

Overview and Evolution of Online Advertisement

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Abstract: *Online advertising has evolved into a pivotal force driving global marketing effectiveness, fundamentally reshaping how organizations communicate, compete, and convert audiences. This study critically examines its transformation from rudimentary banner advertisements of the 1990s to sophisticated, AI-driven and data-centric ecosystems. Drawing on secondary data, the paper identifies key milestones including pay-per-click (PPC), social media proliferation, and programmatic automation and evaluates their measurable impact on reach, efficiency, and return on investment (ROI).*

The analysis highlights that online advertising enables unparalleled precision targeting, real-time optimization, and cost efficiency compared to traditional media. Simultaneously, it uncovers structural challenges such as privacy regulations, ad fraud, and ad-blocking technologies, all of which directly influence campaign effectiveness and consumer trust.

Through case analyses of Google Ads and Meta platforms, the study demonstrates how data-driven strategies translate into scalable and performance-oriented business outcomes. The findings suggest that the future of online advertising will be shaped by AI-driven personalization, immersive technologies, and privacy-centric frameworks, requiring marketers to balance technological innovation with ethical accountability...

Keywords: *Online advertising, digital marketing, PPC, programmatic advertising, AI marketing, data-driven strategy*

I. INTRODUCTION

Advertising is a fundamental pillar of modern economic activity. In its broadest sense, advertising refers to any paid, non-personal communication through various media by an identified sponsor, with the intent to inform, persuade, or remind a target audience about a product, service, idea, or organization (Kotler & Armstrong, 2018). Historically, businesses relied on print, radio, television, and outdoor signage to reach consumers. While these traditional channels proved effective for mass communication, they offered limited flexibility, high costs, and minimal measurability in terms of audience engagement.

The proliferation of the internet in the early 1990s set the stage for a paradigm shift in how advertisers reached their audiences. What began as simple hyperlinked image banners on web pages has evolved into a highly complex, multi-channel ecosystem encompassing search engine marketing, social media campaigns, video advertising, influencer partnerships, and programmatic ad placements. Today, online advertising is not merely an alternative to traditional media; it has become the dominant advertising medium worldwide, accounting for over 60 percent of total global advertising expenditure (Statista, 2024).

The relevance of online advertising in the contemporary world cannot be overstated. It enables businesses of all sizes from multinational corporations to small local enterprises — to communicate with precisely defined audience segments, measure outcomes in real time, and optimize campaigns continuously. As digital connectivity deepens globally, understanding the trajectory, mechanics, and future of online advertising becomes increasingly essential for students, practitioners, and policymakers alike.

II. LITERATURE REVIEW

Academic scholarship on online advertising has grown substantially since the late 1990s, reflecting the rapid commercialization of the internet. Chaffey and Ellis-Chadwick (2019) define digital marketing as the application of



digital technologies to contribute to marketing activities aimed at achieving profitable acquisition and retention of customers. Their work emphasizes the centrality of data analytics in shaping effective digital advertising strategies and underscores the importance of integrating online and offline approaches for holistic brand communication.

Ryan (2016) traces the historical evolution of digital marketing tools, including advertising platforms, from early email campaigns and banner ads to the sophisticated social and mobile advertising formats prevalent today. Ryan argues that the democratization of advertising that is, the ability of any business to advertise at a global scale with minimal budget is one of the most significant contributions of digital technology to the commercial landscape. Similarly, Kotler, Kartajaya, and Setiawan (2021) in Marketing 5.0 articulate how technology-enhanced marketing, including machine learning and artificial intelligence, is redefining consumer engagement and advertising effectiveness.

Goldfarb and Tucker (2011) examined the privacy-advertising trade-off in online environments, finding that restrictions on online behavioral targeting can significantly reduce the effectiveness of advertising. This foundational study has informed ongoing regulatory debates around data privacy in digital advertising. More recently, Evans (2009) analyzed the economics of online advertising markets, introducing the concept of the advertising platform as a two-sided market connecting advertisers and consumers.

