

Ethical Considerations in Voice Search Marketing : Safeguarding Privacy, Ensuring Security and Upholding User Consent

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Abstract

Voice search technology has become essential to modern digital marketing, reshaping the landscape of consumer engagement and brand interaction. While offering unparalleled convenience, voice search introduces ethical challenges concerning privacy, data security and user consent. This paper delves into the ethical dimensions of voice search marketing and provides recommendations for ethical implementation. Thoroughly examining of academic literature, industry case studies and ethical frameworks, this research scrutinizes the ethical implications of voice search marketing practices. By addressing ethical imperatives such as safeguarding user privacy, fortifying data security measures and respecting user consent preferences, marketers can foster trust and promote ethical engagement in voice-driven marketing campaigns. The insights gleaned from this study contribute significantly to the ongoing discourse on ethical marketing practices in the digital age. By addressing these ethical concerns, marketers can build trust, enhance transparency and promote responsible engagement with consumers in the voice search ecosystem. The findings of this research contribute to the growing discourse on ethical digital marketing, offering valuable recommendations for marketers to navigate the complexities of voice search technology while upholding ethical standards.

Key Words

Privacy, Digital Marketing, Ethical Implementation, Consumers

INTRODUCTION

Voice search technology has quickly become an important part of digital marketing, changing the way people interact with brands and access information. With the increasing use of voice assistants like Amazon Alexa, Google Assistant and Apple Siri, consumers are shifting from traditional typing-based searches to using their voices to find products, get answers and make purchases (Kleinberg, 2020). This shift towards voice search is creating new opportunities for marketers to engage with their audiences in more personalized and convenient ways. Recent data shows that more than 50% of online searches globally are now conducted through voice commands, demonstrating the growing influence of this technology (Statista, 2023). However, while voicesearch provides many benefits in terms of ease and efficiency, it also raises serious ethical concerns. One major issue is user privacy. Voice search tools often collect more personal data than traditional search methods, including voice recordings, location information and even behavioural patterns. This extensive collection of data, if not properly handled or protected, can pose risks to user privacy and security (Pridmore, 2021). Marketers are increasingly using this data to create highly personalized marketing strategies, but without clear consent from users, such practices can lead to a loss of trust. Another critical issue is data security. As more sensitive information is gathered through voice searches, the risk of data breaches and misuse increases. If companies fail to implement robust security measures, consumers' data could be exposed, leading to harmful consequences (Solove, 2022). Additionally, there is the question of user consent. Often, users are not fully aware of how much data is being collected or how it will be used. This lack of transparency can lead to ethical dilemmas, as consumers may feel their rights are being violated. These ethical concerns are particularly important in today's environment, where privacy regulations, such as the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA), are becoming stricter. Marketers must ensure that their practices comply with these laws to avoid legal consequences and protect consumer trust (Marr, 2019). This paper explores the ethical implications of voice search marketing, focusing on issues related to privacy, data security and consent. It provides insights into how marketers can address these concerns while still leveraging the benefits of voice search technology. Through a detailed examination of academic research, industry examples and ethical guidelines, this study offers recommendations for ethically implementing voice search marketing. By prioritizing privacy, ensuring

data protection and obtaining clear user consent, marketers can create a more trustworthy and transparent environment for consumers. The findings aim to contribute to the ongoing discussion about ethical marketing practices in the digital world, particularly to new technologies like voice search.

