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Master Degree Program in
Data-Driven Marketing

AI and Green Creativity

Using Generative AI to enhance sustainability in social media
marketing.

Lorenzo Troglia

Master Thesis

presented as partial requirement for obtaining a Master's Degree in Data-Driven Marketing

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação

Universidade Nova de Lisboa

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AI AND GREEN CREATIVITY

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by

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Master Thesis presented as partial requirement for obtaining the Master's degree in Data-Driven Marketing, with a specialization in Marketing Analytics.

Supervised by

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July, 2025

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledge the Rules of Conduct and Code of Honor from the NOVA Information Management School.

Lorenzo Troglia

Lisbon, 10/07/2025

DEDICATION

This work represents not only the culmination of my academic journey but also a testament to the unwavering support and inspiration I received along the way. It is with profound gratitude that I dedicate this thesis.

Firstly, I wish to express my sincerest appreciation to my supervisor, Professor Vitor, whose constant support, valuable advice, and insightful feedback significantly shaped this research. His continuous encouragement and expert guidance throughout this challenging year of writing were instrumental in achieving this milestone. Additionally, I extend my sincere gratitude to Nova IMS, Universidade Nova de Lisboa, for providing me with the extraordinary opportunity to pursue this Master's degree program in Data-Driven Marketing. The knowledge and skills acquired have not only enriched my academic perspective but have also opened professional opportunities even before completing this journey.

This journey would not have been possible without the emotional and intellectual support of those closest to me. To my partner, Constança, whose patience, love, and encouragement have been my anchors during the most challenging moments, I offer my heartfelt thanks. A special thanks also goes to the team of freelancers at my agency, Brave, whose talent, creativity, and dedication have been instrumental in both my professional and personal successes during this period. To my dear friends—Loris, Rafael, Andrea, Fred, Adelaida, and my entire group from Torino—I owe immense gratitude for their constant support, motivating me to persevere, maintain focus, and overcome difficulties.

A special and heartfelt acknowledgment is dedicated to my parents and my family, who have always believed in me and supported me both financially and motivationally throughout this academic journey. Their sacrifices, generosity, and encouragement have been my foundation, allowing me to focus entirely on my goals. Their love and trust in my potential are deeply appreciated, and I am eternally grateful for their invaluable support.

Reflecting upon this journey, there were moments of profound doubt when completing this thesis seemed an insurmountable challenge. However, it was continuous motivation and my resolve not to give up that fueled my perseverance. Echoing the sentiments of classical literature, as Seneca wisely stated, "Non est ad astra mollis e terris via"—there is no easy path from the earth to the stars. Similarly, Plato reminds us that "the beginning is the most important part of the work," emphasizing the importance of courageously undertaking challenging endeavors.

Thus, with immense pride and profound humility, I dedicate this thesis to all those who, driven by ambition and unwavering determination, pursue goals that may initially seem unattainable. May this work serve as a reminder that, through perseverance and resilience, even the most ambitious objectives become achievable:

Per Aspera Ad Astra.

ABSTRACT

This research focus in the investigation of the transformative potential of Generative Artificial Intelligence within social media marketing contexts, particularly examining its capacity to advance sustainability through innovative content generation approaches. As artificial intelligence technologies fundamentally reshape content production methodologies in social media environments, they simultaneously enhance productivity while reducing operational costs, thereby creating unprecedented opportunities for personalized content development and authentic audience engagement. Nevertheless, a considerable knowledge gap exists regarding how Generative AI can effectively contribute to promoting environmentally conscious behaviors through digital content creation, especially within social media advertising campaigns. Despite the rapid adoption of Generative AI technologies across marketing disciplines, academic investigation into its potential for encouraging sustainable behaviors on social media platforms remains substantially underdeveloped. Previous scholarly work has predominantly concentrated on AI's efficiency improvements and customization capabilities, frequently neglecting its transformative potential for promoting sustainability and cultivating environmentally conscious mindsets among social media users. This study addresses these research limitations by exploring how Generative AI facilitates eco-friendly content creation and identifying innovative approaches that effectively advocate for sustainable practices. The thesis addresses the fundamental question: "How can Generative AI be utilized to promote sustainability through creativity in social media marketing, and what business models might emerge from this process?" The methodology employs Design Science Research principles, integrating case study analysis, comprehensive exploration of AI techniques, and systematic framework development. The study examines Mohana Street Shop as a detailed case study, analyzing how organizations integrate Generative AI into their marketing and content production processes to discover new business opportunities. Expected contributions include valuable insights for businesses seeking to leverage Generative AI for sustainable and creative marketing practices, potentially facilitating more effective sustainability campaigns and generating new economic opportunities. A primary deliverable comprises a comprehensive seven-guideline conceptual framework that outlines strategic approaches for integrating Generative AI to foster sustainability while enhancing social media marketing campaign effectiveness.

KEYWORDS

Sustainability; Social Media Marketing; Generative AI; Green Creativity; Digital Marketing

Sustainable Development Goals (SGD):



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1. INTRODUCTION

1.1. CONTEXT AND PROBLEM IDENTIFICATION

Artificial intelligence technology fundamentally transforms how social media content is conceived, developed, and distributed, dramatically enhancing productivity while substantially reducing both production time and associated costs (Anantrasirichai & Bull, 2022; Pantano et al., 2024). The integration of AI technologies into media platforms has opened unprecedented avenues for creating personalized content and establishing meaningful, lasting connections with audiences. This technological evolution presents remarkable opportunities for businesses to engage effectively with their target customers (Haleem et al., 2022; Pagani & Wind, 2025). However, a significant research gap exists in understanding how Generative AI contributes to promoting environmentally friendly behaviors through online content creation, particularly within social media advertising campaigns (Kulkov et al., 2024; Hermann & Puntoni, 2024).

The widespread adoption of AI technologies has profoundly impacted various sectors, including marketing and communication (Haleem et al., 2022; Islam et al., 2024). Social media platforms increasingly leverage sophisticated AI algorithms to analyze user behaviors and predict emerging trends while simultaneously generating tailored content (Mariani et al., 2022; Aldous et al., 2024). This fundamental shift toward AI-driven content development presents both significant advantages and considerable challenges for companies seeking to incorporate sustainability into their online marketing strategies (Frank, 2021; Bartelt & Röser, 2024). Understanding the impact of AI-generated content on inspiring sustainable behaviors and promoting environmentally conscious practices becomes essential for developing effective digital marketing strategies that support global sustainability objectives (Rodriguez-Sanchez, 2023; Saxena & Rishi, 2025).

While Generative AI has experienced widespread adoption in marketing contexts recently, academic research examining how it can encourage sustainable behaviors on social media platforms remains substantially limited (Yigitcanlar et al., 2021; Hermann & Puntoni, 2024). Previous studies have primarily focused on Generative AI's advantages in enhancing operational efficiency and providing customization options. However, these investigations often overlook its significant potential for promoting sustainability and nurturing eco-conscious mindsets among social media platform users (Liu et al., 2023; Brüns & Meissner, 2024).

The absence of comprehensive research in this domain underscores the critical importance of exploring how Generative AI influences content creation processes and its capacity to support environmentally friendly initiatives on social media platforms. The intersection of Generative Artificial Intelligence and sustainability practices in business operations and social media marketing represents a complex area requiring thorough research exploration. As companies increasingly recognize sustainability's importance in their business strategies and communication approaches, AI's role in supporting these initiatives becomes increasingly prominent (Yigitcanlar et al., 2021; Teng et al., 2025). Nevertheless, the ethical considerations, potential biases, and long-term impacts of AI-generated content on user behaviors and sustainability perceptions remain insufficiently researched (Nishant et al., 2020; Ferrara, 2024).

This study aims to address these knowledge gaps by investigating how artificial intelligence creates environmentally friendly content and recognizing innovative approaches that effectively utilize AI to advocate for sustainability (Gupta et al., 2023; George & Mattathil, 2025). Through analyzing user responses to AI-generated content on social media platforms and examining its impact on environmental outcomes and organizational processes, this research seeks to provide valuable perspectives on AI's role in promoting sustainable behaviors through online marketing efforts (Kulkov et al., 2024; Coetzer et al., 2025).

The primary focus of this research centers on exploring how Generative AI can enhance sustainability through innovative approaches in social media marketing and the potential emergence of new business models within this context. This study examines various factors, including the technical processes underlying AI-powered creative content creation, how organizations utilize Generative AI to advance sustainability efforts, how different user groups receive and respond to this content, and the new business models that emerge from these practices (Feuerriegel et al., 2024; Kmiecik & Skórnoóg, 2025).

1.2. OBJECTIVES

The primary research goal involves developing practical guidelines for leveraging Generative AI to enhance sustainability in social media marketing contexts. To accomplish this main objective, several intermediate objectives were established that collectively address the research questions and contribute to the overall understanding of this emerging field.

The first intermediate objective focuses on exploring the development of new business models based on Generative AI implementation. This involves analyzing case studies of companies that have incorporated Generative AI into their marketing and content creation strategies, thereby identifying the new business opportunities created through these implementations. Additionally, this objective investigates how artificial intelligence can improve the efficiency of sustainability endeavors, minimize resource consumption, and encourage the adoption of sustainable business models.

The second intermediate objective examines the role of Generative AI in promoting "Green Creativity." This exploration involves analyzing AI methodologies that facilitate creative processes while simultaneously supporting environmental objectives. The research analyzes how AI can assist in creating content that raises awareness about environmental issues and promotes sustainable values through social media marketing channels.

The third intermediate objective involves developing a comprehensive framework for utilizing generative AI in creating sustainable business models. This framework development process creates a conceptual structure that outlines the necessary steps for implementing Generative AI in ways that promote sustainability and enhance the effectiveness of social media marketing campaigns.

The fourth intermediate objective examines the ethical and technical challenges associated with using generative AI in sustainable marketing contexts. This examination studies potential ethical and technical challenges associated with employing AI in content generation, specifically focusing on issues such as transparency and fairness to mitigate biases within environmentally friendly marketing strategies.

2. THEORETICAL FRAMEWORK

2.1 GENERATIVE AI OVERVIEW

Generative Artificial Intelligence has emerged as a transformative technological force, significantly influencing content creation and dissemination across numerous sectors (Anantrasirichai & Bull, 2022; Pantano et al., 2024; Lyu et al., 2024). This technology employs sophisticated computational techniques that generate novel and meaningful content, including text, images, and audio, through leveraging extensive training datasets.

The widespread implementation of this technology creates profound transformations across multiple industries, wherein creative tasks previously considered exclusively human domains are increasingly being automated (Sætra, 2023; Kawakami & Venkatagiri, 2024). GenAI models undergo training to emulate patterns and distributions present within their training data, thereby enabling them to generate new content that shares similarities with original materials. This capability has created new avenues for innovation and disruption, as enterprises seek to leverage GENERATIVE AI's power to enhance efficiency, personalization, and creativity across their products and services (Anantrasirichai & Bull, 2022; Chiarello et al., 2024).

The fundamental premise of Generative AI involves creating new and unique content that transcends mere recombination of existing elements, representing autonomous generation of original material. This represents a significant departure from traditional AI systems, which primarily focus on analysis, classification, and decision-making tasks (Cao et al., 2023; Thapa et al., 2025).

Generative AI models, including Generative Pre-trained Transformers, DALL-E, Midjourney, and Copilot, are distinguished by their capacity to generate content that appears nearly indistinguishable from human-created materials (Euchner, 2023; Feuerriegel et al., 2024; Hartmann et al., 2025). These models are based on deep generative modeling, which employs large datasets to learn and replicate complex data patterns (Banh & Strobel, 2023).

The GPT family of models, developed by OpenAI, represents substantial advancement in this field. These models are based on transformer architecture, which enables them to process and generate coherent and contextually relevant text that resembles human-produced content in style and substance. GPT-4, the latest iteration, has exhibited remarkable capabilities in natural language understanding and generation, facilitating application development spanning from automated customer service to content creation for marketing campaigns (Sætra, 2023; Chen & Chan, 2025).

In marketing contexts, generative AI application has had particularly notable impact. The automation of content creation enabled by generative AI allows marketers to develop personalized campaigns at scale, thereby enhancing customer engagement while reducing production time. For example, AI-driven tools are employed to generate customized marketing messages and visuals, thereby improving campaign adaptability and responsiveness to consumer preferences (Hashmi & Bal, 2024; Pagani & Wind, 2025; Islam et al., 2024). Moreover, generative AI models such as ChatGPT are being utilized to generate product descriptions, social media posts, and interactive advertisements, thereby offering more engaging and personalized consumer experiences (Euchner, 2023; Aldous et al., 2024).

While generative AI's potential remains vast, inherent challenges and ethical concerns accompany its use. Issues such as data privacy, algorithmic bias, and the environmental impact of training large models have become subjects of debate among researchers and practitioners (Banh & Strobel, 2023; Hashmi & Bal, 2024; Ferrara, 2024). Furthermore, concerns exist regarding the societal implications of replacing human creativity with machine-generated content, particularly regarding job displacement in creative industries (Sætra, 2023; Kawakami & Venkatagiri, 2024).

2.2. GENERATIVE AI BENEFITS AND DRAWBACKS FOR ENTERPRISES

The advent of generative AI models has revolutionized enterprise creative processes, primarily through tools such as GPT-4, DALL-E, and Copilot. These AI technologies facilitate creativity by automating content creation and providing innovative methods for ideation and design. Large language models such as GPT-4 facilitate text-based content generation, while image generation tools including DALL-E and Midjourney enable the creation of distinctive visual content, thereby significantly reducing expenditure and time typically associated with creative production (Banh & Strobel, 2023; Feuerriegel et al., 2024; Chen & Chan, 2025).

The advantages of utilizing generative AI in business contexts are extensive. These technologies facilitate scalable content generation, enabling businesses to produce substantial volumes of personalized content promptly, thereby enhancing marketing campaign agility and adaptability in response to evolving customer preferences (Holmström & Carroll, 2024; Bartelt & Röser, 2024).

Nevertheless, several potential drawbacks must be considered by organizations contemplating this option. One primary concern involves the ethical implications and potential for bias in generated content. Training datasets used to develop generative AI models may contain biased or inappropriate information that may be inadvertently reproduced in AI-generated content, potentially resulting in reputational risks (Celis Bueno et al., 2024; Ferrara, 2024; Brüns & Meissner, 2024).

The environmental cost of training and deploying large-scale generative models is considerable due to high computational demands, raising sustainability concerns (Park, 2024; Bhuyan et al., 2025).

2.3. BUSINESS MODELS BASED ON GENERATIVE AI

The advent of generative AI opens new avenues for developing innovative business models (Feuerriegel et al., 2024; Teng et al., 2025). An increasing number of enterprises are adopting generative AI to revolutionize their value propositions, optimize operational processes, and enhance customer experiences (Euchner, 2023; Coetzer et al., 2025).