Despite the breadth of existing research, gaps remain in several areas. Most studies focus on advertising effectiveness from the advertiser's perspective, with comparatively fewer examining the consumer experience comprehensively. Furthermore, the rapid emergence of artificial intelligence, voice interfaces, and augmented reality as advertising channels has outpaced scholarly investigation. This paper seeks to contribute to filling these gaps by providing an integrated overview of the field.

III. OBJECTIVES OF THE STUDY

- To define and classify online advertising formats and study its evolution and performance implications.
- To examine enabling technologies and their strategic significance, while identifying future trends shaping competitive edge.
- To study advantages and limitations in measurable terms while assessing real-world applications through cases.

IV. RESEARCH METHODOLOGY

The present research is descriptive and analytical in nature, relying exclusively on secondary data. Secondary data was gathered from a diverse range of credible sources, including peer-reviewed academic journals (such as the Journal of Marketing, Journal of Advertising Research, and MIS Quarterly), textbooks authored by marketing scholars, industry reports published by organizations such as eMarketer, Statista, and the Interactive Advertising Bureau (IAB), as well as authoritative websites maintained by leading technology companies including Google, Meta, and the World Advertising Research Center (WARC).

A thematic review approach was employed, whereby content from various sources was synthesized thematically across the dimensions of definition and typology, historical evolution, technological infrastructure, advantages, challenges, case applications, and future directions. No primary data collection or fieldwork was conducted. The study does not claim statistical generalizability but aims to offer a substantive, academically grounded conceptual synthesis.

V. OVERVIEW OF ONLINE ADVERTISING

Online advertising, also referred to as internet advertising or digital advertising, denotes any form of marketing communication delivered through the internet to promote products, services, or brands to a defined audience. Unlike traditional advertising, online advertising is inherently interactive, measurable, and highly targeted. It leverages user data, behavioral signals, and algorithmic processes to deliver messages to the most relevant consumers at the most opportune moments.



5.1 Types of Online Advertising

Display Advertising

Display advertising encompasses visual-based advertisements including banners, images, videos, and interactive rich media placed on websites, apps, or digital platforms. These ads are typically served through ad networks and are designed to build brand awareness or drive direct response from users.

Search Engine Advertising (Pay-Per-Click)

Search engine advertising, commonly referred to as pay-per-click (PPC) or search engine marketing (SEM), involves placing advertisements within the results pages of search engines such as Google or Bing. Advertisers bid on specific keywords, and ads are displayed when users search for those terms. Charges are incurred only when a user clicks on the advertisement, making this model highly cost-efficient.

Social Media Advertising

Platforms such as Facebook, Instagram, Twitter (now X), LinkedIn, Pinterest, and TikTok offer sophisticated advertising solutions that leverage rich demographic and psychographic user data. Social media advertising enables granular audience targeting based on age, gender, location, interests, behaviors, and even relationship status.

Video Advertising

Video advertising is delivered through digital channels such as YouTube, streaming services, and social media feeds. Formats range from pre-roll ads that play before video content to mid-roll insertions and fully skippable or non-skippable spots. Video advertising has experienced exponential growth, driven by increased mobile video consumption and the visual nature of the medium.

Email Marketing

Email marketing involves sending targeted commercial messages to a list of subscribers who have opted in to receive communications from a brand. Despite being one of the oldest forms of digital advertising, email marketing continues to offer one of the highest returns on investment of any online advertising channel, owing to its direct nature and personalization potential.

Native Advertising

Native advertising refers to paid content that is designed to blend seamlessly with the editorial or organic content of the host platform, minimizing the perception of intrusiveness. Examples include sponsored articles on news websites, promoted listings on e-commerce platforms, and recommended content widgets at the bottom of web pages.