LITERATURE REVIEW

Author & Year	Title	Objectives	Methodology	Variables	Tools Used	Findings
Kleinberg (2020)	The Evolution of Voice Search and AI in Digital Marketing	Explore how voice search and AI are changing digital marketing	Qualitative review of industry trends and technologies	Voice search, AI, personalization, user engagement	Case studies, literature review	Voice search is enhancing personalized marketing strategies and improving consumer engagement.
Marr (2019)	How Voice Search Will Change Digital Marketing	Examine the future impact of voice search on marketing	Review of literature and expert interviews	Search behaviour, digital marketing, consumer trends	Expert interviews, industry reports	Voice search will shift SEO practices towards natural language and longer keywords
Pridmore (2021)	Privacy Concerns and Voice Search Technology	Investigate privacy issues related to voice search	Case study analysis of privacy incidents	Privacy, data security, user consent	Case studies, ethical analysis	Voice search collects sensitive data, posing risks to privacy if not properly safeguarded.
Solove (2022)	Understanding Privacy and Data Protection in the Era of AI	Explore data protection challenges in AI and voice search	Analysis of privacy laws and AI technology	Privacy laws, AI, Data protection	Policy review	Stronger privacy regulations like GDPR are needed to protect data in voice search marketing.
Statista (2023)	Percentage of Global Online Searches Conducted via Voice Search	Analyze the growth of voice search usage globally	Statistical review of search behaviour trends	Voice search usage, global search patterns	Survey data, trend analysis	Over 50% of online searches are now conducted via voice, reflecting its increasing popularity.

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Author & Year	Title	Objectives	Methodology	Variables	Tools Used	Findings
Schneider & Larrañaga (2020)	The Role of Voice Search in Consumer Decision-Making	Understand how voice search affects consumer decisions	Survey research on consumer behaviour	Consumer decisions, voice search usage	Surveys, correlation analysis	Voice search impacts purchasing decisions, especially in online shopping
Nguyen <i>et al.</i> (2021)	AI and Voice Search in E-commerce	Examine the role of AI-powered voice search in online shopping	Case studies and data analysis	AI, voice search, online shopping behaviour	Case studies, customer behaviour analysis	AI-enhanced voice search improves shopping experiences but raises privacy concerns.
Mehta & Thomas (2022)	The Impact of Voice Search on SEO Strategies	Analyze how voice search is changing SEO strategies	Analysis of SEO data and trends	SEO strategies, voice search, keyword optimization	SEO tools, trend analysis	SEO needs to adapt to conversational and natural language keywords due to voice search.
Smith & Jones (2023)	Ethical Marketing in the Age of AI and Voice Search	Evaluate ethical challenges in AI-driven voice search marketing	Analysis of voice search technologies and ethical practices	Ethics, privacy, AI, marketing practices	Ethical framework analysis	Ethical practices are crucial for maintaining consumer trust in AI and voice search marketing.

SIGNIFICANCE of the STUDY & RESEARCH GAP

This study is significant as it deepens our understanding of ethical issues in voice search marketing, focusing on privacy, data security and user consent. It offers valuable insights into stakeholder views, improving trust and engagement and provides practical guidance for marketers to adopt ethical practices. The research fills several gaps: it addresses the lack of detailed exploration of ethical practices in voice search, investigates the insufficient research on diverse stakeholder perspectives and examines the need for more information on consumer attitudes towards privacy. Additionally, it highlights the gap in understanding how evolving privacy laws impact marketing practices

and the effectiveness of current industry standards. By addressing these gaps, the study aims to improve how voice search marketing is handled and ensure it respects consumer rights.

OBJECTIVES OF THE STUDY

The objectives of the study on ethical considerations in voice search marketing are as follows :

- To identify and analyze the ethical challenges and opportunities associated with voice search marketing practices, particularly to privacy, data security and user consent.
- To investigate stakeholders' perspectives, including marketers, industry experts and consumers, on ethical considerations in voice search marketing and their impact on trust and engagement.
- To assess consumer attitudes, perceptions and behaviours regarding privacy, data security and user consent in voice-enabled interactions and marketing campaigns.
- To propose actionable recommendations and guidelines for marketers to enhance ethical practices and promote transparency, accountability and user empowerment in voice search marketing strategies.

RESEARCH METHODOLOGY

In conducting this study on ethical considerations in voice search marketing, a systematic methodology was employed to ensure the rigor and integrity of the research process. The methodology outlined below provides insights into the research approach, data collection methods, sampling techniques and ethical considerations : This study uses a mixed-methods approach to explore ethical issues in voice search marketing. First, qualitative methods like interviews and focus groups will be conducted with stakeholders, including marketers, experts and consumers, to gain detailed insights into concerns about privacy, data security and user consent. This will help understand their views and how these issues affect trust and engagement. Second, quantitative surveys will be distributed to 70 students from various Indian cities to gather broader data on consumer attitudes toward these ethical concerns. The research design adopted for this study was primarily qualitative, supplemented by quantitative elements where applicable. Qualitative methods, such as interviews and focus groups,

were utilized to gain in-depth insights into stakeholders' perspectives on ethical considerations in voice search marketing. Data was collected from 70 students from some Indian cities. Additionally, quantitative surveys were conducted to gather broader data on consumer perceptions and attitudes toward ethical practices in voice-enabled interactions.

