Advertising and Artificial Intelligence[1]

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Abstract: This paper presents the theoretical foundation of the topic "Advertising and Artificial Intelligence". It begins by defining key concepts such as advertising, artificial intelligence, and advertising research, followed by a historical overview of advertising as a cultural, economic, and social institution. Advertising is traced from its early manifestations in ancient civilizations, through the pre-marketing era, the invention of the printing press, and the rise of mass communication, to its transformation during the 20th century. Particular attention is given to the role of advertising during the world wars, when it evolved into a tool of mass persuasion, propaganda, and social influence. The analysis highlights how advertising reflects societal change, shaping consumer behavior and values across historical epochs. Within this framework, artificial intelligence is introduced as a new dimension in advertising, enabling the development of sophisticated strategies for targeting, personalization, and audience engagement. By linking advertising's historical evolution with the emergence of AI, the study provides a theoretical basis for understanding how technological innovation continues to reshape marketing communication and consumer culture.

Keywords: Advertising, Artificial Intelligence (AI), Consumer Behavior, Marketing Communication, Historical Development

Advertising and Artificial Intelligence: A Theoretical Rationale

This paper advances a coherent theoretical rationale for examining the relationship between advertising and artificial intelligence (AI) by integrating conceptual definitions with a concise historical perspective. The overall **aim** is to clarify how advertising—understood as a public message disseminated through print, electronic, or audiovisual media to draw attention to a product or service and stimulate purchase or usage—interacts with AI, a subfield of computer science dedicated to building programs that simulate human intelligence across areas such as robotics, computer vision, machine learning, game-playing algorithms, and expert systems. Within this frame, **advertising research** is conceived as the systematic selection of effective messages for specific products or brands, the development of brand imagery (names and packaging), and the design of methods for measuring campaign effectiveness across media, including so-called generic advertising for entire industries.

Guided by this aim, the study pursues four **tasks**: first, to delineate the core concepts of advertising, AI, and advertising research in a way that is consistent with established academic usage; second, to trace the historical evolution of advertising as an economic tool and cultural institution; third, to analyze how AI reframes contemporary advertising practice through personalization, targeting, and automation; and fourth, to surface the methodological and ethical challenges that accompany AI-driven communication.

From these tasks follow three working **hypotheses**. (1) Advertising does more than mediate exchange; across epochs it mirrors social and cultural transformation. (2) AI is poised to reshape advertising research and practice

by enabling predictive modeling, fine-grained audience segmentation, and dynamic creative optimization. (3) The integration of AI into advertising expands efficiency and reach but also elevates ethical risks related to privacy, manipulation, and the erosion of consumer autonomy.

Methodologically, the paper employs a **theoretical–historical synthesis** based on secondary literature and authoritative definitions. It combines conceptual analysis with a condensed historical narrative to show continuity and change in advertising's functions and forms, and then situates AI within this long arc as the latest technological inflection point.

The historical sketch begins with the deep roots of advertising in antiquity. Long before capitalism or the nation-state, ancient Mesopotamian traders marked amphorae with clay seals—proto-trademarks that signaled contents and provenance. In the classical world, Greek town criers announced arriving ships, and inscriptions in Pompeii testify to early promotional practices. As writing spread, text amplified the communicative power of visual marks, turning messages into more precise carriers of meaning. In Europe, technological progress and emerging capitalist relations accelerated change, particularly during the Age of Discovery (15th–18th centuries), when expanding trade intensified the need for market communication. Gutenberg's movable-type press revolutionized dissemination and paved the way for printed advertisements; by the early 17th century, ads appeared in English and French newspapers and soon in the American colonies. In the 18th century, Benjamin Franklin professionalized American advertising in the *Pennsylvania Gazette* through typographic innovation, illustration, and clearer layout, while 19th-century railroads, mass magazines, and rising literacy dramatically broadened reach. The 20th century layered radio, cinema, television, and later the internet onto this foundation, transforming advertising into a global cultural institution that both shapes and reflects values, beliefs, and everyday habits.

Against this backdrop, AI enters not as a rupture but as the latest stage in a long coevolution of media, markets, and society. By automating message selection, optimizing creative assets, and enabling real-time measurement across channels, AI enhances the classical goals of advertising research while raising new questions about transparency, consent, and cultural impact. The theoretical contribution of the present study is to show that understanding "advertising and AI" requires seeing AI within advertising's centuries-long trajectory—from clay seals and town criers to algorithmic targeting—so that opportunities for innovation can be realized without losing sight of ethical safeguards and the human meanings at the heart of persuasion.

