

Automation, Authority and Authenticity: A qualitative inquiry into the Lived Experiences of SEO Experts in the era of Retrieval-Augmented Generation

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Abstract: The process of information discovery and visibility has transformed from traditional search engine optimization to Generative Engine Optimization due to the integration of generative AI and the shift to retrieval augmented data generation on search engines. While AI content generation increases the velocity of content generation, however it also poses some serious risks, including citation aristocracy, content hallucinations and ouroboros effect leading model collapse.

Using Everett Rogers Diffusion of Innovation (DOI) framework, this qualitative research paper analyzes by using phenomenological approach as for how senior search engine optimization professionals, having at least four years of work experience in software technology companies, navigate their way to keep up with operational requirement of increasing the velocity of content generation, while keeping the authority intact. This study suggests a six stages Human in the Loop content verification and authority protocol, created after analyzing the semi closed qualitative questionnaires filled by SEO professionals reflecting upon their lived experiences.

The research finds that content generated entirely by AI systems without human intervention, lacks intrinsic compatibility and fidelity required for businesses where any error or misleading data can question the credibility of the business. To resolve this current problem practitioners have now engaged in systematic innovation. Their professional identities have now transformed from content writers to system architects. They have now learned and applied prompt engineering into the process of AI content generation and have become factual gatekeepers.

Keywords: Search Engine Optimization, Generative Engine Optimization, Citation Aristocracy, Ouroboros Effect, AI Model Collapse, AI Content Generation, Prompt Engineering

1. Introduction

A structural paradigm shift has taken place in search engine optimization industry, where there is a transition from click through rates, backlinking and keyword driven indexing system to probability based generative information retrieval system. In traditional search engine optimization practices the field experts would rank websites on the bases of making web crawling efficient for search engines, indexing their landing pages, and creating a link-based system to create authority and signal the search engine for quality results. However, this is not the case right now. The integration of Large Language Models into search systems now dynamically construct conversational answers, completely eliminating the concept of search engine result pages.

This new trend created an acute tension for search engine optimization professionals regarding their strategic and operational decisions. On one hand, the generative information retrieval system provides faster response and creates content faster. But on the other hand, it is experienced that the content generated has factual mistakes, the data is hallucinated and the linking system is either artificially created or the link cluster has serious accuracy failures. Moreover, since the traditional search engine mechanism has shifted to retrieval augmented data generation there is a



drastic drop in organic web traffic, ultimately forcing the search engine optimization professionals to look for alternative solutions to keep both authority and automation in a perfect balance .

To find out what that balance is, this study applied Everett Rogers Diffusion of Innovation theory as it's conceptual framework. The DOI theory suggests that the adaptation of a new technology or innovation is based on the perception of potential adopters. This perception revolves around five foundational innovation attributes knowledge, persuasion, decision, implementation and confirmation . By analyzing the system of retrieval augmented data generation system, applying the system to practical real life tasks, analyzing the quality of results generated, and lastly implementing the technology practically, after experimented getaways to use this system without endangering the authority of the content

2. Literature Review

A major shift has occurred as for how website ranks from traditional search engine optimization to AI-powered search. Traditionally the SEO revolved around using the right keywords and incorporating them in the web content, getting backlinks to rank on the first search engine result pages (SERP) . These ranking factors were easily visible and trackable. However, with the advent of Generative Engine Optimization (GEO), it converts content into numerical representations called vector embeddings. It then retrieves the most relevant data from that content and presents in the form of short, summarized response . Which leads to one major requirement for GEO to perform correctly, the data should be correct, updated, clear and trustworthy.

While traditional SEO revolves around search rankings, organic traffic, click through rate and keywords . Generative engine retrieves data through vector embedding and provides answer in the form of concise to the point conversational summaries .

