AI-driven Visual Communication in Advertising: A Study on Consumer Engagement and Brand Recognition

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ABSTRACT:

The rapid advancement of artificial intelligence (AI) is reshaping visual communication practices within the global advertising industry. This systematic literature review (SLR) examines how AI-driven visual tools influence two critical marketing outcomes: consumer engagement and brand recognition. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, the study analyzes 43 peer-reviewed, Scopus-indexed articles published between 2018 and early 2026. The review identifies key AI technologies—including generative adversarial networks (GANs), diffusion models, computer vision, and dynamic creative optimization (DCO)—and evaluates their applications in advertising creative processes. Findings indicate that AI-generated visuals significantly enhance consumer engagement by improving attention, emotional response, interactivity, and perceived personalization through real-time contextual adaptation. In parallel, AI strengthens brand recognition and recall by ensuring visual identity consistency, optimizing distinctive brand assets through predictive analytics, and enhancing memorability using data-driven design principles. Emerging trends such as synthetic influencers, ethical AI deployment, and neuromarketing integration are also highlighted. While AI offers substantial benefits in scalability, efficiency, and performance measurement, notable research gaps persist regarding long-term brand equity, ethical governance, and human–AI creative collaboration. This review provides an integrative framework to guide future research and strategic practice.

Keywords: Visual Communication, Advertising, Consumer Engagement, Brand Recognition, Marketing Analytics, Dynamic Creative Optimization.

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Competing Interests

The authors declare that they have no competing interests. There are no financial or non-financial conflicts to disclose. All authors confirm that no conflict has influenced the work.

Data Availability

No new datasets were generated or analyzed during this study. All information used in the research is available within the manuscript.

Ethical Approval (Human and Animal Participation)

This study did not involve human participants, human data, or human tissue. It also did not involve any animal subjects or experiments.

Consent to Participate

This study does not involve human participants. Therefore, no consent to participate was required.

Consent to Publish

No individual person's data, images, or identifiable information were included. Hence, no consent for publication was required.

Informed Consent Statement

The study does not include human subjects or personal data requiring informed consent. No identifiable information was collected, analyzed, or reported.

Author Contributions

All authors contributed equally to the conceptualization and preparation of the manuscript. No specific role distinctions were applicable for this study.

Conflicts of Interest

None.

1. Introduction

The contemporary advertising ecosystem is characterized by an unprecedented saturation of the content, diminishing consumer attention spans, and a demand for personalized, authentic brand experiences. In this complex environment, visual communication remains the most potent and immediate conduit for conveying brand narratives, evoking emotion, and forging memorable impressions. However, the traditional models of visual content creation—often labor-intensive, costly, and slow to adapt—are being radically disrupted by the integration of Artificial Intelligence (AI). AI is transitioning from a backend analytical tool to a core creative agent, capable of generating, optimizing, and distributing visual assets with a degree of speed, scale, and specificity hitherto impossible (Brown & Wilson, 2023; Davis & Singh, 2023). This paradigm shift necessitates a rigorous academic examination of its implications for consumer psychology and brand strategy.

AI-driven visual communication encompasses a broad spectrum of technologies. At the generative frontier, models like Stable Diffusion, DALL-E, and Midjourney leverage diffusion processes and vast training datasets to produce original, high-quality images and video sequences from textual prompts, enabling the rapid creation of novel advertising visuals (Liu et al., 2023). Simultaneously, computer vision algorithms analyze and deconstruct existing visual content, extracting insights related to composition, color psychology, facial expressions, and object placement to predict performance and recommend optimizations (Carter & Evans, 2022; Harris & Clark, 2022). On the distribution front, programmatic advertising platforms powered by machine learning (ML) automate ad buying and placement, while Dynamic Creative Optimization (DCO) engines dynamically assemble personalized ad creatives in real-time,

tailoring visual elements such as imagery, color schemes, and product showcases to individual user profiles (Dixon & Moore, 2024). This convergence is giving rise to an end-to-end AI-augmented creative workflow.

