and sustainability awareness through social media, websites, blogs, and commercials. Organisations can use these platforms to develop interactive sustainability content for the public. Articles, movies, infographics, and interactive campaigns about environmental issues and solutions can help. Almansour's study(Almansour, 2022) shows that entrepreneurs may use digital platforms and technologies to spread climate change, renewable energy, waste management, conservation, and ethical consumption information worldwide. Effective audience targeting and segmentation strategies enable effective dissemination of sustainability messages (Ghalwash et al., 2022; Zhou, 2022). Certain locations face more environmental issues. Digital marketing targeting could assist local organisations receive focused messages. Customising information and campaigns can help digital marketers persuade individuals, communities, and businesses to adopt sustainable practices.

Promoting Green Economy and Eco-Friendly Products and Services

A green economy encourages sustainable development and reduces environmental damage. It includes ecological preservation, resource efficiency, sustainable economic growth and job creation, social inclusion and equity, and climate change resilience (Imran et al., 2023). Digital marketing fosters a green economy by raising awareness and encouraging sustainable consumption. It also gives businesses a great platform to promote their eco-friendly products and services and increase awareness of the need of supporting them(Azman et al., 2021). For instance, companies can utilise their website to accurately describe their products' sustainable qualities including energy efficiency, recyclability, renewable materials, and reduced carbon footprint (Carneiro et al., 2000).

Encouraging Behaviour Change Through Digital Campaigns

Digital campaigns enhance awareness of the environmental, economic, and social impacts of specific behaviours via tailored messaging and attractive content. This fosters sustainable consumption decisions (Zaušková & Rezníčková, 2020). Digital marketers and companies can use these efforts to address energy, waste, water, sustainable transport, and responsible consumerism. Digital marketing tools and platforms help understand audience preferences, interests, and motivations (Cano et al., 2022; Oliva Martins et al., 2021) . This information can be used to tailor marketing messages to target groups and affect behaviour. According to (Eisenschink et al., 2022) , social media platforms can be used to promote sustainable lifestyles by showcasing positive role models, sharing success stories, and creating online communities that promote sustainable behaviours.

Implementation of Sustainable Business Models

Businesses must embrace sustainable business strategies as sustainability and sustainable development become buzzwords. (Zhang et al., 2023) define these business models as incorporating environmental, social, and economic concerns into firm operations and choices. Businesses should utilise eco-friendly products and invest in eco-friendly technologies to reduce their environmental effect. Finally, economic sustainability encourages businesses to be profitable and consider their long-term effects (Gustavo et al., 2021; Karbekova et al., 2019). Combining these sustainability factors allows companies to create business models that satisfy all stakeholders (Tkachuk et al., 2020). Economic aspects ensure shareholder revenue, social aspects safeguard employees and customers, and environmental aspects optimise resource use. Sustainable business models create long-term value and competitive advantage.

Challenges in Adopting Digital Marketing for Sustainable Development

Digital marketing helps organisations encourage sustainable development, but it also presents obstacles. Technology necessitates extensive customer data acquisition for digital marketing. Due of their vulnerability to hackers, these technologies raise data security risks. Another issue is when brands purposefully misrepresent

their sustainability efforts to influence consumers. These broad challenges emphasise the necessity to identify and examine digital marketing implementation barriers for continuous success.

Greenwashing

Greenwashing is a major obstacle to sustainable digital marketing. According to (De Freitas Netto et al., 2020), greenwashing involves misrepresenting a company's environmental practices or performance through positive communication. Businesses are under intense pressure from customers and environmental groups to go green. Most organisations spend in green marketing to promote their products and services as socially and environmentally sustainable (Karyotakis & Antonopoulos, 2021; Muangasame & Tan, 2023). Since sustainable brands are more likely to sell, most corporations deceive influencer customers' brand attitudes and intents.(De Freitas Netto et al., 2020) found that "95% of products claiming to be green in Canada and the USA committed at least one of the "sins of greenwashing," from the hidden trade-off to worshipping false labels." Digital marketing technologies are often used by companies to greenwash their sustainability initiatives, products, and services (Kenneth Revett et al., 2017).