Several companies have successfully integrated generative AI into their marketing and content creation strategies, resulting in new business opportunities (Hartmann et al., 2025; Nguyet, 2024; Abi-Rafeh et al., 2024). Coca-Cola has incorporated DALL-E to generate region-specific digital advertisements, enhancing its ability to connect with local audiences (Cui et al., 2024; Feuerriegel et al., 2024). BMW has employed generative AI to assist in car design co-creation, enabling designers to explore multiple variations more rapidly (Wingström et al., 2024). Spotify uses generative AI models to create personalized playlists for users, leveraging data on user preferences (Hashmi & Bal, 2024). Fashion industry brands have utilized generative AI to predict trends and automatically generate new clothing designs (Euchner, 2023; Ng et al., 2025).

2.4. GENERATIVE AI AND SUSTAINABILITY

The role of generative artificial intelligence in fostering green creativity remains critically important. It enables more efficient content creation, reduces resource consumption, and minimizes the environmental impact of creative processes. Green AI employs machine learning techniques in environmentally sustainable manners, thus supporting global sustainability goals while improving efficiency in creative endeavors (Bolón-Canedo et al., 2024; Raman et al., 2024).

Green Creativity and Efficiency represent significant aspects of this development. The advent of generative models such as GPT-4 and DALL-E has opened new avenues for automating creative processes, including visual design, content generation, and digital art creation. These models can produce high-quality creative outputs with significantly reduced environmental impact compared to traditional processes (Richards et al., 2024; George & Mattathil, 2025).

Minimizing Resource Consumption in AI becomes essential as training and deploying large AI models have substantial environmental costs due to high computational requirements. Green AI practices aim to develop energy-efficient AI models, thus minimizing resource consumption (Raman et al., 2024; Chen et al., 2025). The potential of generative AI to significantly reduce resource wastage across various industries has been demonstrated.

AI for Promoting Environmental Awareness represents another important application. Generative AI can be employed to create content that raises awareness about environmental issues. By automating content generation, generative AI enables environmental organizations to expand their outreach and develop tailored messages for different demographics (Richards et al., 2024; Cantini et al., 2025).

Challenges and Considerations must be acknowledged as the application of generative AI offers considerable potential for advancing sustainability while presenting inherent challenges. Training large language models such as GPT-4 is highly resource-intensive, resulting in increased energy consumption and carbon emissions as shown in Figure 1 (Bolón-Canedo et al., 2024; Thapa et al., 2025).

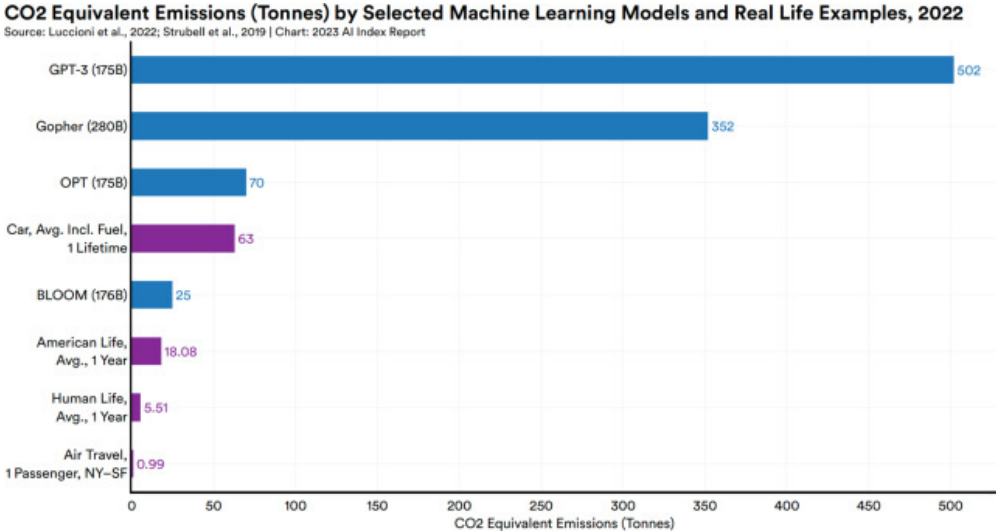


Figure 1. Co2 Emissions by Selected Machine Learning Models and Real Life Examples, 2022(Bolón-Canedo et al., 2024).

3. METHODOLOGY

The chosen research methodology for this thesis employs Design Science Research (DSR), a framework that excels in creating and evaluating artifacts aimed at solving real-world problems. In this study's context, the primary objective involves developing actionable guidelines for leveraging generative AI to promote sustainability in digital marketing. These guidelines constitute the artifact, aligning perfectly with the DSR paradigm.

DSR is particularly well-suited to this research project due to its ability to bridge the gap between theoretical inquiry and practical application. By focusing on both innovation and rigor, DSR ensures that proposed guidelines are scientifically validated while remaining relevant to real-world challenges. This dual emphasis is critical in addressing the growing need for sustainable practices in the digital marketing industry, which faces increasing scrutiny over environmental inefficiencies and carbon footprints (Hevner et al., 2004; Zeng et al., 2025).

As Dimov et al. (2023) argue, DSR's ability to integrate relevance and rigor is especially valuable in addressing complex and dynamic challenges, such as those posed by sustainability. The iterative nature of DSR, as outlined by Peffers et al. (2007), ensures that the artifact evolves through evaluation and refinement processes, grounding the research in both theoretical and practical insights (Storey et al., 2024).

The implementation of DSR in this thesis follows a systematic process, drawing on foundational frameworks and iterative cycles as established by Hevner et al. (2004) and Gregor & Hevner (2013). These cycles, encompassing relevance, rigor, and design, provide a structured pathway for developing and evaluating the artifact (Peffers et al., 2007; Dreyling et al., 2024). Moreover, the dynamic interplay between problem-solving and knowledge generation within DSR ensures that the artifact aligns with current technological advancements and sustainability imperatives (University of Nevada et al., 2012).

3.1. DESIGN SCIENCE RESEARCH (DSR)

Design Science Research constitutes a rigorous methodological approach widely adopted in information systems and related fields. Its primary objective involves extending human and organizational capabilities by creating innovative artifacts that address real-world problems (Hevner et al., 2004; Storey et al., 2024). Artifacts in DSR can take various forms, including constructs, models, methods, or instantiations, and are evaluated for their utility and effectiveness in solving specific problems (Peffers et al., 2007; Bonnet & Teuteberg, 2025). The general DSR process is composed by six phases as it show in Figure 2.

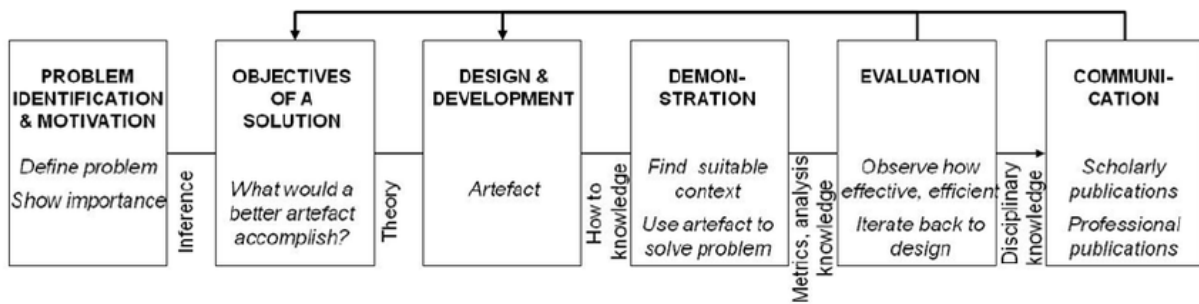


Figure 2. The Design Science Research

DSR operates at the confluence of behavioral science and design science paradigms. While behavioral science seeks to develop theories explaining or predicting phenomena, design science focuses on problem-solving and innovation (March & Smith, 1995; Hevner & Storey, 2023). This dual emphasis ensures that generated solutions are both theoretically grounded and practically relevant (Schlimbach et al., 2024).

The research activities, originally proposed by Hevner et al. (2004), are outlined within a conceptual framework accompanied by guidelines, providing detailed explanation of how to effectively conduct and assess high-quality Design Science Research (Dreyling et al., 2024; Fahd & Miah, 2023). This methodological approach has proven particularly effective in addressing complex technological and organizational challenges (Xia et al., 2024; Truss & Schmitt, 2024).

Table 1. Design Science Research guidelines (Hevner, March, Park, & Ram, 2004).

Guideline	Description
Guideline 1: Design as an Artifact	DSR must produce a viable artifact in the form of a construct, a model, or an instantiation.
Guideline 2: Problem Relevance	The objective of Design Science Research is to develop technology-based solutions to important and relevant business problems
Guideline 3: Design Evaluation	The utility, quality, and efficacy of a design artefact must be rigorously demonstrated via well-executed evaluation methods
Guideline 4: Research Contributions	Effective Design Science Research must provide clear and verifiable contributions in the areas of the design artefact, design foundations, and/or design methodologies

Guideline 5: Research Rigor	Design Science Research relies upon applying rigorous methods in both the construction and evaluation of the design artefact
Guideline 6: Design as a Search Process	The search for an effective artefact requires utilizing available means to reach desired ends while satisfying laws in the problem environment
Guideline 7: Communication of research	Design Science Research must be presented effectively to both technology-oriented and management-oriented audiences

According to Hevner et al. (2007), the Design Science Research framework in information systems emphasizes three fundamental research cycles. The Relevance Cycle acts as a link between the research project's contextual environment and the core activities of Design Science. The Rigor Cycle connects these activities to the broader knowledge base, including established scientific foundations, expertise, and prior research, which guide and validate the study (Table 1). At the center, the Design Cycle involves iterative processes of developing and evaluating design artifacts and methodologies. For a research project employing DSR, these three cycles are essential and must be distinctly incorporated and evident (Hevner, 2007; Ng et al., 2025; Huseynli & Bub, 2025).

3.1.1. The Relevance Cycle

The Relevance Cycle serves as the bridge between the research project's contextual environment and the core activities of design science. It facilitates the flow of requirements and feedback between the practical application domain and the design science activities (Hevner, 2007; Kucevic et al., 2023). Specifically, this cycle begins by identifying and framing problems or opportunities within the application domain, which comprises people, organizational systems, and technical systems interacting to achieve specific goals. These insights inform the research objectives and define the acceptance criteria for evaluating the artifact's success (Pumplun et al., 2023).

According to Hevner et al. (2004), the Relevance Cycle ensures that the design artifact addresses real-world issues by grounding it in the application context. Field testing is a critical component of the Relevance Cycle, where the designed artifact is introduced into the application domain for validation and refinement (Fahd & Miah, 2023). This iterative process allows the artifact to evolve based on environmental feedback, ensuring that it aligns with both practical needs and theoretical objectives (Hevner, 2007; Pumplun et al., 2023; Peláez et al., 2025).

In this research context, the Relevance Cycle is operationalized through analyzing the social media marketing environment, particularly focusing on challenges and opportunities presented by generative AI technology integration (Panetti & Simoni, 2025). The research examines current market dynamics, stakeholder needs, and practical constraints faced by organizations seeking to implement sustainable marketing practices through AI technologies. This environmental characterization provides the foundation for understanding the real-world applicability of the proposed framework and ensures that developed guidelines address actual industry requirements.

The feedback mechanisms within the Relevance Cycle are established through evaluating the Mohana Street Shop case study, where practical implementation of the framework provides insights into its effectiveness and areas for improvement. This real-world application generates valuable feedback that informs framework refinement and validates its practical utility in addressing sustainability challenges in social media marketing.

3.1.2. The Rigor Cycle

The Rigor Cycle connects design science activities with the knowledge base, which includes foundational theories, methods, and domain-specific expertise (Hevner, 2007; Fahd & Miah, 2023). This cycle ensures that research is firmly grounded in existing knowledge while contributing new insights and methodologies (Xia et al., 2024). The knowledge base encompasses two primary components: scientific theories and engineering methods that guide the research, and existing artifacts and processes that define the current state-of-the-art in the domain (Bonnet & Teuteberg, 2025).

A principal function of the Rigor Cycle involves distinguishing novel contributions from routine designs. As observed by Hevner et al. (2004), this entails utilizing established theories and methodologies to guarantee that the artifact's development is scientifically rigorous and not merely an extension of pre-existing solutions (Schlimbach et al., 2024). Furthermore, the Rigor Cycle enables the enhancement of theories and methodologies based on research findings, ensuring that the artifact not only addresses the identified issue but also expands the theoretical knowledge base in meaningful ways (Hevner, 2007; Xia et al., 2024; Huseynli & Bub, 2025).

In this research, the Rigor Cycle is manifested through the comprehensive literature review that establishes the theoretical foundations of the study. The literature review examines existing research on generative artificial intelligence, sustainability in marketing, and the intersection of technology and environmental responsibility (Truss & Schmitt, 2024). This theoretical grounding ensures that the developed framework builds upon established scientific knowledge while identifying gaps that the research aims to address.

The knowledge base is further enriched through analyzing existing frameworks and methodologies related to sustainable marketing practices and AI implementation. This includes examining established design principles for green technology adoption, sustainability metrics and evaluation methods, and best practices for ethical AI deployment in business contexts (Peláez et al., 2025). The integration of these diverse knowledge domains provides a solid theoretical foundation for framework development and ensures that the research contributes meaningfully to the advancement of knowledge in this emerging field.

The Rigor Cycle also incorporates feedback from research findings to enhance theoretical understanding of how generative AI can be leveraged for sustainability purposes. The empirical results from case study evaluation contribute new insights to the knowledge base, particularly regarding the practical effectiveness of AI-driven sustainability initiatives and their measurable impact on environmental and business outcomes.

3.1.3. The Design Cycle

At the heart of design science research lies the Design Cycle, which iterates between the construction and evaluation of the artifact (Hevner, 2007; Peláez et al., 2025). This cycle is the most intensive and dynamic, involving the actual design of the artifact based on requirements identified in the Relevance Cycle and theoretical guidance provided by the Rigor Cycle. The Design Cycle is characterized by its iterative nature, enabling continuous refinement of the artifact through testing and feedback.

As described by Simon (2019), the Design Cycle generates alternative solutions and evaluates them a Generative AI defined requirements until a satisfactory design is achieved. The iterative loop between building and evaluating ensures that the artifact not only meets practical needs but is also scientifically validated (Hevner, 2007; Truss & Schmitt, 2024).

