

The impact of generative artificial intelligence on SEO metrics and web content performance

Olha Anisimova^{1,*†}, Oleksii Prihunov^{1,†} and Halyna Lukash^{1,†}

¹Vasyl' Stus Donetsk National University, 600-richchia Str., 21, Vinnytsia, 21021, Ukraine

Abstract

This paper investigates the impact of generative artificial intelligence on web content production efficiency and SEO performance within the Blogger platform ecosystem. Contemporary approaches to web content automation based on large language models and AI-powered visual content generation tools are analyzed. A hybrid methodology for web content creation is proposed, combining automated semantic core development, text generation, visual content creation, HTML code optimization, and expert human verification. A comprehensive framework for evaluating the effectiveness of artificial intelligence implementation is developed, incorporating web administrator productivity metrics, text structure and quality indicators, SEO metrics, and web analytics data. The experimental study was conducted using websites representing academic, legal, public, and commercial sectors, with data collected from Google Analytics 4 and Google Search Console. The results demonstrate that the integration of generative artificial intelligence reduced the complete content production and publication cycle from 120–180 minutes to 12 minutes, increasing web administrator productivity by 4–5 times. Behavioral analytics confirmed the effectiveness of AI-assisted content: organic search generated 828 sessions and 5,724 user events, with an engagement rate of 63.04% and an average engagement time of 54.53 seconds. The findings indicate that the use of generative artificial intelligence, when combined with mandatory expert supervision and content verification, does not lead to algorithmic penalties from search engines and contributes to improved organic visibility, audience engagement, and overall content management efficiency.

Keywords

generative artificial intelligence, artificial intelligence, web content performance, process automation, SEO optimization, SEO metrics, Blogger platform, organic traffic, web analytics

1. Introduction

The relevance of this study is driven by the profound transformation of the digital environment and the emergence of several contradictions between market demands and the evident shortage of human resources available to website administrators. This process is shaped by three main factors.

First, the attention crisis caused by intense online competition forces websites to publish content more frequently while maintaining its informational value. Second, the evolution of Google's algorithms and SEO practices in 2026 has introduced sophisticated multimodal quality assessment mechanisms that evaluate the actual usefulness, expertise, and relevance of content to user intent. As a result, manual optimization has become a routine task consuming up to 70% of an administrator's working time. Third, economic considerations and time constraints resulting from the limited availability and high cost of human resources prevent traditional editorial teams or individual specialists from scaling projects without significant financial investments.

Under these conditions, automation through generative artificial intelligence is no longer merely a technological trend but an objective necessity for the sustainability and scalability of web resources.

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*Corresponding author.

† These authors contributed equally.

✉ o.anisimova@donnu.edu.ua (O. Anisimova); prighunov@donnu.edu.ua (O. Prihunov); g.lukash@donnu.edu.ua (H. Lukash)

ORCID 0000-0002-8016-9361 (O. Anisimova); 0000-0003-1440-0809 (O. Prihunov); 0000-0002-9777-7718 (H. Lukash)



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2. Literature review and problem statement

In the field of SEO optimization and web content management, the impact of generative artificial intelligence (AI) has attracted considerable attention from researchers and professional organizations. One of the leading scholars in this area is P. Aggarwal, who, together with colleagues, proposed the concept of Generative Engine Optimization (GEO), aimed at increasing website visibility in AI-generated responses. The authors emphasize that generative models fundamentally transform search architecture by integrating information from multiple sources, thereby requiring new visibility metrics and content adaptation strategies [1]. Similarly, M. Havia, analyzing practical applications of AI, argues that despite the significant acceleration of content generation, AI-produced materials require mandatory human verification due to the risk of factual inaccuracies and hallucinations [2]. Similar conclusions have been reported in studies of higher education, where researchers emphasize that artificial intelligence should function as a decision-support instrument rather than a fully autonomous content-production system [3].

Other studies have expanded the scope of research on web optimization and content management systems. In particular, I. Bielykh examined the most effective CMS platforms for SEO professionals, while H. Shafaei and M. Taheri conducted a comparative analysis of web visibility tools. Although these studies primarily focus on general technical characteristics of websites, their methodological approaches are relevant to the analysis of the Blogger platform because they highlight the importance of technical structure, metadata, and code optimization, which critically influence domain authority and search rankings. At the same time, H. Salem and co-authors investigated the automated implementation of Linked Data technologies, enabling even outdated web resources to be effectively integrated into the modern Semantic Web environment [4, 5, 6].

