Effectiveness of Online Marketing Based Search Engine Advertisements: A Study on Google and Bing in Chennai

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Abstract - **This study analyse the effectiveness of online marketing through search engine advertisements on Google and Bing among consumers in Chennai. With the fast growth of digital marketing, companies are increasingly relying on search engine ads to reach potential customers. Using a combination of quantitative and qualitative methods, the study analyses data from various campaigns run on both platforms, alongside consumer interviews and surveys. The results of this study indicate significant differences in user demographics, ad engagement, and conversion effectiveness between Google and Bing (Xing & Lin, 2006). Google ads determine a broader reach and higher engagement rates, whereas Bing ads show higher conversion rates among the audience. The findings provide valuable information for marketers seeking to optimize the search engine advertising strategies in Chennai also it contributes to the growing knowledge on digital marketing effectiveness and offers recommendations for companies aiming to enhance their online advertising efforts.**

Keywords: **SEA, Online Advertising, Digital Marketing and Effectiveness**

I. INTRODUCTION

The digital revolution has transformed the landscape of marketing, shifting the focus from traditional to online platforms (Sunarto et al., 2023). Among these, SEA has emerged as a critical tool for companies seeking to enhance their reputation and reach target audiences effectively. Search engines like Google and Bing offer robust advertising platforms that enable businesses to display targeted ads to users based on their search queries, demographics, and online behaviour (Jafarzadeh et al., 2015; Bunkangsang Buchag et al., 2022; Obeidat & Yaqbeh, 2023). Google, with its foremost market share, has long been the preferred choice for many promoters. It's widespread reach and sophisticated targeting options provide supreme opportunities for companies to connect with a vast audience. Thus, Bing, though smaller in scale, offers unique advantages, including lower competition for keywords and a different user demographic, which can lead to higher conversion rates for certain areas. Search engine tools offer opportunities to explore artificial intelligence and machine learning, as modern search engines heavily rely on these technologies for personalized search results and improved accuracy. Incorporating search engine development tools into the curriculum not only enriches technical proficiency but also develops critical thinking and problem-solving skills.

II. REVIEW OF LITERATURE

Alkarablieh, (2016), revealed the Search Engine, popular for its advanced algorithms and extensive reach, is a dominant force in the territory of online advertising. Conversely, the Yahoo Bing Network, though less prominent than Google, offers unique advantages. It lower cost-per-click rates and less competition, which can be particularly appealing for small to medium-sized companies with limited budgets.

Chau et al., (2010) ascertained the use of search engine development tools in IT education has transformed how students learn and engage with complex concepts. These tools, like Google's Custom Search JSON API and Bing Search API, allow students to integrate dominant search functionalities into their projects, providing hands-on experience with real-world applications. Through these, the students can learn to build sophisticated search engines, understand the intricacies of ranking algorithms, and develop skills in handling large datasets.

Hassan & Zhang, (2001) examined that a blend of advanced technologies and user-friendly functionalities designed to develop the search experience. Leading image search engines, like Bing Images, Google Images, and Pinterest Visual Search, influence AI and machine learning to provide accurate and relevant results. These platforms offer features like reverse image search, where users can upload an image to find related content, making it easier to track the origin of an image or find high-resolution versions (Iryna et al., 2024).

Jafarzadeh et al., (2015) shows the success of companies in effectively utilizing search engine advertising is influenced by some important factors. Continuous monitoring and analysis of campaign performance enable companies to make important decisions and enhance their strategies over time.

Staying updated with the latest trends and changes in search engine algorithms ensures that companies can adapt and maintain their competitive edge. This will help the companies to improve growth and achieve their marketing objectives.

Lewandowski, (2011), indicates the effectiveness of search engines is rooted in their ability to deliver relevant and accurate information swiftly, catering to the diverse needs of users worldwide. Advanced algorithms and machine learning technologies enable search engines like Google, Bing, and Yahoo to interpret complex queries and provide precise results, enhancing user satisfaction. The integration of voice search and mobile optimization ensures convenience and accessibility for users on various devices. These capabilities make search engines essential tools for conducting research, finding information, and directing the internet effectively.

Martzoukou, (2008) examined that search engines are motivating an increasing appreciation of search strategies, transforming how users interact with and retrieve information online. With advancements in machine learning and artificial intelligence, search engines can now understand natural language queries, identify user intent, and deliver relevant results. This will encouraged users to adopt more complex and nuanced search strategies, moving beyond simple keyword queries to using long-tail keywords, questions, and conversational phrases.

