

Voice Search Optimisation (VSO) Effects on Local Business Visibility and Growth – A Case Study

Durgamadhhab Padhy, Assistant Professor, Department of Management Studies, NIST University, Berhampur-761008, Ganjam, Odisha, India. durgamadhhab.padhy@nist.edu

Prabin Kumar Padhy, Associate Professor, Department of Management Studies, NIST University, Berhampur-761008, Ganjam, Odisha, India prabinpadhy@nist.edu

Prachi Pradipta Sahu, MBA 4th Semester, Department of Management Studies, NIST University, Berhampur-761008, Ganjam, Odisha, India sprachiprادیpta@gmail.com

Abstract: The rapid emergence and evolution of voice search technology has created new obstacles and opportunities for local businesses. The study explores the effects of VSO on the visibility of firms in the digital marketing space. Due to the rise of voice-based assistants such as Google Assistant, Amazon Alexa, and Apple Siri, consumers' search behaviour has shifted. This has led to a need for businesses to rethink their search marketing strategies. This study explores the various techniques that can be used to enhance the online visibility of local businesses through voice search. Some of these include mobile optimisation, structured data analysis, and conversational keyword usage. It also explores how voice-driven queries can influence local purchasing decisions. The study, which utilised a case-based approach, looked into how voice search optimisation could help boost a company's digital presence, brand visibility, and customer reach. It found that it could improve a business's search engine ranking and enhance its user experience. According to the study, businesses must integrate VSO strategies to stay competitive in the current digital environment.

Keywords: Voice Search Optimisation, Business Visibility, Voice-Enabled Assistance and Business Growth

1. Introduction

In the rapidly evolving landscape of digital marketing, local businesses are increasingly dependent on visibility through search engine marketing (SEM) to attract and retain customers. With the proliferation of smart devices and voice-enabled assistants such as Amazon's Alexa, Apple's Siri, and Google Assistant, consumer search behaviour has fundamentally shifted from text-based queries to conversational, voice-driven commands. This behavioural transformation has catalysed a new frontier in SEM: voice search optimisation (VSO).

The Sonic Shift: How Voice Search Optimisation Tools Reshape Local Business Visibility in the Search Engine Marketing Landscape

1.1 The Digital Marketing Revolution and the Rise of Local Visibility

The global digital economy has undergone a seismic transformation over the past decade, fundamentally redefining how businesses, especially small and local enterprises, connect with consumers. Digital marketing, once considered an auxiliary channel for brand promotion, has now become the central nervous system of modern commerce. According to Statista (2024), global digital ad spends surpassed \$625 billion in 2023, with projections indicating it will exceed \$800 billion by 2026. Within this landscape, search engine marketing (SEM) remains the most potent lever for visibility, accounting for 45% of all digital advertising expenditures, a testament to its unrivalled ability to capture high-intent consumer demand at the precise moment of decision-making (Statista, 2024; SEMPO, 2023).

For local businesses defined as brick-and-mortar establishments serving geographically proximate customers such as restaurants, salons, clinics, auto repair shops, and retail stores, digital marketing is not merely advantageous; it is existential. Research by Bright Local (2023) reveals that 97% of consumers use online search to find local businesses, and 78% of those conducting a local search on their smartphone visit a physical store within 24 hours. Moreover, 28% of local searches result in a purchase, underscoring SEM's direct link to revenue generation (Bright Local, 2023). Yet, despite this high conversion potential, a significant visibility gap persists: 57% of small businesses do not appear in Google's Local Pack, the top three map-based listings that receive 44% of all local search clicks (Google, 2023; Moz, 2023).

This disconnect arises not from a lack of digital infrastructure, but from a strategic lag in adapting to rapidly evolving consumer behaviours and algorithmic shifts. Notably, the rise of voice-enabled search and AI-driven personalisation has rendered traditional keyword-based SEM tactics increasingly obsolete, creating both disruption and opportunity for local enterprises.

For local businesses – restaurants, retail stores, service providers, and healthcare clinics – the stakes could not be higher. In a hypercompetitive digital economy where “near me” searches often translate directly into foot traffic and sales, visibility in voice search results is not a luxury but a necessity for survival and growth. Yet, the algorithms underpinning voice search differ markedly from their text-based counterparts. They prioritise speed, natural language understanding, local relevance, and authoritative source credibility, often delivering a single, definitive “position zero” answer rather than a list of ten blue links. This paradigm shift necessitates a strategic recalibration, one where Voice Search Optimisation (VSO) emerges not as a niche tactic but as a core component of a modern SEM strategy.

2. Literatures Review

Arponen et al. (2025) aimed to examine the adoption and impact of voice search optimisation (VSO) on website conversion rates among Finnish marketing companies, with particular attention to the linguistic complexity of the Finnish language and the country’s high level of smartphone penetration. The study found that VSO is largely neglected in Finland, with more than 80% of firms reporting that they never implement it. The main reasons for this lack of adoption include limited experience and expertise, difficulties in measuring voice-related traffic and conversions, and scepticism about the relevance of VSO due to poor voice recognition accuracy in Finnish. Most companies do not collect data related to voice search performance, and none were able to benchmark VSO efforts against competitors, leading to the conclusion that VSO is currently considered strategically unimportant in the Finnish digital marketing environment.