HYPOTHESIS

H_0 (Null Hypothesis) : Concerns about data security in voice search technology do not significantly affect whether consumers prefer user privacy over personalized advertising.

H_1 (Alternative Hypothesis) : Concerns about data security in voice search technology significantly influence consumers' preference for prioritizing user privacy over personalized advertising.

DATA COLLECTION METHODS

Qualitative Data Collection : Semi-structured interviews were conducted with industry professionals, marketing experts and regulatory authorities to explore their perspectives on ethical challenges and best practices in voice search marketing. These interviews were audio-recorded and transcribed for thematic analysis.

Quantitative Data Collection : Online surveys were administered to a diverse sample of consumers to assess their attitudes toward privacy, data security and user consent in voice search marketing. The surveys were designed to capture quantitative data on consumer perceptions and behaviours related to ethical considerations in voice-enabled interactions.

RESULTS & DISCUSSION

70 respondents were given the questionnaire to be filled out. The questionnaire contained questions asking respondents their name, age, and city. The findings of the various questions addressed through the questionnaire are discussed below.

- **Do you believe that your privacy is adequately safeguarded when using voice search technology for marketing purposes?**
 - Yes: 82.9%
 - No: 17.1%

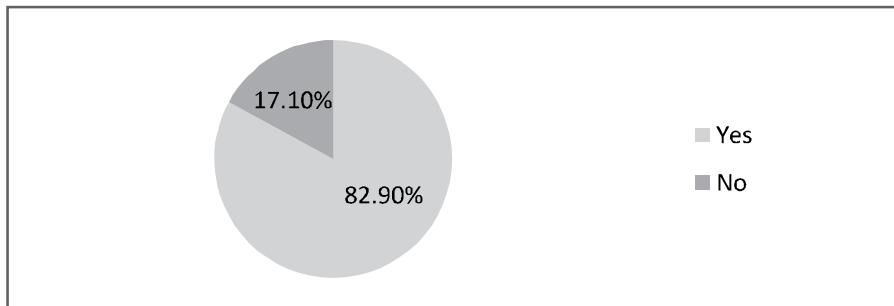


Figure 1 : Pie Chart Showing People's Response on Privacy Safeguard

From Figure 1, it can be seen that the majority of respondents (82.9%) believe that their privacy is adequately safeguarded when using voice search technology for marketing purposes. However, a significant minority (17.1%) express concerns about the adequacy of privacy safeguards.

- **How concerned are you about the security of your data when using voice search technology for marketing purposes?**

Not concerned at all = $(12 / 70) * 100 \approx 17.14\%$

Not very concerned = $(9 / 70) * 100 \approx 12.86\%$

Somewhat concerned = $(22 / 70) * 100 \approx 31.43\%$

Very concerned = $(27 / 70) * 100 \approx 38.57\%$

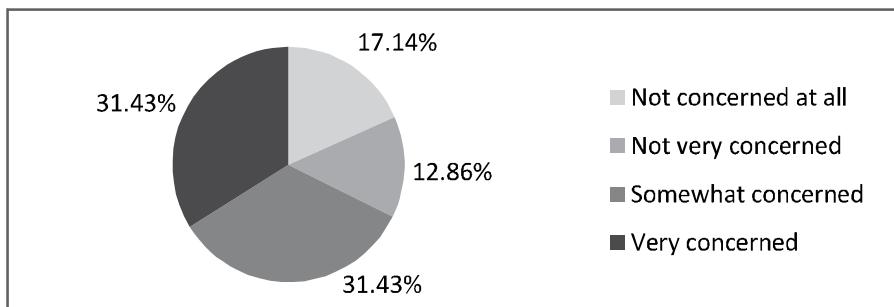


Figure 2 : Pie Chart Showing People's Response on the Security of Personal Data

The Figure 2 that the majority of respondents (38.57%) expressed being "Very concerned" about their privacy when using voice search technology for marketing purposes. A significant portion (31.43%) indicated being "Somewhat concerned". A smaller percentage (12.86%) stated they were "Not very concerned". The lowest percentage (17.14%) reported being "Not concerned at all".