*User Data Collection → Data Processing (AI/ML) → Audience Segmentation → Ad Creation
→ Ad Delivery (Platforms) → User Interaction → Performance Measurement → Optimization*

VI. EVOLUTION OF ONLINE ADVERTISING

6.1 The Early Stage: Banner Ads (1990s)

The history of online advertising is commonly traced to October 1994, when HotWired (the digital counterpart of Wired magazine) published the first clickable banner advertisement for AT&T. The banner, a simple rectangular graphic with the text "Have you ever clicked your mouse right HERE? YOU WILL," achieved a remarkable click-through rate of approximately 44 percent a figure that modern advertisers could scarcely imagine. This milestone demonstrated that the internet could serve as a viable commercial advertising medium and launched a new industry. Throughout the late 1990s, banner advertising proliferated rapidly, fueled by the dot-com boom. Websites sold advertising space in standardized banner formats, and advertisers flocked to capitalize on the novelty of the new medium.

6.2 The Search Engine Era: PPC and Google Ads (2000s)

Following the dot-com bust of 2000-2001, the online advertising industry underwent significant restructuring. The emergence of search engines as primary internet navigation tools created a new advertising paradigm. Google launched AdWords in 2000 (later rebranded as Google Ads), introducing the keyword-based pay-per-click model that would become the cornerstone of digital advertising. This innovation aligned advertiser costs directly with user engagement,



improving return on investment and accountability. Simultaneously, contextual advertising displaying ads relevant to the content of a webpage grew in sophistication, and affiliate marketing networks gained traction as a performance-based channel.

6.3 The Social Media Era (2010s)

The 2010s witnessed the rise of social media platforms as formidable advertising ecosystems. Facebook's introduction of self-serve advertising tools allowed businesses to target users with unprecedented demographic and psychographic precision. Instagram, acquired by Facebook in 2012, became a powerful visual advertising platform, while Twitter offered real-time engagement opportunities. LinkedIn emerged as the dominant platform for business-to-business advertising. The proliferation of smartphones further accelerated this shift, as mobile devices became the primary point of contact between brands and consumers. Social media advertising distinguished itself through its ability to facilitate two-way communication, user-generated content, and viral sharing.

6.4 Programmatic Advertising

Programmatic advertising represents a watershed development in digital advertising technology. Rather than relying on direct human negotiations to purchase advertising space, programmatic systems use automated software and real-time bidding (RTB) protocols to buy and sell advertising inventory instantaneously. When a user visits a web page, an auction for that impression is conducted in milliseconds, with the highest bidder's advertisement being displayed. This automation allows for highly efficient, data-driven ad placement at scale. By the mid-2010s, programmatic advertising had become the dominant method for purchasing digital display advertising inventory.

6.5 Mobile, Video, and AI-Driven Advertising (2020s)

The current decade has been defined by the convergence of mobile-first consumption habits, streaming video proliferation, and the integration of artificial intelligence throughout the advertising stack. Short-form video platforms, most notably TikTok, have created new advertising formats that blur the line between entertainment and commercial content. AI-powered tools now enable dynamic creative optimization (DCO), sentiment analysis, audience lookalike modeling, and predictive attribution. Advertisers can deliver hyper-personalized messages that adapt in real time based on user behavior, contextual signals, and machine learning predictions.

Evolution Timeline Chart of Online Advertising

1990's → Banner Ads
2000's → Search & PPC
2010's → Social Media Advertising
Mid-2010's → Programmatic Advertising
2020's → AI & Data-Driven Advertising

VII. TECHNOLOGIES USED IN ONLINE ADVERTISING

The sophisticated targeting and measurement capabilities of online advertising are underpinned by a suite of enabling technologies:

Cookies and Tracking: Cookies are small data files placed on users' browsers to record browsing behavior, preferences, and session information. Third-party cookies, in particular, have historically been the backbone of cross-site behavioral targeting, enabling advertisers to follow users across the web and serve contextually relevant advertisements.

Big Data: The volume, velocity, and variety of data generated by internet users encompassing search queries, purchase histories, social interactions, geographic movement, and media consumption constitutes "big data." Advertisers leverage big data analytics platforms to extract actionable insights about audience behavior and preferences.

Artificial Intelligence (AI): AI underpins a broad range of advertising functions, from natural language processing in voice search optimization to computer vision in visual content analysis. AI algorithms analyze vast datasets to identify patterns, predict user intent, and automate decision-making in advertising campaigns.