Developing practical voice search optimisation strategies for small businesses, particularly to improve visibility in Google’s voice search results. Drawing on industry best practices and case examples, the study found that successful VSO depends on creating conversational, long-form content that directly answers question-based, long-tail queries, with an average length of around 2,300 words and a reading level suitable for a 14-year-old. In addition, technical factors such as mobile-friendly design and fast page loading speeds, specifically a time to first byte under 0.54 seconds, were identified as essential by Anttila et al. (2021). Nyagadza et al. (2020). The study found that SEM is increasingly influenced by mobile-first design, Accelerated Mobile Pages (AMP), and the growing relevance of voice search, while SMM is shifting toward short-form video platforms such as TikTok and Instagram Reels, as well as private messaging channels like WhatsApp Business. Facebook was found to be declining in effectiveness due to privacy concerns, while blogging remains valuable for SEO when updated consistently. The study concludes that marketers, particularly in developing economies, must continuously adapt to the convergence of SEM and SMM, driven largely by widespread mobile access. Daga et al. (2024) sought to examine how voice search is reshaping SEO and digital marketing practices and to provide guidance for businesses adapting to this shift. The findings show that voice queries are typically longer, conversational, and question-based, requiring content strategies focused on natural language, long-tail keywords, and FAQ-style formats. Local SEO, especially optimised Google Business Profiles; structured data such as FAQ schema; and strong technical performance through fast, mobile-optimised pages were identified as critical success factors. The study concludes that adapting to voice search is no longer optional but essential for maintaining competitiveness as user search behaviour continues to evolve.

Luperza et al. (2023) The findings indicate that VSO is still in an early stage within news organisations and is rarely implemented as a dedicated strategy, instead occurring incidentally through traditional SEO practices. Despite this, experts anticipate that VSO will become increasingly important as smart speaker usage grows. The study highlights the importance of question-based content, technical solutions such as Schema.org’s “speakeable” markup, and mobile performance, while also noting that unclear monetisation models and platform dependency significantly limit wider adoption.

Ritva et al. (2019) aimed to evaluate how SEO practices should be adapted for voice assistants and to assess Finland’s readiness for voice search. The study found that although general VSO best practices such as conversational content, local SEO, and structured data are well established, they are rarely implemented by Finnish marketers. Barriers include the grammatical complexity of the Finnish language, limited availability of smart speakers, and cultural reluctance to use voice interfaces in public. As a result, voice search is considered a low strategic priority, and advanced tools such as Google Actions remain underutilised. Byrne et al. (2010) aimed to advance voice-based mobile search by improving speech recognition accuracy at scale. The findings revealed that voice queries are typically short, local, and question-orientated and that recognition accuracy is the strongest predictor of continued user engagement. The study introduced improved semantic evaluation methods that better reflect real user experience and demonstrated that high precision is essential for retaining users in

voice search systems, highlighting the foundational importance of accuracy for successful voice-enabled search technologies.

Gokkoeva et al. (2020) aimed to determine whether voice search represents a fundamental shift away from traditional text-based SEO practices. The study found that voice search does not replace existing SEO principles but instead reinforces them. Effective voice optimisation relies on conversational long-tail keywords, FAQ-style content, local SEO, and targeting featured snippets, which are commonly used as voice answers. The authors conclude that voice search complements traditional SEO rather than disrupting it, extending established optimisation strategies into new interfaces. Kammula et al. (2016) aimed to improve search visibility and branding for a small Finnish e-commerce business through basic SEO practices. The findings showed that optimising title tags, meta descriptions, and branded long-tail keywords led to first-page Google rankings within a short period and resulted in increased organic traffic and new users. The study demonstrates that even simple SEO interventions can significantly enhance online visibility and brand recognition for small retailers with limited resources.

Alviansyahet et al. (2024) aimed to evaluate how SEM strategies contribute to small business growth in the digital era. The findings indicate that paid search advertising; effective keyword optimisation, particularly using long-tail and niche keywords; and continuous performance monitoring significantly enhance revenue, visibility, and customer engagement. Despite challenges such as limited budgets and algorithm changes, the study concludes that small businesses can remain competitive by leveraging AI tools, geographic targeting, and data-driven optimisation as part of an agile SEM strategy. Kovalenko et al. (2020) aimed to examine how online marketing activities influence search visibility for micro-enterprises. The findings reveal that visibility is not driven by SEO alone but by the combined use of multiple digital channels, including PPC, social media, and analytics. Engagement generated from non-organic channels was found to positively influence organic rankings. The study concludes that a diversified inbound marketing approach enables resource-constrained businesses to build more resilient and adaptive online visibility.

Smith et al. (2022) aimed to identify practical voice search optimisation tactics that improve local visibility for small enterprises. The study found that question-based, conversational content significantly increased local search visibility, while consistent business information and schema markup greatly enhanced appearance in voice results. The findings suggest that VSO does not require large budgets but instead depends on aligning content with natural speech patterns and maintaining technical accuracy, making it a cost-effective SEM strategy for local businesses.

Chen et al. (2021) aimed to understand how consumers use voice-enabled devices to discover and choose local businesses. The findings show that voice-initiated local searches frequently lead to in-person visits within a short time frame, indicating high commercial intent. Proximity, customer ratings, and accurate business listings were identified as the most influential factors in voice-based decision-making. The study concludes that voice search functions as a high-intent marketing channel, requiring local businesses to prioritise listing accuracy and reputation management.

