



The Ads Know What You Want

How AI Is Accelerating Programmatic
Advertising at Platform Scale

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EXECUTIVE SUMMARY

Artificial intelligence is no longer theoretical in the world of advertising—it's driving measurable performance improvements across leading platforms. Programmatic ad delivery powered by AI is enabling more precise targeting, better budget allocation, and higher return on ad spend for brands. This piece explores how programmatic advertising works, where AI is already showing real traction, and why this convergence may represent one of the first scaled, commercial applications of AI with long-term investment implications.

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Artificial intelligence is no longer theoretical in the world of advertising—it's driving measurable performance improvements across leading platforms. Programmatic ad delivery powered by AI is enabling more precise targeting, better budget allocation, and higher return on ad spend for brands. This piece explores how programmatic advertising works, where AI is already showing real traction, and why this convergence may represent one of the first scaled, commercial applications of AI with long-term investment implications. Artificial intelligence (AI) has captured the market's attention, driving unprecedented capital flows into both infrastructure and applications. Yet daily market swings dominate headlines, making it harder for investors to focus on the structural trends that will shape AI's long-term trajectory. Identifying where some of the best opportunities lie in an increasingly volatile environment requires prioritizing enduring investment themes rather than short-term disruptions.

My train pulls up to the platform with a screech of the brakes. It's packed. My chances of getting a seat for the ride home are fading fast. Resigned to another crowded journey, I take out my phone to play one of my favorite

puzzle games, pressed shoulder to shoulder with strangers. I clear a level of the game, but my satisfaction is quickly replaced by irritation when a non-skippable 20-second ad appears. Eventually, I wager that it seems like a fair trade-off. Even free-to-play games need to generate revenue, and the ad actually features a game I find somewhat interesting.

But there's more beyond the surface: the ads that appear on my screen aren't random. No, instead these ads are highly targeted to maximize the likelihood that I will engage or take action.

Over the past decade, the advertising industry has undergone a revolution marked by both major shifts in revenue and market share. Now, the convergence of artificial intelligence (AI) and automation is enabling both industry leaders and challengers to shape the future of advertising campaigns.

Investors should take note. This represents more than a trend, AI's role in advertising may be one of its earliest commercially scaled applications, with broad implications for platforms, margins, and future growth.

The Evolution of Advertising: From Broad Strokes to High Precision

For decades, major brands promoted products through broad-reach display campaigns—appearing on television, in print media, on radio, or on high-traffic billboards—offering massive exposure but limited precision. By the early

2010s, consumers had shifted online in meaningful numbers. In this sea change, digital media platforms and publishers discovered that online channels offered vast amounts of behavior data, something traditional media could never provide. This opened the door to precision audience targeting.

As users browsed websites and apps, their behavior was tracked in detail, allowing platforms to build comprehensive profiles of preferences and interests. These data-driven insights became the foundation of performance advertising, where success is measured by whether a user takes a specific action, like making a purchase or signing up for a service. Today, digital channels like social media, search engines, and news publishers excel at mapping the customer journey from impression to conversion.

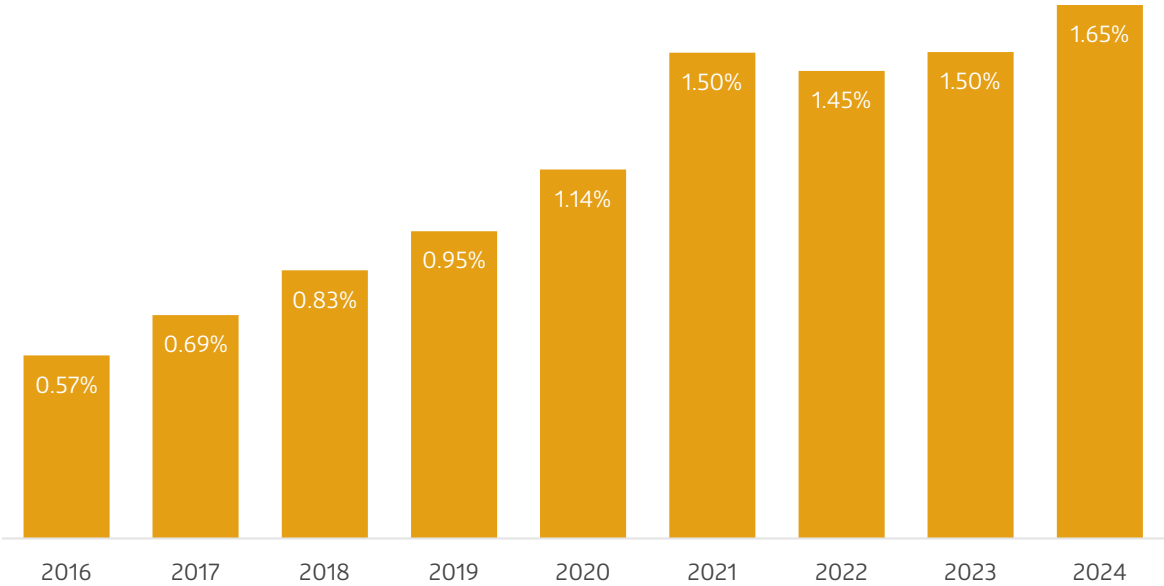
Just look at the dominance of the largest three online advertising platforms—Google, Meta, and Amazon—whose combined ad revenue now accounts for nearly 2% of U.S. GDP. Their success tells a clear story. Over the past decade, the exceptional ability of these platforms in driving customer acquisition has led brands to steadily increase their ad spend and to shift more of their marketing budgets to platforms that can deliver measurable outcomes.