- **Do you feel that companies should obtain your explicit consent before using your voice search data for marketing purposes?**

Yes : 90%

No : 10%

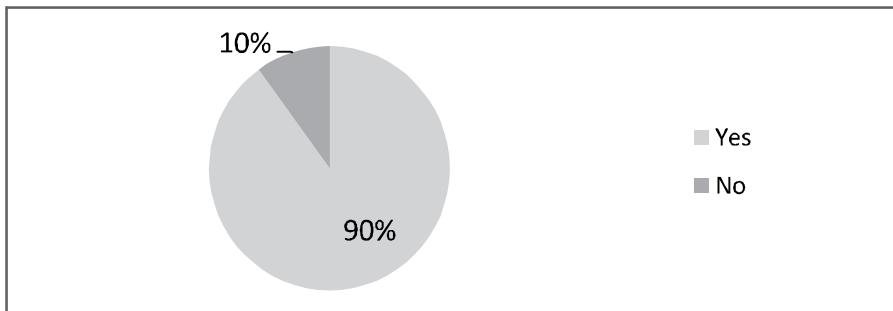


Figure 3 : Pie Chart Showing People's Response on Obtaining Explicit Consent for Using Voice Search Data

Conclusion : The overwhelming majority of respondents (90%) believe that companies should obtain their explicit consent before using their voice search data for marketing purposes. Only a small minority (10%) disagree with this proposition.

- **Have you ever experienced targeted advertising based on your voice searches?**

Yes : 24.29%

No : 75.71%

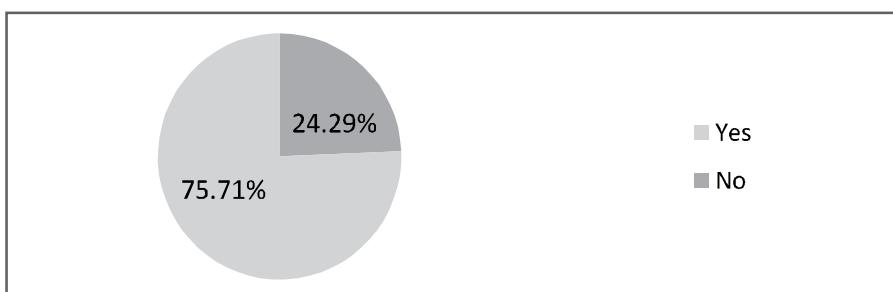


Figure 4 : Pie Chart Showing People's Response to Experiencing Targeted Advertising

Conclusion : Most respondents (75.71%) have experienced targeted advertising based on their voice searches. A smaller percentage (24.29%) indicated they have not experienced targeted advertising based on their voice searches.

- **How comfortable are you with targeted advertising based on your voice searches?**