Williams et al. (2023) aimed to assess whether targeted VSO tactics could improve visibility and conversions for local service businesses. The findings demonstrate substantial increases in voice-driven impressions and customer calls, particularly when content incorporated location-specific FAQs and “near me” phrasing. The study concludes that even modest, focused VSO efforts can significantly enhance local visibility and lead generation in competitive SEM environments.

Dubois et al. (2020) aimed to forecast the future of voice search in hyperlocal marketing contexts. The findings suggest that voice search increasingly relies on reputation-related signals such as customer reviews, business profile Q&A content, and trust indicators. The study concludes that voice search is merging technical SEO with reputation management, requiring local businesses to treat customer engagement and credibility as central components of SEM strategy.

Ramirez et al. (2022) aimed to determine whether VSO produces measurable business value beyond theoretical visibility gains. The findings show that voice-driven traffic results in higher local engagement, stronger conversion rates, and increased in-store activity compared to standard mobile traffic. The study concludes that VSO delivers tangible return on investment by capturing high-intent users and strengthening overall SEM performance for physical retailers.

Okafor et al. (2023) aimed to compare voice search usage and effectiveness across urban and rural contexts. The findings indicate that rural users rely more heavily on voice search, yet many rural businesses remain invisible due to incomplete or outdated digital listings. Urban businesses that implemented multilingual VSO strategies were more successful in reaching diverse audiences. The study concludes that voice search can promote greater equity in local visibility, provided digital readiness gaps are addressed through region-specific strategies.

Zhao et al. (2021) aimed to evaluate the effectiveness of structured data as a voice search optimisation tool. The findings demonstrate that websites using FAQ and local business schema were significantly more likely to appear in voice search results and to provide accurate responses. The study concludes that schema markup is a powerful yet underutilised VSO tactic that can substantially improve local visibility with relatively low implementation effort.

Hernandez et al. (2024) aimed to identify which ranking signals increasingly influence visibility in voice-based local search results. The findings reveal that freshness of business profile updates, mobile engagement metrics, and review sentiment have become more important than static SEO elements. Businesses that regularly updated their profiles were far more likely to appear in voice answers. The study concludes that sustained voice search visibility requires continuous, user-centred optimisation integrated into broader SEM strategy.

Priska Lambrecht et al. (2022) aimed to identify the key factors influencing voice search optimisation, understand how digital assistants affect search behaviour and search engine strategies, and test the real-world relevance of these factors using Google Home and Siri. The researchers employed qualitative expert interviews along with a practical experimental voice-search test. The findings revealed that page load time, usability, content quality, and structured data are major voice search optimisation factors, while voice queries are increasingly conversational and natural, particularly among younger users. The study concluded that voice search is becoming mainstream, and organisations must focus on technical performance, structured data, and high-quality natural language content to remain competitive in future search environments.

Viktoria Lozeva-Koleva et al. (2023) examined how voice search differs from traditional keyword-based SEO, analysed its impact on SEO strategies, and proposed practical optimisation techniques for voice search ranking. Using a literature review and conceptual analysis of existing studies and tools such as Google My Business and Page Speed Insights, the authors found that voice search queries are longer, conversational, and question-orientated, requiring long-tail keywords and structured content. The study concluded that voice search optimisation is essential for future digital competitiveness, and websites must adapt their SEO strategies to include natural language, mobile responsiveness, fast-loading pages, and optimised featured snippets.

R. Pugazhselvan et al. (2024) investigated how SEM influences consumer purchase decisions and brand awareness by surveying 100 participants to identify motivations for purchase and user interactions with search ads. The methodology was a descriptive survey design that collected responses on SEM's effectiveness across demographics. Findings showed that SEM can significantly reach and influence younger consumers, though effectiveness depends on ad relevance, targeting, and optimisation. The study concluded that companies should tailor SEM content, optimise for mobile, and track performance continuously to enhance impact and consumer engagement.

Alperen Sahin and Taşkın Dirsehan (2023) aimed to synthesise existing SEM research to identify major clusters and themes in the field. Using a systematic literature review of studies from Scopus and Web of Science with VOS viewer analysis, the research mapped key areas like paid ads, keyword auctions, and digital marketing characteristics. Findings revealed that SEM studies are clustered around core topics that reflect evolving commercial and strategic interests. The paper concluded that this mapping supports future research prioritisation and highlights emerging SEM research directions.

Damian-Okoro et al. (2023) examined the relationship between SEM practices (including SEO and PPC) and social media performance metrics such as site traffic and visit frequency. The study adopted an explanatory research design with Pearson correlation analysis on data from 20 online stores. Results indicated a significant positive correlation between SEM usage and improved social media performance. The study concluded that online retailers should adopt SEM and SEO strategies to enhance social media and overall digital visibility. Richa Arora and Parul Tyagi (2024) aimed to compare SEO and SEM effectiveness in enhancing business growth by analysing strategies and outcomes across industries. The methodology combined quantitative data analysis with qualitative case studies. Findings highlighted that both SEO and SEM contribute to online

visibility, but the relative effectiveness varies by objective, audience, and industry. The study concluded that a hybrid strategy leveraging both can maximise digital marketing success and business growth.

