

Measuring the Effectiveness of Online Advertising: A Systematic Literature Review

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Abstract

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This study investigates the measurement of online advertising effectiveness through a Systematic Literature Review (SLR) of research published between 2018 and 2020. The rapid growth of digital platforms has shifted evaluation from traditional exposure-based metrics toward engagement-driven indicators such as click-through rates, conversions, and consumer interaction. Findings reveal three dominant themes: engagement metrics remain central in capturing advertising effectiveness; personalization and targeting strategies enhance short-term outcomes but raise concerns over privacy and trust; and platform specific characteristics shape outcomes, with interactive formats on social media outperforming static ads. While controlled experiments and behavioral data provide valuable insights, challenges like endogeneity and selection bias call for more robust causal designs. The review concludes that online advertising effectiveness requires a multidimensional approach integrating engagement, platform context, and methodological rigor, while future research should address ethical concerns and consider both short- and long-term brand effects.

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1. Introduction

Over the past two decades, online advertising has become one of the most dominant and strategic channels in modern marketing. Its interactive features and the ability to collect real-time consumer data make it possible to evaluate its effectiveness more accurately compared to traditional advertising media (Rzemieniak, 2015). This evolution has driven both scholars and practitioners to seek deeper understanding of how online advertising impacts consumer behavior and business performance.

The measurement of online advertising effectiveness, however, is far from straightforward. A primary challenge lies in ensuring that the collected data truly reflect causal effects of advertisements on consumer actions, rather than simple exposure. For instance, issues of endogeneity often arise, since ad exposure is rarely random but influenced by consumer characteristics and targeting strategies (Gordon et al., 2019). While granular data such as clicks, impressions, page visits, and purchase records are widely available, these do not necessarily guarantee accuracy in estimating the true effect of advertising on sales outcomes.

A variety of metrics and approaches have been proposed to capture advertising effectiveness, ranging from traditional measures such as recall and click-through rates (CTR) to more advanced frameworks like return on advertising spend (ROAS) and viewability assessments (Tellis, 2009; Danaher & Dagger, 2013). Despite their usefulness, these measures each carry limitations, particularly in attributing sales or brand outcomes to specific campaigns in a complex digital environment.

Given these complexities, a Systematic Literature Review (SLR) offers an appropriate methodological approach to synthesize existing knowledge. By applying transparent and rigorous procedures, SLR enables the identification of dominant trends, methodological challenges, and research gaps in the measurement of online advertising effectiveness (Kitchenham & Charters, 2007). This study, therefore, aims to provide a comprehensive review of prior research, evaluate the strengths and weaknesses of different measurement methods, and suggest future directions for both scholars and practitioners.

2. Literature Review

The effectiveness of online advertising has been a widely explored area in marketing and communication research, with scholars examining both consumer-level responses and firm-level outcomes. Early studies emphasized the importance of exposure and recall as fundamental indicators of advertising success, but more recent research highlights the significance of behavioral metrics such as click-through rates, conversion, and consumer engagement (Chatterjee et al., 2003; Li & Leckenby, 2007). These shifts demonstrate how the rise of digital technologies has transformed advertising measurement from traditional attitudinal responses to more quantifiable behavioral outcomes.

Researchers have also investigated the role of targeting and personalization in shaping the effectiveness of online advertising. Tailored messages and data-driven targeting strategies have been shown to enhance consumer responses by increasing relevance and reducing information overload (Bleier & Eisenbeiss, 2015; De Keyser

et al., 2015). However, concerns regarding consumer privacy and ad intrusiveness remain a challenge, suggesting that effectiveness cannot be assessed purely from outcome metrics but must also consider consumer perceptions of trust and acceptance.

Moreover, literature emphasizes that online advertising effectiveness is context-dependent, influenced by factors such as platform characteristics, content format, and cultural differences. For example, video-based advertising has been found to generate stronger emotional engagement compared to static banner ads, while social media platforms enable interactive forms of brand-consumer communication that can significantly affect loyalty and purchase intentions (Taylor, et al., 2011; Voorveld et al., 2018). This indicates the need for multidimensional approaches to measurement that account for both short-term behavioral outcomes and long-term brand effects.

Finally, systematic reviews and meta-analyses in the field have revealed inconsistent findings, suggesting that methodological diversity plays a role in shaping conclusions about online advertising effectiveness. Some studies rely on experimental designs to establish causality, while others depend on observational data, which can introduce biases related to targeting and selection (Cho & Cheon, 2004; El Ashmawy et al., 2014). These methodological challenges underline the importance of synthesizing evidence systematically, providing a comprehensive perspective on what constitutes effective online advertising in varying contexts.

3. Methods

This study employs a Systematic Literature Review (SLR) approach to consolidate and analyze prior research on measuring the effectiveness of online advertising. The SLR method was chosen because it provides a structured, transparent, and replicable process for collecting and synthesizing evidence across different studies. The review followed four main stages: planning, searching, screening, and synthesis.

In the planning stage, the scope of the study was defined with a clear focus on academic works that addressed the measurement of online advertising effectiveness. To maintain a relevant and up-to-date perspective, the review was limited to studies published between 2018 and 2020. This timeframe was selected to capture recent advancements in digital advertising metrics, data analytics, and consumer engagement research.

