CAN GENERATIVE AI CREATE LOW-COST PERSONALIZED VIDEO ADS THAT ENGAGE CONSUMERS?

IN THIS BRIEF

- *Generative AI may transform marketing by automating core processes like ad design and personalized content creation. But does AI-generated content engage consumers in a meaningful way? To find out, two researchers—Madhav Kumar of MIT and Anuj Kapoor of the University of Missouri—conducted a field experiment involving over 21,000 consumers.*

- *The researchers also worked with three partners: a GenAI technology company, a delivery partner that provides marketing services via WhatsApp, and an Indian direct-to-consumer (D2C) company. They used GenAI to create personalized video ads.*

- *The researchers then sent ads to three sets of users. The first set received ads with personalized videos that were created by GenAI and targeted to their personal purchase histories—an approach that made possible a level of massive personalization scalability that was previously cost-prohibitive. Of the other two groups, one received personalized image ads—the current industry standard. The third group received video ads that were generic.*

- *After the ads were sent, the researchers compared the engagement levels of the GenAI-generated ads with those of ads created using more traditional technologies. The results were striking. AI-generated personalized videos increased customer engagement by 6-9 percentage points compared with both personalized image and generic video ads.*

- *In addition, the researchers found that using GenAI can reduce video-ad production costs by approximately 90%, making personalized video campaigns economically viable for the first time at scale. The researchers also suggest that careful implementation is needed to balance GenAI's scalability benefits with quality control and privacy considerations.*

RESEARCH OVERVIEW

Generative AI is making a splash in marketing. The technology has the potential to transform the marketing industry in ways that include automating such core processes as creating advertising designs, analyzing consumer feedback, and developing content for personalized targeting projects (Deveau et al., 2023). Already, the marketing industry collectively spends some $1.9 billion a year on GenAI, and it's forecast to spend over $22 billion on the technology by 2032 (Market.us, 2023).

Video advertising dominates digital marketing, yet creating personalized video content remains expensive and logistically complex. While 72% of consumers prefer video content over text (Alaimo, 2018), personalizing videos for thousands of customers has been economically unfeasible. The costs for recording individual messages when working with professional talent are significantly high, making large-scale campaigns prohibitive for most businesses. Yet marketers believe GenAI could help them develop and distribute video ads that are personalized for individual consumers, and to do so with far greater ease and lower costs.

To explore this topic, two researchers—Madhav Kumar of the MIT Initiative on the Digital Economy (IDE) and Anuj Kapoor of the University of Missouri—recently conducted an online experiment. Seeking to investigate whether GenAI can solve this economic constraint, their research examined a fundamental question: Can AI-generated personalized videos deliver meaningful engagement benefits while also dramatically reducing production costs?

The researchers designed a real-world experiment to test both the effectiveness and scalability of this emerging technology. They have published their experimental results in a recent paper, **Frontiers: Generative AI and Personalized Video Advertisements**.

THE EXPERIMENT

The researchers conducted a randomized field experiment through a multi-stakeholder collaboration. There were three partners: a GenAI technology company, an Indian e-commerce retailer selling eco-friendly products, and a WhatsApp marketing provider. These partnerships enabled the researchers to test AI-generated content in an authentic business setting with real customers and actual marketing objectives.

synchronizing the avatar's speech and facial movements with customized text scripts. Importantly, the marketing team retained full control over message content, using GenAI as a production tool rather than as a creative engine.

The second group of consumers received personalized image ads with text, the current industry standard for WhatsApp marketing. The third group received video ads with generic content; the ads were identical for all recipients. (Figure 1 visualizes the experiment design.)