Google's documentation on helpful content and the E-E-A-T principles (Experience, Expertise, Authoritativeness, and Trustworthiness) emphasizes the priority of creating content that serves real users rather than manipulating search rankings. This approach aims to reduce the prevalence of low-quality content characterized by a lack of expertise, practical experience, and signs of automated spam. Modern ranking algorithms analyze both content quality and depth to identify websites that excessively rely on mass-generated texts and subsequently downgrade them in search results. Consequently, users receive information based on authentic human experience, which standard AI-generated texts often lack [7].

Researchers emphasize that strategic search engine optimization requires a comprehensive approach to content creation and a clear understanding of the appropriate boundaries for the use of automated tools [4]. Website visibility depends directly on how effectively webmasters combine the analytical capabilities of AI with thorough editorial refinement and the inclusion of unique value propositions [5]. Excessive reliance on artificial intelligence without proper verification and expert assessment can undermine trust in a website and lead to traffic losses [2]. Therefore, professionals must develop a deep understanding of modern search algorithms and apply flexible optimization strategies [4].

Linguistic studies of communication in social networks further confirm that language structure and communication patterns directly affect information perception and audience interaction in digital environments [8].

Among Ukrainian researchers, notable contributions have been made by M. Movchan, who investigated practical approaches to generating hundreds of SEO pages daily using AI and highlighted the challenge of maintaining proper JSON data structures. O. Duma and M. Melnyk analyzed advanced marketing research technologies, focusing on the integration of AI and Big Data for in-depth audience analysis. Other scholars have explored web productivity, content optimization strategies, semantic core adaptation, and the impact of generative AI on SEO metrics. Earlier research on social media analytics also demonstrated the potential of automated methods for identifying and modeling user characteristics based on digital communication data, providing a foundation for modern AI-driven audience analysis techniques [9]. However, researchers consistently note the lack of empirical evidence regarding the long-term implementation of such technologies within the unique Blogger ecosystem [10, 11, 12].

Recent studies also emphasize the importance of information hygiene in digital communication environments, demonstrating that the quality and ecological characteristics of online interaction

significantly influence the effectiveness of information dissemination and user engagement[13].

In summary, although the scientific literature provides substantial insights into the use of generative artificial intelligence for web content creation and optimization, the practical application of these technologies to specific CMS platforms, particularly Blogger, remains insufficiently explored [12]. Several contradictions require further investigation:

- the lack of empirical evidence regarding the long-term impact of generative AI on the Blogger ecosystem, which possesses unique technical characteristics, architecture, and indexing mechanisms [12];
- the technological paradox of Blogger: while the platform is highly accessible to beginners and domain experts without programming or SEO skills, successful website promotion still requires professional code optimization, structured content organization, and SEO management [4, 14, 15];
- the strict requirements of modern search algorithms, which rigorously assess content uniqueness and expertise, causing websites that mass-produce low-quality automated content to lose rankings or even disappear from search indexes [7];
- the absence of clear methodological guidelines for web administrators, making it difficult to determine where acceptable automation of routine tasks ends and harmful spam practices begin [2].

These contradictions formed the basis of the present study and shaped its primary research directions. Given the ongoing debate, we hypothesize that the systematic integration of generative artificial intelligence into web administration processes can significantly increase publication speed and improve key SEO metrics without triggering penalties from modern search algorithms, provided that generated content undergoes proper editorial review [12].

The purpose of this study is to substantiate the theoretical and methodological foundations and experimentally evaluate the impact of integrating generative artificial intelligence models on the efficiency of the web content lifecycle, as well as to determine the nature and direction of changes in key SEO metrics and audience engagement indicators within the Blogger platform under conditions of automated content production. To achieve this objective, the following tasks were defined:

- to analyze current trends and scientific-practical approaches to the use of generative artificial intelligence in web administration and search engine optimization;
- to identify the architectural and technical characteristics of content organization on the Blogger platform in order to determine routine processes suitable for automation;
- to develop and test a hybrid web content creation methodology combining AI-assisted semantic analysis, content structuring, and coding with expert human verification;
- to compare time expenditures and structural-quality characteristics of textual materials before and after the implementation of generative AI models;
- to conduct a statistical assessment of changes in key web analytics metrics, including organic traffic, average search ranking positions, and click-through rates;
- to investigate the causes of search engine penalties and propose guidelines for developers and website administrators regarding the safe scaling of AI-assisted content production.