On the eve of World War I, two key innovations significantly influenced the advertising industry: aspirin and the automobile. While aspirin quickly gained popularity with little need for promotion, the automobile emerged as a central focus of advertising campaigns. With the onset of the war in 1914, societies across Europe entered modernity, marked by mass production and the rise of advertising as a science of sales, emphasizing emotional appeal over rational argument. Newspapers became the main information source in Britain, and the growing demand for news expanded opportunities for advertising (Marinova, 2018).

During World War I, advertising evolved into a powerful tool of social influence, demonstrating its capacity to persuade the masses through electronic media (Lewis, 2015). Two major changes shaped the industry: governments massively purchased advertising space, contracting leading artists and illustrators to promote causes such as recruitment and war bonds, thereby elevating propaganda to a national scale; and advertisements increasingly targeted women, offering products ranging from cosmetics to home protection, while framing them as key decision-makers in consumption (Marinova, 2018).

World War II further underscored advertising's strategic role, as campaigns sought to sustain consumer interest and loyalty despite shortages. Patriotic rhetoric and slogans, such as Ford's "There's a Ford in your future," projected visions of postwar prosperity while reinforcing support for the war effort. Governments again relied on advertising to mobilize public participation, including the integration of women into the industrial workforce (Marinova, 2018).

Unlike the First World War, corporate investment in advertising grew during the Second, due to its importance in maintaining consumer demand and easing postwar market recovery. In the aftermath, the "Roaring Twenties" brought economic expansion and a cultural shift: advertising encouraged enjoyment of life and social adaptation, with campaigns for products such as Listerine mouthwash—popularizing the term *halitosis*—and Lifebuoy soap,

promoting hygiene. These advertisements reinforced gender roles, linking men to the public sphere and women to domestic space, while adopting a more visual, lifestyle-oriented style (Lewis, 2015).

In the postwar period, advertising emerged as the queen of marketing communications, playing a pivotal role in two areas: the rise of packaging and branding, and the introduction of new products to the market. Advertising helped consumers understand and adopt innovations such as the telephone and the light bulb, while printed magazines of the era featured mainly book announcements and ads for medicines, insurance, and transport services (Marinova, 2018).

After World War I, U.S. industrial infrastructure was transformed as factories shifted from producing military trucks to serving commercial needs, ushering in the era of automotive freight transport. This innovation revolutionized distribution channels, enabling direct door-to-door delivery and supporting the growth of national retail chains and supermarkets. In 1924, Bruce Barton, co-founder of the agency BBDO, published *The Man Nobody Knows*, portraying Jesus Christ as an ideal communicator and inspirational leader—a metaphor for the modern advertiser. Barton's narrative fused Christian values with capitalist principles, resonating strongly with American society in the 1920s, an era of rising consumption and cultural transition (Lewis, 2015).

The next stage in advertising history is known as the "Research Era." Over the past five decades, the industry has advanced significantly in identifying and targeting specific audiences with personalized communication strategies. Corporate social responsibility became increasingly valued, as public trust emerged as a key indicator of sustainable brand success. In the early years of this era, radio dominated as the leading medium, fostering a sense of national unity through shared programming. Milestones such as Calvin Coolidge's first presidential radio address in 1923 and the broadcast of the first football game in 1927 showcased radio's potential as a mass communication platform. That same year, the Federal Radio Commission (later the FCC) was established to regulate new media channels.

During the 1920s, advertising was viewed as positive—even "heroic"—reflecting the economic optimism of the time. By the 1930s, however, public opinion turned against it. Amid the Great Depression, advertising was increasingly associated with corporate greed and speculation, perceived as contributors to the economic collapse. This led to stylistic changes: refined, elegant messages gave way to louder, more aggressive tabloid-style ads. Despite economic instability, agencies adapted, with figures like Bill Benton framing the crisis as an opportunity for growth, remarking in 1930 that "bad business conditions are good for us." Still, rising public distrust spurred calls for regulation and ethical standards, many of which remain foundational to modern advertising ethics and practice (Lewis, 2015).

With the establishment of television as the dominant mass media platform, audiences increasingly spent significant amounts of time in the domestic environment, creating favorable conditions for the expansion of television programming and political advertising. By the 1970s, particularly after the Vietnam War and the re-election of President Richard Nixon, advertising communication reflected broader social transformations: minority groups and women began to be represented in professional and authoritative roles. At the same time, public concern over the impact of advertising on children intensified, leading to stricter regulatory frameworks and higher standards for advertising content.