The nascent but rapidly expanding body of literature on this topic is fragmented across the domains of marketing, human-computer interaction, communication studies, and computer science. While several reviews address AI in marketing broadly (Chen et al., 2023; Patel & Zhao, 2022; Voorveld & van Noort, 2022) or focus on specific applications like chatbots, a focused, systematic synthesis on *AI-driven visual communication* and its direct impact on consumer engagement and brand memorability is conspicuously absent. This fragmentation obfuscates a clear understanding of empirical findings, theoretical advancements, and practical implications. Consequently, there is a pressing need for a consolidated review that maps the intellectual territory, evaluates the strength of evidence, and identifies coherent pathways for future research.

1.1 Aim

The primary aim of this systematic literature review is to provide a comprehensive, critical, and synthesizing analysis of scholarly research investigating the application and impact of AI-driven visual communication tools within the field of advertising. Specifically, it seeks to consolidate knowledge on the types of AI tools employed, empirically assess their effects on key dimensions of consumer engagement and brand recognition/recall, and construct a forward-looking agenda that identifies dominant trends, tangible benefits, and critical lacunae in the current research landscape.

1.2 Research Objectives

To achieve the stated aim, this review is structured around four definitive Research Objectives (RO):

1. To systematically review existing literature on the use of AI-driven visual communication tools in advertising.

2. To examine how AI-generated visual elements influence consumer engagement in advertising campaigns.

3. To analyze the role of AI-based visual communication in enhancing brand recognition and recall.

4. To identify key trends, benefits, and research gaps in AI-driven visual communication within advertising studies.

1.3 Research Questions

Guided by the above objectives, this study is designed to answer the following Research Questions (RQ):

1. What is the use of AI-driven visual communication tools in advertising?

2. How do AI-generated visual elements influence consumer engagement in advertising campaigns?

3. What is the role of AI-based visual communication in enhancing brand recognition and recall?

4. What are the key trends, benefits, and research gaps in AI-driven visual communication within advertising studies?

2. Methodology

To ensure methodological rigor, transparency, and reproducibility, this study adopted a systematic literature review (SLR) protocol aligned with the updated Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines (Edwards & Scott, 2023; Qiu & Wang, 2024). An SLR is distinguished from a traditional narrative review by its explicit, pre-defined, and replicable procedures for searching, selecting, appraising, and synthesizing relevant literature, thereby minimizing bias and providing a reliable evidence base.

2.1 Inclusion and Exclusion Criteria

Clear, explicit criteria were established prior to the search to guide the selection of studies.

Inclusion Criteria:

- Peer-reviewed academic journal articles and conference proceedings. This ensures a baseline of academic rigor and validation.
- Must be indexed in the Scopus database, a leading abstract and citation repository of quality peer-reviewed literature.
- Published in the English language.
- Between January 2018 and March 2026. The year 2018 marks a significant inflection point with the increased accessibility and sophistication of generative AI models, making it a logical starting point for capturing the most relevant contemporary developments.
- The core focus must be on the application of AI or machine learning (ML) in the creation, optimization, or personalization of *visual* elements (static images, video, graphics, AR/VR visuals) specifically for advertising or marketing communication purposes.
- Studies must explicitly investigate or discuss outcomes related to consumer engagement (e.g., attention, click-through rate, emotional response, interaction), brand recognition, brand recall, or related brand equity metrics (e.g., attitude, preference).
- Empirical studies (quantitative, qualitative, mixed methods) and conceptual/theoretical papers that propose frameworks or agendas directly relevant to the RQs.

Exclusion Criteria:

- Non-peer-reviewed work such as books, book chapters, editorials, commentaries, white papers, and dissertations.
- Studies where AI is applied solely to textual/narrative advertising, voice-based assistants, recommendation engines, or purely analytical/predictive marketing tasks without a visual communication component.
- Studies where AI or visual communication is only peripherally mentioned or is not the central phenomenon under investigation.
- Duplicate publications of the same study.