Machine Learning (ML): A subset of AI, machine learning enables advertising systems to improve their performance over time through experience, without being explicitly reprogrammed. ML models power bid optimization, fraud detection, audience segmentation, and content recommendation engines.

Programmatic Systems: Demand-side platforms (DSPs), supply-side platforms (SSPs), ad exchanges, and data management platforms (DMPs) collectively constitute the programmatic advertising infrastructure. These automated systems execute billions of advertising transactions daily across the global digital advertising marketplace.

<i>Data Driven Advertising Flow</i>
Input: User Data → Processing: AI/ML Algorithms → Output: Personalized Ads → Outcome: Conversions & ROI

VIII. ADVANTAGES OF ONLINE ADVERTISING

Global Reach: Online advertising transcends geographical boundaries, enabling businesses to reach audiences in any corner of the world with equal ease. A small enterprise can, with a modest budget, achieve visibility in international markets that would have been prohibitively expensive through traditional media.

Cost-Effectiveness: Digital advertising typically offers substantially lower costs per impression, click, or conversion compared to television, print, or radio. Performance-based models such as PPC ensure that advertisers pay only for measurable user engagement, maximizing the efficiency of advertising expenditure.

Precision Targeting: Perhaps the most significant advantage of online advertising is its capacity for granular audience targeting. Advertisers can define their audience based on demographics, geographic location, interests, online behavior, purchase intent, and device type, ensuring that messages are delivered to the most receptive individuals.

Real-Time Measurability: Online advertising provides access to a comprehensive range of metrics including impressions, clicks, click-through rates, conversion rates, cost per acquisition, return on ad spend, and customer lifetime value enabling continuous campaign monitoring and data-driven optimization.

IX. CHALLENGES AND LIMITATIONS

Privacy Concerns: The collection and use of personal data for advertising purposes has attracted significant regulatory scrutiny and public concern. Legislation such as the General Data Protection Regulation (GDPR) in Europe and the California Consumer Privacy Act (CCPA) in the United States has introduced stringent requirements for data transparency and user consent, complicating the operational landscape for advertisers.

Ad Fraud: Ad fraud encompassing click fraud, impression fraud, domain spoofing, and bot traffic represents a significant drain on advertising budgets. Industry estimates suggest that advertisers globally lose tens of billions of dollars annually to fraudulent activity, undermining confidence in the digital advertising ecosystem.

Ad Blockers: The widespread adoption of ad-blocking software by internet users poses a structural challenge to the display advertising industry. Research indicates that a significant proportion of internet users, particularly among younger demographics, actively block advertisements, reducing reach and revenue for both advertisers and publishers.

Intense Competition: The relatively low barriers to entry in digital advertising have led to intense competition for user attention and advertising inventory. This competitive pressure drives up costs for popular keywords and audiences, particularly in high-value sectors such as finance, insurance, and legal services.

X. CASE STUDIES

10.1 Case Study: Google Ads and the Small Business Revolution

Google Ads (formerly Google AdWords) represents perhaps the most consequential development in the history of online advertising. Launched in 2000, the platform introduced the self-serve keyword-based PPC model that democratized advertising access. A compelling real-world example of Google Ads' transformative impact is that of Warby Parker, the eyewear company, which in its early stages relied heavily on Google Search advertising to acquire customers at a fraction of the cost of traditional optical retail advertising. By bidding on specific search terms related to



affordable eyewear, prescription glasses, and home try-on programs, Warby Parker was able to reach consumers at the precise moment of purchase intent. The company's use of Google's Performance Max campaigns which leverage AI to optimize bids and placements across Search, Display, YouTube, Gmail, and Maps simultaneously enabled dramatic improvements in conversion rate and cost efficiency. This case illustrates how intent-based advertising, combined with AI-powered optimization, can deliver highly effective results even for challenger brands with limited marketing budgets.

