International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

Performance Evaluation of Search Engine Optimization Techniques of E-Commerce Website

Swati Mohanlal Lathia
Assistant Professor: Bhavan's Shri H. J. Doshi Info. Tech. Institute, Jamnagar
Ph. D. Scolar: Sabarmati University, Ahmadabad

Dr. Meenakshi Kaushik
Associate Professor: Sabarmati University, Ahmadabad

ABSTRACT - In order to increase e-commerce websites' visibility, traffic, and general success, search engine optimization, or SEO, is essential. This study examines the effectiveness of popular SEO strategies and measures how they affect user engagement and search engine rankings. The study finds relationships between SEO tactics and important performance metrics including organic traffic, conversion rates, and search engine results page (SERP) rankings by examining on-page, off-page, and technical SEO elements across several e-commerce websites. The findings show that while backlink quality influences domain authority and ranking stability, technical SEO and content optimization have the biggest effects on long-term organic performance. The article offers future directions for adaptive, machine-learning-powered optimization and offers insights into difficulties in SEO evaluation.

KEYWORDS

Search Engine Optimization, E-Commerce, SERP, On-Page SEO, Off-Page SEO, Technical SEO, Organic Traffic, BACKLINK

INTRODUCTION

Online shopping's explosive growth has increased rivalry among e-commerce providers. Users find products online mostly through search engines like Google, Bing, and Yahoo. In order to improve their exposure on SERPs, e-commerce companies consequently make significant investments in Search Engine Optimization (SEO) tactics. SEO includes techniques that increase a website's authority and relevancy for product and service-related queries. Because search algorithms are always changing, assessing the efficacy of SEO strategies is still a difficult and continuous task for researchers and digital marketers alike.

An analytical performance review of the main SEO strategies used on e-commerce websites is carried out in this article. Finding the tactics that result in quantifiable increases in visibility, traffic, engagement, and conversions is the goal.

In e-commerce settings, SEO is by its very nature multifaceted. It includes technological optimization, content planning, backlink acquisition, structured data implementation, mobile-first design, and user experience enhancement in addition to basic keyword insertion. User intent, semantic relevancy, page performance metrics, and trustworthiness indications are becoming more and more important in today's search algorithms. As a result, a comprehensive plan including web engineering, analytics, behavioral science, and marketing strategy is needed for good SEO.

Even though SEO techniques are widely used, performance measurement is still difficult. Measuring the causal relationship between certain SEO tactics and perceived performance gains is made more difficult by the dynamic and opaque nature of search engine ranking algorithms. Quantitative evaluation is further complicated by exogenous factors like consumer trends, competitive intensity, and seasonality. Because of this, businesses frequently have trouble figuring out which SEO expenditures provide the best return on investment (ROI).

The purpose of this study is to measure the relative influence of the main SEO strategies used in e-commerce websites on key performance indicators (KPIs) and to systematically assess their effectiveness.

BACKGROUND AND RELATED WORK

SEO can broadly be divided into three categories:

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

- **On-Page SEO** – Techniques implemented directly on web pages, such as keyword optimization, meta tags, internal linking, and structured data markup**[1]**.
- **Off-Page SEO** – Practices that improve a website's authority and reputation through external signals, primarily backlinks and social signals**[2]**.
- **Technical SEO** – Infrastructure and performance-related enhancements including site speed, mobile responsiveness, and crawlability**[3]**.

According to earlier studies, SEO tactics and the rise of organic traffic are positively correlated (Jansen et al., 2017). Comparative research on e-commerce environments in particular is still scarce, though, particularly when it comes to measuring the impact of different SEO strategies**[4]**.

REVIEW OF LITERATURE

- **On-page SEO**:
  Studies demonstrate that keyword-rich content and relevant meta descriptions contribute to improved SERP placement (Reddy & Rao, 2019). Internal linking improves user navigation and assists search engine bots in indexing**[5]**.
- **Off-Page SEO**:
  High-quality backlinks are correlated with higher domain authority and better rankings (Cho & Kwon, 2020). Social sharing indirectly affects rankings by increasing visibility and click-through rates**[6]**.
- **Technical SEO**:
  Site speed and mobile-first design have emerged as decisive ranking factors with algorithm updates by major search engines (Google, 2021). Structured data markup and secure connections (HTTPS) are now baseline requirements**[7]**.

Although there is a wealth of research on SEO strategies, there is still a dearth of comparative performance analysis in actual e-commerce environments.

METHODOLODY

- **Research Design:**
  This study uses a mixed-methods approach, integrating qualitative evaluations of implementation issues with quantitative analysis of SEO performance measures.
- **Data Collection:**
  Over the course of six months, data was gathered from a subset of e-commerce websites utilizing technologies like Google Analytics, SEMrush, Ahrefs, and Google Search Console. The volume of organic traffic, conversion rates, average keyword placements, bounce rates, and page load times were among the metrics.
- **SEO Metrics and Evaluation Criteria:**

Metric	Definition	Purpose
Organic Traffic	Visits from search results	Primary traffic indicator
SERP Position	Average keyword rank	Measures visibility
Conversion Rate	Percentage of purchases	Business outcome measure
Bounce Rate	Percentage of single-page visits	Engagement indicator
Page Load Time	Time to render page	Technical performance

- **Comparative Technique Analysis:**
  To evaluate relative performance, sites were categorized based on the importance they placed on their SEO approach (technical, off-page, and on-page).