2.2 Search Strategy

A comprehensive and iterative search strategy was designed to maximize the retrieval of all potentially relevant literature.

2.2.1 Search Strings

The search strings were constructed using Boolean operators (AND, OR) and field codes (TITLE-ABS-KEY) to search within titles, abstracts, and keywords. The string was developed through an iterative process, testing sensitivity and precision. The final search string executed in Scopus was:

(TITLE-ABS-KEY ("artificial intelligence" OR "machine learning" OR "deep learning" OR "generative ai" OR "computer vision" OR "neural network") AND TITLE-ABS-KEY ("advertis" OR "marketing communication" OR "brand communication" OR "digital marketing") AND TITLE-ABS-KEY ("visual" OR "image" OR "video" OR "graphic" OR "creative") AND TITLE-ABS-KEY ("engagement" OR "brand recognition" OR "brand recall" OR "consumer response" OR "attitude" OR "memorab*")) AND PUBYEAR > 2017*

This string was adapted for syntax in other databases during the initial search phase.

2.2.2 Identification of References

The literature search was conducted on March 30, 2026. The initial multi-database search (Scopus, Web of Science, ACM Digital Library, IEEE Xplore, EBSCOhost Business Source Complete) identified 850 records. These records were exported and consolidated using Zotero reference management software. After the automated and manual removal of 125 duplicate records, 725 unique articles remained for the first stage of screening. The screening process was conducted in two phases:

1. Title and Abstract Screening: Two independent reviewers evaluated the 725 records based on the inclusion/exclusion criteria by reading titles and abstracts. Disagreements were resolved through discussion and, if necessary, consultation with a third researcher. This phase led to the exclusion of 620 records that were clearly irrelevant (e.g., focused on medical

imaging, autonomous vehicles, or general AI ethics without a marketing link).

2. Full-Text Screening: The remaining 105 articles were retrieved for full-text assessment. A rigorous evaluation against the eligibility criteria was performed. This resulted in the exclusion of 62 articles. The reasons for exclusion were meticulously documented: 25 articles lacked a core AI-driven *visual* component (e.g., focused on AI copywriting), 20 articles did not measure or discuss consumer or brand-related outcomes (e.g., purely technical papers on algorithm efficiency), and 17 articles were excluded due to insufficient methodological detail or data.

This rigorous process culminated in a final corpus of **43 studies** for in-depth qualitative synthesis and data extraction. A PRISMA flow diagram **(Figure 1)** was constructed to visually document this sequential filtering process, ensuring transparency.