Kaur et al., (2011) analysed that both Google and Bing search engines have made significant steps, yet they exhibit distinct strengths and approaches. Google, with its advanced algorithms and huge indexing capabilities, excels in delivering highly precise search results. It influences AI and machine learning to understand user intent, context, and nuances in queries, providing results that are not only relevant but also contextually accurate. Features like Knowledge Graph and rich snippets further enhance the precision by presenting direct answers and detailed information snippets.

III. Effectiveness of Online Marketing Based Search Engine Advertisements

The effectiveness of online marketing through search engine advertisements is determined by the platform's ability to connect companies with their target audiences and initiative desired actions. Search engine advertisements, such as those on Google and Bing, offer robust tools for reaching potential customers at crucial moments when they are actively seeking information or making purchasing decisions. The effectiveness of these ads is influenced by several factors, targeting precision, including ad relevance, conversion rates and cost per click. Google, with its extensive reach and advanced targeting options, often leads to higher engagement and broader visibility (Kushwaha, 2020). Bing provides a more cost-effective solution with competitive CPC rates and can be particularly effective for reaching niche markets. The key to maximizing effectiveness lies in understanding each platform's unique features and audience dynamics, continuously optimizing ad strategies based on performance

metrics (Gleason et al., 2024). Through data-driven adjustments and strategic planning, companies can enhance the impact of their search engine advertisements and achieve significant returns on their marketing investments.

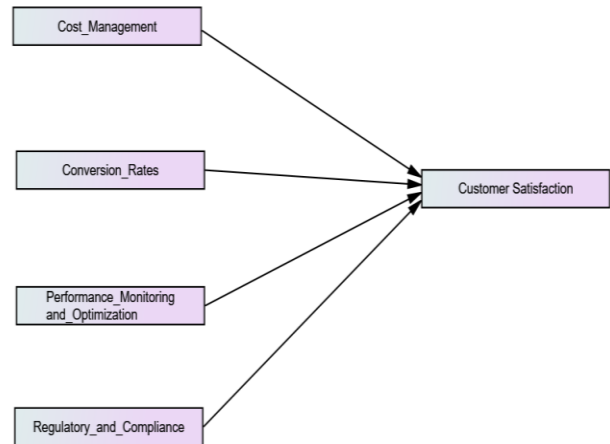### Research Model

Figure 1 displays the research model.

Fig. 1 Research Model

Cost Management

Cost management is a critical aspect of financial planning that involves the process of estimating, planning, budgeting, and controlling expenses to ensure that an organization can operate efficiently and profitably (Alkarablieh, 2016). Effective cost management helps companies allocate resources wisely, reduce unnecessary expenses, and optimize spending to achieve financial goals. This process includes analyzing cost behavior, setting cost objectives, and implementing strategies to control and reduce costs without compromising quality or performance (Chouaki et al., 2023) . Tools such as variance analysis, cost-benefit analysis, and activity-based costing are often employed to gain insights into cost drivers and identify areas for improvement. Cost management involves strategically allocating budgets, and continuously monitoring ad performance to minimize and control expenses while achieving desired outcomes.

Conversion Rates

Utilizing tools such as Google Ads' Keyword Planner and Bing Ads Intelligence can help in estimating costs and potential returns. Setting clear budget limits, using bid strategies such as implementing cost-per-click and automated bidding, and cost-per-acquisition models are essential for managing expenses. Regular analysis of campaign performance, containing metrics like click-through rates, conversion rates, and cost per conversion, allows advertisers to refine their strategies and eliminate underperforming ads. Moreover, leveraging negative keywords, improving landing page quality and optimizing ad copy can enhance ad relevance and reduce wasted spend.

Performance Monitoring and Optimization

Performance monitoring and optimization are important for maximizing the effectiveness of search engine advertising campaigns. Monitoring involves continuously tracking key metrics such as conversion rates, click-through rates, and cost-per-click to assess the performance of ads. By analysing these metrics, advertisers can identify trends, spot issues, and understand user behaviour(Makani, 2008). Optimization involves making data-driven adjustments to improve campaign performance based on the insights gained from monitoring. This may comprise refining ad copy, adjusting keyword bids, reallocating budget to high-performing ads, and testing different variations of landing pages(Chen & Lin, 2011; Chouaki et al., 2023). Techniques such as A/B testing and using analytics tools such as Google Analytics or Bing Ads Insights can help pinpoint what works best. Regularly reviewing and optimizing campaigns ensures that ad spend is used efficiently, increases the likelihood of achieving desired outcomes, and help to maintain a competitive edge in a dynamic advertising landscape (Fang, 2010).