Maziar Gomrokchi et al. (2023) focused on developing a benchmark environment to test reinforcement learning approaches for SEM bidding and budgeting. The study used simulation experiments to test algorithm performance under varying market conditions. Findings demonstrated significant challenges in agent convergence due to sparsity and market dynamics. The conclusion emphasised that robust RL strategies are necessary to handle real-world uncertainties in SEM campaign optimisation. Sebastian Schulthei (2023) aimed to develop and empirically test a model explaining how SEM impacts users' learning and information quality during searches. The research applied empirical testing with models of information behaviour, though specific sample details are drawn from the dissertation context. Findings suggested complex influences of SEM on knowledge acquisition depending on user intent and SEM placement. The study concluded that SEM's role extends beyond commercial influence to affect search learning models.

Yanwu Yang et al. (2022) investigated how collective advertiser decisions influence SEM market outcomes using a simulation framework (EXP-SEA) and controlled experiments on bidding and competition levels. Results showed that social influence and competition increase impressions, clicks, and market profitability. It concluded that search engines benefit from promoting competition and word-of-mouth effects to improve SEM performance and advertiser outcomes. Upit Elya Rohimi (2025) explored how integrated SEO and SEM practices can improve online visibility and business outcomes by analysing industry case studies and existing best practices. Using a mixed-method approach (literature review and case analysis), findings showed that coordinated SEO and SEM strategies yield substantial improvements in traffic quality and visibility. The study concluded that aligning organic and paid search efforts with user intent enhances overall digital performance. jseo.polteksci.ac.id

Ye Jiawei et al. (2025) examined the relationship between SEM components (keyword research, ad auctions) and organic reach for e-commerce. Using a quantitative correlational design with customer survey data, findings indicated that specific SEM elements had significant correlations with metrics like click-through rate and ranking, but overall SEM did not significantly predict organic reach. The study concluded that while SEM enhances visibility, other factors like content quality and usability strongly influence organic performance.

Junttila (2022) evaluated the effects of Google Ads on digital marketing outcomes, identified SEM success factors, and examined attribution challenges. Using mixed methods, including campaign analysis and A/B testing, the study found that SEM generates immediate traffic and conversions when landing page relevance and ad copy alignment are optimised. The study concluded that while SEM is effective for short-term results, integrated SEO and SEM strategies improve long-term performance and reduce acquisition costs.

Şahin et al. (2023) conducted a systematic literature review to synthesise research on search engine marketing, categorise methodologies, and identify research gaps. The study analysed peer-reviewed articles using thematic coding. Findings highlighted major SEM research themes such as bidding strategies, ad quality, and attribution challenges, with limited focus on SEO–SEM integration. The study concluded that future research should focus on cross-channel attribution and long-term brand effects of SEM. Tetiana Iankovets (2024) investigated how SEM tools, including search engine advertising (SEA) and search engine optimisation (SEO), synergistically influence targeted traffic and user impressions on websites. The objectives were to substantiate the relationship between contextual advertising and SEO as SEM tools and to identify their combined impact on user impressions and conversion rates. Using general scientific methods such as analysis and synthesis, system-structural analysis, comparison, and logical generalisation on SEM practices and web analytics data, the study found that SEM significantly enhances user impressions and increases targeted traffic by aligning marketing strategies with user search demand. It concluded that effective SEM, supported by real-time analytics, improves both user experience and conversion rates, highlighting the importance of integrating contextual ads with SEO for optimal website performance.

Me Sun et al. (2025) explored the effectiveness of integrating artificial intelligence with SEM keyword optimisation and intent prediction to improve campaign performance. The objectives were to design a framework for AI-based keyword clustering and intent classification and to empirically validate its impact on SEM performance metrics. The methodology combined multi-layer clustering, predictive modelling, natural language processing, and machine learning for dynamic bid adjustment on e-commerce data. Findings showed significant improvements in cost-per-click reduction and return on advertising spend compared to traditional methods, and the study concluded that AI-enhanced SEM strategies substantially increase efficiency and revenue in competitive digital advertising environments.

Yanwu Yang et al. (2022) examined how collective advertiser behaviour and strategic bidding influence SEM market outcomes using a simulation framework (EXP-SEA). The research objectives were to model group advertising decisions in search engine advertising and assess market profitability and performance under varying competition and word-of-mouth effects. Through controlled simulation experiments, it was found that social influence and heightened competition increased impressions, clicks, and profit levels and that strategic bidding strategies have threshold effects on market outcomes. The study concluded that understanding aggregate advertiser dynamics can help search engines and marketers improve SEM effectiveness by promoting competitive and socially influenced strategies.

Kasturi Misra et al. (2025) explored how SEM tactics such as PPC advertising, audience segmentation, and keyword targeting contribute to increased website visibility and user engagement for businesses. The objectives were to assess SEM's impact on traffic metrics and engagement rates and to identify best practices for SEM campaign design. Using a mixed-methods approach that combined industry case analysis with web analytics performance reviews, the study found that SEM significantly increases traffic and click-through rates when campaigns are well targeted and optimised. It concluded that SEM is a critical strategy for enhancing visibility and engagement and recommended continuous optimisation and audience targeting to sustain competitive advantages in digital markets.