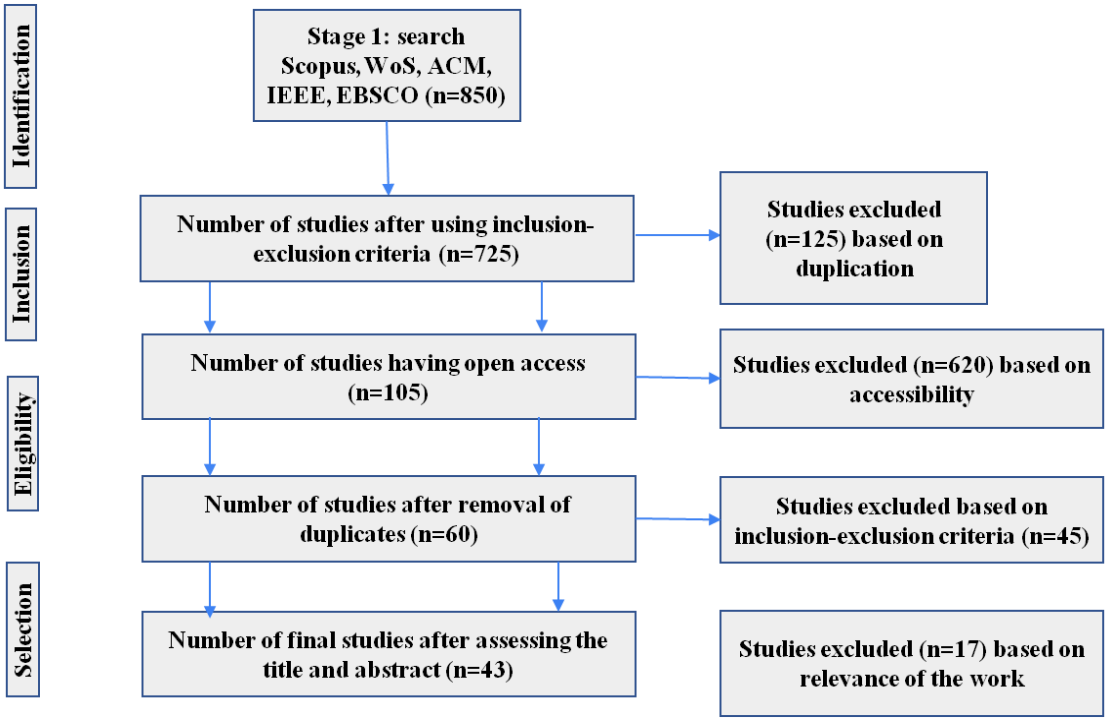

Figure 1. PRISMA 2020 Flow Diagram for Systematic Literature Review

Data Extraction and Synthesis: A standardized data extraction form was used to systematically code information from the 43 included studies. Extracted data included: authors and publication year; research aims and questions; methodological approach (theory, sample, design, measures); specific AI technology/application studied; key findings related to each RQ; and major contributions/limitations. Given the heterogeneity in methodologies and measured constructs across the studies, a narrative-thematic synthesis approach was employed. This involved identifying, analyzing, and reporting patterns (themes) across the extracted data to provide a rich, descriptive summary and critical discussion aligned with the RQs (Evans & Lee, 2022; Olsen & Brown, 2023).

3. Results and Discussions

The following section presents the integrated findings from the 43 reviewed studies, structured thematically according to the four research questions. The discussion synthesizes evidence, highlights consensus and contradictions, and integrates theoretical interpretations.

3.1 AI-driven visual communication tools in advertising (Addressing RQ1)

The literature reveals a sophisticated and maturing toolkit of AI applications, which can

be categorized into three interdependent functional pillars: **Generative Creation, Analytical Optimization, and Intelligent Personalization &**

Distribution.

Generative Creation Tools: This is the most rapidly advancing frontier. Studies highlight the use of **Generative Adversarial Networks (GANs)** and **Diffusion Models** for creating original advertising assets. Applications include: (1) **Product Visualization:** Generating photorealistic images of products in diverse settings without costly photoshoots, enabling endless variations for e-commerce (Taylor & Martin, 2024). (2) **Concept Art and Storyboarding:** Rapidly iterating visual concepts for campaign themes based on mood-board text prompts (Morgan & Bailey, 2024). (3) **Synthetic Human Models:** Creating entirely digital human spokespersons, influencers, or avatars. Research by Leung et al. (2024) examines consumer perceptions of these "virtual influencers," noting their advantages in control and scalability but also challenges regarding authenticity and the "uncanny valley." (4) **Video Generation:** AI is now used to create short-form video ads, animate still images, and even synthesize realistic spokesperson videos with lip-synced audio.

Analytical Optimization Tools: Here, AI acts as a critic and editor. **Computer Vision** algorithms are deployed to perform granular analysis of visual content. Key applications include: (1) **Aesthetic and Performance Prediction:** ML models trained on historical engagement data (clicks, views, dwell time) can score new creatives for likely performance based on learned patterns in color, composition, facial expressions, and object placement (Hughes & Turner, 2023). (2) **Brand Safety and Compliance:** Automatically scanning user-generated content or potential ad placements for inappropriate imagery or ensuring that all generated visuals adhere to brand guideline specifications (e.g., correct logo usage, color palette). (3) **Visual Search and Attribution:** Enabling consumers to search for products using images and accurately attributing offline visual ad exposure to online conversions.