3. Materials and methods

The experimental framework of this study encompassed four information segments operating within the Blogger platform ecosystem and integrated with Google Analytics 4 (GA4) and Google Search Console.

The academic segment included the official website of the Department of Information Systems Management at Vasyl' Stus Donetsk National University (isu.vn.ua). The analysis covered the news section (/kafedra-news), Olympiad pages (/kafedra-news/olympics), conference pages (/kafedra-news/conferences), as well as trust-building modules containing stakeholder testimonials and graduate achievement boards.

The legal segment was represented by the blog of the “Rule of Law” law partnership (advokatvp.top/bloh). Content in this domain requires the highest level of factual accuracy because of Google’s low tolerance for errors within the Your Money or Your Life (YMYL) category.

The social-oriented media segment included the website of the Student Trade Union of Vasyl’ Stus Donetsk National University (ppopdonnu.vn.ua/events-and-news), characterized by a high frequency of dynamic content updates.

The commercial segment was represented by the website of the construction company “HYDROCORE” (hydrocore.com.ua). The monitoring focused on pages presenting drilling technologies (/galary/video-gnb and /galary/video-vnb), which require specialized textual descriptions, LSI optimization, and technical video markup.

The inclusion of these diverse website categories ensured data representativeness and minimized random errors. This approach enabled a comprehensive assessment of content automation effectiveness across academic, commercial, legal, and public sectors.

To reduce the influence of seasonality, the study was divided into two comparable four-month periods:

- baseline period (“Pre-AI”): from November 1, 2025, to February 28, 2026. During this stage, website administration and optimization were performed entirely manually, including conventional content writing and independent creation of metadata;
- experimental period (“Post-AI”): from March 1, 2026, to June 30, 2026. Content creation, optimization, adaptation of HTML structures to Blogger requirements, and metadata generation were carried out using the proposed hybrid methodology involving systematic application of neural-network-based tools combined with mandatory expert human verification.

The synchronization of the experiment (four months before AI implementation versus four months after implementation) ensured the reliability of comparative analyses conducted using Google Analytics 4 and Google Search Console. Since seasonal activity patterns in education and business remained relatively stable across these periods, it was possible to objectively evaluate the impact of automation on SEO performance and content production efficiency.

The following toolset was employed in the study:

- Gemini Pro, a large language model, served as the primary engine for text generation, initial clustering of medium- and high-frequency search queries, logical structuring of future publications, adaptation of writing style to target audiences, automatic generation of metadata (title and description tags), as well as analysis and cleaning of source code to optimize Blogger HTML templates.
- Nano Banana Pro was used as a specialized AI-based visual generation tool that automatically created relevant images based on contextual analysis of textual content.
- Google Docs functioned as a cloud-based knowledge management environment for organizing, categorizing, and storing effective prompts, as well as documenting interaction scenarios with generative AI models.
- Google Analytics 4 served as the primary analytical platform for quantitative monitoring and statistical evaluation of user behavioral metrics, including session duration, engagement rate, and page interaction depth, allowing precise identification of audience response patterns following the adoption of automated content production methods [16].

The use of monitoring systems for continuous data collection and analysis is consistent with approaches widely applied in environmental and technical monitoring research [17]. The statistical interpretation of web traffic indicators was based on approaches commonly used in the analysis of complex communication and information systems, where traffic behavior is characterized by self-similar and non-linear patterns [18, 19]. The integration of these tools enabled a continuous workflow consisting of analysis → generation → optimization → monitoring, ensuring the collection of reliable and verifiable empirical results.

To evaluate the effectiveness of AI-assisted content production, three groups of metrics were employed (Figure 1). As shown in Figure 1, the proposed framework integrates three groups of indicators used to assess the impact of artificial intelligence on web content production and search engine optimization performance.

1. Web administrator productivity metrics: total production cycle time (measured in minutes) required to prepare a single publication; stage-specific labor intensity; output productivity, measured as the number of successfully optimized and published materials per unit of time.
2. SEO metrics and web analytics indicators: organic clicks and impressions in SERPs; average click-through rate (CTR, %); average ranking position; user behavioral metrics, including average engagement time and engagement rate.
3. Text structure and quality metrics: text uniqueness coefficient (U, %) determined using shingle-based algorithms; academic and classical word frequency indicators used to identify signs of technical spam (over-optimization); readability index (based on the Flesch–Kincaid scale adapted to the linguistic characteristics of the content).