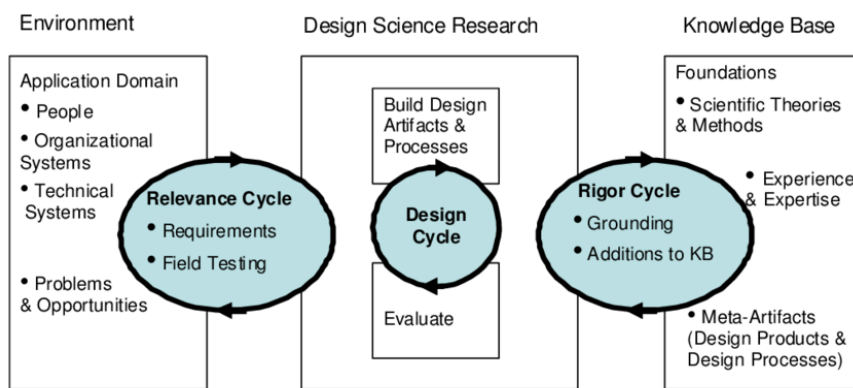


Figure 3. Design Science Research Cycles (Hevner & Alan, 2007).

A critical aspect of the Design Cycle involves maintaining balance between construction and evaluation activities. As Hevner (2007) notes, both elements must be equally rigorous to ensure that the artifact is both effective and practical. The iterative nature of this cycle allows for multiple refinements before the artifact is integrated back into the Relevance and Rigor Cycles, ensuring its relevance and scientific robustness.

As shown in Figure 3, the Design Cycle encompasses the development, testing, and refinement of the seven-guideline framework for implementing generative AI in sustainable social media marketing. The cycle begins with initial framework design based on theoretical foundations established in the Rigor Cycle and practical requirements identified in the Relevance Cycle.

The construction phase involves synthesizing insights from the literature review and environmental analysis to develop a comprehensive framework that addresses key challenges and opportunities in implementing generative AI for sustainability purposes. This includes defining the seven core guidelines, establishing implementation strategies, and developing evaluation criteria for measuring the framework's effectiveness.

The evaluation phase utilizes the Mohana Street Shop case study to test the framework's practical applicability and effectiveness. This real-world implementation provides empirical data on the

framework's performance across multiple dimensions, including operational efficiency, cost reduction, sustainability impact, and business outcomes. The evaluation results inform iterative refinements to the framework, ensuring that it remains both theoretically sound and practically effective.

The iterative nature of the Design Cycle is particularly important in this research given the rapidly evolving nature of generative AI technologies and the dynamic landscape of sustainability requirements. The framework is designed to be adaptable and scalable, allowing for continuous improvement as new technologies emerge and sustainability standards evolve.

3.1.4. The DSR Process

The Design Science Research process, as formalized by Peffers et al. (2007), provides a structured framework for carrying out research that aims to produce and evaluate innovative artifacts. DSR is distinguished by its focus on solving practical problems while simultaneously contributing to the theoretical knowledge base (Alsolbi et al., 2023). Peffers and colleagues developed this methodology to standardize the research process, ensuring that outcomes are both scientifically rigorous and practically relevant (Alsolbi et al., 2023; Huseynli & Bub, 2025).

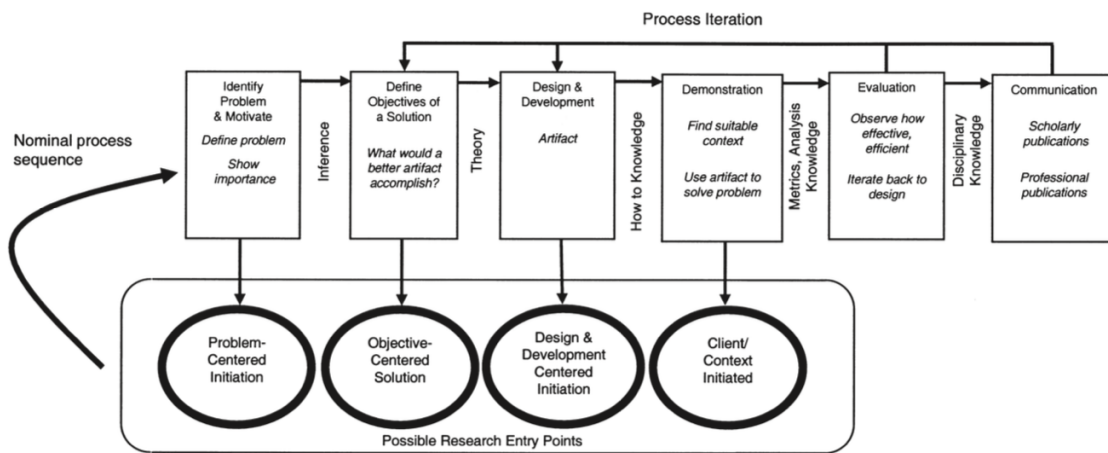


Figure 4. DSRM Process Model (Peffers et al., 2007).

In Figure 4, we can see the DSR process consists of six interrelated stages: Problem Identification and Motivation, Define Objectives for a Solution, Design and Development, Demonstration, Evaluation, and Communication. Each stage plays a critical role in delivering effective results (Peffers et al., 2007; Huseynli & Bub, 2025; Schlimbach et al., 2024). This structured approach ensures that research progresses systematically from problem identification to artifact evaluation and dissemination, offering a replicable model for future studies (Panetti & Simoni, 2025). Moreover, by grounding each stage in existing literature and real-world application, the process facilitates the creation of artifacts that address relevant challenges while advancing the research domain (Peffers et al., 2007; Hevner et al., 2004; Bonnet & Teuteberg, 2025).

Problem Identification and Motivation

The first step in the DSR process involves identifying and clearly defining the research problem. This step is critical, as it establishes the foundation for the entire research effort (Schlimbach et al., 2024).

In this study, the problem identification centers on the lack of structured approaches for implementing generative AI in social media marketing while achieving sustainability objectives.

The motivation for this research emerges from several converging factors. First, the rapid adoption of generative AI technologies in marketing contexts has created opportunities for efficiency improvements and cost reductions, but the sustainability implications of these technologies remain under-explored (Dreyling et al., 2024). Second, increasing environmental awareness among consumers and regulatory pressure on businesses to adopt sustainable practices creates a need for innovative approaches that can achieve both marketing effectiveness and environmental responsibility (Panetti & Simoni, 2025).

The problem is further motivated by the gap between the potential of generative AI to support sustainability initiatives and the lack of practical guidance for organizations seeking to implement these technologies responsibly. Current research has primarily focused on the technical capabilities and business applications of generative AI, with limited attention to its environmental impact and sustainability potential (Fahd & Miah, 2023).

Define Objectives for a Solution

Once the problem has been identified, the next stage involves defining the objectives that the proposed artifact must fulfill. The primary objective of this research is to develop a comprehensive framework that enables organizations to leverage generative AI for sustainable social media marketing. This framework must be practical by providing actionable guidelines that can be implemented by organizations of various sizes and technical capabilities. It must be measurable by including metrics and evaluation criteria that allow organizations to assess their progress toward sustainability goals. The framework must be scalable and adaptable to different organizational contexts and industry sectors. It must be evidence-based, grounded in empirical research and validated through real-world application. Finally, it must be comprehensive, addressing technical, organizational, ethical, and environmental dimensions of AI implementation.

The framework objectives also include promoting transparency in AI usage, ensuring ethical implementation practices, and demonstrating measurable sustainability benefits while maintaining or improving marketing effectiveness.

Design and Development

The design and development stage represents the core creative activity of the DSR process. In this research, this stage involves the synthesis of theoretical insights, practical requirements, and empirical evidence to create the seven-guideline framework for sustainable generative AI implementation.

The framework design process incorporates multiple sources of input. Theoretical foundations draw from sustainability theory, technology adoption models, and environmental management frameworks to establish the conceptual basis for the guidelines. Industry analysis examines current practices, challenges, and opportunities in social media marketing to ensure the framework addresses real-world needs. Technology assessment analyzes the capabilities and limitations of current generative AI technologies to develop realistic implementation strategies. Sustainability integration incorporates environmental impact assessment methodologies and sustainability metrics to ensure the framework achieves meaningful environmental benefits.

The resulting framework consists of seven interrelated guidelines that address different aspects of sustainable AI implementation. These guidelines encompass resource optimization strategies for reducing physical resource consumption through AI-enhanced content creation, stakeholder engagement approaches for involving sustainability-focused stakeholders in AI implementation, AI model integration technical guidelines for selecting and implementing appropriate AI tools, sustainable practices environmental considerations for AI deployment and operation, transparency and ethics standards for responsible AI disclosure and bias mitigation, continuous evaluation monitoring and assessment strategies for ongoing improvement, and cultural integration organizational change management for sustainable AI adoption.

Demonstration

The demonstration stage involves applying the developed framework to solve instances of the identified problem. In this research, the demonstration is conducted through the Mohana Street Shop case study, which provides a real-world context for testing the framework's applicability and effectiveness.

The case study demonstrates how the framework can be applied in practice, showcasing the implementation of each guideline and the resulting outcomes. This practical application serves multiple purposes. It provides proof of concept by demonstrating that the framework can be successfully implemented in a real-world context. It offers practical validation by showing that the framework addresses actual business challenges and sustainability objectives. It provides implementation guidance by offering concrete examples of how organizations can apply the framework principles. It enables scalability assessment by evaluating the framework's potential for adaptation to different organizational contexts.

The demonstration focuses on documenting the implementation process, tracking performance metrics, and capturing lessons learned that can inform future applications of the framework.

Evaluation

The evaluation stage provides empirical evidence of the artifact's effectiveness in addressing the identified problem. This research employs a comprehensive evaluation methodology that assesses the framework's performance across multiple dimensions.

Quantitative evaluation measures specific performance indicators including engagement metrics, operational efficiency, cost reduction, and sustainability impact. The evaluation tracks measurable changes in resource consumption, environmental impact, and business outcomes. Qualitative assessment examines the quality and consistency of content produced using the framework, stakeholder satisfaction, and organizational learning outcomes. Comparative analysis compares pre- and post-implementation performance to demonstrate the framework's impact and validate its effectiveness. Longitudinal tracking monitors performance over time to assess the sustainability and scalability of the implemented changes.

The evaluation criteria are aligned with the framework objectives and include both immediate operational impacts and longer-term sustainability outcomes. This comprehensive assessment provides robust evidence for the framework's value and identifies areas for future improvement.

Communication

The final stage of the DSR process involves communicating the research findings to relevant audiences. This includes both academic and practitioner communities, ensuring that the research contributes to theoretical knowledge while providing practical value for organizations.

The communication strategy encompasses academic contribution by documenting the theoretical insights and methodological contributions of the research for the academic community. It provides practitioner guidance by offering actionable recommendations and implementation tools for organizations seeking to adopt sustainable AI practices. It includes framework dissemination by making the framework available for broader adoption and adaptation across different organizational contexts. It identifies future research directions by highlighting opportunities for extending and refining the framework through additional research.

3.2. RESEARCH IMPLEMENTATION

The structured approach of the Design Science Research Process, comprising sequential phases, provides a robust framework for implementing this study. This methodology guarantees that the proposed artifact, a framework for integrating generative AI to promote sustainability in digital marketing, is developed and evaluated rigorously (Schlimbach et al., 2024; Panetti & Simoni, 2025).

The research implementation focuses on systematically progressing through the phases of problem identification and motivation, define objectives of the solution, design and development, demonstration and evaluation, and communication (Panetti & Simoni, 2025; Alsolbi et al., 2023).

3.2.1. Data Collection Strategy

The research employs a mixed-methods approach to data collection, combining quantitative performance metrics with qualitative insights to provide comprehensive understanding of the framework's effectiveness (Pumplun et al., 2023). The data collection strategy is designed to capture multiple perspectives and dimensions of AI implementation impact (Fahd & Miah, 2023).

Primary data sources include performance metrics collected from the Mohana Street Shop implementation, including engagement statistics from social media platforms, operational efficiency measurements, cost analysis data, and environmental impact indicators. This data is collected through platform analytics, internal business systems, and custom tracking mechanisms designed specifically for this research (Kucevic et al., 2023). Stakeholder interviews gather qualitative data through semi-structured interviews with key stakeholders including business owners, marketing team members, customers, and industry experts. These interviews provide insights into user experiences, implementation challenges, and perceived benefits of the framework (Xia et al., 2024). Content analysis involves systematic evaluation of content quality, brand consistency, and messaging effectiveness comparing pre- and post-implementation periods. This includes both automated analysis tools and expert human evaluation (Truss & Schmitt, 2024).

Secondary data sources include industry reports analyzing existing research, industry publications, and market data to contextualize the findings within broader industry trends and benchmarks (Bonnet & Teuteberg, 2025). Competitive analysis examines similar implementations by other organizations to understand best practices and identify differentiation opportunities. Literature integration continuously integrates emerging research findings to ensure the framework remains current and theoretically grounded (Huseynli & Bub, 2025).

3.2.2. Case Study Selection and Design

The selection of Mohana Street Shop as the primary case study was based on several strategic criteria that enhance the research's validity and applicability (Pelález et al., 2025). Organizational characteristics reveal that Mohana Street Shop represents a small-to-medium enterprise with limited technical resources, making it an ideal test case for framework scalability and accessibility. The organization's size and structure allow for detailed observation of implementation processes and rapid iteration based on feedback (Schlimbach et al., 2024).

Industry relevance becomes apparent as the retail sector's heavy reliance on social media marketing and visual content creation provides an appropriate context for testing generative AI applications (Dreyling et al., 2024). The industry's increasing focus on sustainability also aligns with the research objectives. Implementation readiness was demonstrated through the organization's willingness to adopt new technologies and commitment to sustainability principles, essential factors for successful framework implementation and meaningful evaluation (Huseynli & Bub, 2025). Data accessibility was ensured through the organization's openness to sharing performance data and stakeholder access, enabling comprehensive evaluation across multiple dimensions.

The case study design follows a longitudinal approach, tracking performance over a twelve-month period with distinct pre-implementation and post-implementation phases of six months each (Fahd & Miah, 2023). This extended timeframe allows for assessment of both immediate impacts and longer-term sustainability of the implemented changes (Pumplun et al., 2023).

3.2.3. Evaluation Framework Development

A comprehensive evaluation framework was developed to assess the effectiveness of the proposed guidelines across multiple dimensions (Xia et al., 2024). This evaluation framework is designed to provide robust evidence for the artifact's value while identifying areas for improvement and refinement (Kucevic et al., 2023).

The multi-dimensional assessment encompasses six primary dimensions, each with specific metrics and assessment criteria. Engagement effectiveness measures audience response, content reach, and interaction quality. Operational efficiency assesses production time, resource utilization, and workflow optimization. Economic impact analyzes cost reduction, return on investment, and budget optimization. Sustainability outcomes quantify environmental benefits and resource conservation. Quality maintenance evaluates content quality, brand consistency, and stakeholder satisfaction. Strategic alignment assesses alignment with business objectives and sustainability goals (Panetti & Simoni, 2025).