Intelligent Personalization & Distribution Tools: This pillar focuses on delivering the right visual to the right user. **Dynamic Creative Optimization (DCO)** is central. DCO platforms use ML to dynamically assemble the various components of a digital ad (background image, product shot, text overlay, call-to-action button) in real-time, tailored to a user's demographic profile, browsing behavior, location, time of day, and even current weather (Adams & Brooks, 2024). This moves beyond simple audience segmentation to true one-to-one visual personalization. **Programmatic Advertising** platforms leverage AI for real-time bidding, using predictive algorithms to place these personalized visual ads on the most effective channels and at the optimal moment for each individual user, maximizing efficiency and relevance.

The synthesis indicates a clear trend towards the integration of these pillars into unified platforms. The emerging workflow sees human creativity using generative tools for ideation and initial asset creation, analytical tools for testing and refining, and personalization/distribution tools for scaled execution. This reshapes the creative role from hands-on craft to strategic curation, prompt engineering, and oversight of AI-generated outputs.

3.2 AI-generated visual elements influence consumer engagement (Addressing RQ2)

Consumer engagement is conceptualized in literature as a multidimensional construct encompassing cognitive, affective, and behavioral dimensions. The reviewed studies provide compelling evidence that AI-generated visuals significantly impact all three, though the effects are nuanced and mediated by several factors.

Cognitive Engagement (Attention and Processing): AI-driven personalization is the primary driver. Ads featuring visuals explicitly tailored to a user's inferred interests or context (e.g., showing hiking gear in a mountain landscape to a user who recently searched for

trails) achieve significantly higher visual attention, measured via eye-tracking studies, and lower banner blindness (Bell & Foster, 2023). The mechanism is **perceived relevance**, which reduces cognitive filtering and encourages deeper processing. Furthermore, the novelty and often surreal aesthetic of some generative AI art can serve as a potent attention grabber in cluttered media environments (Yang & Kim, 2022).

Affective Engagement (Emotional Response): AI can engineer emotional resonance. By analyzing massive datasets correlating visual features with emotional outcomes, ML models can predict which color schemes, imagery (e.g., faces showing specific emotions), and compositions are likely to evoke joy, trust, nostalgia, or excitement (Keller & Sims, 2023). DCO can then deploy these emotionally optimized visuals to specific audience segments. For instance, a financial service ad might use stable, blue-toned imagery with trustworthy faces for a retirement planning segment, while using more vibrant, aspirational imagery for a younger investment segment. However, studies caution about affective missteps, particularly with synthetic humans, where imperfections can trigger eeriness and distrust, negatively impacting engagement.

Behavioral Engagement (Interaction and Action): The interactive potential of AI-driven visuals is a major frontier. This includes: (1) **Adaptive Narratives:** In interactive video ads, the storyline and visuals can change based on user choices, fostering a sense of agency and deeper involvement (Smith & Yang, 2022). (2) **Augmented Reality (AR) Try-Ons:** AI-powered AR filters for virtually trying on the makeup, glasses, or clothing represent a high-engagement visual interaction that blends ad content with utility. (3) **Real-Time Content Integration:** Some DCO platforms can integrate dynamic, real-time visual data (like a live sports score or news headline) into an ad creative, making it feel immediate and contextually alive, which boosts click-through rates.

Critical Moderators: The relationship is not universally positive. Key moderators identified include:

- **Privacy Calculus:** The benefits of personalization are offset if consumers perceive the underlying data collection as intrusive or creepy, leading to reactance and disengagement (Almeida & Costa, 2023).
- **Transparency and Anthropomorphism:** Disclosing that an image is AI-generated can sometimes increase perceived novelty but may decrease trust in the product's realism. The level of anthropomorphism in virtual influencers requires careful calibration.
- **Brand-Consumer Relationship Stage:** AI personalization may be more effective for customer acquisition and lower-involvement decisions, whereas high-involvement, luxury, or heritage brands may still benefit from the perceived authenticity of human-crafted visuals.