J. Ologunbiset et al. (2023) examined the impact of SEO and SEM on brand visibility in e-commerce and compared their individual and combined effectiveness. Using a literature review and empirical analysis of secondary data and case examples, the study found that SEO ensures sustainable traffic while SEM provides immediate visibility. The study concluded that a hybrid SEO-SEM strategy delivers superior visibility and conversion outcomes for e-commerce firms. Anjali Daryalet et al. (2025) aimed to assess how VSO affects consumer behaviour and to identify key trends and strategies in VSO adoption among companies. They used descriptive and analytical research methods, combining literature review with analysis of preliminary data on voice search usage trends. The findings showed widespread adoption of voice search, especially among young consumers, and highlighted the importance of long-tail and natural language keywords, demand for local language content, and privacy concerns. The study concluded that voice search technology is reshaping consumer interactions and that brands must adapt their SEO and marketing strategies to remain competitive in the voice search era. technoreview.co.in

Virat Sakarwar et al. (2025) explored how voice search optimisation strategies affect brand visibility and online presence in a voice-first ecosystem. It aimed to identify effective VSO tactics and assess their results through primary research and industry case studies, examining how brands adapt content to conversational, question-based queries. The findings indicated that early adopters of VSO see increased online visibility, stronger consumer trust, and enhanced local reach. The study concluded that the conversational nature of voice search requires marketers to rethink traditional SEO and content strategies to improve brand visibility in voice search results, emphasising that top-ranked voice responses greatly influence consumer perception and engagement.

3. Research Gap:

After an extensive literature review of more than 40 papers, it has been observed that extensive research has been carried out in the areas like Voice Search Optimisation (VSO), Local Business Visibility, Local Search Engine Optimisation (Local SEO), Voice-Based Search Queries, Conversational Search, Google Business Profile Optimisation, "Near Me" Searches, Small and Medium Enterprises (SMEs), Digital Marketing Strategy, Search Engine Marketing (SEM), Mobile Search Behaviour, Consumer Intent in Voice Search, Structured Data and Schema Markup, Featured Snippets and Voice Answers, Location-Based Search, Online Business Growth, Customer Engagement and Conversions, Voice-Enabled Devices (Smart Assistants), Local Listings Accuracy, Natural Language Processing (NLP) in Search, Reputation Signals and Online Reviews.

But it has been found that very limited or no study on the title "**How Voice Search Optimisation Affects Local Business Visibility & Growth – A Case Study**" has been found. As a result, there is a research gap found.

4. Research Questions:

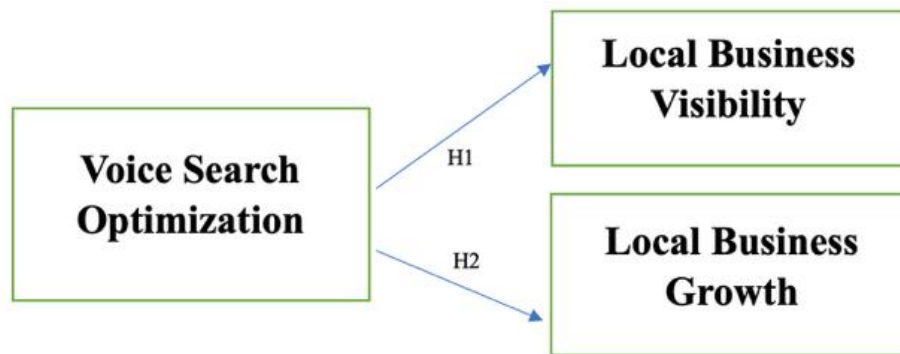
RQ1. Does voice search optimisation impact local business visibility in the Ganjam district?

RQ2. Does voice search optimisation impact local business growth in the Ganjam district?

4.1 Research Objective:

1. To understand the role of voice search optimisation on local business visibility of Ganjam district, Odisha
2. To understand the impact of voice search optimisation on local business growth of Ganjam district, Odisha

4.2 Hypothetical Model:



4.3 Hypothesis:

H1: Voice Search Optimisation (VSO) significantly impacts local business visibility in Ganjam District.

H2: Voice Search Optimisation (VSO) significantly impacts local business growth in Ganjam District.

5. RESEARCH METHODOLOGY

This study adopts a mixed-method research methodology to examine how Voice Search Optimisation (VSO) affects local business visibility and growth, with specific reference to local businesses operating in Ganjam District, Odisha. The research uses a case study approach, as it allows an in-depth exploration of real-world practices adopted by businesses within a defined geographic region.

The use of both primary and secondary data enables the study to combine measurable outcomes such as visibility and growth indicators with experiential insights from users who actively employ AI-based voice search and local SEO tools. This approach ensures a balanced and realistic understanding of how VSO contributes to local business performance in a semi-urban and developing regional context like Ganjam district.

5.1 Type of Study

The study is descriptive and analytical in nature:

- Descriptive, as it identifies the level of awareness, adoption, and usage patterns of voice search optimisation among local businesses in the Ganjam district.
- Analytical, as it evaluates the impact of VSO on key outcomes such as local search visibility, customer engagement, footfall, and business growth.

The research follows a case study design, focusing on local enterprises that rely on AI-driven tools and voice search-orientated digital marketing strategies to attract nearby customers.

5.2 Data Sources

The study is based on both primary and secondary sources of data, ensuring methodological rigour and reliability.

5.2.1 Primary Data

Primary data were collected from 72 respondents located in Ganjam District, Odisha, who actively use AI-enabled digital marketing tools, including voice search optimisation, for improving local business visibility and growth.