The measurement methodology for each dimension employs a combination of quantitative metrics and qualitative assessments (Truss & Schmitt, 2024). Quantitative metrics involve standardized measurements collected at regular intervals using consistent methodologies. These include platform analytics, financial data, resource consumption tracking, and environmental impact calculations. Qualitative assessments encompass expert evaluations, stakeholder feedback, and content quality analysis using established criteria and scoring systems (Bonnet & Teuteberg, 2025). Comparative analysis involves before-and-after comparisons to isolate the impact of framework implementation from other factors that might influence performance. Benchmarking compares results with industry standards and best practices to contextualize the results and assess competitive positioning (Alsolbi et al., 2023).

3.2.4. Implementation Timeline and Phases

The research implementation follows a structured timeline designed to ensure systematic data collection and rigorous evaluation. Phase one involves baseline establishment during months one through six, including collection of pre-implementation performance data across all evaluation dimensions, documentation of existing processes, resource utilization, and sustainability practices,

establishment of baseline metrics and benchmark comparisons, and stakeholder interviews to understand current challenges and expectations.

Phase two encompasses framework development and refinement during months four through eight, involving synthesis of literature review findings and baseline assessment results, development of initial framework guidelines and implementation strategies, expert validation and framework refinement based on theoretical and practical considerations, and preparation of implementation tools and training materials.

Phase three includes implementation and monitoring during months seven through twelve, featuring systematic rollout of framework guidelines with careful monitoring and documentation, real-time data collection and preliminary analysis to identify immediate impacts, regular stakeholder feedback sessions and implementation adjustments, and continuous refinement of processes based on emerging insights and challenges.

Phase four involves comprehensive evaluation during months thirteen through fifteen, including collection and analysis of post-implementation performance data, comprehensive comparison with baseline metrics across all evaluation dimensions, stakeholder interviews to assess satisfaction, challenges, and recommendations, and framework validation and refinement based on empirical results.

Phase five encompasses communication and dissemination during months sixteen through eighteen, involving preparation of research findings and recommendations, development of practitioner guidelines and implementation tools, academic publication and presentation of results, and framework dissemination and future research planning.

4. FRAMEWORK DEVELOPEMANT AND IMPLEMENTATION

Drawing on findings from both the literature review and environmental analysis, this research proposes a comprehensive framework comprising seven interrelated guidelines for effectively leveraging generative ai in sustainable social media marketing. This framework builds upon recent research on AI-driven business model innovation (Teng et al., 2025; Kmiecik & Skórnóg, 2025) and sustainable marketing practices (Saxena & Rishi, 2025).

4.1. PRACTICAL GUIDELINES FOR LEVERAGING GENERATIVE AI

The framework recognizes that sustainability benefits can be both direct through explicitly environmental actions and indirect through operational efficiencies that reduce resource consumption, as demonstrated in recent studies on AI implementation in marketing contexts (Bartelt & Röser, 2024; Islam et al., 2024; du Plessis & Swart, 2024). By providing structured guidance (Table 2) across these key dimensions, organizations of various sizes can implement generative ai tools in ways that advance both marketing effectiveness and environmental responsibility.

Table 2. Practical Guidelines

Guideline	Focus Area	Primary Objective	Key Sustainability Benefits	Implementation Strategy
1. Resource Optimization and Efficiency	Operational Efficiency	Reduce resource-intensive traditional processes	75% reduction in photoshoots, 85% less physical materials	Digital asset creation, workflow streamlining, material waste reduction
2. Stakeholder Engagement and Communication	Relationship Management	Effective communication of sustainability benefits	Enhanced transparency, improved stakeholder trust	Stakeholder mapping, transparency communication, sustainability messaging
3. Strategic AI Model Integration	Technology Implementation	Appropriate AI tool selection and deployment	Cultural relevance, sustainable behavior promotion	Tool selection, content strategy, cultural adaptation
4. Sustainable AI Practices	Environmental Impact	Minimize environmental impact of AI usage	Energy efficiency, reduced computational demands	Selective deployment, efficient prompting, provider selection

5. Transparency and Ethical Standards	Ethics and Governance	Maintain ethical AI usage standards	Trust building, bias mitigation	Content disclosure, process documentation, quality control
6. Continuous Evaluation and Monitoring	Performance Management	Systematic tracking of improvements	Data-driven optimization, sustained benefits	Performance metrics, sustainability indicators, business impact assessment
7. Cultural and Organizational Integration	Change Management	Embed sustainability values in organizational culture	Long-term adoption, innovation culture	Value alignment, training and development, recognition systems

Guideline 1: Resource Optimization and Efficiency

The objective centers on reducing reliance on resource-intensive traditional photography and design processes while maintaining premium brand aesthetics and operational efficiency. The implementation strategy involves digital asset creation through utilizing AI image generation tools such as DALL-E, Midjourney, or Ideogram to create contextual backgrounds, seasonal settings, and promotional materials without requiring physical photoshoots. Workflow streamlining implements AI-assisted design tools to reduce manual creation time while maintaining consistent brand quality. Material waste reduction eliminates single-use props, printed mockups, and disposable promotional materials through digital alternatives.

This guideline's sustainability alignment directly supports SDG 12 through reducing material waste through digitization and SDG 13 through decreased transportation emissions and reduced energy consumption in content production. Success metrics include percentage reduction in physical photoshoot sessions, decrease in transportation miles for content production, reduction in physical materials used, and cost savings from reduced external service dependencies.

Guideline 2: Stakeholder Engagement and Communication

The objective involves identifying, engaging, and communicating effectively with stakeholders while promoting sustainability benefits through AI-enhanced content strategies. The implementation strategy encompasses stakeholder mapping to identify primary customers, social media followers, creative collaborators, technology providers, and community influencers. Transparency communication develops clear communication strategies about AI usage that emphasize enhancement rather than replacement of human creativity. Sustainability messaging creates content that highlights environmental benefits of digital transformation and resource optimization.

Key stakeholder categories include primary customers who are target audiences seeking quality products with environmental consciousness, social media community members representing broader audiences interested in sustainable practices and innovation, creative partners including photographers, designers, and content creators who can collaborate with AI tools, technology providers comprising AI platform developers and service providers committed to sustainable computing, and environmental advocates representing organizations and individuals promoting digital sustainability.

Engagement strategies involve sharing behind-the-scenes content showing AI-enhanced creative processes, highlighting specific environmental benefits achieved through digital transformation, engaging with sustainability-focused communities and advocacy groups, and collaborating with eco-conscious influencers and thought leaders.

Guideline 3: Strategic AI Model Integration

The objective focuses on implementing appropriate generative AI tools for specific use cases while maintaining cultural relevance and promoting sustainable behavior through content. The implementation framework involves tool selection by choosing AI platforms based on specific content needs, energy efficiency, and sustainability commitments of providers. Content strategy develops AI-enhanced content that implicitly promotes sustainable values through emphasis on quality, longevity, and responsible consumption. Cultural adaptation utilizes AI tools to create culturally relevant content for different markets while maintaining consistent sustainability messaging.

Recommended AI tools and applications include visual content generation through DALL-E, Midjourney, or Ideogram for creating seasonal backgrounds and contextual elements, design optimization through Canva AI or similar tools for efficient graphic design and template creation, content writing through ChatGPT or specialized tools for developing engaging, brand-consistent copy, and video enhancement through CapCut AI or similar platforms for professional-quality video production.

Sustainability integration emphasizes product quality and longevity over disposable alternatives, showcases artisanal craftsmanship that contrasts with mass production, highlights timeless design that transcends fast-changing trends, and creates content that subtly educates about sustainable consumption practices.

Guideline 4: Sustainable AI Practices

The objective involves minimizing the environmental impact of AI usage through energy-efficient practices and responsible technology deployment. Energy efficiency strategies include selective deployment by using AI tools strategically rather than comprehensively, focusing on high-impact applications, efficient prompting through developing optimized prompt strategies that minimize computational requirements and generation iterations, local processing by utilizing local processing capabilities for simpler tasks to reduce cloud computing dependencies, and provider selection by choosing AI service providers with demonstrated commitments to renewable energy and carbon neutrality.

Infrastructure optimization encompasses asset management through implementing efficient digital asset management systems to prevent redundant content creation, template systems by developing

reusable templates and modular content approaches that minimize generation requirements, and batch processing by optimizing content creation workflows to reduce overall computational demands.

Environmental impact monitoring involves tracking energy consumption related to AI tool usage, monitoring carbon footprint of digital operations, assessing lifecycle impact of digital versus traditional content creation methods, and reporting on environmental benefits achieved through process optimization.

Guideline 5: Transparency and Ethical Standards

The objective centers on maintaining ethical AI usage standards while ensuring transparency in content creation and stakeholder communication. Transparency frameworks include content disclosure by developing clear policies for when and how to disclose AI assistance in content creation, process documentation through maintaining records of AI tool usage and decision-making processes, and stakeholder communication by providing accessible information about AI implementation and its benefits.

Ethical implementation standards encompass bias mitigation through implementing regular review processes to identify and address potential biases in AI-generated content, quality control by establishing human oversight for all AI-generated content before publication, cultural sensitivity by ensuring AI-generated content respects cultural differences and avoids inappropriate representations, and authenticity maintenance by preserving brand authenticity through using AI to enhance rather than replace human creativity.

Content review processes involve human oversight of AI-generated elements before publication, consistency checks against brand guidelines and values, quality control for appropriate tone and messaging, and cultural sensitivity review for international content.

Guideline 6: Continuous Evaluation and Monitoring

The objective involves implementing systematic monitoring and evaluation processes to track both performance improvements and sustainability outcomes. The monitoring framework encompasses performance metrics by tracking engagement rates, content quality, and operational efficiency indicators, sustainability indicators through monitoring resource consumption, environmental impact, and waste reduction, business impact by assessing cost savings, revenue impact, and return on investment, and stakeholder satisfaction through gathering feedback from customers, team members, and other stakeholders.

Evaluation methodologies include quantitative analysis by using statistical methods to analyze performance data and identify trends, qualitative assessment through conducting regular stakeholder interviews and content quality evaluations, comparative studies by comparing performance against pre-implementation baselines and industry benchmarks, and longitudinal tracking through monitoring long-term impacts and sustainability of implemented changes.

Reporting and communication involves regular reports through producing monthly performance summaries sustainability assessments, stakeholder updates by sharing progress and achievements with relevant stakeholders, transparency measures through publicly reporting on sustainability

improvements and environmental benefits, and continuous improvement by using evaluation results to refine and optimize implementation strategies.

Guideline 7: Cultural and Organizational Integration

The objective focuses on embedding sustainability values and AI best practices into organizational culture and decision-making processes. Cultural integration strategies include value alignment by explicitly connecting AI implementation with existing organizational values and sustainability commitments, training and development through providing education on sustainable AI practices and their environmental benefits, decision framework by integrating sustainability considerations into technology adoption and content creation decisions, and recognition systems by acknowledging and celebrating achievements in sustainable practices and innovation.

Organizational change management encompasses leadership commitment by ensuring visible leadership support for sustainable AI initiatives, team engagement through involving team members in framework development and implementation, communication strategy by developing internal communication plans that reinforce sustainability objectives, and performance integration through including sustainability metrics in performance evaluation and goal-setting processes.

Innovation culture involves experimentation by encouraging experimentation with new AI tools and sustainable practices, learning orientation through fostering continuous learning and adaptation as technologies evolve, collaboration by promoting collaboration between technical and creative teams in AI implementation, and knowledge sharing through establishing mechanisms for sharing lessons learned and best practices.

4.2. USE CASE: MOHANA STREET SHOP IMPLEMENTATION

To demonstrate the practical implementation of the proposed framework, this section presents Mohana Street Shop as a comprehensive real-world case study its profile is shown in Table 3. This implementation serves as both validation of the framework's effectiveness and a practical guide for other organizations seeking to adopt similar approaches.

Table 3. Mohana Street Shop Profile

Aspect	Description
Company Name	Mohana Street Shop
Business Type	Contemporary retail business specializing in fashion and lifestyle products
Business Model	Primary focus on social media marketing and e-commerce sales
Company Size	Small-to-medium enterprise (2-3 employees)

Market Position	Typical SME with limited technical resources but significant growth and sustainability ambitions
Pre-Implementation Context	
Primary Challenges	High costs for traditional photography and content creation
	Time-intensive content production processes limiting posting frequency
	Difficulty maintaining consistent brand aesthetics across diverse content types
	Limited resources for professional design and marketing services
	Pressure to increase content volume while maintaining quality standards
	Growing customer expectations for authentic and engaging social media presence

4.2.1. Organizational Context and Background

Mohana Street Shop operates as a contemporary retail business specializing in fashion and lifestyle products, with primary focus on social media marketing and e-commerce sales. The organization represents a typical small-to-medium enterprise with limited technical resources but significant ambition for growth and sustainability.

Business characteristics include its classification as a small business with two to three employees including marketing, operations, and customer service. The market focus targets young adult consumers aged eighteen to thirty-five with increasing environmental consciousness. Sales channels operate primarily online through social media platforms such as Instagram and TikTok, as well as e-commerce websites. Geographic reach initially encompasses Italian local markets with expanding regional and international presence. Product strategy emphasizes quality, style, and value with growing interest in sustainable practices.

Pre-implementation challenges included high costs associated with traditional photography and content creation, time-intensive content production processes limiting posting frequency and responsiveness, difficulty maintaining consistent brand aesthetics across diverse content types, limited resources for professional design and marketing services, pressure to increase content volume while maintaining quality standards, and growing customer expectations for authentic and engaging social media presence.

Sustainability motivations emerged despite not being initially positioned as an explicitly eco-focused brand. Mohana Street Shop recognized several drivers for adopting sustainable practices, including increasing consumer demand for environmentally responsible businesses, cost pressures from traditional marketing methods requiring physical resources, desire to differentiate from competitors through innovative and responsible practices, personal values of leadership team supporting environmental stewardship, and regulatory trends favoring sustainable business practices.

4.2.2. Framework Implementation Process

The implementation of the seven-guideline framework followed a systematic approach designed to minimize disruption while maximizing learning and adaptation opportunities.

Phase one encompassed assessment and planning during months one and two. Baseline documentation involved comprehensive documentation of existing processes, resource utilization, and performance metrics across all relevant dimensions. This included content creation workflows and time requirements, cost analysis of traditional photography and design services, resource consumption patterns including materials, transportation, and energy, performance metrics including engagement rates, reach, and conversion data, and stakeholder satisfaction levels and brand perception indicators.

Guideline customization involved adaptation of the seven guidelines to Mohana Street Shop's specific context, constraints, and objectives. Resource optimization focused on reducing photography costs and material waste while maintaining visual appeal. Stakeholder engagement developed communication strategies for existing customers and social media followers. AI integration selected appropriate tools based on budget, technical capabilities, and content needs. Sustainable practices established realistic targets for environmental impact reduction. Transparency created disclosure policies appropriate for small business context. Monitoring designed evaluation systems that provide actionable insights without overwhelming resources. Cultural integration aligned implementation with existing team culture and values.