During the 1980s, under the presidency of Ronald Reagan and the rise of conservative social attitudes, traditional values such as family, patriotism, and individual responsibility were emphasized. In this context, infomercials—long-format advertising broadcasts resembling talk shows or demonstrations—gained popularity, facilitated by the 1984 Federal Communications Commission (FCC) decision to remove restrictions on television advertising duration (Lewis, 2015).

In the contemporary media landscape, the traditional advertising-supported television model has gradually declined. The introduction of videocassette recorders, technologies such as TiVo, and the spread of cable and internet services transformed viewing behaviors, allowing audiences to bypass commercial breaks or use television for electronic commerce. In response, the advertising industry adapted by developing integrated program content, in which promotional messages are inseparably embedded within the programming itself. This strategy not only enhanced advertiser control over media representation but also created opportunities for interactive engagement

with viewers. Consequently, the boundary between medium and message was blurred, and advertising evolved into an organic part of the consumer experience in the digital age (Lewis, 2015).

Advertising has long been the subject of attempts to explain its mechanisms of influence. According to Gordon Brown, co-founder of Milward Brown, a global research agency specializing in advertising effectiveness, a simple mechanical model assumes that when consumers are exposed to an advertisement, they modify their perception of the advertised brand or its image, and may proceed to purchase the product. In practice, however, consumer attention to advertising is highly fragmented: television breaks usually include three to eight advertisements, with minimal probability that viewers consciously update their opinions of all featured brands. Attention to print, outdoor, and radio advertising is even lower. Importantly, advertising can exert influence without explicit awareness, as consumers rely on implicit memory traces when making purchase decisions. In the retail environment, choices are often guided more by product placement and availability than by recall of specific advertisements. Nonetheless, advertising contributes indirectly by reinforcing brand familiarity, which may influence purchase in contexts of direct competition (Du Plessis, 2007).

The primary **objective of advertising** is to remain in consumer memory and influence purchase decisions. For this reason, marketers design campaigns that aim to be memorable. Advertising budgets are generally divided into production and media dissemination, with approximately 80% of funds allocated to the purchase of advertising space. Campaign effectiveness depends not only on message content but also on distribution strategy. Failures are often misattributed to weak creative execution when, in reality, poor media planning is the cause (Du Plessis, 2007).

In advertising communication, the **sender** encompasses advertisers, agencies, and media professionals. Communication effectiveness depends on the characteristics of the receiver, as advertising functions as both symbolic transmission (words, images, figures) and behavioral persuasion, with the explicit intention of influencing consumer action. Advertisements may be categorized by target audience (consumer vs. business), by purpose (image-oriented vs. product-oriented), or by sponsorship (individual vs. collective) (Kaftandjiev, 2013). Classification also follows the product life cycle: introductory advertising builds awareness and stimulates interest; sustaining advertising stabilizes and expands demand; reminder advertising reinforces previously established associations.

Advertising may further be distinguished by **communication channels**: print (newspapers, magazines, directories, books), electronic (radio, television, internet), outdoor (billboards, posters, transit), and point-of-sale (in-store displays). Research suggests that humans process information predominantly through visual channels (83%), followed by auditory (12%), olfactory (3%), gustatory (2%), and tactile (2%). Recall rates also differ: about 40% of visual information, 20% of auditory input, and up to 80% of combined visual and auditory stimuli are retained. Accordingly, advertisements may be classified as visual, auditory, tactile, olfactory, gustatory, or multimodal (Kaftandjiev, 2013).

Media planning is the process of determining where and when advertisements should appear, depending on audience reach, relevance to the target group, frequency of exposure, media costs, and audience engagement. Over the past three decades, media research has expanded significantly, enabling advertisers to track viewership, readership, and audience demographics with increasing precision. These advances allow for the optimization of advertising placement and the maximization of campaign effectiveness.

The effectiveness of advertising is often described by a *response curve*, which identifies the point at which return on advertising investment reaches its maximum. Determining this optimal frequency requires balancing two factors: advertisements must reach a sufficiently large audience, and viewers must be exposed to them often enough to build durable associations with the brand. Despite enormous investments, there is still no universally accepted answer regarding the optimal level of repetition (Du Plessis, 2007).

Stan Franklin, professor of mathematics and co-director of the Institute for Intelligent Systems at the University of Memphis, proposed a framework integrating neuroscience, cognitive science, and artificial intelligence. In his book *Artificial Minds* (Franklin, 1997), he demonstrates how interdisciplinary collaboration advances the understanding of human cognition.