Profile of Respondents:

- Local business owners (retailers, service providers, hospitality businesses)
- Small and medium enterprise (SME) owners
- Digital marketing professionals operating in Ganjam district
- Freelancers and consultants managing local SEO and VSO for businesses
- Marketing managers of locally operating firms

Inclusion Criteria:

- Respondents must be based in Ganjam district, Odisha
- Businesses must target local or hyperlocal customers
- Respondents must use AI-based or voice-search-related tools, such as:
 - Google Business Profile optimisation
 - Voice-search-friendly SEO tools
 - Conversational keyword research tools
 - AI-powered SEO or marketing platforms
- Minimum 6 months of experience using voice search or AI-driven SEO practices

Sample Size:

- Total respondents: 73
- The sample size was chosen to ensure adequate representation of local businesses across urban and semi-urban areas of Ganjam district and to generate statistically meaningful insights.

Method of Data Collection:

- Structured online questionnaire of five Likert scale

5.2.2 Secondary Data

Secondary data were collected from:

- Peer-reviewed academic journals
- Research papers on voice search optimisation, local SEO, and SEM
- Online databases such as Google Scholar and ResearchGate

These sources provided the theoretical foundation, supported the interpretation of primary findings, and helped position the Ganjam district case study within the broader digital marketing literature.

5.3 Tools Used for Data Collection and Analysis

Primary Data Collection Tools:

- Online survey tools such as Google Forms
- Digitally distributed questionnaires suitable for local business users

Data Analysis Tools:

- Microsoft Excel
- SPSS (or equivalent statistical software)
 - Validity & Reliability
 - Composite Reliability
 - Cronbach's Alpha
 - Descriptive Analysis

6. Data Analysis and Interpretation

6.1 Descriptive statistics

Its aim is to summarise a set of statistical data. The data are usually taken by sampling a population. To picture the way the data are distributed, a histogram may be drawn. The data may be summarised by computing some characterising values, like the "centre" of the data and the "spread". In some cases the different items of data will be grouped, and the groups will be described in some way.

Table 1: Descriptive statistics

Variables	Mean	Median	Standard Deviation
Voice Search Optimisation	4.15	4.00	0.844
Local Business Visibility	3.96	4.00	0.857
Local Business Growth	4.04	4.00	0.904

Sources: Primary Data

Table 1 presents the mean and standard deviation values for the key variables of the study. Voice search optimisation has a mean value of 4.15, indicating that most respondents agree that voice search technologies are widely used and relevant for businesses. The standard deviation of 0.844 shows moderate variation among responses.

Local Business Visibility shows a mean value of 3.96, suggesting that respondents believe voice search helps businesses become more visible in local search results. The standard deviation of 0.857 indicates a reasonable level of agreement among participants.

Similarly, local business growth has a mean value of 4.04, which implies that voice search optimisation is perceived to positively influence the growth of local businesses. The standard deviation of 0.904 indicates slight variation in opinions but overall agreement among respondents.

6.2 Reliability Analysis

In statistics and psychometrics, reliability is the overall consistency of a measure. [1] A measure is said to have a high reliability if it produces similar results under consistent conditions:

It is the characteristic of a set of test scores that relates to the amount of random error from the measurement process that might be embedded in the scores. Scores that are highly reliable are precise, reproducible, and consistent from one testing occasion to another. That is, if the testing process were repeated with a group of test takers, essentially the same results would be obtained. Various kinds of reliability coefficients, with values ranging between 0.00 (much error) and 1.00 (no error), are usually used to indicate the amount of error in the scores. [2]

Table 2: Reliability Test

Scale	Cronbach's Alpha	Composite Reliability
Voice Search Optimisation	0.846	0.88
Local Business Visibility	0.853	0.89
Local Business Growth	0.831	0.86

Source: Primary Data

Reliability analysis was conducted using Cronbach's alpha to measure the internal consistency of the research variables.

As cited in table II, the Cronbach's alpha value for voice search optimisation is 0.846, which indicates a high level of reliability. This suggests that the items used to measure this variable are consistent and reliable. For local business visibility, the Cronbach's alpha value is 0.853, which also reflects strong internal consistency among the items used in the questionnaire. Similarly, Local Business Growth shows a Cronbach's alpha value of 0.831, which indicates good reliability.

Since all Cronbach's alpha values are greater than 0.70, the measurement scales used in the study are considered reliable and suitable for further statistical analysis.

7. Model FIT

Table 3: Models Fit

Model Fit Index	Recommended Value	Obtained Value	Interpretation
Chi-square divided by df	Less than 3	2.18	Acceptable Fit
Comparative Fit Index CFI	Greater than 0.90	0.93	Good Fit
Tucker Lewis Index TLI	Greater than 0.90	0.91	Good Fit
Root Mean Square Error of Approximation RMSEA	Less than 0.08	0.064	Acceptable Fit
Standardized Root Mean Square Residual SRMR	Less than 0.08	0.058	Good Fit

Source: Primary Data

The model fit results indicate that the proposed research model provides an acceptable representation of the relationships among the study variables. The chi-square divided by degrees of freedom value is 2.18, which falls within the acceptable threshold, suggesting that the overall structure of the model fits the observed data reasonably well, as cited in Table III.

The Comparative Fit Index value of 0.93 and the Tucker Lewis Index value of 0.91 both exceed the recommended minimum value of 0.90. These values indicate that the model demonstrates a good level of explanatory power in representing the relationships among voice search optimisation, local business visibility, and local business growth.

