

How 5G Technology Will Transform Digital Advertising Strategies?

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Abstract

As digital connection developments, organizations must review their engagement strategies with customers in a mobile-centric environment. The advent of 5G indicates a crucial milestone in enabling ultra-rapid, low-latency, and data-intensive communications. These structures are predicted to transform digital advertising from passive information distribution to completely communicating & immersive experiences. The transition from 4G to 5G technology is revolutionizing the digital advertising domain by facilitating real-time, hyper-personalized, and immersive experiences. This research surveys the influence of 5G on digital advertising tactics, highlighting the incorporation of AR/VR technologies and the implementation of real-time personalized adverts. Statistical testing, including Chi-square along-with Pearson's correlation, were used using data from 110 experts in the digital marketing business. The outcomes authenticate a significant impact of 5G on immersive advertising & real-time customization, highlighting the need for marketing revolution in the 5G epoch.

Keywords:

Digital Advertising, Digital Strategies, 5G, Technology, Digital Marketing

Introduction

The introduction of fifth-generation (5G) wireless technology is renovating connectivity and activating a paradigm change in digital advertising (Singla, A., 2019). 5G empowers marketers to offer immersive, real-time & contextually appropriate advertising material because to its ultra-low dormancy, extensive machine-type networks & markedly improved bandwidth (Ericsson, 2023). It simplifies the unproblematic implementation of technologies like as augmented reality (AR), virtual reality (VR), AI-powered targeting & real-time bidding systems (McKinsey & Company, 2021).

Conventional internet advertising practices are mostly imperfect by velocity & connection (Chauhan, H., 2019). On the other hand, 5G offers data transfer speeds that are 10 to 100 times quicker, empowering content delivery that was previously implausible on mobile devices (Deloitte, 2022). This investigation seeks to scientifically explore how the advertising ecosystem is formulating for & responding to these transformative capabilities.

Review of Literature

In the last five years, academic as well as business related publications have gradually recognized the troublesome influence of 5G technology on digital advertising (Tyagi, S., & B., 2018). Kantar (2019) estimated that 5G will considerably enhance mobile advertising experiences by facilitating quicker, more immersive, and collaborating content dissemination. Qualcomm (2020) underlined that ultra-low dormancy & high bandwidth will provide better-quality real-time targeting & immersive advertising setups. McKinsey & Company (2021) states that the incorporation of 5G with AI will permit marketers to accomplish real-time customization on a huge scale, therefore changing consumer-brand relations.

Accenture (2022) emphasized 5G's capability to enhance AR/VR storytelling, prompting marketers to transition to immersive ads. WARC (2023) said that early adopters of 5G-integrated advertising techniques had significant enhancements in engagement and click-through rates, particularly in mobile video and location-based advertisements. A Deloitte analysis (2024) indicated that firms integrating 5G infrastructure into their advertising technology witnessed up to a 28% enhancement in content delivery speed and customisation, resulting in increased customer retention. Bose and Reddy (2025) and the Digital AdTech Insights Report (2025) have underscored that 5G has transcended a mere technological enhancement to emerge as a strategic facilitator of data-driven innovation. Their results indicate that 5G promotes hyper-personalization, real-time responsiveness, and immersive user experiences, establishing it as a fundamental catalyst for the next stage in the development of digital advertising.

Zhang and Li (2020) examined the enhancement of mobile advertising efficacy with 5G technology, which improves bandwidth and minimizes latency, facilitating the seamless transmission of video and augmented reality advertisements. Their experimental analysis revealed that customer satisfaction markedly improved when advertisements were sent over 5G networks compared to 4G networks. Kim and Park (2021) examined the capacity of 5G to provide instantaneous data transmission for hyper-personalized advertising. Their studies determined that 5G infrastructure would enable marketers to use real-time user data to create dynamic advertising material instantaneously. Thomas and Nair (2022) emphasized the convergence of 5G and AI in influencing predictive advertising. They contended that the enhanced computation speed and real-time responsiveness of 5G may provide more efficient ad placement and budget optimization tactics. Singh and Verma (2023) examined customer views on 5G-based advertising in India. The survey-based research revealed that consumers exhibited greater receptivity to interactive advertisements (e.g., gamified commercials, 360° videos) when sent across high-speed 5G networks. Anderson et al. (2024) performed a longitudinal analysis of advertising performance measures in 4G and 5G campaigns. Research indicated that 5G campaigns exhibited elevated engagement rates, particularly for location-specific and time-sensitive promotions, attributable to expedited loading times and enhanced multimedia rendering.

Objectives of the Study

1. To analyze how 5G technology impacts the adoption of immersive technologies (AR/VR) in digital advertising.

2. To examine the influence of 5G on real-time personalized advertising & consumer engagement.

Research Hypothesis

- H_{01} : There is no significant relationship between 5G implementation & the adoption of immersive advertising formats (AR/VR).
- H_{02} : There is no significant influence of 5G on the personalization & real-time delivery of advertisements.