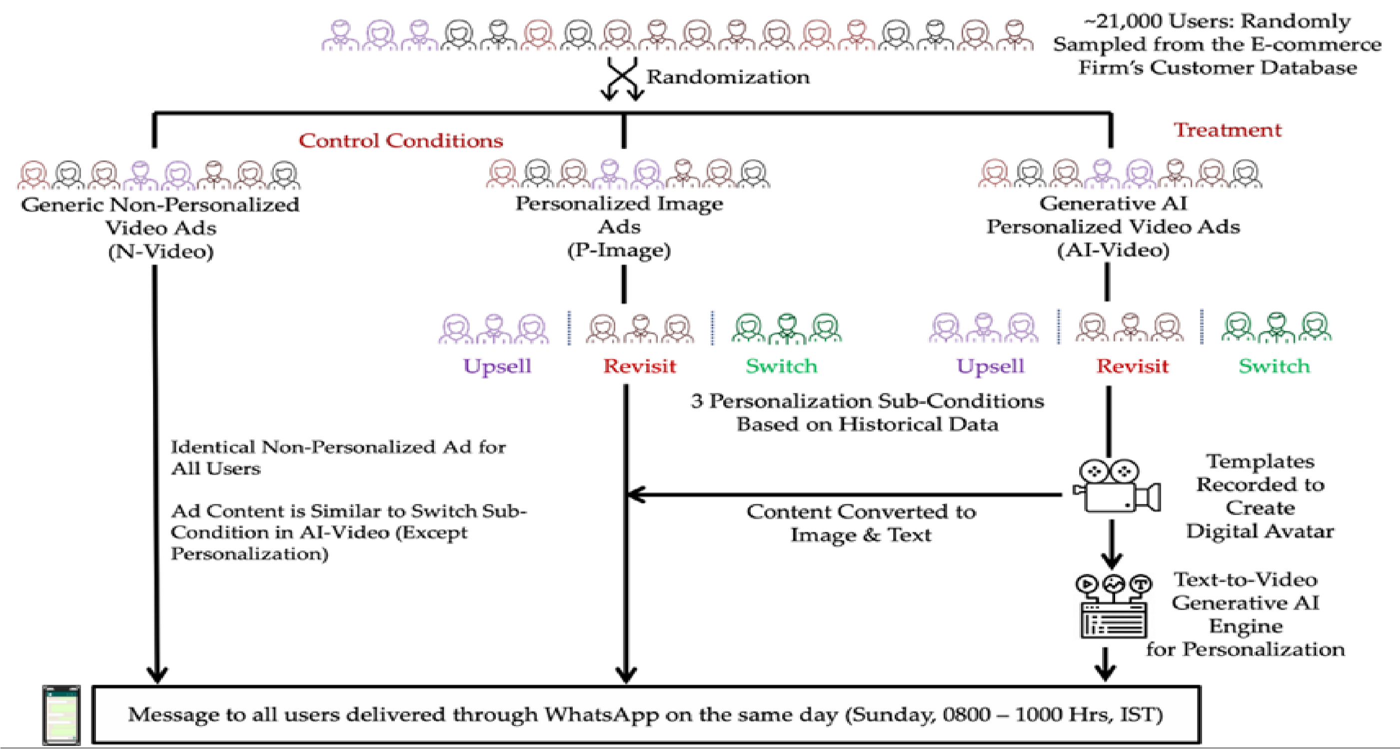

Figure 1: Experimental design for targeting users with GenAI-created personalized video ads

The experiment included 21,328 existing customers of the Indian retailer, and each customer was randomly assigned to one of three groups. The first group received GenAI-generated personalized video ads created using proprietary text-to-video technology. These videos featured a digital avatar of the brand's ambassador delivering customized messages based on each customer's purchase history. The AI system worked by first creating a digital avatar from 10 to 15 minutes of template video featuring the brand ambassador. Then the technology generated personalized videos by

For the first two groups, the researchers designed their personalization strategy to reflect actual business practices. Customers who hadn't made purchases received upsell messages; those who hadn't bought recently received messages to revisit the website; and registered prospects who hadn't made purchases received messages encouraging them to switch to the retailer's brand.