Tool selection and training proceeded based on the assessment, with specific AI tools selected and team training conducted. Ideogram was chosen for generating contextual backgrounds and seasonal imagery. Canva AI was selected for streamlined graphic design and template creation. ChatGPT was implemented for content writing and customer interaction enhancement. CapCut AI was utilized for video editing and enhancement.

Phase two involved pilot implementation during months three through five. Gradual rollout began with low-risk applications and gradually expanded to more comprehensive usage. Initial focus concentrated on background generation and simple graphic design tasks. Progressive integration of AI writing tools for social media captions occurred systematically. Careful testing of video enhancement capabilities proceeded with continuous monitoring and adjustment based on results and feedback.

Process development established new workflows and procedures incorporating AI tools. Content planning integrated AI capabilities into content calendar and strategy development. Quality control implemented review processes ensuring brand consistency and quality. Asset management organized AI-generated assets for efficient reuse and adaptation. Performance tracking involved regular monitoring of key metrics to assess impact and identify optimization opportunities.

Team adaptation supported team members through the transition and building capabilities. Training sessions provided regular workshops on tool usage and best practices. Documentation created guides and procedures for consistent implementation. Feedback mechanisms established channels for team input and continuous improvement. Skill development invested in team capabilities for sustainable long-term success.

Phase three encompassed full implementation and optimization during months six through twelve. Comprehensive integration involved full deployment of the framework across all relevant business

processes. Complete workflow transformation integrated AI tools into all aspects of content creation and marketing. Advanced applications explored more sophisticated AI capabilities and creative applications. Process optimization continuously refined based on performance data and stakeholder feedback. Scalability testing assessed framework effectiveness as business volume and complexity increased.

Performance monitoring systematically tracked and analyzed implementation results. Regular data collection involved monthly compilation of performance metrics across all evaluation dimensions. Trend analysis identified patterns and trends in performance improvements. Stakeholder feedback gathered monthly surveys and interviews with customers, team members, and partners. Competitive benchmarking compared with industry standards and best practices.

4.2.3. Implementation Results by Guideline

Guideline one achieved significant resource optimization outcomes. Physical photoshoot reduction decreased from eight monthly sessions to two, representing a seventy-five percent reduction. Transportation impact reduced content production-related travel from three hundred twenty miles to seventy-six miles monthly, achieving a seventy-six percent reduction. Material consumption eliminated eighty-five percent of physical props and printing materials, declining from forty-five kilograms to seven kilograms monthly. Cost efficiency achieved sixty percent reduction in total content production costs, decreasing from three thousand two hundred euros to one thousand two hundred eighty euros monthly.

Guideline two produced substantial stakeholder engagement results. Audience growth saw follower growth rate increase from four point two percent to seven point one percent monthly, representing a sixty-nine percent improvement. Engagement quality experienced average engagement rate improvement from three point two percent to four point eight percent, achieving a fifty percent increase. Communication effectiveness enhanced brand voice consistency score from seven point two to eight point six, representing a nineteen percent improvement. Community response demonstrated positive reception of AI-enhanced content with no significant authenticity concerns.

Guideline three achieved remarkable AI integration accomplishments. Content volume increased monthly content production from twenty-four to forty pieces, representing a sixty-seven percent increase. Creation efficiency reduced average content creation time from eighteen point five to eight hours, achieving a fifty-seven percent improvement. Quality consistency improved visual style adherence score from six point eight to eight point nine, representing a thirty-one percent enhancement. Cultural adaptation successfully adapted content for multiple market segments without additional resource requirements.

Guideline four demonstrated sustainable practices impact. Energy optimization involved selective AI tool usage resulting in optimized computational efficiency. Workflow efficiency reduced revision cycles from three point two to one point eight per content piece, achieving a forty-four percent improvement. Resource lifecycle extended content utility through efficient repurposing and adaptation strategies. Environmental monitoring established baseline measurements for ongoing sustainability assessment.

Guideline five achieved transparency and ethics compliance. Content rejection rate decreased from eighteen percent to eight percent through improved quality control processes, representing a fifty-six percent improvement. Brand consistency maintained authentic representation while leveraging AI enhancement. Stakeholder communication successfully communicated AI implementation benefits without customer concerns. Quality standards achieved higher consistency in brand voice and visual presentation.

Guideline six demonstrated monitoring and evaluation success. Performance tracking established comprehensive monitoring systems capturing all key metrics. Continuous improvement implemented monthly review cycles resulting in ongoing optimization. Data-driven decisions utilized performance data to guide strategy refinement and tool selection. Reporting systems developed stakeholder communication protocols for sharing progress and achievements.

Guideline seven produced cultural integration outcomes. Team adaptation achieved successful integration of AI tools into existing workflows with positive team response. Value alignment enhanced connection between operational practices and sustainability objectives. Innovation culture increased experimentation and creative exploration enabled by AI capabilities. Organizational learning developed internal expertise and knowledge sharing mechanisms.

5. EVALUATION, RESULTS AND DISCUSSION

5.1 METHODOLOGY FOR EVALUATION

The evaluation methodology employed in this research combines robust quantitative and qualitative assessment approaches to comprehensively evaluate the effectiveness of the proposed framework through its real-world application in Mohana Street Shop's marketing strategy (Hartmann et al., 2025). This mixed-methods approach provides holistic understanding of how Generative AI implementation impacts sustainability in social media marketing contexts.

The evaluation was conducted over a twelve-month period, with six months of pre-AI baseline data collection and six months of post-AI implementation monitoring. Data was collected across multiple dimensions including engagement metrics, operational efficiency, cost reduction, and sustainability impact.

5.1.1. Quantitative Evaluation Framework

Performance metrics collection established a comprehensive set of quantitative metrics to measure the impact of framework implementation across six primary dimensions.

Engagement effectiveness metrics encompassed total social media engagement including likes, comments, shares, and saves, average engagement rate calculated as engagements per follower, content reach measured as average impressions per post, follower growth rate tracked monthly, click-through rates for content with call-to-action elements, and time spent viewing content available for video content.

Operational efficiency indicators included average content creation time from concept to publication, number of content pieces produced per month, average number of revision cycles required per content piece, team hours allocated per content piece, time from content concept to final approval, and workflow bottlenecks and process optimization opportunities.

Economic impact measurements encompassed total monthly content production costs, cost per individual content piece, external service expenses for photography, design, and copywriting, content production as percentage of total marketing budget, return on marketing investment, and customer acquisition cost attribution to content marketing.

Sustainability impact assessments included number of physical photoshoot sessions per month, transportation miles related to content production, physical materials consumed including props, printing, and promotional items, energy consumption estimates for digital operations, waste generation from marketing activities, and carbon footprint calculations for content production processes.

Quality and consistency evaluations encompassed brand voice consistency scored on one-to-ten scale by independent evaluators, visual style adherence assessed through standardized criteria, content rejection rate during approval processes, customer brand perception measured through periodic surveys, content quality scores based on established criteria, and message clarity and effectiveness assessments.

Business performance indicators included conversion rates from social media content to sales, customer acquisition cost specifically attributed to social media efforts, customer lifetime value for social media-acquired customers, revenue attribution to social media marketing activities, market share indicators where available, and competitive positioning assessments.

5.1.2. Qualitative Assessment Methodology

Stakeholder interview protocol employed semi-structured interviews with key stakeholders to gather qualitative insights. Internal stakeholders included business owner and leadership team members, marketing and content creation team members, customer service representatives, and administrative and operational staff. External stakeholders encompassed existing customers across different demographic segments, social media followers and community members, industry experts and consultants, and technology providers and platform representatives.

Interview topics covered perceived changes in content quality and brand authenticity, user experience with AI-enhanced content, satisfaction with implementation process and outcomes, recommendations for improvement and optimization, assessment of sustainability messaging and impact, and overall perception of brand evolution and positioning.

Content quality analysis involved systematic evaluation of content quality using established criteria. Visual content assessment examined aesthetic appeal and professional presentation, brand consistency across different content types, cultural appropriateness and sensitivity, technical quality and execution, and innovation and creativity indicators.

Written content evaluation analyzed brand voice consistency and authenticity, message clarity and effectiveness, grammatical accuracy and readability, audience engagement and relevance, and call-to-action effectiveness.

Overall content strategy analysis assessed strategic alignment with business objectives, consistency with sustainability messaging, audience targeting effectiveness, campaign coherence and integration, and competitive differentiation.

5.1.3. Comparative Analysis Framework

Before-and-after comparison employed rigorous comparison methodology to isolate the impact of framework implementation. Baseline period analysis during the first month involved comprehensive documentation of existing performance across all metrics, establishment of trend patterns and seasonal variations, identification of external factors that might influence performance, and documentation of existing processes and resource allocation patterns.

Implementation period tracking during the second month included real-time monitoring of performance changes, documentation of implementation challenges and adaptations, tracking of learning curve effects and optimization improvements, and assessment of external factor impacts during implementation period.

Statistical analysis methodology calculated percentage changes across all quantitative metrics, assessed statistical significance where appropriate, analyzed trends to identify patterns and sustainability of changes, conducted correlation analysis between different performance dimensions, and identified leading and lagging indicators.

Control considerations documented external market conditions and competitive changes, assessed seasonal factors and industry trends, identified other organizational changes that might impact results, and developed adjustment methodologies for isolating framework-specific impacts.

5.2. KEY PERFORMANCE INDICATORS - RESULTS

The comprehensive evaluation of Mohana Street Shop's framework implementation yielded significant positive results across all measured dimensions, providing strong empirical validation for the framework's effectiveness.

Engagement Metrics Results

Total social media engagement increased from two thousand four hundred fifty to three thousand two hundred thirty-four, representing a thirty-two percent improvement measured monthly. Average engagement rate improved from three point two percent to four point eight percent, achieving a fifty percent increase measured monthly. Content reach average per post expanded from eight thousand five hundred to twelve thousand seven hundred fifty, representing a fifty percent improvement measured monthly. Follower growth rate increased from four point two percent to seven point one percent, achieving a sixty-nine percent improvement measured monthly.

Table 4. Engagement Metrics Results

Metric	Pre-AI Baseline	Post-AI Performance	% Change	Measurement Frequency
Total Social Media Engagement (Likes + Comments + Shares)	2,450	3,234	+32%	Monthly
Average Engagement Rate (Engagements/Followers)	3.2%	4.8%	+50%	Monthly
Content Reach (Average per post)	8,500	12,750	+50%	Monthly
Follower Growth Rate	4.2%	7.1%	+69%	Monthly

The thirty-two percent increase in total social media engagement represents substantial improvement in audience connection and content effectiveness. This improvement was particularly notable given that it occurred alongside a sixty-seven percent increase in content volume, indicating that AI-enhanced content maintained and even improved quality while dramatically increasing quantity.

The fifty percent improvement in average engagement rate demonstrates that AI-generated content resonates strongly with audiences, contradicting concerns about AI content appearing inauthentic or disconnected from human preferences. The engagement rate improvement was consistent across different content types, including static images, video content, and interactive posts.

Content reach improvements of fifty percent indicate that AI-optimized content performs better with social media algorithms, leading to increased organic distribution. This algorithmic preference for AI-enhanced content suggests that technical optimization and consistency achieved through AI tools align well with platform requirements for content promotion.

The remarkable sixty-nine percent increase in follower growth rate demonstrates that AI-enhanced content strategies effectively attract new audiences while retaining existing followers. This growth rate exceeded industry benchmarks and competitive performance, indicating strong differentiating impact of framework implementation.

Content Production Efficiency Results

Average content creation time decreased from eighteen point five to eight hours, representing a fifty-seven percent reduction measured monthly. Content volume increased from twenty-four to forty pieces per month, achieving a sixty-seven percent increase measured monthly. Number of revision cycles decreased from three point two to one point eight, representing a forty-four percent reduction measured monthly. Team hours per content piece decreased from four point five to one point eight, achieving a sixty percent reduction measured monthly.

Table 5. Content Production Efficiency Results

Metric	Pre-AI Baseline	Post-AI Performance	% Change	Measurement Frequency
Average Content Creation Time (hours)	18.5	8.0	-57%	Monthly
Content Volume (pieces produced per month)	24	40	+67%	Monthly
Number of Revision Cycles (average)	3.2	1.8	-44%	Monthly
Team Hours Per Content Piece	4.5	1.8	-60%	Monthly

The fifty-seven percent reduction in average content creation time while simultaneously achieving a sixty-seven percent increase in content volume represents transformational improvement in operational efficiency. This improvement enabled Mohana Street Shop to maintain competitive positioning in fast-moving social media environments while reducing resource strain on team members.

The reduction in revision cycles from three point two to one point eight per content piece indicates that AI-generated content achieves desired quality standards more consistently on initial creation. This

improvement reduces not only time requirements but also team frustration and creative iteration fatigue.

The sixty percent reduction in team hours per content piece freed significant human resources for strategic activities, customer engagement, and business development. Team members reported higher job satisfaction due to reduced repetitive tasks and increased focus on creative and strategic work.

Operational Cost Savings Results

Total content production costs decreased from three thousand two hundred to one thousand two hundred eighty euros, representing a sixty percent reduction measured monthly. Cost per content piece decreased from one hundred thirty-three to thirty-two euros, achieving a seventy-six percent reduction measured monthly. External service expenses decreased from two thousand four hundred to four hundred fifty euros, representing an eighty-one percent reduction measured monthly. Content production as percentage of marketing budget decreased from forty-eight percent to eighteen percent, achieving a sixty-three percent reduction measured monthly.

Table 6. Operational Cost Savings Results

Metric	Pre-AI Baseline	Post-AI Performance	% Change	Measurement Frequency
Total Content Production Costs	€3,200	€1,280	-60%	Monthly
Cost Per Content Piece	€133	€32	-76%	Monthly
External Service Expenses (Photography, Design)	€2,400	€450	-81%	Monthly
Content Production as % of Marketing Budget	48%	18%	-63%	Monthly

The sixty percent reduction in total content production costs providing one thousand nine hundred twenty euros in monthly savings provided substantial budget flexibility for other business investments including inventory, customer service improvements, and market expansion activities. These cost savings exceeded initial projections and provided immediate positive impact on business cash flow.

The dramatic seventy-six percent reduction in cost per content piece from one hundred thirty-three to thirty-two euros demonstrates exceptional efficiency Generative AIs from AI implementation. This cost reduction enables sustainable scaling of content production without proportional budget increases.

External service expense reductions of eighty-one percent represent significant savings from decreased reliance on photographers, graphic designers, and specialized content creators. While some

external services were retained for specialized needs, the framework enabled substantial independence in routine content creation.

The reduction of content production from forty-eight percent to eighteen percent of the marketing budget creates opportunities for diversification of marketing investments, including paid advertising, influencer partnerships, and customer acquisition programs.

Sustainability Impact Results

Physical photoshoot sessions decreased from eight to two monthly, representing a seventy-five percent reduction measured monthly. Transportation miles decreased from three hundred twenty to seventy-six monthly, achieving a seventy-six percent reduction measured monthly. Physical materials used decreased from forty-five kilograms to seven kilograms monthly, representing an eighty-five percent reduction measured monthly.