The Rise of Programmatic Advertising

The explosion of user data gave rise to hyper-targeted advertising, ushering in a new approach known as programmatic advertising. This software-driven, real-time auction model of ad buying allows advertisers to bid on ad space displayed the moment a user loads a

DIGITAL AD DOMINANCE

Annual advertising revenue for Google, Meta, and Amazon as a percentage of U.S. GDP



Sources: FactSet, Federal Reserve Bank of St. Louis. Calendar year ends through 12/31/2024. <https://fred.stlouisfed.org/series/GDPA>.

webpage or app. The highest bid wins, and the ad is served instantly.

This highly automated, instantaneous process enables highly flexible campaigns, where advertisers define detailed audience criteria and target extremely specific segments across media properties.

Over the past decade, advertisers have embraced programmatic ad buying. Instead of broadcasting to the masses, they now focus on reaching refined audiences more likely to take action, like purchasing a product or following the brand on social media. This shift has increased the return on ad spend and, in turn, raised the value of the advertising inventory (i.e., the space publishers offer for ad delivery).

Programmatic advertising has proven to be a win-win for both advertisers and digital publishers. It's rapidly becoming the standard for ad delivery in the U.S.

Why Advertising May Be AI's Killer App

AI is the powerful new force transforming the advertising landscape. At the heart of this revolution are large language models (LLMs): foundational AI technology that analyzes vast, complex datasets to uncover patterns and inform real-time decisions.

AdTech companies—firms that develop the tools and platforms used to deliver, target, and optimize digital advertising—have quickly recognized AI's potential to improve performance and efficiency. These companies have built sophisticated models trained on billions of parameters, that can deliver ads with extreme precision to the users most likely to engage. The result? Brands are reaching more of the right people, using less input data, at lower cost.

These AI systems process real-time behavior signals across hundreds of websites, apps, and

“What has historically happened in advertising is you spend money, you learn from the results, you modify it, you adjust, and you keep doing that thing. You learn from the money that you’ve spent.

But what if we could simulate using all the data of the past and using AI to take in all the variables so that we can forecast how a campaign’s going to perform before we spend a single penny. That is what we built in this forecasting AI product.”