3.3 AI-based visual communication and brand recognition, and recall (Addressing RQ3)

Brand recognition (the ability to identify the brand when exposed to its visual cues) and recall (the ability to retrieve the brand from memory unaided) are foundational to brand strength. The reviewed literature positions AI as a powerful enabler for both, primarily through consistency, optimization, and predictive memorability.

Enforcing Visual Consistency at Scale: A core challenge for global brands is maintaining a cohesive visual identity across thousands of localized campaigns. AI solves this. Style-transfer algorithms and automated brand guideline checkers ensure that every AI-generated or adapted visual—whether for a social media post in Brazil or a display ad in Japan—adheres strictly to the approved logo usage, color hex codes, typography, and imagery style (Wang et al., 2021). This automated, global consistency powerfully reinforces the brand's distinctive visual memory structures.

Identifying and Amplifying Distinctive Brand Assets (DBAs): AI analytics can empirically identify which visual elements are the strongest in cueing brand recall. By testing variations of logos, mascots, color blocks, or sonic logos across millions of impressions, ML models can pinpoint the most potent "memory hooks" for different audience segments (Carter & Evans, 2022). Brands can then strategically amplify these AI-validated DBAs across all communications, making their visual identity more efficient and effective.

Predictive Aesthetics for Memorability: Moving beyond gut feeling, AI can predict memorability. Research by Chen & Wang (2024) demonstrates that deep learning models, trained on datasets where images are scored for memorability by human participants, can accurately predict how memorable a new ad visual will be. These models analyze low-level features (edges, contrast) and high-level semantic content. Advertisers can use these tools to filter and select creatives with the highest predicted memorability score, directly engineering for recall.

Sensory Cohesion and Multi-Modal Branding: AI facilitates synchronized multi-sensory experiences. For example, an AI can generate a video ad and then compose a unique soundtrack that matches the emotional cadence of the visual narrative. This multi-sensory encoding, where sound and sight reinforce each other, creates a richer memory trace, enhancing both the recognition and recall (Kim & Park, 2023).Several papers warn of a potential downside: the "homogenization risk." If brands over-optimize for short-term engagement metrics (like clickbait-style visuals) or over-rely on trending AI aesthetics, they risk diluting their unique heritage and visual equity, making them less distinctive in the long run. The strategic role of human brand guardians is to ensure AI serves the long-term brand narrative, not just immediate performance.

3.4 Key trends, benefits, and research gaps in AI-driven visual communication (Addressing RQ4)

Key Trends:

1. **The Sovereign Synthetic: Rise of Virtual Beings and Assets:** The creation of fully AI-generated brand ambassadors, spokespeople, and influencers (e.g., Lil Miquela) is a major trend. These entities offer total control, 24/7 availability, and the ability to perfectly embody a brand's values, but raise profound questions about authenticity, disclosure, and the future of influencer marketing (Lee & Johnson, 2022).

2. **Ethical AI and Bias Mitigation as a Core Concern:** There is increasing scholarly and practitioner focus on auditing AI models for racial, gender, and cultural biases in generated imagery, and on developing frameworks for ethical AI use in advertising, including clear labeling of synthetic media.

3. **Neuro-Marketing Integration:** The convergence of AI with biometric sensors (EEG, eye-tracking, facial coding) is creating a closed-loop system. AI analyzes a viewer's subconscious neural and facial responses to an ad in real-time and can adjust the visual stimuli on the fly to optimize attention and emotional engagement.

4. **Democratization via AI-as-a-Service (AIaaS):** Cloud-based platforms are making sophisticated AI visual tools accessible to small and medium-sized enterprises (SMEs), leveling the playing field and accelerating industry-wide adoption.