The statistical significance of observed changes was assessed using the following methods:

- descriptive statistics, including the calculation of arithmetic mean ($\bar{X}$), median (Me), sample variance (S^2), and standard deviation (S or σ) for time expenditures and SEO indicators within each group of websites;
- Shapiro–Wilk test, used to determine the distribution characteristics of the collected metrics;
- paired Student’s t-test, applied to compare mean values of total time expenditure (T_{total}) and text quality metrics before and after AI implementation;
- Mann–Whitney U test, employed to evaluate changes in organic traffic and CTR indicators, as web analytics data frequently exhibit non-normal distributions due to traffic spikes and seasonal fluctuations;
- Pearson’s or Spearman’s correlation analysis, used to determine the strength and direction of the relationship between the level of content automation and changes in the average search ranking position of a website.

Similar approaches to signal and pattern analysis have been successfully applied in studies involving large-scale observational datasets characterized by stochastic fluctuations and heterogeneous distributions [20].

4. Basic points statement

The transition to the hybrid content production model on March 1, 2026, resulted in a substantial reduction in time expenditures across all stages of content creation. Before the implementation of artificial intelligence tools, the manual preparation of a single article required between 120 and 180 minutes. The integration of Gemini Pro and Nano Banana Pro significantly optimized this process. The time required for topic discovery, semantic analysis, keyword clustering, and content planning was reduced from 30–40 minutes to 2–3 minutes due to the ability of Gemini Pro to rapidly process large volumes of data and organize LSI keywords. The content writing process, which previously required 60–90 minutes of copywriting work, was transformed into interactive draft generation followed by expert revision, reducing the overall duration to 5–7 minutes. Similarly, the creation of visual materials was accelerated through the use of Nano Banana Pro, decreasing the required time from 15–20 minutes to approximately one minute. Furthermore, automated source-code cleaning and HTML optimization substantially reduced the effort required for adapting content to the Blogger environment.

Particularly valuable from both scientific and practical perspectives are the results obtained from processing diversified input sources. The experiment demonstrated that the proposed hybrid methodology achieves exceptionally high efficiency when working with raw source materials, including unstructured