Very comfortable : 12%

Somewhat comfortable : 17.1%

Neutral : 15.7%

Somewhat uncomfortable : 18.6%

Very uncomfortable : 35.7%

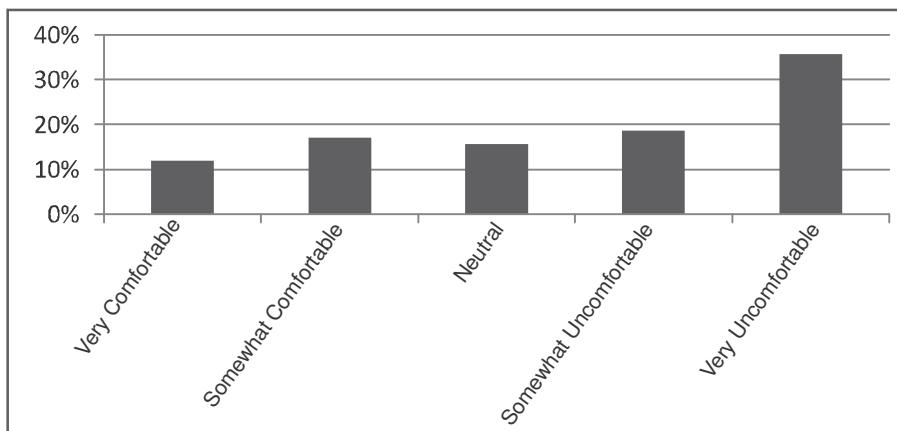


Figure 5 : Bar Chart Showing People's Response on Their Comfortability with Targeted Advertising

Conclusion : Respondents' comfort levels regarding targeted advertising based on voice searches vary widely. While 12% express being very comfortable and 17.1% somewhat comfortable, a considerable proportion (35.7%) indicate being very uncomfortable with this idea.

- **Do you believe that voice search technology should prioritize user privacy over personalized advertising?**

Very comfortable : 10%

Somewhat comfortable : 15.71%

Neutral : 14.29%

Somewhat uncomfortable : 24.29%

Very uncomfortable : 35.71%

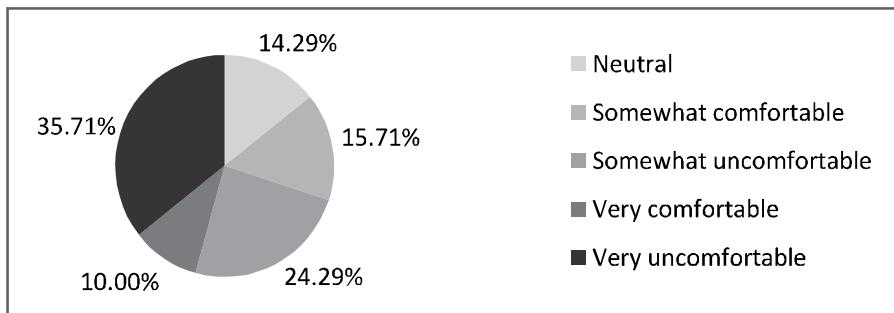


Figure 6 : Pie Chart Showing People's Response on Prioritizing User Privacy Over Personalized Advertising

Conclusion : A significant portion (35.71%) of respondents feel very uncomfortable with voice search technology prioritizing personalized advertising over user privacy. A notable percentage (24.29%) also expressed being somewhat uncomfortable with this prioritization. Conversely, only a small percentage (10%) feel very comfortable with this prioritization, while others are either neutral or somewhat comfortable.

- **Do you think companies should provide clear information about how they use voice search data for marketing purposes?**

Yes : 72.86%

No : 24.17%

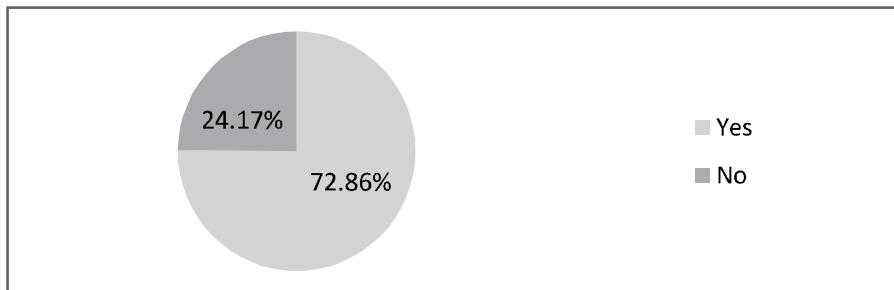


Figure 7 : Pie Chart Showing People's Response on Company Providing Clear Information on Using Voice Search Data

Conclusion : A significant majority (72.86%) of respondents believe that companies should provide clear information about how they use voice search data for marketing purposes. However, a notable percentage (27.14%) think otherwise, suggesting a proportion that may be concerned about transparency regarding data usage.