—Jeff Green (March 5, 2025)
CEO & Founder, The Trade Desk

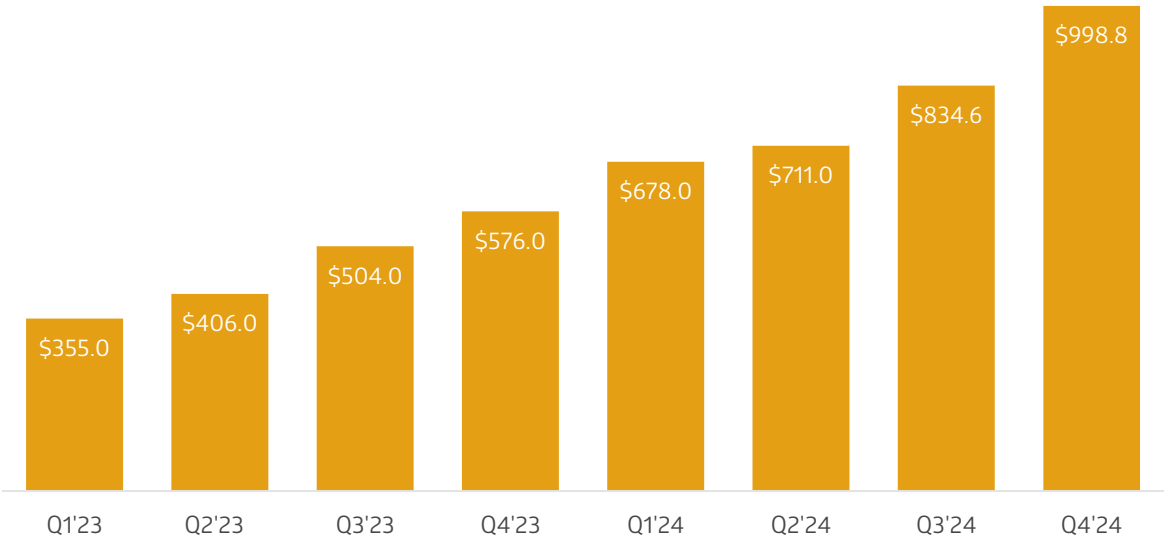
content channels. They can help surface high-intent users that might have been overlooked with traditional targeting, thus further enhancing the brand's bottom line.

AI also helps determine where to allocate budget. For example, it might suggest shifting spend from a news site to a streaming platform to drive yield higher returns. This matters because high-intent consumers often engage with multiple channels throughout the day, making it critical to choose the right platform at the right time. By removing guesswork from media buying, AI allows brands to optimize ad spend with greater accuracy, efficiency, and impact.

The AI impact has been significant: advertisers are already seeing double-digit improvements in cost-per-conversion and cost-per-acquisition.

APPOLOVIN ADVERTISING REVENUE GROWTH

Quarterly advertising revenue in millions (USD), showing significant growth since early 2023 following AI model adoption.



Source: FactSet. Advertising segment revenue, January 2023 through December 2024.

In other words: brands are doing more with less, guided by an AI co-pilot that learns and adapts in real time.

When evaluating new technologies, investors often look for a ‘killer app,’ a real-world use case so valuable that it drives adoption and commercial success. Digital advertising is proving to be AI’s killer app.

Where AI + Programmatic is Already Delivering

This isn’t theory, it’s happening now. We’re already seeing industry players stake their claims in this space. Companies like Meta, Unity, The Trade Desk, and AppLovin are already showcasing meaningful results from their AI-powered ad platforms.

AppLovin, a dominant force in mobile gaming AdTech, has seen its ad revenue more than double since launching a user-targeting AI

model just two and a half years ago. Meta reports that over four million advertisers are now using at least one generative AI tool from its Advantage+ suite to optimize ad creation and performance. These breakthroughs mark a pivotal moment in the evolution of advertising.

What’s Next for AI and AdTech

In the coming years, we expect generative AI to unlock powerful new applications that significantly enhance the advertiser’s experience. We’re already seeing its early impact in creative development, where AI is used to design ad variations tailored to specific audience segments or geographies.

As LLMs process billions of data points to identify high-performing content, personalization will only become more refined. Instead of building dozens of ad versions manually, marketers will be able to upload a few core assets and



Targeting in Action, a programmatic ad use case

A footwear brand launches a campaign that targets 30-year-old male runners in the San Francisco Bay Area who recently searched for “marathon training plans,” watched running content on YouTube, and browsed carbon-plated running shoes, all within the past two weeks.

price for each ad impression, minute by minute. And unlike earlier models, this won't be a black box. Brands will gain real-time insights into which creative elements are working, enabling smarter budget decisions and stronger performance outcomes. These advances are already resulting in market share gains for the leading AI enabled platforms.

Why This Matters

In the era of AI-driven programmatic advertising, companies that can adapt rapidly iterate and implement AI effectively are poised to lead. Performance gains are already driving advertiser confidence. More ad dollars are flowing toward the platforms proving they can deliver.

For investors, this is more than a technology trend. It's a clear sign that AI isn't just theoretical. It's becoming embedded in digital infrastructure, reshaping how advertising works, and creating new opportunities for platforms with scale, data, and strategic advantage.

let generative AI build out the full campaign, including the images, video and text, optimized for each user segment.

For example, a running shoe brand could use generative AI to show its performance sneakers in Central Park for New York customers, and on the Golden Gate Bridge for those in San Francisco. This creates efficiency in production, while simultaneously increasing user engagement through greater relevance.

At the same time, AI is improving real-time bidding, allowing platforms to determine the right

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