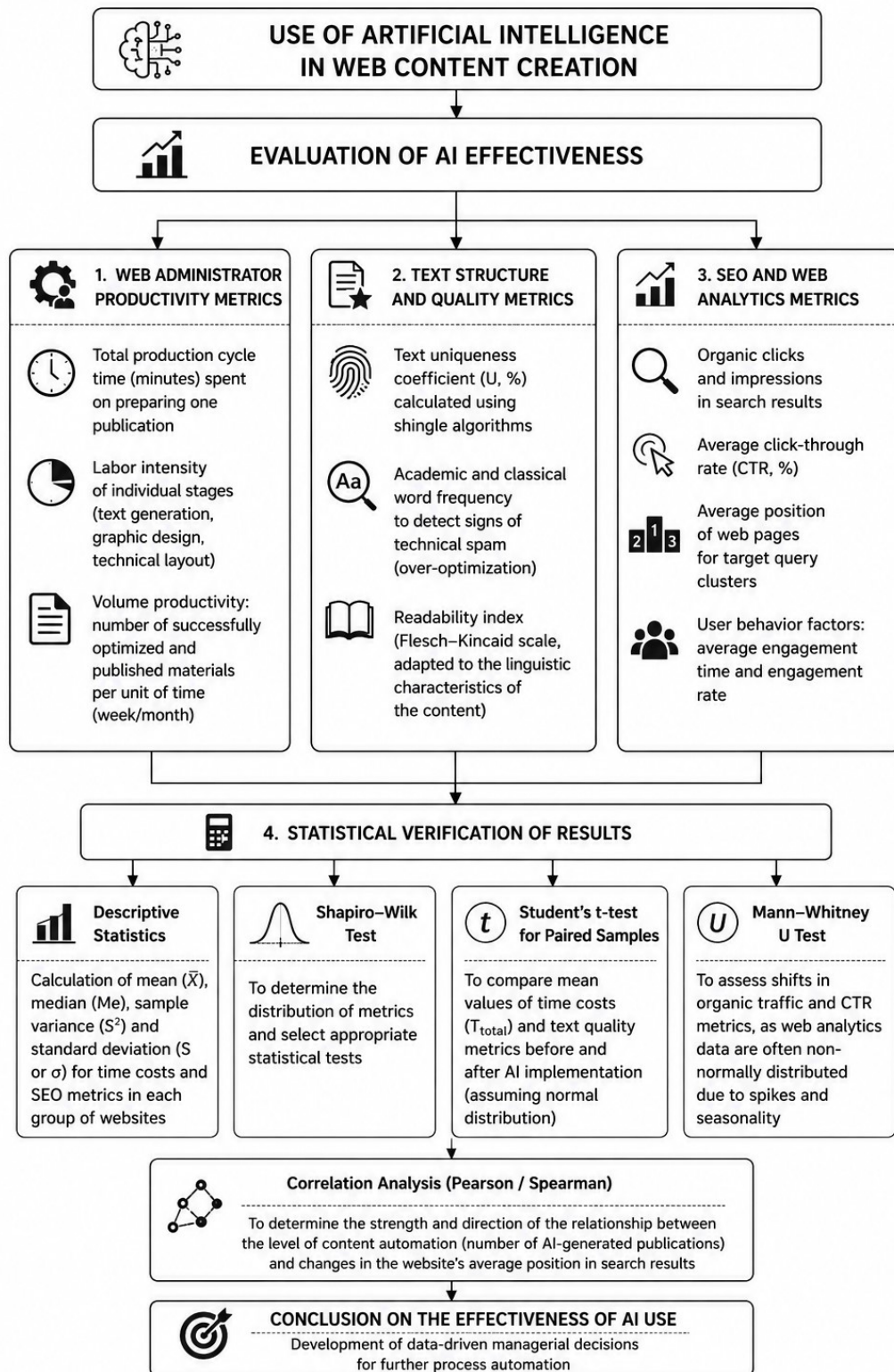


Figure 1 – System of indicators for evaluating the effectiveness of artificial intelligence use in web content creation and SEO optimization

Figure 1: Framework of indicators for assessing the effectiveness of artificial intelligence in web content creation and SEO optimization.

text documents, direct links to external websites, and multimedia content obtained from YouTube. The ability of AI systems to automatically analyze, structure, and transform heterogeneous information sources considerably accelerated the preparation of publication-ready content.

The automation of the entire publication workflow produced notable performance improvements. The complete cycle, including intelligent processing of source material, code optimization, image generation, publication on the Blogger platform, and cross-posting of adapted announcements to Facebook and Instagram with backlinks to the original publication, required only 12 minutes. In contrast, the equivalent process during the baseline period required at least 50–60 minutes. Consequently, web administrator productivity increased by more than four times.

The resulting release of time resources enables administrators and non-specialist content managers to redirect their efforts from routine operational tasks toward strategic content planning, audience development, and advanced engagement analysis. This shift increases not only operational efficiency but also the overall effectiveness of content management activities.

User behavioral metrics for the analyzed websites were evaluated using Google Analytics 4. The aggregated statistical results for the primary traffic acquisition channels during the reporting period are presented in Table 1.

Table 1

Fragment of the list of search terms of users for the period from 05/01/2022 to 04/30/2023 [21]

Default Channel Group	Sessions	Interactions	Int. Rate	Avg. Time (s)	Events/Sess	Total Events
Direct	872	228	26.15%	19.34	4.42	3851
Organic Search	828	522	63.04%	54.53	6.91	5724
Organic Social	433	206	47.58%	14.05	5.42	2348
Referral	56	37	66.07%	31.66	5.98	335
Unassigned	12	2	16.67%	11.00	3.42	41
Organic Video	3	2	66.67%	14.67	5.33	16
Paid Search	1	0	0.00%	0.00	3.00	3

The analysis of the obtained indicators revealed several patterns that support the initial research hypothesis. The Organic Search channel demonstrated the highest level of quality user interaction, generating 828 sessions, a figure comparable to the number of direct visits (872 sessions). However, organic search significantly outperformed all other acquisition channels in terms of behavioral metrics. The engagement rate of users arriving through search engines reached 63.04%, which is almost 2.5 times higher than that recorded for direct traffic (26.15%). Furthermore, the average engagement time per session in the Organic Search channel amounted to 54.53 seconds, representing the highest value among all major traffic sources and indicating a strong correspondence between AI-optimized content and actual user intent.

User activity and content consumption depth were also most pronounced among visitors acquired through search engines. This channel generated an average of 6.91 events per session and a total of 5,724 events, accounting for more than 46% of all recorded events across the analyzed websites (12,318 events). These results suggest that users reached through organic search not only access the content but also actively interact with it.