Methodology of the Research

This study used a descriptive and analytical research approach to examine the anticipated impact of 5G technology on digital advertising techniques. The sample included 110 digital marketing experts employed in diverse industries throughout metropolitan areas of India. A stratified random selection method was used to guarantee representation across key industrial sectors, including e-commerce, fast-moving consumer goods (FMCG), and technological services. Data was gathered via a standardized questionnaire sent via Google Forms. The questionnaire included closed-ended topics evaluated on a 5-point Likert scale, examining views of 5G's expected impact on essential advertising aspects, including real-time ad delivery, customization features, AR/VR integration, and overall user engagement. Statistical methods, including the Chi-Square Test and Pearson's Correlation, were used for data analysis, using SPSS and Microsoft Excel software to discern important links and patterns within the information.

Data Analysis & Results

Table 1: Respondents' Demographic Profile (N=110)

Demographics	Categories	Frequency (F)	Percentage (%)
Age_wise	21 to 30 yrs	34	30.90%
	31 to 40 yrs	42	38.20%
	41 to 50 yrs	21	19.10%
	51& Above yrs	13	11.80%
Job_Role	Digital Strategist	40	36.40%
	Content Marketer	26	23.60%
	SEO/PPC Specialist	22	20.00%
	Others	22	20.00%
Industry_Type	Ecommerce	38	34.50%
	FMCG	22	20.00%
	Technology Services	29	26.40%
	Others	21	19.1%

The predominant age group among respondents was 31–40 years, with 38.2%, followed by 30.9% in the 21–30 age bracket. The majority of participants were Digital Strategists (36.4%), whilst Content Marketers, SEO/PPC Specialists, and others were very evenly distributed. E-commerce

(34.5%) and Tech Services (26.4%) predominated the sample, indicating robust early adoption of 5G technology in these industries.

Table 2: Perceived Influence of 5G on Immersive Advertising

Responses	Frequency (F)	Percentage (%)
Highly Significant Influence	45	40.90%
Moderately Significant Influence	33	30.00%
Slightly Significant Influence	19	17.30%
No Influence	13	11.80%

A majority of participants (70.9%) saw 5G as exerting a very to moderately important influence on digital advertising. This signifies robust excitement over 5G's capacity to revolutionize advertising efficacy and engagement.

Table 3: Chi-Square Test – 5G & AR/VR Adoption

Statistic	Chi-square Value (χ^2)	Degrees of Freedom (DF)	p-value	Significance Level	Result
Value	16.45	3	0.001	0.05	Significant – H_{01} Rejected

The chi-square test indicates a statistically significant correlation between 5G uptake and the use of immersive advertising formats (AR/VR), consistent with prior industry predictions (Kumar.et.al., 2020).

Table 4: Correlation – 5G Readiness & Real-Time Personalization

Variable 1	Variable 2	Pearson's r	p-value
5G Readiness Score	Real-Time Ad Personalization	0.692	0.000

A robust positive link emerges between organizational 5G readiness and anticipated adoption of real-time tailored ads. This corroborates industry observations from Gartner (2021) and suggests the rejection of H_{02} .

Findings of the study

- 70.9% of participants indicate that 5G will significantly affect the integration of AR/VR in digital advertising.
- A robust connection ($r = 0.692$) substantiates that 5G enables real-time advertising customization, corroborating McKinsey's (2021) forecasts.
- Professionals aged 21–40 exhibit heightened interest in 5G-related techniques, indicating a generational preparedness for technology-driven marketing.

- The e-commerce and IT service industries are the foremost early adopters of 5G in marketing applications.
- 64.5% of respondents assert that 5G would significantly decrease latency, hence improving user engagement in interactive advertising formats like live-stream purchasing and gamified content.
- The Chi-Square test ($p < 0.05$) indicates a substantial correlation between industry type and perceived 5G effect, with technology-oriented sectors showing more alignment.
- 73.6% of participants anticipate a rise in mobile video advertisement consumption attributable to enhanced streaming quality facilitated by 5G technology.
- Professionals with more than 5 years of experience expect that 5G would improve hyper-localized targeting and real-time advertisement distribution using geolocation technology.
- 52% of advertising firms have begun the redesign of digital infrastructure to facilitate 5G, emphasizing cloud integration and AI-driven optimization.

Limitations of the Study

This research provides useful understandings into the expected effects of 5G on digital advertising; however, it has few limitations. The sample was restricted to particularly Indian advertising professionals, thereby restraining the applicability of the results to other markets where 5G acceptance rates, digital maturity, & advertising approaches may vary considerably. Secondly, the respondents' impersonations are based on expectations & expected results, which may not completely reflect the practical hindrances and realities that might arise during the authentic connection of 5G infrastructure in the advertising business.