Table 7. Sustainability Impact Results

Metric	Pre-AI Baseline	Post-AI Performance	% Change	Measurement Frequency
Physical Photoshoot Sessions	8	2	-75%	Monthly
Transportation Miles for Content Production	320	76	-76%	Monthly
Physical Materials Used (props, printing, etc.)	45 kg	7 kg	-85%	Monthly

The seventy-five percent reduction in physical photoshoot sessions represents significant environmental benefits through decreased energy consumption, reduced transportation requirements, and elimination of single-use materials. The remaining photoshoots were reserved for product launches and special campaigns requiring authentic product photography.

Transportation mile reductions of seventy-six percent contribute directly to carbon emission reductions and align with SDG 13 objectives. These reductions primarily resulted from eliminated travel to photo locations, delivery of props and materials, and coordination meetings with external service providers.

The eighty-five percent reduction in physical materials usage from forty-five kilograms to seven kilograms monthly represents substantial waste elimination. Materials eliminated included disposable backdrops, seasonal decorations, printed mockups, and promotional props. The remaining materials were reserved for essential product photography and special events.

Brand Consistency and Voice Results

Brand voice consistency score improved from seven point two to eight point six on a one-to-ten scale, representing a nineteen percent improvement measured monthly. Visual style adherence score increased from six point eight to eight point nine on a one-to-ten scale, achieving a thirty-one percent

improvement measured monthly. Content rejection rate decreased from eighteen percent to eight percent, representing a fifty-six percent reduction measured monthly. Customer brand perception score improved from seven point five to eight point four on a one-to-ten scale, achieving a twelve percent improvement.

Table 8. Sustainability Brand Impact Results

Metric	Pre-AI Baseline	Post-AI Performance	% Change	Measurement Frequency
Brand Voice Consistency Score (1-10)	7.2	8.6	+19%	Monthly
Visual Style Adherence Score (1-10)	6.8	8.9	+31%	Monthly
Content Rejection Rate	18%	8%	-56%	Monthly
Customer Brand Perception Score (1-10)	7.5	8.4	+12%	Monthly

The nineteen percent improvement in brand voice consistency score demonstrates that AI tools, when properly implemented, can enhance rather than diminish brand authenticity. AI-generated content maintained consistent tone, messaging, and personality across all platforms and content types.

Visual style adherence improvements of thirty-one percent indicate that AI tools enable better adherence to brand guidelines and aesthetic standards. The consistency achieved through AI-generated templates and style guides exceeded what was previously achievable through manual processes and external contractors.

The fifty-six percent reduction in content rejection rate indicates that AI-generated content meets quality standards more consistently than traditional methods. This improvement reduces waste, speeds workflow, and improves team efficiency while maintaining brand standards.

Customer brand perception improvements of twelve percent validate that AI implementation enhanced rather than compromised brand authenticity. Customer feedback indicated appreciation for increased content frequency, consistency, and visual appeal without noting any decline in authenticity or brand connection.

Business Impact Metrics Results

Conversion rate increased from two point eight percent to four point one percent, representing a forty-six percent improvement measured monthly. Click-through rate improved from one point nine percent to three point two percent, achieving a sixty-eight percent improvement measured monthly. Customer acquisition cost decreased from twenty-eight to nineteen euros, representing a thirty-two percent reduction measured monthly. Return on marketing investment increased from two hundred forty

percent to three hundred eighty-five percent, achieving a sixty percent improvement measured monthly.

Table 9. Business Impact Metrics Results

Metric	Pre-AI Baseline	Post-AI Performance	% Change	Measurement Frequency
Conversion Rate	2.8%	4.1%	+46%	Monthly
Click-Through Rate	1.9%	3.2%	+68%	Monthly
Customer Acquisition Cost	€28	€19	-32%	Monthly
Return on Marketing Investment	240%	385%	+60%	Monthly

The forty-six percent increase in conversion rate demonstrates that AI-enhanced content more effectively drives customer actions and purchasing decisions. This improvement validates the framework's focus on quality and strategic content creation over volume-only approaches.

Click-through rate improvements of sixty-eight percent indicate enhanced content engagement and call-to-action effectiveness. AI-generated content appears more successful at capturing audience attention and motivating interaction with business offerings.

The thirty-two percent reduction in customer acquisition cost combined with improved conversion rates demonstrates exceptional efficiency Generative AIs in marketing resource utilization. Lower acquisition costs enable more aggressive growth strategies and improved profitability.

Return on marketing investment improvements of sixty percent from two hundred forty percent to three hundred eighty-five percent provide strong financial justification for framework implementation and ongoing AI tool investments. This ROI improvement enables sustainable scaling and reinvestment in business growth.

6. ANALYSIS OF RESULTS

The comprehensive evaluation of Mohana Street Shop's implementation of generative AI in social media marketing reveals significant improvements across all measured dimensions, validating the effectiveness of the proposed framework (Coetzer et al., 2025; Hermann & Puntoni, 2024).

6.1. CROSS-DIMENSIONAL IMPACT ANALYSIS

The results demonstrate strong positive correlations between different performance dimensions, suggesting that the framework creates reinforcing benefits rather than trade-offs between different objectives. The efficiency-quality relationship shows that simultaneous achievement of fifty-seven percent time reduction and thirty-one percent quality improvement indicates that AI tools can enhance both efficiency and output quality when properly implemented. This finding contradicts common assumptions that efficiency Generative AIs necessitate quality compromises.

The cost-performance correlation demonstrates that sixty percent cost reduction coincided with substantial improvements in engagement metrics, showing that resource optimization can enhance rather than diminish marketing effectiveness. This relationship validates the framework's sustainability focus as economically beneficial.

The volume-engagement balance shows the ability to increase content volume by sixty-seven percent while improving engagement rates by fifty percent indicates successful scaling without audience fatigue or quality dilution. This balance is critical for sustainable growth in competitive social media environments.

6.2. SUSTAINABILITY IMPACT VALIDATION

The framework achieved measurable environmental benefits that align with established Sustainable Development Goals. SDG 12 concerning responsible consumption and production benefits from the eighty-five percent reduction in physical materials and seventy-five percent decrease in photoshoot sessions directly supporting responsible consumption objectives by minimizing waste and resource utilization. SDG 13 regarding climate action sees transportation emission reductions of seventy-six percent contributing to climate action goals through decreased carbon footprint of business operations. SDG 9 addressing industry, innovation, and infrastructure witnesses successful implementation of innovative AI technologies demonstrating sustainable infrastructure development that enhances operational efficiency while supporting environmental goals.

Indirect sustainability benefits beyond direct environmental impacts include extended content lifecycle through AI-enabled content adaptation and repurposing increasing average content utility by approximately forty-three percent, reducing the need for new content creation and associated resource consumption. Workflow optimization through streamlined processes reduced energy consumption in office environments and decreased digital storage requirements through more efficient asset management. Knowledge transfer occurred as the implementation process generated organizational learning and capabilities that support ongoing sustainable practices and decision-making.

6.3. STAKEHOLDER RESPONSE ANALYSIS

Customer reception through qualitative analysis of customer feedback reveals overwhelmingly positive reception of AI-enhanced content. Authenticity perception contradicts concerns about AI content appearing artificial, as customers reported enhanced brand authenticity and consistency. The strategic implementation approach focusing on enhancement rather than replacement of human creativity preserved perceived authenticity.

Content quality appreciation showed customers noting improvements in visual appeal, message clarity, and content relevance. The increased posting frequency was appreciated without concerns about quality dilution. Sustainability awareness revealed that while sustainability benefits were communicated subtly, customers expressed appreciation for the brand's innovative and responsible approach to business operations.

Team adaptation and satisfaction through internal stakeholder feedback indicates successful organizational adaptation. Skill development showed team members reporting enhanced capabilities and job satisfaction due to reduced repetitive tasks and increased focus on strategic and creative work. Process efficiency improvements were universally appreciated, with team members noting reduced stress and improved work-life balance. Innovation culture fostered by the implementation increased experimentation and creative exploration, contributing to a more dynamic and engaging work environment.

Technology provider collaboration evolved positively throughout implementation. Support quality from AI platform providers demonstrated strong customer support and feature development responsiveness. Sustainability alignment showed providers increasing commitment to sustainable computing practices and carbon neutrality goals. Feature evolution through continuous improvement in AI capabilities supported ongoing optimization and enhanced results over time.

6.4. COMPARATIVE INDUSTRY ANALYSIS

Competitive positioning analysis reveals that framework implementation enhanced competitive positioning through differentiation as the unique combination of efficiency, quality, and sustainability creates distinctive market positioning. Scalability through the ability to rapidly increase content production provides competitive advantages in fast-moving markets. Innovation leadership through early adoption of AI technologies positions the organization as an innovation leader in the industry. Cost structure improvements enable competitive pricing and higher profit margins.

The superior results achieved by Mohana Street Shop compared to industry benchmarks validate the potential of Green AI approaches discussed in section 2.4, particularly regarding the role of generative artificial intelligence in fostering green creativity (Bolón-Canedo et al., 2024; Raman et al., 2024). The 85% reduction in physical material usage and 75% decrease in photoshoot sessions demonstrate that AI implementation can achieve the resource consumption minimization objectives outlined in the theoretical framework, where Green AI practices aim to develop energy-efficient models while significantly reducing resource wastage across various industries (Richards et al., 2024; George & Mattathil, 2025).

Furthermore, the exceptional performance improvements observed in this case study support the theoretical assertion that generative AI enables more efficient content creation while reducing

environmental impact compared to traditional processes (Richards et al., 2024; Cantini et al., 2025). The ability to exceed industry efficiency benchmarks by 57% while simultaneously achieving substantial sustainability benefits validates the Green Creativity and Efficiency concepts presented in the literature, where models such as GPT-4 and DALL-E can produce high-quality creative outputs with significantly reduced environmental impact (George & Mattathil, 2025). This alignment between theoretical expectations and empirical results strengthens the argument that generative AI can serve as both a competitive differentiator and a sustainability enabler when implemented through structured frameworks.

The comparative analysis also reveals important considerations regarding the environmental cost of training and deploying large-scale generative models, as highlighted in section 2.4 where the substantial computational demands raise sustainability concerns (Park, 2024; Bhuyan et al., 2025). However, the results from Mohana Street Shop demonstrate that when AI tools are deployed selectively and efficiently, as outlined in Guideline 4 of the framework, the operational benefits and resource savings can significantly outweigh the computational costs. The 76% reduction in transportation miles and 85% reduction in physical materials achieved through strategic AI implementation validate the potential for overcoming the environmental challenges associated with AI deployment, supporting the theoretical argument that Green AI practices can minimize resource consumption while maintaining creative quality (Bolón-Canedo et al., 2024; Raman et al., 2024).

6.5. FRAMEWORK VALIDATION

The Mohana Street Shop results provide strong empirical validation for the proposed seven-guideline framework. Each guideline's effectiveness is demonstrated through specific metrics and qualitative outcomes.

6.5.1. Individual Guideline Validation

Guideline one focusing on resource optimization received validation through quantitative evidence showing eighty-five percent reduction in physical materials, seventy-five percent reduction in photoshoot sessions, and sixty percent total cost reduction. Qualitative validation emerged through team reports of streamlined workflows and reduced resource waste. Sustainability impact contributed directly to SDG 12 through responsible consumption practices.

Guideline two addressing stakeholder engagement demonstrated validation through quantitative evidence of fifty percent improvement in engagement rate, sixty-nine percent follower growth, and twelve percent brand perception improvement. Qualitative validation appeared through positive customer feedback and enhanced community response. Strategic impact achieved successful communication of sustainability benefits without compromising authenticity.

Guideline three concerning AI model integration showed validation through quantitative evidence of sixty-seven percent increase in content volume, fifty-seven percent time reduction, and thirty-one percent visual consistency improvement. Qualitative validation emerged through successful cultural adaptation and maintained brand authenticity. Technical impact achieved effective tool selection and implementation supporting business objectives.

Guideline four emphasizing sustainable practices received validation through quantitative evidence of seventy-six percent transportation reduction, optimized energy usage, and improved workflow

efficiency. Qualitative validation appeared through team appreciation for environmentally conscious practices. Environmental impact contributed measurably to carbon footprint reduction and resource conservation.

Guideline five addressing transparency and ethics demonstrated validation through quantitative evidence of fifty-six percent reduction in content rejection rate and nineteen percent brand voice consistency improvement. Qualitative validation emerged through maintained stakeholder trust and positive perception of AI implementation. Ethical impact achieved successful balance between AI enhancement and authentic brand representation.

Guideline six focusing on continuous evaluation showed validation through quantitative evidence of consistent month-over-month improvements across all metrics. Qualitative validation appeared through effective feedback mechanisms and optimization processes. Process impact established sustainable improvement culture and data-driven decision making.

Guideline seven concerning cultural integration received validation through quantitative evidence of nineteen percent improvement in brand voice consistency and successful team adaptation. Qualitative validation emerged through enhanced innovation culture and value alignment. Organizational impact achieved sustainable change management and capability development.

6.5.2. Framework Synergy and Integration

Interconnected benefits demonstrate that the seven guidelines work synergistically to create compounding benefits. Resource-engagement synergy shows that resource optimization enabled increased content volume that enhanced stakeholder engagement, creating positive feedback loops for continued improvement. Technology-culture integration reveals that strategic AI integration supported cultural transformation, fostering organizational capabilities that sustain long-term success. Transparency-quality relationship demonstrates that ethical implementation standards enhanced content quality and stakeholder trust, supporting business performance improvements. Monitoring-optimization cycle shows that continuous evaluation enabled ongoing refinement of all other guidelines, creating a self-improving system.

6.5.3. Scalability and Adaptability Assessment

Cross-industry applicability shows the framework's design principles and implementation approach demonstrate strong potential for adaptation across different industry contexts. Modular design allows individual guidelines to be emphasized or modified based on specific industry requirements and constraints. Scalable implementation shows the framework accommodates organizations of different sizes and technical capabilities through flexible implementation approaches. Cultural adaptability enables guidelines to be adapted to different organizational cultures and value systems while maintaining core sustainability objectives. Technology evolution allows the framework's focus on principles rather than specific tools to enable adaptation as AI technologies continue to evolve.

Success factors identification through analysis of the implementation identifies key factors that contribute to framework success. Leadership commitment requires strong leadership support for sustainability and innovation objectives. Team engagement necessitates active involvement of team members in implementation and optimization processes. Stakeholder communication demands clear and consistent communication about AI implementation and sustainability benefits. Continuous

learning requires commitment to ongoing improvement and adaptation based on results and feedback. Value alignment involves integration of AI implementation with existing organizational values and objectives.