Social media channels, categorized as Organic Social, also contributed substantially to audience acquisition. As a distribution mechanism for announcements linked to Blogger publications, these channels generated 433 sessions and 206 engaged sessions while maintaining a stable engagement rate of 47.58%. This finding confirms the effectiveness of integrating social media promotion into the overall content distribution strategy.

An additional important observation concerns the structure of traffic sources. The combined share of free organic traffic, including search, social media, and video content channels, exceeded 57% of all sessions. At the same time, paid search generated only a single session during the reporting period, indicating that the studied resources were able to maintain visibility and audience growth without relying on paid advertising instruments. Overall, the findings demonstrate that algorithm-driven

content optimization supported by artificial intelligence attracts a highly targeted and engaged audience characterized by strong attention retention and deeper interaction with website content.

To investigate the transformation of key website performance indicators under conditions of automated web content management, a comparative analysis of web analytics metrics was conducted across two distinct stages: the baseline period (before March 1, 2026) and the experimental period (after March 1, 2026). The summarized results of this comparative analysis are presented in Table 2.

Table 2
Comparative Analysis of Key Performance Indicators During the Baseline and Experimental Periods [21]

Analysis Dimension	Baseline Period (Before March 1, 2026)	Experimental Period (After March 1, 2026)
Administration Methodology	Fully manual semantic keyword collection, traditional time-consuming content writing, and manual tagging.	Hybrid approach combining automated code cleaning, AI-generated content based on prompts, and expert supervision.
Publication Speed	120–180 minutes required per publication and distribution.	12 minutes for processing, HTML cleaning, visualization, and cross-posting.
Content Quality (GA4)	Low frequency and unstable engagement indicators.	54.53s average engagement time, 63.04% engagement rate, no spam issues.
Search Engine Performance	Limited visibility for low-frequency queries due to scaling constraints.	Expanded organic reach, no penalties, and growth in clicks.

The comparison of the two study periods clearly demonstrates substantial improvements in both productivity and SEO performance indicators. During the baseline period, the monthly number of sessions generated through the Organic Search channel showed signs of stagnation due to the time-consuming and routine nature of content preparation performed by non-specialists. In contrast, the experimental period was characterized by a stable monthly increase in impressions and clicks recorded in Google Search Console, resulting in a total of 828 organic search sessions during four months of active use of artificial intelligence models.

Significant changes were also observed in the quality of user interaction with content. The transition to hybrid content generation based on Gemini Pro and Nano Banana Pro increased the engagement rate of the search segment to 63.04%[cite: 11]. This improvement can be attributed to algorithmic keyword clustering and LSI-based content optimization, which enabled a more accurate alignment between content structure and user search intent.

User behavioral factors exhibited a similarly positive transformation. During the period following March 1, 2026, the average engagement time per session within the Organic Search channel reached 54.53 seconds. This result indicates the elimination of the “artificiality” and technical spam characteristics that are often associated with fully automated content generation lacking human expert supervision.

The distribution of content through social media channels also became more effective. Owing to the optimization of the cross-posting process, which enabled the publication of announcements on Facebook and Instagram linking back to Blogger within approximately 12 minutes, the post-AI period generated 433 sessions through the Organic Social channel. These visitors demonstrated a high level of engagement, averaging 5.42 events per session.

The overall volume of user activity increased considerably following the implementation of automated content production. During the experimental period, the Organic Search channel alone generated 5,724 user events, confirming the positive influence of regular content updates on Google’s ranking algorithms and on audience interaction with website materials. The comparative analysis clearly demonstrates that the integration of generative artificial intelligence beginning on March 1, 2026, resolved the contradiction between the accessibility of the Blogger platform for non-specialists and the stringent quality and structural requirements imposed by modern search engines.

To obtain a deeper understanding of user behavior, the effectiveness of landing-page engagement metrics was analyzed using data from the file `Landing_Page_Landing_Page.csv`. The statistical indicators of landing-page performance and user engagement are presented in Table 3.