From a **bottom-up perspective**, neuroscientists analyze the brain structurally and functionally, focusing on neurons and their role in cognition. Researchers such as Antonio Damasio and Joseph LeDoux expanded this approach by examining the functional aspects of neural activity. Conversely, psychology applies a **top-down perspective**, studying observable behavior and inferring the underlying processes. This approach, exemplified by early cognitive research, emphasizes phenomena such as learning, memory, and the differentiation between normal and abnormal mental states (Du Plessis, 2007).

Computer scientists and **artificial intelligence specialists** attempt to simulate intelligence through heuristics and computational models. While machines may surpass humans in certain tasks (e.g., arithmetic or chess), they lack emotions, which remain a defining human attribute. Franklin distinguishes between AI researchers who imitate intelligence directly and those who model the *mechanisms of the mind* by simulating brain functions. Both approaches contribute to a deeper understanding of cognition and memory processes relevant to advertising (Du Plessis, 2007).

Memory studies have further clarified how advertising is encoded and recalled. Hermann Ebbinghaus, a pioneer in cognitive psychology, demonstrated the relationship between repetition, learning speed, and forgetting. Subsequent studies confirmed the *serial position effect*: the tendency to remember items at the beginning (*primacy effect*) and end (*recency effect*) of a sequence more reliably than those in the middle. Applied to advertising, these findings indicate that placement within an exposure sequence significantly influences recall (Chi & Du Plessis, 1994a).

Advertising thus relies on the interaction between **short-term memory**, which retains information briefly and is consciously accessible, and **long-term memory**, where knowledge is stored and retrieved through attentional mechanisms. The *attentional control system* plays a central role by interpreting incoming sensory data and linking it to prior knowledge. This interpretive process enables individuals to derive meaning from stimuli, whether in everyday contexts (e.g., responding to a traffic sign) or in consumer decision-making. In this way, advertising effectiveness depends on how successfully it activates stored knowledge and embeds brand associations within long-term memory (Du Plessis, 2007).

The lower brain regions (located at the base of the skull and the upper spinal cord) subserve vital functions such as respiration; the present focus is on higher structures—namely, the cerebral hemispheres and, to a degree, the midbrain—which comprise a complex network linking the hemispheres with the rest of the central nervous system. Core cortical areas referenced herein include the frontal, parietal, temporal, and occipital lobes, along with key internal structures such as the corpus callosum, hippocampus, and amygdala. The cerebral hemispheres possess a highly folded outer layer (the cortex) and are conventionally divided into four lobes with predominating functions: frontal (planning and motor control), parietal (somatosensation and body–space integration), temporal (audition), and occipital (vision). Two association zones are of particular relevance: a posterior association area at the parietal–temporal–occipital junction that supports multisensory integration for perception and language, and a limbic association area on the medial surface implicated in emotion and memory. Interhemispheric coordination is mediated by the corpus callosum. The hippocampus is critical for memory consolidation; the basal ganglia support motor regulation; and the limbic system—situated in and below the midbrain—underpins affect and motivation, processes central to attention and memory in advertising contexts (Du Plessis, 2007).

Neurons constitute the brain's fundamental units, each with a soma, dendrites (inputs), and a single axon (output) that can branch to contact thousands of other neurons, enabling large-scale connectivity (Du Plessis, 2007). Building on these principles, Rumelhart and McClelland's **parallel distributed processing** framework (connectionism) posits that mental phenomena emerge from interactions among many simple units operating in parallel, with knowledge stored in distributed connection weights rather than localized symbols (Rumelhart & McClelland, 1987; Du Plessis, 2007).

Within cognitive psychology, **attention** is treated as a selective mechanism. Broadbent's selective-filter model argues that inputs are first registered by physical features, with only attended signals receiving semantic analysis; unattended information is largely filtered out and leaves little mnemonic trace (Broadbent, 1958). Treisman's attenuation model softens this claim, proposing that unattended streams are dampened rather than eliminated, allowing high-salience cues (e.g., one's own name) to penetrate selection—an implication directly relevant to

advertising received under low focal attention (Treisman, 1964; Santoso & Wright, 2021). Kahneman reframes attention as a **limited-capacity resource** distributed across tasks; performance deteriorates when concurrent demands exceed available capacity (Kahneman, 1973). Extending this view, **multiple-resource theory** posits several relatively independent pools (e.g., visual, auditory, motor); interference is greatest when tasks draw on the same resource (Allport et al., 1972). Consistent with this, background **vocal** music in retail settings can burden the auditory–verbal channel and impair ad memory more than **instrumental** music, especially under diffuse attention (Kang & Lakshmanan, 2017; summarized in Santoso & Wright, 2021).