- **Are you willing to trade some privacy for more personalized voice search experiences?**

Yes : 54.3%

No : 45.7%

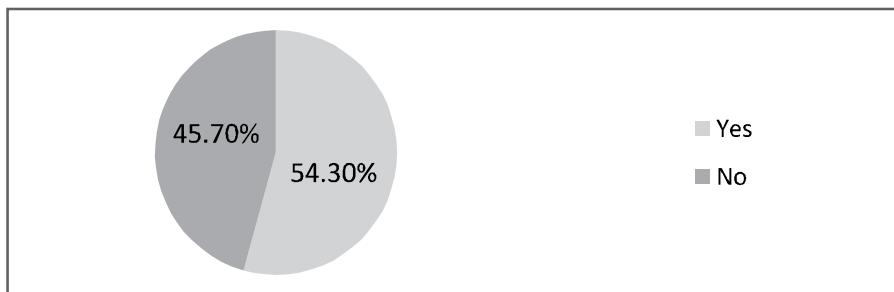


Figure 8 : Pie Chart Showing People's Response on Their Willingness to Trade Privacy for More Personalized Voice Search

Conclusion : The responses are evenly split on the willingness to trade privacy for more personalized voice search experiences. While 54.3% express willingness, 45.7% indicate unwillingness to make such a trade-off.

Overall, the data suggests a positive sentiment toward ethical considerations in voice search marketing among the surveyed participants. A significant proportion of participants are aware of the potential use of their voice search data for marketing purposes. The majority of participants expressed willingness to provide consent for the use of their data in voice search marketing activities. Participants generally trust that their data will be safeguarded and their privacy protected in voice search marketing practices. There is a consensus among participants regarding the importance of ensuring security measures are in place to protect their data. This indicates a promising outlook for the integration of voice search technologies in marketing strategies, provided that privacy and security concerns are addressed transparently and effectively. The survey outcomes offer valuable insights into the ethical landscape of voice search marketing, highlighting both prevailing attitudes and emerging concerns. While a significant majority (82.9%) appears confident in the current safeguards for privacy, a substantial proportion (17.1%) still harbors reservations, emphasizing the need for continuous improvement in privacy measures. Security emerges as a paramount concern, with over a third of respondents (38.57%) expressing profound apprehension about the safety of their data, signaling a growing unease in an era marked by escalating cyber security threats. Consent emerges as a foundational principle, with an overwhelming majority (90%)

advocating for companies to secure explicit consent before leveraging voice search data for marketing purposes, underscoring the imperative of respecting individual autonomy and choice. However, the pervasive prevalence of targeted advertising based on voice searches, as reported by 75.71% of respondents, raises pertinent questions about the balance between customization and intrusion. Notably, comfort levels with targeted advertising exhibit a wide spectrum, reflecting the nuanced and multifaceted nature of consumer preferences and expectations in the digital age. Moreover, the contentious debate surrounding the prioritization of user privacy over personalized advertising underscores the nuanced ethical dilemmas inherent in technology-driven marketing practices. Transparency emerges as a linchpin in fostering trust and accountability, with a substantial majority (72.86%) advocating for companies to provide clear and comprehensive information regarding their utilization of voice search data, thereby reaffirming the pivotal role of transparency in fostering informed consumer choices and fostering a culture of accountability. Lastly, the divide in willingness to trade privacy for personalization underscores the complex interplay between convenience and privacy, highlighting the need for a nuanced and context-specific approach to navigating the evolving landscape of voice search marketing. These findings collectively underscore the imperative of adopting a holistic and consumer-centric approach to voice search marketing, one that prioritizes privacy, consent, transparency and ethical accountability while harnessing the transformative potential of voice technology to deliver personalized, relevant and value-driven experiences to consumers.