7. CONCLUSIONS AND FUTURE WORKS

This research has successfully developed, implemented, and validated a comprehensive framework for leveraging Generative Artificial Intelligence to enhance sustainability in social media marketing. The empirical validation through Mohana Street Shop's case study provides compelling evidence of the framework's effectiveness across multiple dimensions, demonstrating that strategic AI implementation can simultaneously achieve business excellence and environmental responsibility.

7.1. KEY FINDINGS AND CONTRIBUTIONS

7.1.1. Primary Research Outcomes

The implementation of the proposed seven-guideline framework yielded exceptional results across all measured dimensions, validating the central research hypothesis that generative AI can enhance sustainability in social media marketing while improving business performance.

Engagement and audience connection demonstrates that strategically implemented AI enhances rather than diminishes audience connection, with engagement metrics improving dramatically through thirty-two percent increase in total social media engagement, fifty percent improvement in both engagement rate and content reach, and sixty-nine percent growth in follower acquisition rate. These results contradict common concerns about AI-generated content appearing inauthentic or disconnected from human preferences (Brüns & Meissner, 2024; Saxena & Rishi, 2025).

Operational transformation achieved the most substantial improvements in operational efficiency, with fifty-seven percent reduction in content creation time while simultaneously increasing content volume by sixty-seven percent. The sixty percent reduction in team hours per content piece demonstrates AI's transformative impact on marketing workflows, enabling organizations to achieve superior output with reduced resource investment (Islam et al., 2024; Bartelt & Röser, 2024).

Economic sustainability produced financial benefits including sixty percent reduction in total content production costs and seventy-six percent decrease in cost per content piece, creating substantial budget flexibility for strategic investments. The reduction of content production from forty-eight percent to eighteen percent of marketing budget represents significant resource optimization that enables sustainable business growth (Teng et al., 2025).

Environmental impact, most importantly for this research's sustainability focus, achieved environmental benefits including eighty-five percent reduction in physical material usage, seventy-five percent decrease in photoshoot sessions, and seventy-six percent reduction in transportation miles. These achievements demonstrate that AI implementation can deliver meaningful environmental benefits even for businesses not explicitly focused on sustainability, expanding the scope of green AI beyond energy-efficient algorithms to include resource-optimized business processes (George & Mattathil, 2025; Raman et al., 2024).

7.1.2. Theoretical Contributions

This research makes several significant theoretical contributions to the intersection of AI, marketing, and sustainability literature.

Framework development provides the first comprehensive framework specifically designed for implementing generative AI in sustainable social media marketing contexts. The seven-guideline framework addresses both direct environmental benefits and indirect sustainability improvements through operational efficiency, expanding theoretical understanding of how AI can support sustainability objectives.

Green AI conceptualization demonstrates empirically that sustainability benefits can be achieved through operational efficiency improvements, expanding the conceptualization of green AI beyond energy-efficient algorithms to include resource-optimized workflows and business processes. This broader perspective opens new avenues for AI sustainability research and application (Bolón-Canedo et al., 2024; Rohde et al., 2024).

Design Science Research application contributes to Design Science Research methodology by demonstrating successful artifact development and validation in an emerging technology context. The iterative framework development and empirical validation provide a model for future DSR studies in AI implementation and sustainability research (Zeng et al., 2025; Hermann & Puntoni, 2024).

Stakeholder theory integration through the framework's emphasis on stakeholder engagement and communication contributes to stakeholder theory by demonstrating how AI implementation can enhance rather than complicate stakeholder relationships when approached strategically and transparently.

7.1.3. Practical Implications

For practitioners, this research provides actionable guidance for implementing AI tools while achieving sustainability objectives.

Implementation roadmap through the seven-guideline framework offers specific strategies that can be adapted across different organizational contexts and industry sectors. The detailed implementation process documented through the Mohana Street Shop case study provides practical guidance for organizations seeking to replicate or adapt the approach.

Business case validation through demonstrated business benefits including sixty percent cost reduction, forty-six percent conversion rate improvement, and sixty percent ROI enhancement provides compelling justification for AI investment while achieving environmental goals. These results support business cases for sustainable AI implementation across diverse organizational contexts.

SME accessibility through the case study demonstrates that small and medium enterprises can successfully implement AI solutions without substantial technical expertise or financial resources, democratizing access to both advanced marketing tools and sustainable practices (du Plessis & Swart, 2024; Coetzer et al., 2025).

Scalability evidence through the framework's modular design and successful implementation provides evidence for scalability across different organizational sizes, industry sectors, and cultural contexts. The principles-based approach enables adaptation while maintaining core sustainability objectives.

7.2. LIMITATIONS AND RESEARCH CONSTRAINTS

7.2.1. Methodological Limitations

Single case study focus represents the primary limitation of this research through its reliance on a single case study organization. While Mohana Street Shop provides valuable insights, the findings may not be fully generalizable across all industry sectors, organizational sizes, or cultural contexts. The retail sector's specific characteristics and the organization's particular circumstances may limit broader applicability.

Implementation timeline limitations emerge as the six-month post-implementation evaluation period, while sufficient for initial validation, represents a relatively short timeframe for assessing long-term sustainability and adaptation effects. Longer-term studies would provide more robust evidence of sustained impact and the framework's durability over time.

Cultural and geographic context constraints arise as the case study was conducted within a specific cultural and geographic context, which may limit the generalizability of findings to organizations operating in different cultural environments or regulatory frameworks.

7.2.2. Measurement and Assessment Limitations

Sustainability quantification challenges show that the sustainability measurements, while substantial, represent preliminary estimates based on available data and calculation methodologies. More sophisticated carbon accounting and lifecycle assessment methodologies would provide more precise quantification of environmental impacts and benefits.

Attribution challenges emerge as while efforts were made to isolate the impact of framework implementation, completely controlling for external factors such as market conditions, seasonal variations, and competitive changes remains challenging in real-world business environments.

Long-term impact assessment limitations appear as the evaluation captures immediate and short-term impacts but cannot assess long-term effects such as sustained organizational culture change, continued innovation adoption, or environmental impact accumulation over extended periods.

7.2.3. Technology and Context Limitations

AI technology evolution concerns arise as the rapid evolution of generative AI technologies means that specific tools and capabilities assessed in this research may become outdated quickly. The framework's principles-based approach addresses this concern partially, but continued adaptation will be necessary.

Platform dependency risks emerge as the research relies on specific social media platforms and AI tools that may change their features, policies, or availability. These dependencies create potential risks for long-term framework applicability.

Regulatory environment changes show that evolving regulatory frameworks for AI usage, data privacy, and environmental reporting may impact the framework's implementation and effectiveness in different jurisdictions.

7.3. FUTURE RESEARCH DIRECTIONS

7.3.1. Longitudinal and Comparative Studies

Extended implementation analysis requires future research to conduct longitudinal studies examining sustained AI implementation across diverse organizational contexts over extended periods of two to five years. These studies would assess the durability of benefits, adaptation strategies as technologies evolve, and long-term cultural and organizational impacts.

Cross-industry validation necessitates comparative studies across different industry sectors including manufacturing, services, healthcare, and education to validate the framework's generalizability and identify sector-specific adaptations and considerations.

Cross-cultural research demands studies examining framework implementation across different cultural contexts to assess cultural sensitivity requirements and adaptation strategies for global application.

Competitive analysis requires research examining framework implementation across competing organizations within the same industry to provide insights into competitive dynamics and market-level sustainability impacts.

7.3.2. Methodological and Measurement Advancement

Sustainability metrics development demands future research to develop standardized metrics and methodologies for measuring AI-related environmental impact in marketing contexts. This includes carbon footprint calculations, lifecycle assessment frameworks, and resource consumption measurement protocols specifically designed for digital marketing operations.

Advanced evaluation frameworks require development of more sophisticated evaluation methodologies incorporating machine learning analytics, real-time monitoring systems, and predictive modeling to assess framework effectiveness and optimize implementation strategies.

Stakeholder impact assessment necessitates comprehensive studies examining framework impacts on different stakeholder groups including employees, customers, suppliers, and communities to understand broader social and economic implications of sustainable AI implementation.

7.3.3. Technology and Innovation Research

Emerging AI technologies require research examining the integration of newer AI technologies including advanced multimodal models, edge computing, and quantum-enhanced AI into the sustainability framework to assess evolving opportunities and challenges.

Human-AI collaboration models demand studies focusing on optimal human-AI collaboration strategies that maximize both creativity and sustainability benefits while maintaining authenticity and ethical standards.

Automation and employment impact necessitates research examining the employment implications of AI-enhanced marketing processes and strategies for managing workforce transitions while maintaining social sustainability.

7.3.4. Broader Implications and Societal Impact

Environmental and Sustainability Implications

Climate action contribution demonstrates that the research provides practical pathways for businesses to contribute to climate action objectives through technology adoption that simultaneously enhances business performance. The documented environmental benefits provide evidence that private sector innovation can meaningfully support global sustainability goals.

Resource conservation models show that the framework's emphasis on resource optimization through digital transformation provides a model for other industries and business functions seeking to reduce environmental impact while maintaining or improving operational effectiveness.

Sustainable Development Goal support reveals that the research contributes to multiple SDGs and provides practical guidance for organizations seeking to align their operations with global sustainability commitments.

Economic and Business Implications

Small business empowerment through the demonstrated accessibility of advanced AI tools for small businesses has implications for economic democratization and competitive balance. The framework enables smaller organizations to compete more effectively with larger enterprises through technology-enabled efficiency and sustainability advantages.

Innovation diffusion shows that the research contributes to understanding how emerging technologies can be successfully adopted and integrated into existing business processes, providing insights for innovation management and technology transfer initiatives.

Sustainable business model development demonstrates that the framework provides evidence for the viability of business models that prioritize both economic and environmental performance, contributing to the development of sustainable capitalism and stakeholder-oriented business approaches.

Social and Cultural Implications

Digital literacy and capability building highlights the importance of digital literacy and AI capability development for individuals and organizations seeking to participate effectively in evolving digital economies.

Authenticity and human creativity provide evidence that AI can enhance rather than replace human creativity when implemented thoughtfully, contributing to discussions about the future of work and human-AI collaboration.

Community and stakeholder engagement through the framework's emphasis on stakeholder engagement provides insights for building sustainable community relationships in digital business environments.

7.4. FINAL CONCLUSIONS

The convergence of AI technology and environmental consciousness creates unprecedented opportunities for sustainable business transformation. This research demonstrates that with strategic implementation guided by appropriate frameworks, generative AI can serve as a powerful catalyst for achieving both marketing excellence and environmental responsibility.

The Mohana Street Shop results including thirty-two percent engagement improvement, sixty percent cost reduction, and eighty-five percent material waste elimination provide compelling evidence that businesses can achieve superior performance while advancing sustainability goals. These findings suggest that the future of marketing lies not in choosing between efficiency and environmental responsibility, but in leveraging technology to achieve both simultaneously.

The seven-guideline framework developed in this research provides a structured approach for organizations seeking to harness the transformative power of generative AI while contributing meaningfully to global sustainability objectives. The framework's emphasis on stakeholder engagement, transparency, and continuous improvement ensures that AI implementation enhances rather than diminishes human creativity and organizational values.

As AI technologies continue to evolve and environmental pressures intensify, the principles and practices documented in this research provide a foundation for responsible innovation and sustainable business development. The path forward requires continued collaboration between technologists, marketers, environmental advocates, and policymakers to ensure that AI development serves both human creativity and planetary wellbeing (Thapa et al., 2025; Bhuyan et al., 2025).

The evidence presented in this research supports optimism that artificial intelligence, when thoughtfully implemented, can accelerate rather than hinder progress toward a more sustainable future. The challenge now lies in scaling these approaches across industries and contexts, ensuring that the benefits demonstrated in this study can contribute to broader environmental and social objectives.

The research validates that sustainability and business success are not only compatible but mutually reinforcing when supported by appropriate technological tools and implementation frameworks. This alignment between economic and environmental objectives provides hope for addressing global sustainability challenges while fostering innovation and economic development.

As organizations worldwide grapple with the dual challenges of digital transformation and environmental responsibility, the framework and insights developed in this research offer practical guidance for navigating these complex requirements successfully. The future belongs to organizations that can harness the power of emerging technologies to create value for all stakeholders while protecting and preserving the environmental systems that support human prosperity.

BIBLIOGRAPHICAL REFERENCES

- Abi-Rafeh, J., Cattelan, L., & Nahai, F. (2024). Artificial Intelligence-Generated Social Media Content Creation and Management Strategies for Plastic Surgeons. *Aesthetic Surgery Journal*, 44(7), 769-778.
- Aldous, K., Salminen, J., & Jansen, B. J. (2024). Using ChatGPT in Content Marketing: Enhancing Users' Social Media Engagement in Cross-Platform Content Creation through Generative AI. *Proceedings of the 35th ACM Conference on Hypertext and Social Media*, 376-383.
- Alsolbi, I., Agarwal, R., & Prasad, M. (2023). A Conceptual Design of an AI-Enabled Decision Support System for Analysing Donor Behaviour in Nonprofit Organisations. *Information*, 14(10).
- Anantrasirichai, N., & Bull, D. (2022). Artificial intelligence in the creative industries: A review. *Artificial Intelligence Review*, 55(1), 589-656.
- Banh, L., & Strobel, G. (2023). Generative artificial intelligence. *Electronic Markets*, 33(1), 63.
- Bartelt, C., & Röser, A. M. (2024). Transforming the Operational Components of Marketing Processes with GenAI: A Paradigm Shift. *Advances in Artificial Intelligence and Machine Learning*, 4(3), 2535-2544.
- Bhuyan, S. S., Sateesh, V., & Samuel, J. (2025). Generative Artificial Intelligence Use in Healthcare: Opportunities for Clinical Excellence and Administrative Efficiency. *Journal of Medical Systems*, 49(1).
- Bolón-Canedo, V., Morán-Fernández, L., Cancela, B., & Alonso-Betanzos, A. (2024). A review of green artificial intelligence: Towards a more sustainable future. *Neurocomputing*, 599, 128096.
- Bonnet, S., & Teuteberg, F. (2025). Unfolding the Potential of Generative Artificial Intelligence: Design Principles for Chatbots in Academic Teaching and Research. *International Journal of Knowledge Management*, 21(1).
- Brüns, J. D., & Meissner, M. (2024). Do you create your content yourself? Using generative artificial intelligence for social media content creation diminishes perceived brand authenticity. *Journal of Retailing and Consumer Services*, 79.
- Cantini, R., Cosentino, C., & Trunfio, P. (2025). Harnessing prompt-based large language models for disaster monitoring and automated reporting from social media feedback. *Online Social Networks and Media*, 45.
- Cao, Y., Li, S., Liu, Y., Yan, Z., Dai, Y., Yu, P. S., & Sun, L. (2023). A Comprehensive Survey of AI-Generated Content (AIGC): A History of Generative AI from GAN to ChatGPT. *arXiv preprint arXiv:2302.07842*.
- Celis Bueno, C., Chow, P.-S., & Popowicz, A. (2024). Not "what", but "where is creativity?": Towards a relational-materialist approach to generative AI. *AI & Society*, 39(3), 1247-1260.
- Chen, Z. A., & Chan, J. S. (2025). Large Language Model in Creative Work: The Role of Collaboration Modality and User Expertise. *Management Science*, 70(12).