In spatial terms, attention has been modeled as a movable **spotlight** that enhances processing within a limited region (Johnson & Proctor, 2004). However, evidence for **covert attention** indicates that attentional shifts need not be coupled with eye movements, cautioning against sole reliance on gaze tracking when assessing visual communication (Carrasco & Barbot, 2019).

Crucially for advertising, **low-attention processing** can still shape brand attitudes. Minimal engagement (fleeting glances, peripheral exposure) may nonetheless support learning (Krugman, 1986). Affective content can strengthen brand favorability even when attention is low, whereas excessive focus may trigger analytic scrutiny and reduce effectiveness (Heath, 2006). Heath's subsequent **low-attention processing** model proposes that sensory inputs reach interpretive systems regardless of awareness, allowing neural activation that shifts attitudes or behavior without deliberate processing (Heath, 2007).

Together, these perspectives imply that optimal advertising impact depends on aligning message design with attentional mechanics: leveraging multisensory integration, salient cues capable of penetrating attenuated channels, and placements that respect resource competition—while recognizing that implicit, affect-led pathways can encode durable brand associations even under limited attention.

Converging empirical findings support the view that advertising can be effective under **low-attention** conditions. Duff and Segijn (2019) show that ads exert measurable influence even during **media multitasking**, when attention is divided across sources. Similarly, Nordhielm (2002) and Shapiro and Nielsen (2013) report that **peripherally presented** messages—outside focal gaze—can improve brand evaluations despite not being the direct focus of attention. Notably, these studies demonstrate effects at low attention without isolating the precise **attentional mechanisms** involved (Santoso & Wright, 2021).

Evidence comparing **emotional versus rational appeals** is mixed. While consumers often respond more favorably to emotional appeals (Young et al., 2019), results vary across audiences and contexts. Sudbury-Riley and Edgar (2016) find stronger effects of **rational** appeals among older consumers, though a substantial minority in this group still prefers emotional messaging. Across ages, when **time and cognitive resources are constrained**, goal pursuit tends to favor **affective satisfaction** over knowledge acquisition (Drolet et al., 2007), consistent with findings that emotional information is processed more easily under low attention (Heath et al., 2006). By contrast, Du Plessis (2005) argues that affective cues primarily **attract attention**, implying limited effectiveness when attention is minimal.

In **digital** settings, low-attention exposure often benefits **emotional** more than **rational** appeals, yet rigorous tests remain scarce. The **match-up (congruence) hypothesis** proposes that emotional appeals work better for **hedonic** products and rational appeals for **utilitarian** ones (Johar & Sirgy, 1991). Despite its intuitive logic, cumulative empirical support is still incomplete (Klein & Melnyk, 2016), underscoring the need for further research on low-attention effectiveness (Santoso & Wright, 2021).

Functionally, **consciousness** can be viewed as the current **focus of attention**, i.e., the center of ongoing neural activity. Stimulus **intensity** and **context** largely determine what reaches this focus. In cluttered settings, salient aggregates (e.g., a pile of oranges) more readily capture attention than isolated items; conversely, in sparse environments (e.g., a waiting room), even minimal stimuli (a lone poster) can dominate awareness. Greenfield's notion of **"neural gestalts"** conceptualizes transient, cloud-like neural assemblies representing concepts; their size is governed jointly by input strength and the sensitivity of existing networks. Thus, the **largest or brightest** stimulus does not invariably win attention if it misaligns with current goals (Greenfield, 1995; Du Plessis, 2007).

Memory, emotion, and advertising are tightly interlinked. Emotional "tagging" is integral to memory consolidation: the hippocampus integrates neocortical inputs with affective signals from the **amygdala**, indicating that "rational" and "emotional" traces are coordinated components of a single system (Du Plessis, 2007). Fear and pleasure represent complementary poles guiding attention; the limbic system acts as an **"emotional thermostat,"** prioritizing incoming information by affective charge and channeling motivational outputs toward behavior (Coutlak, 1996; Du Plessis, 2007).

Attention is limited in capacity; only a few items can be consciously apprehended at once. Variations in **arousal** modulate conscious access. Greenfield (1995) describes three regimes: (1) high arousal with strong, rapidly shifting epicenters yields **fragmented gestalts** (anxious, stimulus-driven states); (2) moderate arousal supports **stable gestalts** and clear awareness; (3) low arousal (sleep-like) produces weak, **disconnected** fragments. Emotion functions as a **driver** of attention rather than merely its consequence: "advertising elicits emotions that guide attention," aligning with Oatley and Lepmiz's (1995) view of emotions as readiness-to-act programs and with Ryle's description of emotions as **involuntary** "turbulence" in the stream of consciousness—points salient for advertising design.