Digital Divide and Inclusivity

The digital gap and inclusivity hamper sustainable development digital marketing adoption. Between those with Internet and digital technology access and those without is the digital divide (Ghalwash et al., 2022). Digital marketing inclusiveness is about reaching and benefiting different audiences, particularly marginalised and disadvantaged groups (Vodă et al., 2021) Despite economic and technological advances, many rural and remote places lack dependable internet connectivity and digital technology (Cano et al., 2022). In addition, low digital literacy and abilities hamper digital marketing engagement. These constraints hinder access, making digital marketing efforts and sustainability communications harder to reach.

Privacy and Data Protection

Cyberattacks and consumer data theft have raised privacy and data protection issues. Personal customer data is crucial to digital marketing (Zakic et al., 2022). Thus, protecting personal data is essential for trust and sustainability (Eisenschink et al., 2022). However, failure to obtain consent before data collection, inadequate data security and protection measures, failure to comply with data protection regulations, and unethical data usage hinder the efficient use of digital marketing to support sustainable development (Shiqun et al., 2021). Customers lose trust in an organization's ability to preserve their personal data, so they remove some information or refuse to contribute data that could improve a brand's audience targeting and segmentation.

CONCLUSIONS

The Internet and social media have changed marketing worldwide, pushing a move to digital. Instead of traditional marketing, digital marketing engages consumers in interactive communication and engagement. Customers can actively create value by communicating their experiences, wishes, preferences, and expectations. Digital platforms allow marketers to watch consumer activity and offer targeted messaging. Commercial sustainability, social welfare, and environmental protection are sustainable development priorities. Sustainable enterprises minimise social and environmental harm. These companies recycle, manage waste, and deploy energy-efficient technologies.

Digital marketing techniques can promote sustainability. Climate change and global warming education can be found on company websites. Eco-friendly products and services enhance the sustainable economy. They may promote sustainability and attract eco-conscious shoppers using SEO and content. Digital marketers may introduce consumers to sustainable products and services. These digital platforms allow companies, consumers, and environmental organisations to collaborate on successful solutions due to the Internet's widespread availability.

To attain these goals, digital marketing and sustainable development issues must be addressed. Greenwashing has increased due to business mandates to reduce their environmental impact. When companies lie about their sustainability efforts and outcomes. Brands frequently greenwash to improve consumer views. Second, privacy

and security. Cybersecurity remains a major threat despite data and system restrictions. More investments and initiatives to reduce the digital divide and promote inclusion are needed for equal resource distribution and access. These concerns impact environmental protection, social fairness, and economic growth in sustainable development.

Digital marketing has enormous theoretical and practical effects on sustainable development. Some main effects: User typed one letter. (i) Digital marketing expands sustainable businesses' reach. It may share their sustainability activities, products, and services with a global audience, breaking down geographical barriers and increasing accessibility; and it can raise awareness of sustainable practices and modify behaviour. Digital campaigns can inspire sustainable living through targeted advertising, content marketing, and social media. Data from digital marketing can be utilised to examine consumer behaviour. Companies can use this data to identify sustainability trends, preferences, and consumer expectations.

Implementing digital marketing strategies helps reach sustainable development goals. Audience and information accessibility changes behaviour, data-driven decision-making, cooperation, measurement, responsibility, cost efficiency, transparency, storytelling, global advocacy, and effect. Different digital marketing studies for sustainable development may improve it. Future researchers may focus on certain locations. (i) Develop sustainable product and service digital marketing strategy. Understanding consumer behaviour, identifying key themes and channels, and assessing how eco-friendly marketing efforts effect consumer attitudes and purchasing decisions; exploring how digital marketing may promote sustainable consumption. Researchers may use social norms and gamification to encourage sustainable decision-making. Digital platforms enable sharing economies and collaborative consumerism, which researchers may study. Data analytics and machine learning may help them detect sustainable consumption trends and customer behaviour. To increase sustainable behaviour change, researchers can analyse how digital marketing campaigns and interventions effect customer decision-making and develop prediction models. They can also analyse how targeted marketing promotes sustainability. Sustainability-focused marketing, recommendations, and incentives can be tailored using user data. Development of tools to assess digital marketing tactics' environmental and social implications is also required. This may require frameworks and measurements to evaluate marketing, digital platforms, and e-commerce sustainability.

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