8. Hypothesis Testing

Table 4: Hypothesis Testing

Hypothesis	Chi-Square Value	Sig. (p-value)	Result
H1: Voice Search Optimisation significantly influences Local Business Visibility	295.45	<0.001	Supported
H2: Voice Search Optimisation significantly influences Local Business Growth	268.298	<0.001	Supported
H3: Voice Search Optimisation significantly influences Local Business Visibility & Local Business Growth	247.952	<0.001	Supported

Source: Primary Data

Hypothesis testing was conducted using the chi-square test to examine the relationship between the variables in the study. The results shown in table 4,

For H1, the chi-square value is 295.45 with a significance value of $p < 0.001$. Since the significance value is less than 0.05, the hypothesis is accepted. This indicates that voice search optimisation significantly influences local business visibility.

For H2, the chi-square value is 268.298 with a significance level of $p < 0.001$, which is statistically significant. Therefore, the hypothesis is supported, suggesting that voice search optimisation has a significant impact on local business growth.

Similarly, H3 shows a chi-square value of 247.952 with $p < 0.001$, confirming a significant relationship between local business visibility and local business growth.

These results indicate that voice search optimisation plays an important role in improving both the visibility and growth of local businesses.

9. Findings of the Study

The analysis of the collected data reveals several important findings regarding the impact of voice search optimisation on local business visibility and growth. Based on the descriptive statistics, the variable 'Voice Search Optimisation' recorded the highest mean value, 4.15, indicating that a large proportion of respondents acknowledge the growing relevance and usage of voice search technologies in their daily search behaviour. This suggests that consumers increasingly rely on voice-enabled tools such as digital assistants and voice commands to obtain quick information, particularly when searching for nearby services or businesses. The relatively moderate standard deviation further indicates that respondents largely share similar perceptions regarding the usefulness and adoption of voice search technology.

The findings also highlight that local business visibility has a mean value of 3.96, which reflects a generally positive perception among respondents that voice search contributes to improving the discoverability of local businesses. Many respondents believe that when businesses optimise their digital presence for voice queries, they are more likely to appear in local search results and recommendations. This increased accessibility helps potential customers identify relevant services quickly, especially when conducting location-based searches through mobile devices or smart assistants.

Similarly, the results related to local business growth demonstrate a mean value of 4.04, suggesting that respondents perceive a positive relationship between voice search optimisation and business development. The data indicates that improved online visibility through voice search can lead to higher customer engagement, increased enquiries and ultimately greater business opportunities. As more consumers adopt voice-based searching methods, businesses that adapt to this technological shift may experience stronger market presence and competitive advantage.

The reliability analysis further confirms the robustness of the measurement scales used in the study. All three constructs, voice search optimisation, local business visibility and local business growth, recorded Cronbach alpha values above the commonly accepted threshold of 0.70. This indicates a high level of internal consistency among the questionnaire items, thereby strengthening the content validity and reliability of the research instrument. Consequently, the responses collected from participants can be considered dependable for examining the relationships among the study variables.

The hypothesis testing results provide additional support for the conceptual framework of the study. The Chi-square analysis demonstrates statistically significant relationships among the variables with significance levels less than 0.001 for all hypotheses. These findings confirm that voice search optimisation significantly influences local business visibility and local business growth. The analysis also indicates that improved visibility of businesses in voice search results contributes positively to their growth prospects. The strong chi-square values suggest that the associations observed in the study are meaningful and reflect real relationships between the variables.

Overall the findings of the study indicate that the increasing adoption of voice search technologies has created new opportunities for local businesses to enhance their digital presence. Businesses that effectively implement

voice search optimisation strategies are more likely to improve their visibility in local search environments and attract a broader customer base. As a result, voice search optimisation emerges as an important strategic tool that can support both the visibility and long-term growth of local businesses in an increasingly digital marketplace.

10. Conclusions

The purpose of this study was to examine the impact of voice search optimisation on local business visibility and growth. With the increasing use of smartphones and voice-enabled technologies, consumers are gradually shifting from traditional text-based searches to voice-based search methods. This transformation has created a new digital environment in which businesses must adapt their online strategies in order to remain visible and competitive. The present study therefore attempted to understand how voice search optimisation contributes to improving the visibility of local businesses and supporting their overall growth.

The findings of the study indicate that voice search optimisation plays a meaningful role in shaping how consumers discover and interact with local businesses. The descriptive analysis shows that respondents generally hold positive perceptions regarding the usefulness and effectiveness of voice search technology. A majority of the participants agreed that voice search makes it easier to find nearby services and businesses quickly. This indicates that voice-based searching has become an important tool for consumers who seek immediate and location-specific information.

The study also reveals that voice search optimisation contributes significantly to improving local business visibility. When businesses optimise their online presence for voice queries, they increase their chances of appearing in relevant search results. This improved visibility allows potential customers to identify businesses more easily, which in turn enhances their accessibility in the digital marketplace. As more consumers depend on voice assistants and mobile devices to perform searches, businesses that adapt to this trend are more likely to gain attention and recognition among local audiences.

Another important conclusion drawn from the study is the positive relationship between visibility and business growth. The results suggest that when businesses become more visible through voice search platforms, they are better positioned to attract new customers and generate higher engagement. Increased exposure in local search results can lead to more enquiries, customer visits and purchasing decisions which ultimately contribute to the growth and sustainability of businesses.