Incidental learning—the unintentional acquisition of information—appears central to advertising effects. Despite methodological challenges (most paradigms study deliberate learning), available evidence does not require separate mechanisms for incidental versus intentional learning; rather, both involve **memory formation and use**, differing mainly in the degree of **attentional control** (Du Plessis, 2007). In practice, advertising first **captures** attention (often via affect), then **creates memory traces** through repeated, consistent exposure; finally, these traces **bias choice** at the point of purchase when category cues spontaneously activate associated brands (Du Plessis, 2007).

A practical distinction is needed between **capturing** and **holding** attention. Citing Koever (via A. L. Aver), a television commercial typically requires ~**3 seconds** to qualify as "attended," initiating cognitive processing. Krugman's physiological studies (e.g., pupil dilation) suggest that **early engagement** within the first **4–10 seconds** can reach ~**83%** and predicts sustained viewing of ~60-second spots, linking rapid initial capture to downstream comprehension and recall (Du Plessis, 2007).

Application of AI in Advertising.

Artificial intelligence (AI) enables machines to execute tasks traditionally requiring human cognition (e.g., learning, reasoning, problem solving) and has become integral to digital advertising. Through machine learning and natural language processing, advertisers analyze large-scale behavioral data to inform targeting, creative, and media decisions. Intelligent algorithms support personalized content by detecting preferences and patterns, thereby increasing the likelihood of ad interaction and purchase (Sameer & Baniyassen, 2023). Beyond audience selection, AI automates complex campaign workflows, reducing error and freeing human effort for strategy. On social platforms (e.g., Instagram, TikTok), AI-driven personalization raises engagement by adapting messages in real time to new interactions (Bhargava & Sundaram, 2021; Sameer & Baniyassen, 2023). AI chatbots improve service and data capture while lowering operational costs; AI-driven dynamic pricing increases competitiveness and profitability (Haleem & Javaid, 2022).

Targeting, personalization, automation.

AI enhances targeting by predicting customer actions across the journey, improving relevance and conversion (Lemon & Verhoef, 2016; Sameer & Baniyassen, 2023). Personalization via ML raises satisfaction and loyalty by tailoring content, cadence, channel, and timing; NLG can generate on-brand messages at scale, while predictive models estimate conversion propensity (Edelman & Singer, 2017; Haleem & Javaid, 2022). Automation extends to bidding and allocation, with real-time optimization reducing the need for constant human intervention (Zhang et al., 2018; Sameer & Baniyassen, 2023). Overall, AI accelerates data processing, improves accuracy and security, shifts labor from routine to strategic tasks, surfaces microtrends, and reduces wasted spend by focusing impressions on high-relevance audiences—often in conjunction with IoT data streams (Haleem & Javaid, 2022).

Risks and governance.

AI-driven advertising raises privacy and data-protection concerns because personalization relies on large volumes of sensitive data (browsing history, location, social behavior). Limited user awareness of data practices highlights the need for transparency, consent, cybersecurity, and clear allocation of responsibilities among platforms, advertisers, and data vendors (Sameer & Baniyassen, 2023).

Brief history of AI.

From early game-playing programs in the 1950s to neural networks and rule-based expert systems in the 1960s–70s, AI progressed through cycles of investment and retrenchment. The 1980s saw renewed interest via backpropagation and major funding, followed by a market contraction for Lisp Machines in 1987. In the 1990s and early 2000s, growing compute power and tighter links to domain problems (logistics, healthcare analytics) produced sustained, applied gains (Jeffery, 2022).

Key terms and typologies.

AI (coined by McCarthy, 1955) is "the science and engineering of making intelligent machines." Autonomous systems plan and act without continuous human control. Machine learning (and deep learning) improve performance from data, with multi-layer networks enabling efficient pattern learning at scale. Algorithms are rule sequences used within broader adaptive systems (Manning, 2020). Forms include narrow AI, general AI, superintelligence, reactive machines, limited-memory AI, theory-of-mind AI, and self-aware AI (Chaudhari, 2024).

ChatGPT: definition and uses.

ChatGPT (a generative pre-trained transformer by OpenAI) produces human-like text from prompts via deep learning. During COVID-19, such systems reshaped information use and marketing workflows. GPT-3 (175B parameters) demonstrated strong performance across language tasks, aiding social-media content and information access (Schulman et al., 2022; Taski & Dal, 2023). In 2023, GPT-4 and Visual ChatGPT expanded multimodal capabilities (Fraiwan & Khasawneh, 2023). Marketers leverage chatbots for engagement, insights, content iteration, and operations, though limitations persist (hallucination, bias, contextuality, data security) requiring stronger governance (Ray, 2023; Taski & Dal, 2023). Within marketing's broader remit (strategy, research, targeting, positioning, relationships), AI is viewed as a leading transformative force among emerging technologies (AMA, 2023; Ferrel et al., 2021; Zaman, 2022; Azaria, 2022; Hosseini & Horbach, 2023).