10.2 Case Study: Facebook and Instagram Advertising for Consumer Brands

Meta's advertising ecosystem encompassing Facebook, Instagram, WhatsApp, and the Audience Network has become indispensable for consumer brand marketers. A notable case is that of Gymshark, the British fitness apparel brand, which built a multi-billion-dollar business largely through social media advertising. In its early years, Gymshark deployed Instagram advertising with a strong emphasis on aspirational visual content and influencer collaboration. The brand leveraged Facebook's Custom Audiences and Lookalike Audiences features to identify users who shared characteristics with their existing customer base, enabling efficient prospecting at scale. Retargeting campaigns re-engaged users who had visited the Gymshark website but had not completed purchases, recovering a significant volume of potential sales. Gymshark's success demonstrates the power of combining creative excellence with data-driven audience strategy on social media platforms, and illustrates how even a startup with no traditional advertising budget can achieve global brand recognition through digital channels.

XI. DISCUSSION

The evolution of online advertising reflects a broader transformation in the relationship between brands and consumers. In the era of traditional advertising, communication was fundamentally one-directional: brands broadcast messages to passive audiences through mass media. The internet disrupted this dynamic by enabling interactivity, personalization, and real-time feedback loops. The progression from static banner ads to AI-optimized, omnichannel campaigns represents not merely a technological upgrade but a fundamental reconceptualization of how advertising functions as a discipline.

Comparing traditional and digital advertising reveals a series of structural contrasts. Traditional advertising excels in brand building through emotional, high-production-value storytelling delivered at scale a television commercial remains a uniquely powerful vehicle for establishing brand identity and cultural resonance. However, digital advertising surpasses traditional media in accountability, flexibility, targeting precision, and cost accessibility. The two approaches are increasingly recognized as complementary rather than competitive, with integrated campaigns spanning both online and offline touchpoints proving most effective in building brand equity and driving commercial outcomes. The ethical dimensions of online advertising warrant serious consideration. The collection of vast quantities of personal data to enable behavioral targeting raises legitimate concerns about consumer privacy, surveillance capitalism, and the commodification of attention. The concentration of advertising market power among a small number of technology platforms primarily Google/Alphabet and Meta also poses questions about market competition, publisher viability, and the health of the broader media ecosystem.

XII. FUTURE TRENDS IN ONLINE ADVERTISING

AI-Driven Hyper-Personalization: Advances in generative AI are enabling advertisers to create dynamically personalized ad creative at scale tailoring imagery, copy, and calls to action to individual user profiles in real time. This represents a fundamental shift from segment-level targeting to true one-to-one marketing.

Voice Search Advertising: The proliferation of voice assistants such as Amazon Alexa, Google Assistant, and Apple Siri is opening new advertising channels. Brands are beginning to explore sponsored responses and branded skills, though the commercial models for voice advertising remain nascent.



Augmented and Virtual Reality (AR/VR) Advertising: Immersive advertising formats enabled by AR and VR technologies allow consumers to virtually try on products, experience services, and interact with branded content in three-dimensional environments. As AR-enabled devices become more mainstream, these formats are expected to become a significant component of the advertising mix.

Cookie less Advertising: The planned deprecation of third-party cookies by major browser vendors, driven by privacy concerns, is compelling the industry to develop alternative identity and targeting solutions. These include first-party data strategies, cohort-based targeting (such as Google's Privacy Sandbox), universal IDs, and contextual advertising powered by natural language processing.