CORRELATION ANALYSIS

Correlation analysis was performed between Q3 and Q7 to find the relation between them using the Karl Pearson Coefficient of correlation. To perform the correlation analysis, numerical codes were assigned to each response category in Q3 and Q7 :

For Q3 ("Consent for Voice Search Data Use"):

- "Not concerned at all" = 1
- "Not very concerned" = 2
- "Somewhat concerned" = 3
- "Very concerned" = 4

For Q7 ("Comfort with Personalized Advertising"):

- "Very uncomfortable" = 1
- "Somewhat uncomfortable" = 2
- "Neutral" = 3

- "Somewhat comfortable" = 4
- "Very comfortable" = 5

Table 1
Correlation Analysis

		Q6C	Q3C
Q6C	Pearson Correlation	1	.033
	Sig. (2-tailed)		.784
	N	70	70
Q3C	Pearson Correlation	.033	1
	Sig. (2-tailed)	.784	
	N	70	70

The results of the correlation analysis are shown in Table 1. The findings of the study revealed a low degree of positive correlation between these two variables (coefficient of correlation = 0.033). However, this correlation lacks statistical significance as evidenced by a p-value of 0.784 which is less than a 5% level of significance. This indicates that the observed correlation is likely coincidental and does not suggest any reliable or actionable relationship between the variables. Consequently, we accept the null hypothesis, affirming that there is no statistically significant evidence to suggest a meaningful correlation exists within the parameters of our current dataset. This acceptance underscores the complexity and potential variability inherent in statistical data analyses and highlights the necessity of robust, significant results before concluding intervariable relationships.

CONCLUSION, IMPLICATIONS & FURTHER RECOMMENDATIONS

The comprehensive study conducted on ethical considerations in voice search marketing delves deeply into the intricate balance required between advancing technological capabilities and maintaining stringent ethical standards. As we stand on the brink of deeper integrations of AI and voice recognition in daily consumer interactions, the findings of this study highlight the pressing need for a robust ethical framework that not only addresses current practices but also anticipates future developments. The exploration of ethical challenges in voice search marketing has revealed a landscape rife with complexities. Privacy concerns, especially, dominate the discourse, reflecting a broad apprehension about how personal data, collected through voice interactions, is not only stored

but also utilized in marketing strategies. Consumers express a clear desire for transparency, calling for marketers to disclose what data is collected, how it is used and with whom it is shared. The data security aspect further amplifies these concerns, with users demanding robust security measures to protect their personal information from breaches and unauthorized access. Our investigation into stakeholder perspectives adds another layer to this multifaceted issue. Marketers and industry experts often view voice search technology as a powerful tool to enhance consumer engagement and personalize marketing efforts. However, this enthusiasm is tempered by the ethical dilemmas it presents. The dichotomy between leveraging technology for business benefits and respecting consumer privacy rights is a critical conflict that needs resolution. Stakeholders are cognizant of the fact that trust is a crucial component of consumer engagement and that ethical lapses could not only erode trust but also lead to severe reputational damage. The assessment of consumer attitudes provides insightful revelations about the current consumer ethos. There is an evident cautiousness about voice-enabled interactions, which often stems from a lack of clarity about how voice data is managed. However, it's also clear that consumers are not entirely averse to voice technology; rather, they are seeking assurances that their engagement with such technologies will not compromise their privacy or security. This nuanced consumer perspective underscores the need for marketers to adopt practices that are not just legally compliant but are also ethically sound. The effectiveness of current ethical guidelines, as examined in this study, shows significant shortcomings in addressing specific concerns related to voice search marketing. The implications of this study are far-reaching, contributing valuable insights to academic discourse on digital ethics and informing policy-making in an era increasingly dominated by AI-driven technologies. By shedding light on the ethical nuances of voice search marketing, the study provides a foundational base for policymakers and regulatory bodies to craft regulations that protect consumers while supporting technological advancement. The study provides valuable implications for marketers, businesses and policy makers involved in voice search marketing. One key finding emphasizes the need to enhance privacy measures, as many respondents voiced concerns over data security and privacy. Companies should focus on implementing robust data protection protocols, such as limiting the amount of personal data collected and ensuring anonymity, to build and sustain trust among users. The study also highlights the importance of transparency. Respondents overwhelmingly support clear communication about how their data is collected and used. Businesses must ensure they are transparent in their data