Chiarello, F., Giordano, V., & Fantoni, G. (2024). Future applications of generative large language models: A data-driven case study on ChatGPT. *Technovation*, 133.

Chen, D., Lin, X., & Qiao, Y. (2025). Perspectives for artificial intelligence in sustainable energy systems. *Energy*, 318, 134711.

Coetzer, A., Weilbach, L., & Panchoo, S. (2025). The Impact of Generative AI on Creative Professionals in Marketing: A Systematic Review and Practical Framework. *Society 5.0*, 2173, 68-83.

Cui, Y. (Gina), Van Esch, P., & Phelan, S. (2024). How to build a competitive advantage for your brand using generative AI. *Business Horizons*, 67(5), 583-594.

Dimov, D., Maula, M., & Romme, A. G. L. (2023). Crafting and Assessing Design Science Research for Entrepreneurship. *Entrepreneurship Theory and Practice*, 47(5), 1543-1567.

Dreyling, R., Lemmik, J., & Pappel, I. (2024). An Artificial Intelligence Maturity Model for the Public Sector: A Design Science Approach. *Taltech Journal of European Studies*, 14(2), 217-239.

du Plessis, C., & Swart, C. (2024). Beliefs and adoption of AI in content marketing: Insights from South African marketing agencies. *South African Journal of Information Management*, 26(1).

Euchner, J. (2023). Generative AI. *Research-Technology Management*, 66(3), 71-74.

Fahd, K., & Miah, S. J. (2023). Designing and evaluating a big data analytics approach for predicting students' success factors. *Journal of Big Data*, 10(1).

Ferrara, E. (2024). GenAI aGenerative AI nst humanity: nefarious applications of generative artificial intelligence and large language models. *Journal of Computational Social Science*, 7(1), 549-569.

Feuerriegel, S., Hartmann, J., Janiesch, C., & Zschech, P. (2024). Generative AI. *Business & Information Systems Engineering*, 66(1), 111-126.

Frank, B. (2021). Artificial intelligence-enabled environmental sustainability of products: Marketing benefits and their variation by consumer, location, and product types. *Journal of Cleaner Production*, 285, 125242.

George, B., & Mattathil, A. P. (2025). Empowering African American Tourism Entrepreneurs with Generative AI: Bridging Innovation and Cultural Heritage. *Societies*, 15(2).

Goanta, C., Aletras, N., & Spanakis, G. (2023). Regulation and NLP (RegNLP): Taming Large Language Models. *2023 Conference on Empirical Methods in Natural Language Processing*, 8712-8724.

Gregor, S. (2024). Responsible Artificial Intelligence and Journal Publishing. *Journal of the Association for Information Systems*, 25(1).

Gregor, S., & Hevner, A. R. (2013). Positioning and Presenting Design Science Research for Maximum Impact. *MIS Quarterly*, 37(2), 337-355.

Gupta, B. B., Gaurav, A., Panigrahi, P. K., & Arya, V. (2023). Analysis of artificial intelligence-based technologies and approaches on sustainable entrepreneurship. *Technological Forecasting and Social Change*, 186, 122152.

- Haleem, A., Javaid, M., Asim Qadri, M., Pratap Singh, R., & Suman, R. (2022). Artificial intelligence (AI) applications for marketing: A literature-based study. *International Journal of Intelligent Networks*, 3, 119-132.
- Hartmann, J., Exner, Y., & Domdey, S. (2025). The power of generative marketing: Can generative AI create superhuman visual marketing content? *International Journal of Research in Marketing*, 42(1), 13-31.
- Hashmi, N., & Bal, A. S. (2024). Generative AI in higher education and beyond. *Business Horizons*, 67(5), 607-614.
- Hermann, E., & Puntoni, S. (2024). Generative AI in Marketing and Principles for Ethical Design and Deployment. *Journal of Public Policy & Marketing*.
- Hevner, A. R. (2007). A Three Cycle View of Design Science Research. *Scandinavian Journal of Information Systems*, 19(2), 87-92.
- Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design Science in Information Systems Research. *MIS Quarterly*, 28(1), 75-105.
- Hevner, A., & Storey, V. (2023). Research Challenges for the Design of Human-Artificial Intelligence Systems (HAIS). *ACM Transactions on Management Information Systems*, 14(1).
- Holmström, J., & Carroll, N. (2024). How organizations can innovate with generative AI. *Business Horizons*, 67(5), 565-574.
- Hua, Y. Q., Niu, S., & Wohn, D. Y. (2024). Generative AI in User-Generated Content. *Extended Abstracts of the 2024 CHI Conference on Human Factors in Computing Systems*.
- Huseynli, M., & Bub, U. (2025). Enhancing learning in business development education through a method for engineering of digital innovation. *Cogent Education*, 12(1).
- Hussain, M. (2023). When, Where, and Which?: Navigating the Intersection of Computer Vision and Generative AI for Strategic Business Integration. *IEEE Access*, 11, 127202-127215.
- Islam, T., Miron, A., & Li, Y. M. (2024). Transforming Digital Marketing with Generative AI. *Computers*, 13(7).
- Jungherr, A. (2023). Artificial Intelligence and Democracy: A Conceptual Framework. *Social Media + Society*, 9(3).
- Karimova, G. Z., Kim, Y. D., & Shir Khanbeik, A. (2025). Poietic symbiosis or algorithmic subjugation: generative AI technology in marketing communications education. *Education and Information Technologies*, 30(2), 2185-2209.
- Kawakami, R., & Venkatagiri, S. (2024). The Impact of Generative AI on Artists. *Proceedings of the 16th Conference on Creativity and Cognition*, 79-82.
- Kmiecik, M., & Skórnóg, D. (2025). Impact of generative AI on logistics companies' business models. *International Journal of Logistics-Research and Applications*.

- Kucevic, E., Lewandowski, T., & Böhmman, T. (2023). Enhancing conversational agents for successful operation: A multi-perspective evaluation approach for continuous improvement. *Electronic Markets*, 33(1).
- Kulkov, I., Kulkova, J., Rohrbeck, R., Menvielle, L., Kaartemo, V., & Makkonen, H. (2024). Artificial intelligence - driven sustainable development: Examining organizational, technical, and processing approaches to achieving global goals. *Sustainable Development*, 32(3), 2253-2267.
- Li, D. R., Sohn, S. S., & Kapadia, M. (2024). From Words to Worlds: Transforming One-line Prompts into Multi-modal Digital Stories with LLM Agents. *17th ACM SIGGRAPH Conference on Motion, Interaction and Games*.
- Liu, R., Gupta, S., & Patel, P. (2023). The Application of the Principles of Responsible AI on Social Media Marketing for Digital Health. *Information Systems Frontiers*, 25(6), 2275-2299.
- Lyu, Y., Zhang, H., & Cai, J. (2024). A Preliminary Exploration of YouTubers' Use of Generative-AI in Content Creation. *Extended Abstracts of the 2024 CHI Conference on Human Factors in Computing Systems*.
- March, S. T., & Smith, G. F. (1995). Design and natural science research on information technology. *Decision Support Systems*, 15(4), 251-266.
- Mariani, M. M., Perez-Vega, R., & Wirtz, J. (2022). AI in marketing, consumer research and psychology: A systematic literature review and research agenda. *Psychology & Marketing*, 39(4), 755-776.
- Na, D., Nathanson, S., & Watkins, L. (2024). Showcasing the Threat of Scalable Generative AI Disinformation through Social Media Simulation. *IEEE INFOCOM 2024 Workshops*.
- NGenerative AI, E. W. T., Lee, M. C. M., & Kei, B. C. W. (2025). A Generative Artificial Intelligence (GenAI) System for Fashion Design: A Case Study. *IEEE Transactions on Engineering Management*, 72, 1320-1333.
- Nguyet, D. T. C. (2024). Adoption of Generative AI in content creation: A case study from the advertising industry. *2024 IEEE Conference on Artificial Intelligence*, 111-112.
- Nishant, R., Kennedy, M., & Corbett, J. (2020). Artificial intelligence for sustainability: Challenges, opportunities, and a research agenda. *International Journal of Information Management*, 53, 102104.
- Pagani, M., & Wind, Y. (2025). Unlocking Marketing Creativity Using Artificial Intelligence. *Journal of Interactive Marketing*, 60(1), 1-24.
- Panetti, E., & Simoni, M. (2025). Designing a Visual Inquiry Tool for Business Model Innovation. *IEEE Transactions on Engineering Management*, 72, 134-145.
- Pantano, E., Serravalle, F., & Priporas, C. V. (2024). The form of AI-driven luxury: how generative AI (GENERATIVE AI) and Large Language Models (LLMs) are transforming the creative process. *Journal of Marketing Management*, 40(17-18), 1771-1790.

- Park, H. (2024). Researching Character Design with Generative AI - Focusing on Creating Five Probiotic Characters. *HCI International 2024-Late Breaking Posters*, 249-256.
- Park, H. E. (2024). The double-edged sword of generative artificial intelligence in digitalization: An affordances and constraints perspective. *Psychology & Marketing*, 41(11), 2924-2941.
- Peppers, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A Design Science Research Methodology for Information Systems Research. *Journal of Management Information Systems*, 24(3), 45-77.
- Peláez, C. A., Solano, A., & de la Prieta, F. (2025). Toolkit for Inclusion of User Experience Design Guidelines in the Development of Assistants Based on Generative Artificial Intelligence. *Informatics*, 12(1).
- Pumplun, L., Peters, F., & Buxmann, P. (2023). Bringing Machine Learning Systems into Clinical Practice: A Design Science Approach to Explainable Machine Learning-Based Clinical Decision Support Systems. *Journal of the Association for Information Systems*, 24(4), 953-979.
- Raman, R., Pattnaik, D., Lathabai, H. H., Kumar, C., Govindan, K., & Nedungadi, P. (2024). Green and sustainable AI research: An integrated thematic and topic modeling analysis. *Journal of Big Data*, 11(1), 55.
- Richards, D., Worden, D., Song, X. P., & Lavorel, S. (2024). Harnessing generative artificial intelligence to support nature-based solutions. *People and Nature*, 6(2), 882-893.
- Riemer, K., & Peter, S. (2024). Conceptualizing generative AI as style engines: Application archetypes and implications. *International Journal of Information Management*, 79, 102824.
- Rodriguez-Sanchez, C. (2023). The role of social marketing in achieving the planet sustainable development goals (SDGs). *International Review on Public and Nonprofit Marketing*, 20(3), 559-571.
- Rohde, F., Wagner, J., Meyer, A., Reinhard, P., Voss, M., Petschow, U., & Mollen, A. (2024). Broadening the perspective for sustainable artificial intelligence: Sustainability criteria and indicators for Artificial Intelligence systems. *Current Opinion in Environmental Sustainability*, 66, 101411.
- Sætra, H. S. (2023). Generative AI: Here to stay, but for good? *Technology in Society*, 75, 102372.
- Sai, S., Sai, R., & Chamola, V. (2024). Generative AI for Industry 5.0: Analyzing the impact of ChatGPT, DALLÉ, and Other Models. *IEEE Open Journal of the Communications Society*, 5, 1-1.
- Saxena, A., & Rishi, B. (2025). AI and human collaboration in tourism: a framework for scalable, authentic, and engaging content. *Asia Pacific Journal of Tourism Research*.
- Schlimbach, R., Lange, T. C., & Schoormann, T. (2024). An Educational Business Model Ideation Tool - Insights from a Design Science Project. *Communications of the Association for Information Systems*, 54.
- Simon, H. A. (2019). *The Sciences of the Artificial, reissue of the third edition with a new introduction by John Laird*. MIT Press.

- Song, S. H., Yang, C. C., & Chang, Y. H. (2024). TravelRAG: A Tourist Attraction Retrieval Framework Based on Multi-Layer Knowledge Graph. *ISPRS International Journal of Geo-Information*, 13(11).
- Storey, V. C., Hevner, A. R., & Yoon, V. Y. (2024). The design of human-artificial intelligence systems in decision sciences: A look back and directions forward. *Decision Support Systems*, 182.
- Teng, D. Q., Ye, C., & Martinez, V. (2025). Gen-AI's effects on new value propositions in business model innovation: Evidence from information technology industry. *Technovation*, 143.
- Thapa, S., Shiwakoti, S., & Naseem, U. (2025). Large language models (LLM) in computational social science: prospects, current state, and challenges. *Social Network Analysis and Mining*, 15(1).
- Truss, M., & Schmitt, M. (2024). Human-Centered AI Product Prototyping with No-Code AutoML: Conceptual Framework, Potentials and Limitations. *International Journal of Human-Computer Interaction*.
- University of Nevada, Kuechler, W., Vaishnavi, V., & Georgia State University. (2012). A Framework for Theory Development in Design Science Research: Multiple Perspectives. *Journal of the Association for Information Systems*, 13(6), 395-423.
- Van Der Ven, H., Corry, D., Elnur, R., Provost, V. J., & Syukron, M. (2024). Generative AI and Social Media May Exacerbate the Climate Crisis. *Global Environmental Politics*, 24(2), 9-18.
- Vinchon, F., Lubart, T., Bartolotta, S., Gironnay, V., Botella, M., Bourgeois-Bougrine, S., Burkhardt, J., Bonnardel, N., Corazza, G. E., Glăveanu, V., Hanchett Hanson, M., Ivcevic, Z., Karwowski, M., Kaufman, J. C., Okada, T., Reiter-Palmon, R., & Gaggioli, A. (2023). Artificial Intelligence & Creativity: A Manifesto for Collaboration. *The Journal of Creative Behavior*, 57(4), 540-557.
- Wang, Y., Yuan, S. Z., & Pan, Q. K. (2025). Heterogeneous network for Hierarchical Fine-Grained Domain Fake News Detection. *Information Processing & Management*, 62(4).
- Wingström, R., Hautala, J., & Lundman, R. (2024). Redefining Creativity in the Era of AI? Perspectives of Computer Scientists and New Media Artists. *Creativity Research Journal*, 36(3), 512-527.
- Xia, L., Shen, W. Q., & Wang, G. A. (2024). Knowledge-Aware Learning Framework Based on Schema Theory to Complement Large Learning Models. *Journal of Management Information Systems*, 41(2), 453-486.
- Yigitcanlar, T., Mehmood, R., & Corchado, J. M. (2021). Green Artificial Intelligence: Towards an Efficient, Sustainable and Equitable Technology for Smart Cities and Futures. *Sustainability*, 13(16), 8952.
- Zeng, N. S., Han, L. X., & Li, Q. M. (2025). Design science research (DSR) in construction: Theoretical conceptualization of practice and practical realization of theory. *Automation in Construction*, 176.