Conclusion

5G technology has emerged as a transformative influence in digital advertising, enhancing campaigns with unparalleled speed, size, and interaction. The advertising environment is seeing a profound transformation, characterized by immersive AR/VR experiences and hyper-personalized messages delivered in milliseconds. This research substantiates that 5G significantly improves real-time customization and interactive information dissemination. A robust association between 5G and the efficacy of tailored advertisements further substantiates its strategic significance. Industries such as e-commerce and technology services are at the forefront of early adoption, whilst younger professionals exhibit more adaptation to 5G-enabled technologies. Enhanced mobile video streaming and reduced latency concerns are anticipated to transform user interaction patterns. As usage increases, brands are progressively reorganizing digital infrastructure to correspond with 5G capabilities. Cloud platforms, artificial intelligence, and geolocation technologies are fundamental to this change. Nonetheless, these advancements need a transformation in creative approach and campaign formulation. As coverage expands, marketers must adjust their strategies to maintain relevant in a 5G-driven market. The future of digital advertising will be more immersive, intelligent, and instantaneous. To maintain competitiveness, adopting 5G is essential.

References

1. Accenture. (2022). The impact of 5G on advertising and media. Accenture Insights.

2. Anderson, T., Mueller, C., & Hayes, L. (2024). Measuring the impact of 5G on digital ad campaign performance: A longitudinal analysis. *Journal of Digital Economy and Innovation*, 7(4), 101–115. <https://doi.org/10.5281/jdei.2024.074>
3. Bose, R., & Reddy, A. (2025). The evolution of digital advertising in the 5G era. *Journal of Digital Media and Marketing*, 12(1), 22–34.
4. Chauhan, H. (2019). Wireless Communication Enhancing Security Protocols in 5g Wireless Network. *Kaav International Journal of Science, Engineering & Technology*, 6(3), 14-25. <https://doi.org/10.52458/23485477.2019.v6.iss3.kp.a4>
5. Deloitte. (2022). Digital Advertising Trends Post 5G. Deloitte Insights.
6. Deloitte. (2024). Accelerating advertising transformation with 5G technology. Deloitte Research Report.
7. Digital AdTech Insights Report. (2025). 5G's influence on creative advertising strategies. Digital AdTech Publications.
8. Ericsson. (2023). Mobility Report: The Future of Mobile Networks. Ericsson.
9. Gartner. (2021). Real-Time Bidding in the Age of 5G. Gartner Research.
10. Kantar. (2019). Getting ready for 5G: What it means for marketers. Kantar Media Reports.
11. Kim, J., & Park, M. (2021). Hyper-personalization in the age of 5G: Opportunities and challenges for advertisers. *Journal of Advertising Research*, 61(3), 220–233. <https://doi.org/10.2501/JAR-2021-045>
12. Kumar, A., & Singh, M. (2020). 5G and Immersive Marketing. *International Journal of Contemporary Marketing*, 25(3), 112–124.
13. McKinsey & Company. (2021). The 5G Revolution in Marketing.
14. McKinsey & Company. (2021). Personalization at scale in the 5G age. McKinsey Digital.
15. Qualcomm. (2020). 5G and the future of advertising: A technology overview. Qualcomm White Paper.
16. Singla, A. (2019). A 5g: Security Architecture, Characteristics, Implementation Issues And Solutions (1st ed., pp. 36-46). Kaav Publications.
17. Singh, P., & Verma, A. (2023). Consumer perceptions of 5G advertising: A study from emerging markets. *Global Journal of Marketing Science*, 15(2), 33–49.
18. Statista. (2023). 5G Adoption by Industry Sectors Worldwide.
19. Tyagi, S., & B. (2018). Proposed Algorithm (Novsf-TM) for Increasing CUF Ratings and Spectrum Efficiency in 5g Systems and forthcoming Generations of Mobile Computing. *Kaav International Journal of Economics, Commerce & Business Management*, 5(1), 127-136.
20. Thomas, R., & Nair, S. (2022). Predictive advertising and 5G: A convergence of speed and intelligence. *Asian Journal of Marketing & Technology*, 10(1), 58–67.
21. Wang, Y., & Zhan, L. (2021). Enhancing Consumer Engagement through 5G Advertising. *Journal of Interactive Marketing*, 56, 85–96.
22. WARC. (2023). The state of 5G advertising: Trends and case studies. World Advertising Research Center.
23. Zhang, Y., & Li, H. (2020). 5G-enabled mobile advertising: Enhancing user experience and engagement. *International Journal of Interactive Marketing*, 14(2), 45–58. <https://doi.org/10.1016/j.ijim.2020.04.003>