Table 3

Statistical Indicators of Landing Page Performance and User Engagement [21]

Landing Page URL	Sessions	Active Users	New Users	Avg. Eng. Time (s)
Homepage (/)	191	172	171	20.09
Article (/2026/05/blog-post_28.html)	76	71	67	46.97
Article (/2026/04/blog-post.html)	22	18	18	22.45
Article (/2026/04/2026_24.html)	15	15	12	20.87
System Parameter ((not set))	11	8	3	18.27
Contacts Page (/contacts)	10	7	5	28.20
Article (/2026/05/blog-post.html)	9	9	9	13.33
News Feed (/events-and-news)	4	4	4	29.75
Information Modules	2	2	1	8.00

The evaluation of web analytics results revealed several distinct patterns in user behavior. The homepage traditionally accumulated the largest volume of incoming traffic, generating 191 sessions and 172 active users while serving as the primary navigation hub of the website. However, its average engagement time remained moderate at 20.09 seconds.

The highest level of audience engagement was recorded for the landing page of the May publication (/2026/05/blog-post_28.html), where the average engagement time reached 46.97 seconds, exceeding the corresponding homepage indicator by more than two times. This finding suggests that users were more inclined to engage deeply with specific content than with general navigational pages.

A high concentration of new users was observed on optimized article pages. For example, the page /2026/05/blog-post_28.html attracted 67 new users, while /2026/04/blog-post.html generated 18 new users. These results provide clear evidence of the effectiveness of AI-assisted semantic analysis and the ability of optimized content to accurately match user search intent.

The data also confirmed a direct relationship between the publication period and audience retention. Articles created and published using the proposed hybrid methodology during April and May 2026 consistently demonstrated strong engagement performance, with average engagement times ranging from 20.87 to 46.97 seconds. These indicators significantly exceeded the performance of many general-purpose website sections.

In contrast, lower behavioral metrics were observed on informational pages such as /events-and-news, which recorded an average engagement time of 29.75 seconds across four sessions, and /contacts, which achieved 28.20 seconds across ten sessions. These results indicate that users preferred in-depth exploration of specific thematic articles rather than general browsing of the website structure.

Overall, the findings confirm that AI-optimized articles function as highly effective landing pages. In terms of attracting new users and sustaining audience attention, they substantially outperform standard informational sections of the website.

5. Results and discussion

The comparison of the periods before and after March 1, 2026, clearly demonstrates that the transition to a hybrid website administration model not only reduced the workload of web administrators but also significantly improved user behavioral factors and SEO performance indicators while protecting websites from potential Google penalties.

The comparative analysis of traffic acquisition channels revealed substantial changes following the implementation of AI-assisted content production. The Organic Search segment became the primary driver of growth during the experimental period. Through the systematic optimization of metadata and LSI-based content structures using Gemini Pro, the analyzed websites generated 828 organic search

sessions. User engagement within this channel reached its highest level, with an engagement rate of 63.04% and an average engagement time of 54.53 seconds. These indicators suggest that the optimized content effectively matched user intent and provided meaningful value to visitors.

The Organic Social segment further confirmed the effectiveness of the adopted content distribution strategy. Automated generation of concise promotional texts for Facebook and Instagram announcements helped maintain a stable engagement rate of 47.58%. This result demonstrates that AI-assisted cross-posting can successfully support audience acquisition while preserving user engagement quality across social media channels.

The accumulation of user activity during the post-AI period resulted in a substantial increase in overall interaction volume. Within the Organic Search channel alone, users generated 5,724 events, corresponding to an average of 6.91 events per session. This finding confirms the positive relationship between regular publication of optimized content and user interaction intensity.

The analysis of landing pages revealed notable differences between the static content characteristic of the baseline period and AI-optimized publications created during the experimental phase. Prior to the implementation of the hybrid methodology, the homepage served as the primary entry point for website visitors. Following the introduction of AI-assisted content production, individual articles evolved into independent traffic acquisition points. For instance, the May publication located at /2026/05/blog-post_28.html attracted 71 active users, of whom 67 (94.3%) were first-time visitors. The average engagement time on this page reached 46.97 seconds, more than twice the value recorded for the homepage (20.09 seconds). These results indicate successful ranking of the article for new keyword clusters identified through Google Search Console and demonstrate the effectiveness of AI-assisted semantic optimization in attracting highly relevant audiences.