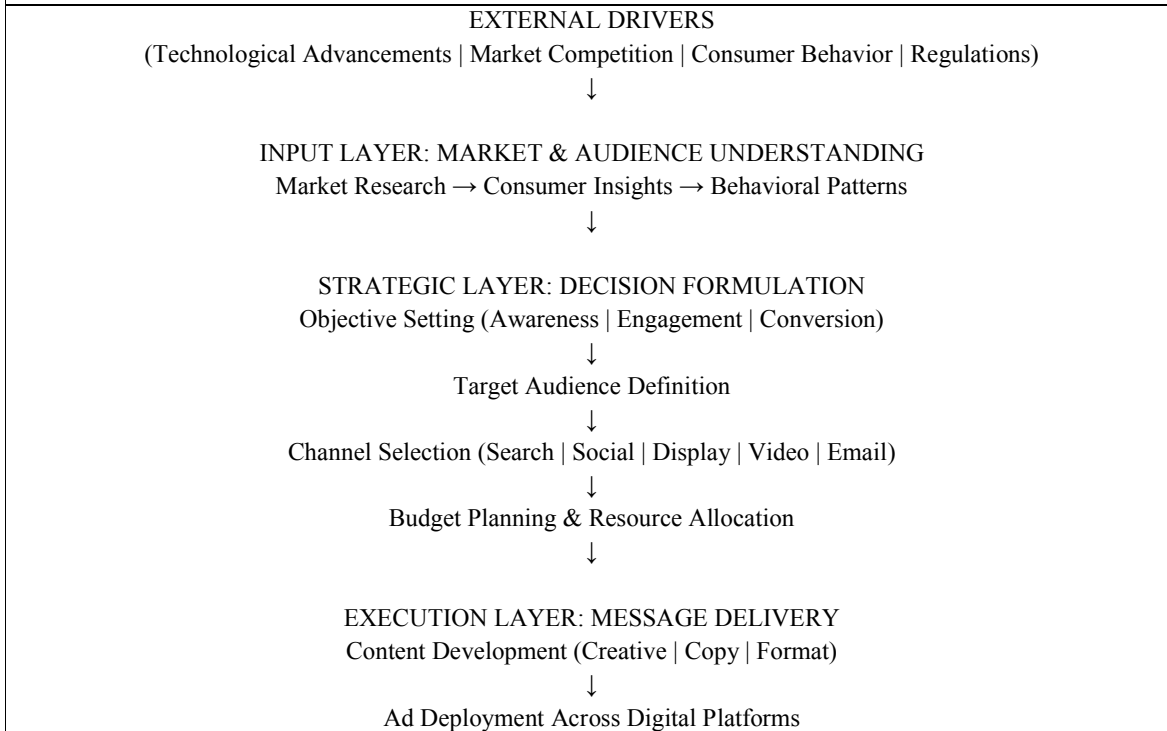
XIII. CONCLUSION

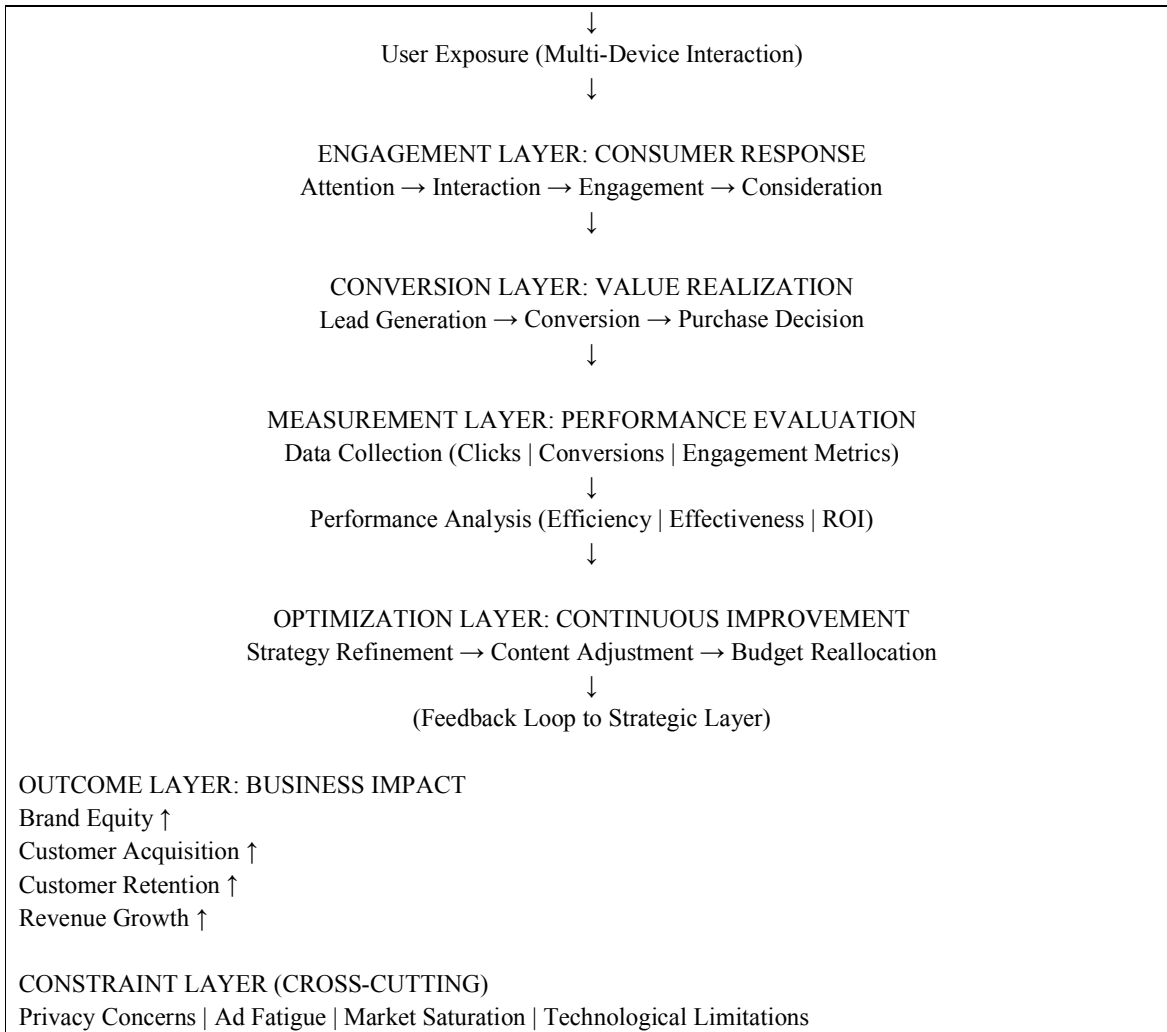
Online advertising has traversed a remarkable journey from its humble origins as a static banner on a mid-1990s website to its current status as a multifaceted, algorithmically sophisticated, and globally dominant commercial medium. This paper has traced that journey across its key developmental stages from the banner ad era and the PPC revolution to the social media boom, programmatic automation, and the current age of AI-driven personalization.

The analysis reveals that the core value proposition of online advertising its ability to connect the right message with the right audience at the right moment, measurably and cost-effectively has remained consistent even as the technologies and formats have evolved dramatically. At the same time, the field faces enduring challenges related to privacy, fraud, and ethical responsibility that will require thoughtful industry-wide responses.

For businesses, marketers, and researchers, the imperative is to engage with online advertising not merely as a tactical tool but as a strategic discipline that demands ongoing learning, ethical awareness, and creative innovation. As the digital landscape continues to evolve shaped by advances in AI, changing consumer behaviors, and an evolving regulatory environment those who understand the history and mechanics of online advertising will be best positioned to navigate and succeed in the dynamic commercial environment ahead.

A very Generalized Digital Advertising Value Chain Model





Key Takeaways (Aligned with Objectives)

Definition & Formats: Online advertising operates as a multi-channel ecosystem, where each format (PPC, social, display, etc.) serves a distinct role in the customer journey.

Evolution Analysis: The shift from banner ads to AI-driven systems reflects a move from visibility-based to performance-driven advertising.

Technological Role: Technologies like AI, big data, and programmatic systems are central to enabling precision, automation, and scalability.

Advantages Evaluation: Online advertising delivers higher ROI, real-time measurability, and targeted reach, outperforming traditional media.

Limitations Assessment: Privacy concerns, ad fraud, and ad-blocking act as key constraints impacting efficiency and trust.

Case Study Insight: Successful campaigns rely on data-driven targeting, platform optimization, and creative strategy integration.



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