COMPARATIVE ANALYSIS AND RESULTS

- **On-Page SEO Performance:**

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

On-page SEO-focused websites demonstrated consistent gains in keyword ranks (average position increased from 34 to 21). Relevance for long-tail search phrases was improved by internal linking and content improvement.

- **Off-Page SEO Performance:**
  Significant improvements in domain authority were shown by sites with high-authority backlinks. On the other hand, acquiring backlinks took longer and cost more money. Over a six-month period, high backlink sites saw an 18% rise in organic traffic.
- **Technical SEO Performance:**
  The biggest gains in user engagement metrics were seen on technical SEO-optimized websites. Compared to websites with poor mobile friendliness and slower loading times, bounce rates dropped by 12% and conversion rates increased by 8%.

- **Comparative Summary:**

SEO Category	Organic Traffic	SERP Position	Conversion	Engagement
On-Page	+22%	Moderate	+6%	+7%
Off-Page	+18%	High	+5%	+4%
Technical	+30%	High Moderate	+8%	+12%

DISCUSSION AND CHALLENGES

- **Observations:**
  - **Technical SEO** exhibited the most consistent impact on both traffic and engagement.
  - **On-Page SEO** was critical for capturing relevant search queries.
  - **Off-Page SEO** contributed significantly to authority but manifested slower performance gains.
- **Implementation Challenges:**
  - Distributing resources across SEO categories in a balanced manner.
  - Static optimization strategies are undermined by constant algorithm changes.
  - It might be challenging to separate the effects of SEO from outside market movements.

FUTURE DIRECTIONS

Emerging trends in SEO include:

- AI-Driven Optimization – Automated content creation and performance forecasting using machine learning.
- Voice Search Optimization – Adapting content for conversational queries.
- User Intent Modeling – Semantic understanding and personalization**[8]**.

CONCLUSION

Three main dimensions—on-page SEO, off-page SEO, and technical SEO—were the focus of this study's comprehensive performance evaluation of SEO strategies used on e-commerce websites. The study offers factual insights into the relative efficacy of various optimization tactics by examining key performance indicators (KPIs), such as organic traffic growth, SERP ranks, conversion rates, bounce rates, and page performance metrics.

This study makes a significant contribution by showing that SEO success needs to be assessed holistically. Improvements in rankings by themselves are not enough to predict a company's success. Rather, a thorough assessment system ought to incorporate revenue attribution, engagement indicators, conversion performance, and traffic quality. Businesses can more effectively match SEO expenditures with quantifiable return on investment (ROI) thanks to this multifaceted evaluation.

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 04 , April - 2026

The study also emphasizes how search engine algorithms are dynamic. Adaptive SEO tactics are required due to ongoing changes, particularly those that highlight mobile-first indexing, page experience signals, and semantic search capabilities. Methods of static optimization are no longer practical. Rather, SEO governance systems must incorporate data-driven monitoring, performance analytics, and continuous testing (A/B experimentation).

According to the findings, managers of e-commerce companies ought to give priority to:

- Putting in place a technically sound infrastructure as a prerequisite.
- Creating excellent, purpose-driven content strategy.
- Establishing long-lasting backlink networks with an emphasis on trust and authority.
- Installing systems for ongoing performance monitoring.

Thus, rather than being a tactical marketing tool, SEO serves as a strategic performance lever for e-commerce companies. SEO increases discoverability, builds brand credibility, boosts customer acquisition effectiveness, and supports long-term competitive advantage when it is used methodically and thoroughly assessed. To improve measurement accuracy and strategic decision-making, future studies should investigate AI-driven predictive optimization models, real-time SEO performance dashboards, and automated technical auditing frameworks.

REFERENCES

[1] Smith, M. & Patel, R. (2020). On-Page Optimization Techniques. Journal of Digital Marketing, 12(3), 45–59.
[2] Zhang, Y. & Li, H. (2019). Impact of Backlinks on Search Rankings. International Journal of e-Commerce Studies, 8(1), 33–49.
[3] Google Webmaster Central. (2021). Technical SEO Guidelines. Google.
[4] Jansen, B., Spink, A., & Pedersen, J. (2017). Search Engine Marketing Metrics. ACM Transactions on the Web.
[5] Reddy, K., & Rao, S. (2019). Keyword Strategies & Ranking. SEO Quarterly, 5(4), 77–92.
[6] Cho, J., & Kwon, B. (2020). Social Signals and SEO Impact. Journal of Internet Marketing, 14(2), 112–129.
[7] Kumar, V., & Singh, A. (2021). Mobile-First Indexing and Performance. Web Performance Review, 9(3), 22–38.
[8] Lee, D. & Kim, J. (2022). Future Trends in Search Technology. AI in Marketing Journal, 3(2), 100–115.