Based on the empirical findings, a set of practical recommendations for web administrators was developed. The proposed framework outlines a step-by-step algorithm for content creation and distribution using artificial intelligence tools:

1. **Semantic Analysis of Source Materials.** Raw source materials, including text documents, YouTube transcripts, or external links, should be imported into Google Docs. Gemini Pro can then be used to perform rapid keyword clustering and generate a preliminary article structure with headings and subheadings. This approach improves content readability for users and facilitates efficient indexing by search engine crawlers.
2. **Hybrid Content Creation.** Extended content sections should be generated in Gemini Pro using predefined prompts. All generated materials must undergo expert human review to eliminate factual inaccuracies, adapt the writing style to the target audience, and evaluate keyword frequency to prevent over-optimization. Particular attention should be paid to improving the Flesch-Kincaid readability score and controlling classical and academic word repetition rates to avoid indicators of technical spam.
3. **Content Visualization.** Key concepts and semantic markers extracted from the text should be used as input for Nano Banana Pro to generate unique visual materials. The resulting images should be converted into modern web formats such as WebP, compressed for performance optimization, and supplemented with relevant alt attributes containing LSI keywords.
4. **Blogger Formatting and SEO Optimization.** The generated content should be cleaned using Gemini Pro to remove redundant tags and unnecessary styling elements that typically appear during content transfer. The optimized HTML code can then be uploaded to Blogger, where internal linking structures should be configured and SEO-optimized Title and Description fields should be completed using primary target keywords to improve click-through rates in search engine results pages.
5. **Automated Distribution and Cross-Media Promotion.** Short promotional announcements should be automatically generated for social media channels to attract new audiences. These announcements should be published on Facebook and Instagram with direct backlinks to the original Blogger publication in order to accelerate indexing and increase referral traffic.

6. Directions for future research

Given the continuous evolution of automation technologies and search engine ranking algorithms, further research should focus on several promising directions. One important area involves investigating the long-term impact of AI-assisted content production on domain authority and evaluating changes in search engine trust according to Google's E-E-A-T criteria. Additional studies should explore multimodal search algorithms and AI-generated search experiences (SGE – Search Generative Experience) to identify strategies that improve content visibility within AI-generated answer blocks.

Future research may also address the automation of technical and interactive website components, including calculators, scripts, and Schema.org structured data implementation within the Blogger ecosystem. Comparative evaluations of different large language models would help identify the most accurate and cost-effective solutions for web content production. Another promising direction involves the development of automated quality-monitoring systems capable of assessing content before publication and reducing the risk of future search engine penalties. Finally, greater attention should be paid to the psychological aspects of audience perception of AI-generated content in order to determine the point at which automation begins to influence user loyalty, trust, and long-term engagement.

7. Conclusions

The study provided a comprehensive theoretical and methodological analysis and generated extensive empirical evidence regarding the effectiveness of integrating generative artificial intelligence models into the processes of web content creation, structuring, and search engine optimization within the Blogger ecosystem. The proposed hypothesis was fully confirmed: the integration of generative AI into web administration workflows significantly increases publication speed and improves SEO performance without triggering penalties from modern search engine algorithms.

The experimental results demonstrated that the proposed hybrid methodology reduces the complete content production cycle, including source material processing, Blogger-based formatting, and cross-posting activities, to only 12 minutes. This optimization increased web administrator productivity by approximately four to five times. Data obtained from Google Analytics 4 and Google Search Console confirmed the absence of penalties, spam filters, or ranking restrictions imposed by Google when AI-generated content undergoes final human review and editorial refinement. These findings challenge common concerns regarding the perception of AI-generated texts as technical spam and indicate that content quality depends primarily on editorial control rather than on the method of content generation itself.

The optimization of metadata and LSI-based content structures using Gemini Pro transformed organic search into the leading source of high-quality user engagement, generating 828 sessions and 5,724 user events with an average engagement time of 54.53 seconds. Articles produced according to the proposed hybrid methodology functioned as effective landing pages, attracting new visitors and retaining audience attention more successfully than traditional static website sections. The highest-performing publication achieved an average engagement time of 46.97 seconds, demonstrating the ability of AI-assisted semantic optimization to align content with user search intent and improve behavioral metrics.

A key prerequisite for achieving these positive outcomes was identified as the hybrid approach itself. Within this framework, artificial intelligence tools, including Gemini Pro and Nano Banana Pro, serve as highly efficient instruments for automating routine operations, while human experts remain responsible for contextual evaluation, editorial refinement, and final verification of factual accuracy. Consequently, the findings demonstrate that generative artificial intelligence represents a powerful catalyst for increasing the efficiency of web administration, enabling organizations to combine the accessibility of content management for non-specialists with the stringent quality and relevance requirements imposed by contemporary search engine algorithms.

Declaration on Generative AI

The authors have not employed any Generative AI tools.

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