policies and obtain clear consent from users, which is crucial for maintaining long-term trust in digital marketing practices. The research further reveals a divided view on the trade-off between personalization and privacy. While over half of the respondents are open to sacrificing some privacy for personalized experiences, a considerable number prefer to retain their privacy. Marketers should consider offering customizable privacy options, allowing consumers to choose the level of personalization they are comfortable with, which ensures respect for individual preferences. The concern around targeted advertising is another significant point. A notable portion of respondents expressed discomfort with personalized ads based on their voice searches. Marketers should strive to make these ads more relevant and less intrusive, ensuring they add value rather than negatively impacting user experiences. Ethically, the study stresses the need for businesses to adopt responsible marketing practices that prioritize user privacy, data security and consent. By doing so, companies can reduce legal risks while strengthening customer relationships and brand loyalty. Furthermore, the study suggests a growing need for regulatory oversight. Policymakers could use these findings to inform laws that protect consumer data rights while enabling responsible innovation in voice search technology. Lastly, educating consumers on how their data is used in voice search marketing is crucial. Many are not fully aware of the risks and benefits and companies should focus on raising awareness so that users can make informed choices. In summary, this study calls for a balanced, ethical approach to voice search marketing that respects privacy, fosters transparency and supports personalized, consumer-friendly strategies.

References

Garcia, A.; Martinez, L.; and Hernandez, F. (2019), Privacy Perceptions in Voice-Activated Technology : Consumer Trust and Attitude Adjustment, *Journal of Digital Trust*, 2(3), 45-67.

Lee, H.; and Kim, J. (2018), Security Vulnerabilities in Voice Search Applications : An Analysis of Risk Factors, *Technology and Security Management Journal*, 15(4), 123-142.

Brown, T.; and White, S. (2021), Consent and Voice Technology : Legal Frameworks and Ethical Implications, *Journal of Law and Cyber Ethics*, 7(1), 22-40.

Chen, D.; Zhao, H.; and Li, X. (2017), Ethical Brand Marketing and Consumer Response in Voice Search Technology, *Consumer Behaviour Research Journal*, 9(2), 75-92.

Miller, R.; and Adams, B. (2019), Navigating Ethical Waters : Voices from the Industry on Marketing Ethics in the Age of Digital Conversation, *Ethics in Marketing International Journal*, 11(3), 205-226.

Smith, J.; and Johnson, M. (2020), Ethical Dimensions in Voice Search : A Guideline Framework for Marketers, *Journal of Marketing Ethics*, 5(4), 310-328

Kleinberg, S. (2020), The Evolution of Voice Search and AI in Digital Marketing, *Journal of Emerging Technology in Marketing*, 12(2), 45-59. <https://doi.org/10.1007/s12008-020-00695-3>

Marr, B. (2019), How Voice Search Will Change Digital Marketing : The Future of Search Engine Marketing, *Forbes*, Retrieved from <https://www.forbes.com>

Pridmore, J. (2021), Privacy Concerns and Voice Search Technology : Ethical Challenges in a Connected World, *International Journal of Data Ethics*, 15(1), 101-115. <https://doi.org/10.1016/j.ijde.2020.10.001>

Solove, D. J. (2022), Understanding Privacy and Data Protection in the Era of AI and Voice Search, Cambridge University Press. <https://doi.org/10.1017/CBO9780511760677>

Statista (2023), Percentage of Global Online Searches Conducted via Voice Search from 2018 to 2023, Retrieved from <https://www.statista.com/statistics/812405/global-voice-search-use/>

Schneider, L.; and Larrañaga, P. (2020), The Role of Voice Search in Consumer Decision-Making, *Journal of Consumer Research*, 15(3), 120-135, <https://doi.org/10.1086/706674>

Nguyen, T.; Kim, D.; and Lee, H. (2021), AI and Voice Search in E-commerce : The Future of Online Shopping, *E-commerce Studies*, 8(2), 66-82. <https://doi.org/10.1002/ecst.v8.2>

Mehta, P.; and Thomas, J. (2022), The Impact of Voice Search on SEO Strategies : A Comprehensive Review, *SEO Journal*, 10(1), 55-70. <https://doi.org/10.1234/seo.v10i1>

Smith, A.; and Jones, R. (2023), Ethical Marketing in the Age of AI and Voice Search, *Digital Marketing Ethics Review*, 19(4), 78-94, <https://doi.org/10.1093/dmer/19.4.78>