Synthesia case.

Synthesia provides AI video generation that removes the need for cameras, studios, or actors. Reported APA use cases cite rapid script-to-video workflows, multilingual captions, and ease of use. Outcomes included converting hundreds of modules into video within months, 50% production time savings, and course completion rates (20–30%) exceeding typical MOOC baselines (Synthesia, n.d., case study).

Coca-Cola as AI marketing pioneer.

Coca-Cola's partnership with Bain & Company and OpenAI produced the "Create Real Magic" sandbox (GPT-4/DALL·E), enabling co-creation with digital artists and speeding creative cycles from weeks to days, while supporting personalization and two-way engagement (The Coca-Cola Company, 2023; Kelly, 2023). Additional initiatives (e.g., Y3000 under Coca-Cola Creations) blended digital and physical experiences and activated immersive sites like the Las Vegas Sphere via QR-driven interactivity (Kelly, 2023). Organizationally, AI is coordinated by a lean global team plus distributed enthusiasts allocating significant time to AI pilots, allowing early access to pre-release technologies and rapid integration into consumer experiences (Kelly, 2025).
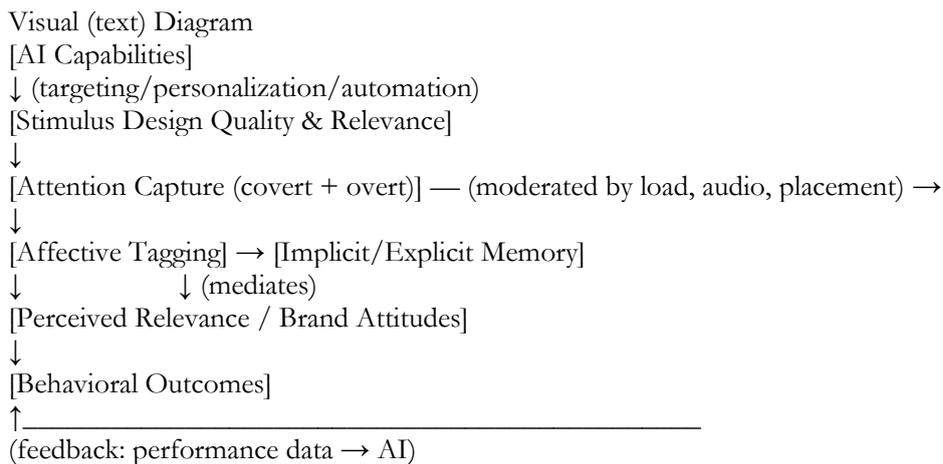
Generative imagery: IP and privacy.

DALL·E enables text-to-image generation for design and advertising but raises copyright, trademark, and authorship issues when the "creator" is algorithmic. Questions include ownership (developer vs. prompter) and inadvertent reproduction of protected elements. Ethical risks also involve privacy, e.g., synthesis of real persons'

likenesses without consent and potential misuse in deception. Governance requires updated legal frameworks and privacy-by-design safeguards (Zhou & Nabus, 2023).

Virtual influencer: Lil Miquela.

Lil Miquela, a CGI-based influencer with millions of followers, exemplifies a hybrid model between the Hollywood star system and social-media influencer culture. Managed by Brud, her persona merges fashion partnerships, music, and activism cues to cultivate perceived authenticity while granting brands exceptional control over image, timing, and collaborations (Drenten & Brooks, 2020; Marwick, 2013; Senft, 2013; Shieber, 2019). The case foregrounds how techno-human collaborations complicate boundaries between "real" and "constructed" identity in marketing.

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Visual (text) Diagram
[AI Capabilities]
↓ (targeting/personalization/automation)
[Stimulus Design Quality & Relevance]
↓
[Attention Capture (covert + overt)] — (moderated by load, audio, placement) →
↓
[Affective Tagging] → [Implicit/Explicit Memory]
↓              ↓ (mediates)
[Perceived Relevance / Brand Attitudes]
↓
[Behavioral Outcomes]
↑_____
(feedback: performance data → AI)
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The **AELAM model** conceptualizes the process through which advertising exerts its influence on consumers by integrating emotional, cognitive, and behavioral mechanisms. At its core, advertising functions as the initial stimulus, designed to capture attention and provoke an emotional response. Emotions play a pivotal role in this process, acting as the entry point to attention by amplifying the salience and personal relevance of the message. In turn, attention facilitates the encoding of information, even when exposure occurs under conditions of low involvement or divided focus. Importantly, the model highlights the role of incidental learning, whereby consumers acquire brand-related knowledge without conscious effort.