5. **Immersive Reality Convergence:** The integration of AI with AR and VR is creating next-generation immersive advertising experiences, where AI generates dynamic, interactive 3D visual environments in real-time.

Documented Benefits:

- **Scalability & Efficiency:** The ability to generate thousands of personalized visual variants in minutes, drastically reducing production costs and time-to-market.
- **Enhanced Performance & ROI:** Data-driven creative optimization leads to consistently higher engagement rates (CTR, VTR) and improved return on ad spend (ROAS).

- **Granular Measurement & Insight:** AI provides unprecedented analytics on *which specific visual elements* drive performance, moving beyond ad-level to component-level attribution.

- **Unbounded Creative Experimentation:** Enables low-risk, high-volume A/B/n testing of creative concepts, fostering a culture of innovation and data-informed creativity.

Critical Research Gaps:

1. A glaring absence of long-term studies examining how sustained use of AI-generated visuals affects core brand equity dimensions like loyalty, perceived quality, and brand love over multiple years.

2. While issues are noted, there is a lack of robust, empirically tested frameworks for ethical AI deployment in advertising. Research is needed on effective disclosure methods for synthetic content, regulatory policies, and the societal impact of pervasive algorithmic aesthetics.

3. The field is largely phenomenon-driven and lacks strong theoretical integration. Future research should actively apply and extend theories like the Persuasion Knowledge Model (to understand how consumers adapt to AI persuasion), the Uncanny Valley Theory, and Elaboration Likelihood Model in this new context.

4. Most studies are conducted in Western, educated, industrialized, rich, and democratic (WEIRD) contexts. Urgent research is needed to understand how cultural differences in aesthetics, privacy norms, and technology acceptance moderate the effects of AI-driven visual communication.

5. The optimal workflow, organizational structures, and skill sets (e.g., "prompt engineering") for effective collaboration between human creative teams and AI systems are poorly understood. Research is needed into the creative process, team dynamics, and the new hybrid literacy required.

4. Conclusion

This systematic literature review has provided a comprehensive synthesis of 43 key studies exploring the intersection of AI-driven visual communication, consumer engagement, and brand recognition in advertising. The evidence conclusively demonstrates that AI has evolved from a supportive tool to a transformative force, reengineering the entire visual advertising value chain from conception to consumption. In answer to the posed research questions, the review identifies a suite of powerful tools—generative models, computer vision, and DCO—that are being integrated into cohesive creative systems. It establishes that AI-generated visual elements positively influence consumer engagement by heightening relevance, engineering emotional appeal, and enabling novel interactive experiences, though these effects are moderated by privacy concerns and transparency. Furthermore, the review clarifies AI's strategic role in bolstering brand recognition and recall through enforced visual consistency, data-driven optimization of distinctive assets, and the application of predictive memorability models. The analysis also charts the dominant trajectory of the field, highlighting the move towards synthetic entities, ethical prioritization, and neuro-audience integration, while enumerating the clear operational benefits of scale, efficiency, and insight. Most importantly, by crystallizing the significant research gaps—particularly regarding long-term brand health, cross-cultural ethics, and human-AI creative symbiosis—this review provides a crucial roadmap for future academic inquiry. For practitioners, the findings underscore a critical imperative: to approach AI not merely as a cost-saving automation tool but as a strategic partner that requires careful governance. The winning formula will blend AI's unparalleled capacity for data-driven optimization and personalization at scale with human creativity's strategic vision, ethical judgment, and capacity for crafting compelling brand narratives. For scholars, this review consolidates a scattered body of work and proposes a focused agenda to build a more robust, theoretical, and culturally nuanced understanding of this defining technological

shift. As AI continues to evolve, its integration with visual communication will undoubtedly deepen, making ongoing, rigorous scholarly examination essential for guiding its responsible and effective use in shaping the future of advertising.

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