The searching stage involved a systematic exploration of recognized academic databases, including Scopus, Web of Science, ScienceDirect, and Google Scholar. A combination of keywords and Boolean operators such as “online advertising effectiveness,” “digital ad measurement,” “internet advertising impact,” and “consumer response to digital ads” was applied to ensure broad coverage. The initial search generated more than 300 articles within the target period.

In the screening stage, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework was applied to ensure transparency and consistency. Studies were included if they (1) were published between 2018 and 2020, (2) explicitly examined online advertising effectiveness

using defined metrics or models, and (3) were peer-reviewed and written in English. Exclusion criteria included duplicate articles, purely theoretical papers without methodological detail, and studies outside the field of online marketing. After this process, a final sample of 60 studies was retained for analysis.

The synthesis stage combined qualitative and quantitative approaches. Studies were organized into thematic categories such as consumer-level outcomes (e.g., attitudes, trust, engagement), behavioral measures (e.g., click-through rates, conversion, purchase intention), and firm-level outcomes (e.g., return on advertising spend, brand equity). Cross-comparison of findings enabled the identification of dominant research themes, methodological limitations, and directions for future studies.

4. Results and Discussion

The systematic review of studies published between 2018 and 2020 reveals several consistent themes regarding the measurement of online advertising effectiveness. First, many scholars emphasize that consumer engagement metrics such as click-through rates (CTR), conversion rates, and time spent on advertisements remain the most widely adopted indicators. For instance, Calder et al. (2019) highlight that engagement-based metrics provide more accurate reflections of consumer attention than traditional exposure based measures. Similarly, Xu et al. (2020) argue that digital ad effectiveness can no longer be assessed solely by impressions; instead, user interaction and behavioral intention are critical indicators in contemporary digital environments.

Second, the findings indicate a strong role for personalization and targeting in driving advertising effectiveness. Studies demonstrate that personalized advertisements significantly improve consumer responses when relevance and timing are optimized (Goldfarb & Tucker, 2019). This aligns with the broader trend of data-driven marketing, where firms utilize advanced analytics and consumer data to refine targeting strategies. However, these benefits are counterbalanced by consumer concerns about privacy and ad intrusiveness, which may undermine long term trust (Boerman et al., 2018). Thus, while personalization enhances short term effectiveness, ethical considerations remain central to sustainable outcomes.

Third, platform differences play an important role in shaping advertising effectiveness. Research shows that social media platforms provide unique opportunities for interactive and participatory advertising formats that foster stronger consumer-brand relationships (Voorveld et al., 2018). By contrast, display and banner ads, though still relevant, often suffer from lower consumer attention and increasing ad avoidance behaviors (Cho & Cheon, 2004; revisited in later empirical studies). This suggests that advertising effectiveness cannot be universally measured but must be contextually aligned with the medium and consumer behavior patterns.

Finally, the review highlights ongoing methodological challenges in advertising measurement. While experimental designs are frequently employed to establish causality, many studies still rely on observational data, which may introduce endogeneity and self selection biases (Lewis & Rao, 2015). Recent contributions advocate for mixed method approaches that combine controlled field experiments

with large-scale behavioral data to strengthen validity and generalizability. These methodological innovations are critical for capturing both short-term behavioral effects and long term brand outcomes in a fragmented digital ecosystem.

In summary, the evidence suggests that online advertising effectiveness between 2018 and 2020 has been shaped by three dominant trends: (1) the shift toward engagement-based metrics, (2) the growing reliance on personalized and targeted advertising, and (3) the contextual influence of platform-specific characteristics. However, methodological limitations and ethical concerns highlight the need for more robust and balanced approaches in future research.

5. Conclusion

This systematic literature review of studies published between 2018 and 2020 provides comprehensive insights into how the effectiveness of online advertising has been conceptualized and measured in recent years. The findings reveal that advertising effectiveness is increasingly evaluated through engagement based metrics such as click-through rates, conversion rates, and user interaction rather than mere exposure. This reflects the growing importance of consumer behavior and active participation in determining advertising success.

The review also highlights the central role of personalization and targeting, where data-driven strategies enhance ad relevance and improve short-term performance. However, these approaches bring significant challenges related to privacy and consumer trust, indicating that effectiveness must be considered in both behavioral and ethical dimensions. Furthermore, platform-specific characteristics

demonstrate that advertising effectiveness is context dependent, with interactive social media advertising generally yielding stronger engagement compared to traditional display formats.

Methodologically, while experimental designs and large-scale behavioral data provide valuable insights, limitations such as endogeneity and selection bias remain persistent concerns. Recent trends toward mixed method approaches offer promising avenues to overcome these challenges and achieve more accurate and generalizable findings.

Overall, this review concludes that measuring the effectiveness of online advertising requires a multidimensional perspective, integrating consumer engagement, contextual platform factors, and methodological rigor. Future research should continue to address ethical issues surrounding personalization, develop robust causal measurement techniques, and explore long-term brand outcomes beyond short-term behavioral metrics. By doing so, both academics and practitioners can achieve a deeper understanding of how digital advertising contributes to sustainable marketing performance.

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