Regulatory and Compliance Factors

Regulatory and compliance factors are crucial considerations in search engine advertising, as they ensure that campaigns adhere to legal standards and industry guidelines. Advertisers must direct various regulations related to data privacy, intellectual property, and advertising standards to avoid legal consequences and maintain consumer trust (Jafarzadeh et al., 2015). Adhering to intellectual property laws involves avoiding the use of copyrighted material without permission and respecting trademark rights. Search engines themselves have their own advertising policies, which include misleading claims, guidelines on prohibited content, and ad placement standards.

Customer Satisfaction

The search engine advertising directly influences brand perception and campaign effectiveness. Achieving high customer satisfaction includes ensuring that the ads are relevant, engaging, and accurately reflect the products or services being promoted (Xing & Lin, 2006). Delivering a positive user experience starts with well-targeted ads that match user intent and lead to high-quality landing pages that meet expectations and facilitate easy conversions. The clear, concise, and honest information in ads helps build trust and reduce bounce rates. Monitoring customer feedback and engagement can offer valuable insights into what resonates with the audience and areas for improvement.

Objectives

- To evaluate the effectiveness of SEA on Google and Bing.
- To measure the targeting options offered by Google and Bing and their impact on reaching the desired audience.

- To determine the cost management of advertising on Google versus Bing by analysing the customer satisfaction.
- To ascertain best practices that lead to successful SEA outcomes on both platforms within the Chennai.

Hypothesis

- H1: There is an association between experience and cost management.
- H2: SEA factors positively associate with outcome variable.

Research Questions

- How do the costs of running SEA on Google compare to those on Bing?
- How do Google and Bing differ in their targeting and personalization capabilities for search engine advertisements?
- What are the differences in ad formats and features offered by Google and Bing for search engine advertisements?

IV. ANALYSIS AND INTERPRETATION

TABLE I DESCRIPTIVE STATISTICS

Descriptive Statistics				
	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Cost Management	125	3.25	.074	.829
Conversion Rates	125	3.20	.081	.906
Performance Monitoring and Optimization	125	3.01	.077	.856
Regulatory and Compliance	125	2.81	.064	.715
Customer Satisfaction	125	2.87	.090	1.008
Valid N (list wise)	125			

Mean

Table I shows the score of mean and std.deviation. Thus, slightly highest mean score of 3.25 representing Cost Management, 3.20 represents Conversion Rates, 3.01 representing Performance Monitoring and Optimization, 2.87 represents Customer Satisfaction and 2.81 represents Regulatory and Compliance. Among these factors of SEA, the Cost Management is a preferred source of the respondents than the, Conversion Rates, Performance Monitoring and Optimization, Regulatory and Compliance and Customer Satisfaction.

Standard Deviation

There is low SD for Regulatory and Compliance, the observed score is.715. Whereas Cost Management (0.829), Conversion Rates (0.906), Performance Monitoring and Optimization (0.856) and Customer Satisfaction (1.008) has slightly highest SD score, representing that the data is spread out over a wide range of values.

TABLE II CHI-SQUARE TESTS

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	100.526[a]	44	.000
Likelihood Ratio	106.023	44	.000
Linear-by-Linear Association	20.757	1	.000
N of Valid Cases	125		
a. 54 cells (90.0%) have expected count less than 5. The minimum expected count is .10.			

Table II highlights, Pearson Chi-square value = 100.526, P-value =.000 is statistically significant @5%. There is an association between experience and cost management.

Thus, H1: There is an association between experience and cost management.

TABLE III CORRELATIONS

Correlations					
	Cost Management	Conversion Rates	Performance Monitoring and Optimization	Regulatory and Compliance	Customer Satisfaction
Cost Management	1	.852**	.799**	.636**	.570**
Conversion Rates		1	.812**	.639**	.617**
Performance Monitoring and Optimization			1	.647**	.595**
Regulatory and Compliance				1	.505**
Customer Satisfaction					1
**. Correlation is significant at the 0.01 level (2-tailed).					

The table III indicates the results of correlation analysis, all variables of SEA were significantly correlated with each other @ 1% level of significance which shows, there is an association between the SEA factors.

The Correlation coefficient among "Cost Management" and "Conversion Rates" is 0.852, which shows 85.2% of positive relationship among "Cost Management" and "Conversion Rates" at 1% level of significance. The Correlation coefficient among "Cost Management" and "Performance Monitoring and Optimization" is 0.799, which shows 79.9% of positive relationship among "Cost Management" and "Performance Monitoring and Optimization" at 1% level of significance. The Correlation coefficient among "Cost Management" and "Regulatory and Compliance" is 0.636, which shows 63.6% of positive relationship among "Cost Management" and "Regulatory and Compliance" at 1% level of significance. The Correlation coefficient among "Cost Management" and "Customer Satisfaction" is 0.570, which shows 57% of positive relationship among "Cost Management" and "Customer Satisfaction" at 1% level of significance.