This behavior-based approach ensured the experiment tested realistic marketing scenarios (Arora et al., 2008). For example, one of the personalized messages was designed to draw user attention to a product that seemed a good fit with their previous purchases. Specifically, in the upselling condition, a user who had previously bought an eco-friendly dishwashing liquid was greeted personally by name, then invited to explore another environmentally-safe offering: "Hi, Esha, I hope you're enjoying chemical-free and eco-friendly living. Have you seen our new range of Cleaner Sheets?"

KEY FINDINGS

The results showed substantial engagement improvements from AI-generated personalized videos. Click-through rates, the primary measure of ad engagement, increased by 9.4 percentage points compared to personalized image ads and 6.5 percentage points compared to generic videos. These effects remained consistent across different customer segments and personalization strategies, suggesting broad applicability.

One major benefit of AI-generated personalized videos could be cost savings. The researchers note that the one-time cost of hiring a celebrity endorser to record template videos for a few hours and then create a high-fidelity digital avatar is about $120,000. Instead, by using AI, a company could create 10,000 personalized videos from those same templates and digital avatar for less than $10,000. On a per-ad basis, that works out to about $13 per ad with AI, compared with approximately $120 for the celebrity version.

That cost difference becomes even more dramatic with scaling. The researchers estimate that AI could create 100,000 personalized video ads for $220,000; the same number of video ads, if created by humans, would cost $12 million. AI also enables faster iterations and streamlined workflows, helping marketers scale personalized campaigns more effectively.

As the researchers note, these are rough, back-of-the-envelope calculations. There may be hidden costs with AI due to the complexities of data infrastructure and implementation at scale. To explore these issues, the researchers say, more work is needed.

For businesses, the research suggests several immediate applications. Companies can now feasibly create personalized video campaigns for customer retention, product launches and targeted promotions that would have been economically impossible with traditional methods. The technology particularly benefits businesses with large customer bases; for them, personalization at scale can drive meaningful revenue improvements. Beyond cost savings, the dramatic acceleration in production time enables more agile marketing strategies and rapid response to market conditions (Marion, 2024).

Nonetheless, the researchers note that some of their experiment's limitations warrant consideration. For one, the observed engagement gains came from only a single-exposure experiment. Novelty effects may diminish as AI-generated content becomes commonplace. For another, privacy concerns and the need for transparency about AI usage require careful navigation. Finally, quality control at scale remains challenging. The experiment benefited from close human-AI collaboration that may be difficult to maintain in broader deployments.

The researchers say more work is needed to understand GenAI's boundary conditions. This could include how effectiveness varies across industries, customer segments and cultural contexts, as well as how consumer acceptance evolves as AI-generated content proliferates (Zhang, 2011).

CONCLUSIONS

To make the most of GenAI-powered marketing, Kapoor and Kumar recommend that companies consider the following:

- Generative AI makes the impossible possible: Personalized video advertising at scale is now economically viable, with 90% cost reductions compared to traditional production methods.

- Engagement gains are substantial: Click-through rate improvements of 6 to 9 percentage points demonstrate that cost savings needn't come at the expense of effectiveness.

- Implementation approach matters: “Guided personalization,” in which humans control content and AI handles production, balances automation benefits with quality control and brand alignment.
- Success requires strategic thinking: Managers should view GenAI as a production enabler, not a replacement for human creativity. They can start with controlled pilots using first-party data. Then they should expect customer expectations to evolve.

REPORT

Read **the full research paper**.

ABOUT THE RESEARCHERS

Madhav Kumar is an Assistant Professor at Harvard Business School and a Digital Fellow at the MIT Initiative on the Digital Economy (IDE). His research examines how AI and algorithms shape consumer behavior in digital markets.

Anuj Kapoor is an Assistant Professor of Marketing at the University of Missouri’s Robert J. Trulaske, Sr., College of Business. His research areas include digital video advertising, AI human interaction and digital platforms.

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MIT Initiative on the Digital Economy
MIT Sloan School of Management
245 First St, Room E94-1521
Cambridge, MA 02142-1347
ide.mit.edu

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MIT Initiative on the Digital Economy
617-452-3216
dverrill@mit.edu

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