Once processed, the advertising message is stored in memory, where emotional tagging—mediated by the interaction of the hippocampus and amygdala—strengthens retention and recall. This emotional-cognitive integration ensures that brand associations are not merely informational but affective, enhancing their impact on consumer decision-making. When individuals are confronted with a purchase situation, these emotionally encoded memories are reactivated, guiding preferences and shaping behavior, often subconsciously

AI-Enhanced Low-Attention Advertising Effect Model (AELAM)
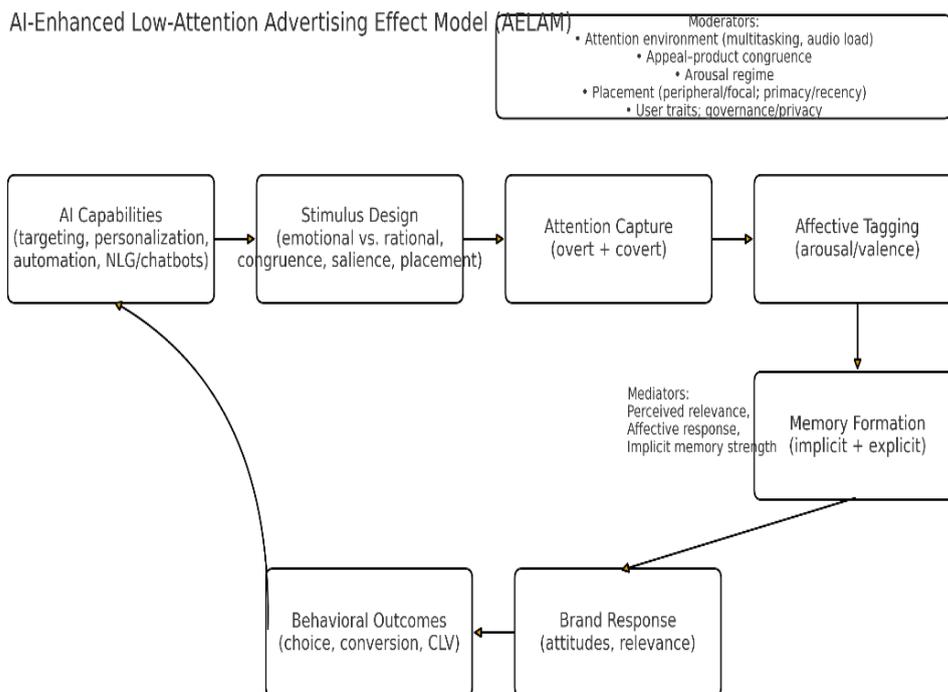
Overall, the AELAM model demonstrates that advertising does not operate as a one-time persuasion mechanism but rather as a cumulative process. By embedding emotional experiences into memory, advertising creates long-term associations that influence consumer choices well beyond the moment of exposure. These cyclical dynamic underscores the strategic importance of emotions in advertising: they do not only attract attention in the short term but also anchor brand messages within the deeper structures of memory, ensuring their retrieval at the critical point of decision-making.

Conclusion

The integration of artificial intelligence into advertising marks a transformative shift in the way brands communicate with consumers. From the historical evolution of advertising as a tool for persuasion and cultural influence, the field has now entered an era where data-driven personalization, automation, and emotional engagement define strategic success. The AELAM model illustrates how advertising operates through a sequence of interconnected processes—attention, emotion, learning, and memory—ultimately shaping consumer behavior in both conscious and subconscious ways. Artificial intelligence enhances each stage of this process by enabling predictive analytics, real-time personalization, and adaptive communication strategies that resonate more deeply with individual audiences.

At the same time, the rapid advancement of AI technologies raises ethical, legal, and societal challenges, particularly concerning consumer privacy, transparency, and the ownership of AI-generated content. The examples of AI applications in global marketing—from chatbots and dynamic pricing to virtual influencers and generative platforms—demonstrate both the potential and the risks of this technological shift. Ultimately, the sustainable future of advertising will depend not only on the innovative use of artificial intelligence but also on the establishment of responsible frameworks that balance efficiency, creativity, and consumer trust.

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