The Correlation coefficient among "Conversion Rates" and "Performance Monitoring and Optimization" is 0.812, which shows 81.2% of positive relationship among "Conversion Rates" and "Performance Monitoring and Optimization" at 1% level of significance. The Correlation coefficient among "Conversion Rates" and "Regulatory and Compliance" is 0.639, which shows 63.9% of positive relationship among "Conversion Rates" and "Regulatory and Compliance" at 1% level of significance. The Correlation coefficient among "Conversion Rates" and "Customer Satisfaction" is 0.617, which shows 61.7% of positive relationship among "Conversion Rates" and "Customer Satisfaction" at 1% level of significance.

The Correlation coefficient among "Performance Monitoring and Optimization" and "Regulatory and Compliance" is 0.647, which shows 64.7% of positive relationship among "Performance Monitoring and Optimization" and "Regulatory and Compliance" at 1% level of significance.

The Correlation coefficient among "Performance Monitoring and Optimization" and "Customer Satisfaction" is 0.595, which shows 59.5% of positive relationship among "Performance Monitoring and Optimization" and "Customer Satisfaction" at 1% level of significance.

The Correlation coefficient among "Regulatory and Compliance" and "Customer Satisfaction" is 0.505, which shows 50.5% of positive relationship among "Regulatory and Compliance" and "Customer Satisfaction" at 1% level of significance.

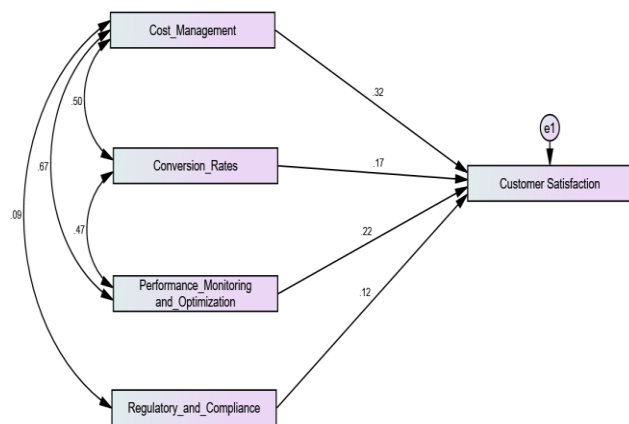**H2: SEA factors positively associate with outcome variable.**

SEM

Fig. 2 Measurement Model

The above (figure 2) measurement model shows the overall model fit is good and therefore, the model fit well with observed data. The fit indices are CMIN/DF = 3.199, GFI= 0.980, CFI=0.975, IFI=0.976, NFI=0.966 and RMR = 0.079.

V. FINDINGS

- Google, with its wide reach and advanced targeting capabilities, demonstrated superior engagement

levels, achieving higher click-through rates and broader audience interaction.

- Bing, while having a smaller user base, provided a more cost-effective solution with competitive cost-per-click rates and higher conversion rates for specific niche markets.

- Bing's lower cost-per-click and targeted features, such as LinkedIn integration, proved advantageous for certain industries, particularly B2B and professional services.

- Both platforms such as Google and Bing exhibited unique strengths.

- Google excelled in engagement and visibility, though Bing offered significant cost benefits and higher conversion efficiency.

VI. RECOMMENDATIONS

- The companies need to adopt a multifaceted approach to maximize the effectiveness of their SEA on Google and Bing.

- The companies should focus on crafting compelling ad copy and employing Google's diverse ad formats and extensions to capture broad audience interest. Investing in detailed keyword research and optimizing campaigns based on performance data can further enhance engagement and conversion rates.

- Bing's cost-effectiveness features should be capitalized on, particularly for niche markets and professional sectors.

- Regular monitoring and adjustment of bid strategies, coupled with A/B testing of ad variations, will help in refining ad performance across Google and Bing platforms.

VII. CONCLUSION

The study highlights the nuanced strengths and opportunities each platform offers(Chouaki et al., 2023). Google, with its vast reach and advanced targeting capabilities, remains a powerful tool for achieving broad audience engagement and high click-through rates. Bing, presents a cost-effective alternative, excelling in specific niches and delivering higher conversion rates among targeted demographics. The unique features and advantages of both Google and Bing platforms will help to maximize the marketing impact(Chen & Lin, 2011) . By aligning ad campaigns with platform-specific strengths and continuously refining based on performance data, companies can enhance their digital marketing efforts, achieve better results and optimize ad spend in the dynamic market.

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