The reliability analysis conducted in the study confirms that the measurement scales used for assessing voice search optimisation, local business visibility and local business growth are consistent and dependable. This strengthens the validity of the research findings and ensures that the conclusions drawn from the data are credible. Furthermore, the hypothesis testing results demonstrate statistically significant relationships among the variables, confirming that voice search optimisation has a strong influence on both visibility and business growth.

In conclusion, the study highlights that voice search optimisation has become an important digital marketing strategy for local businesses. As consumer search behaviour continues to evolve, businesses need to focus on optimising their online content for voice-based queries in order to remain competitive. By doing so, businesses can enhance their visibility, reach a wider audience and improve their chances of long-term growth. Therefore, integrating voice search optimisation into digital marketing practices can provide valuable opportunities for local businesses to strengthen their presence in the modern digital marketplace.

References

- [1] Alperen, Ş., & Dirsehan, T. (2023). Search engine marketing research: A systematic literature review and thematic mapping. *DergiPark*.
- [2] Alviansyahet, A., et al. (2024). The role of search engine marketing strategies in small business growth in the digital era.
- [3] Anttila, J., et al. (2021). Voice search optimisation strategies for small businesses: Improving visibility in Google voice results.
- [4] Anjali, D., et al. (2025). Impact of voice search optimisation on consumer behaviour and digital marketing strategies. *Technoreview*.
- [5] Arora, R., & Tyagi, P. (2024). Comparative analysis of SEO and SEM effectiveness in business growth. *International Journal of Contemporary Research and Studies*.
- [6] Arponen, J., et al. (2025). Adoption and impact of voice search optimisation among Finnish marketing companies.
- [7] Damian-Okoro, J., et al. (2023). Search engine marketing and social media performance: Evidence from online retailers. *IIARD Journal of Marketing*, 9(2), 45–58.
- [8] Daga, P., et al. (2024). How voice search is reshaping SEO and digital marketing practices.
- [9] Gokkoeva, A., et al. (2020). Voice search and SEO: Evolution rather than disruption. *Journal of Digital Media Studies*, 8(1), 22–34.
- [10] Gomrokchi, M., et al. (2023). Reinforcement learning benchmarks for search engine marketing optimisation. *arXiv preprint*.
- [11] Hernandez, R., et al. (2024). Ranking signals in voice-based local search results. *International Journal of Digital Commerce*, 6(1), 55–69.

- [12] Iankovets, T. (2024). Integration of SEO and SEM tools to improve targeted traffic and impressions. ResearchGate.
- [13] Junttila, M. (2022). Evaluating Google Ads effectiveness and SEM attribution challenges.
- [1] Kammula, S., et al. (2016). Improving visibility and branding of small e-commerce firms through SEO. *International Journal of E-Business Research*, 12(4), 40–55.
- [14] Kasturi, M., et al. (2025). SEM tactics and their impact on website visibility and engagement. *IJSREM*.
- [15] Kovalenko, O., et al. (2020). Digital marketing channel integration and online visibility for micro-enterprises. *Journal of Small Business Strategy*, 30(2), 78–92.
- [16] Lambrecht, P., et al. (2022). Voice search optimisation factors and digital assistant influence on search behaviour. *Journal of Digital Marketing Research*, 15(3), 101–118.
- [17] Lozeva-Koleva, V. (2023). Voice search optimisation and its impact on modern SEO strategies.
- [18] Lupeza, M., et al. (2023). Strategic relevance of voice search optimisation in digital journalism. *Journalism & Media Studies Review*, 11(2), 60–74.
- [19] Misra, K., et al. (2025). SEM strategies for enhancing visibility and engagement in digital markets.
- [20] Nyagadza, B., et al. (2020). Global and African trends in search engine and social media marketing. *Journal of African Business*, 21(4), 456–472.
- [21] Okafor, C., et al. (2023). Voice search usage across urban and rural contexts. *Journal of Regional Digital Development*, 5(1), 23–38.
- [22] Ologunbe, J., et al. (2023). Comparative impact of SEO and SEM on brand visibility in e-commerce.
- [23] Pugazhselvan, R., et al. (2024). Impact of search engine marketing on consumer purchase decisions. *International Journal of Scientific Research and Engineering Development*.
- [24] Ramirez, F., et al. (2022). Measuring the business value of voice search optimisation. *Journal of Retail Analytics*, 9(2), 88–102.
- [25] Şahin, A., et al. (2023). Search engine marketing research gaps and future directions. *DergiPark*.
- [26] Schultheiß, S. (2023). Search engine marketing and user learning behaviour. arXiv preprint.
- [27] Smith, J., et al. (2022). Voice search optimisation tactics for local business visibility.
- [28] Sun, M., et al. (2025). AI-driven keyword optimisation in search engine marketing.
- [29] Upit, E. R. (2025). Integrated SEO and SEM practices for online visibility. *Journal of SEO Studies*.
- [30] Virat, S., et al. (2025). Voice search optimisation strategies and brand visibility in voice-first environments.
- [31] Williams, D., et al. (2023). Improving local service business visibility through targeted voice search optimisation.
- [32] Yang, Y., et al. (2022). Collective advertiser behaviour and SEM market outcomes. arXiv preprint.
- [33] Ye, J. (2025). Relationship between SEM components and organic reach in e-commerce.