2.2 Systematic Distortions of Generative AI in Data Retrieval

2.2a The dilemma of how to rank small businesses due to the presence of Citation Aristocracy

The usage of AI helps digital marketers to create content faster but it also possesses some challenges that effects the credibility of the software company's digital profile. One of those major challenges is to fight citation aristocracy, where the bigger companies with stronger domain authority and years of presence gets the attention of the AI search engines, leaving behind the small business whose content is equally based on quality and authority .

2.2b The impact of AI hallucinations and its impact on business reputation

Large Language Models generate responses based on similar words and creating summaries to support prompts, even if the phenomena in reality is not in favor of the prompt given. Moreover, AI also tempers with the statistical data that can negatively impact the strategic decisions based on the search results provided . It also, creates features of software that does not in reality exists and can harm the image of the software company. It also creates links to sources that does not exist . Therefore, creating AI generated content without reviewing it by a human field expert can damage a company's reputation, lead to legal issues and can cause ethical concerns .

2.2c AI citing AI leading to Model Collapse

Another concern with AI generated content is when AI usage is abused, by excessive use of the same data to train the models. This creates a loop of AI constantly citing other AI resources, which trains the model from its own created data without original and unique data provided by a human . This reduces the diversity, uniqueness, quality and factual accuracy of future AI results, leading to creating content that is not informative and cannot be used for decision making. Moreover, businesses using AI to constantly generate content without adding human expertise, experience and skills ultimately face it to be difficult to rank and not worth being shortlisted by AI search engines .

2.3 Theoretical Foundation: Diffusion of Innovation Theory

The theoretical foundation adopted in this research is Everett Rogers Diffusion of Innovation. The DOI highlights the gradual process of adopting a new technology and putting it in practice while it actually serves a purpose and offers efficiency. He highlighted that the new innovation is adopted based on five factors starting from relative advantage, checking compatibility, observing the complexity, putting it into trial and observing the results.

DOI theory Attributes	Meaning	Application to AI content Creation
Relative Advantage	The factors highlighting the features of the new technology	AI creates content ideas and transforms ideas into content at a very faster pace.
Compatibility	Analyzing how well the new technology fits into the needs of the market	AI does not always align with the brand's voice and content quality and authority.
Complexity	Studying the complexity of adoption and the issues along the way	Studying how difficult it is for SEO professionals to rank website as keywords, backlinking and CTR through organic traffic does not help rank.
Trialability	Putting the technology into trial base practical application to observe efficiency and drawbacks.	AI generated content has factual lacking, content hallucinations and can lead to damaging a business image
Observability	Applying mix strategies to observe if that fixed the problem.	Applying solutions that are a combination of traditional practices along with AI systems to observe if that worked and solved the problem that was faced earlier.

According to the theory of DOI, AI systems do offer advantages such as saving time, increasing productivity and can be easily tested by using free or affordable AI models. Having said that it is also clear that AI models do generate outputs that contain errors, does not align with the brand guidelines or creates features that are not offered by the software created. Moreover, software companies cannot track how AI is ranking their website, what strategy works and what is causing their site to fall behind, which means blind application of strategies without clear performance analysis.

To analyze what field experts are doing to resolve this problem, in the next chapter we will conduct a survey and study what are the practices in the software technology market right now to help the business rank on search engines.

3. Research Methodology

To analyze the experiences of search engine optimization professionals working in the software technology companies for at least four years, this study uses a qualitative phenomenological research approach. Using this approach helps to understand their personal experiences with trying various methodologies to rank AI generated content and their perceptions about how algorithms work with the advent of AI and suggestions to other SEO professionals to rank their content.

3.1 Sample selection Strategy

Search Engine Optimization professionals working in the software technology company for at least four years were selected, due to their experience with both traditional methods of SEO and now using generative AI tools to rank. The industry was chosen because it requires strong brand credibility, accurate information and it's need to adopt to new technologies. This makes the professionals working in software technology field best suited to provide their insights into using AI to create content that ranks and is authoritative.

3.2 Data Collection Methodology

The data was collected from twenty-five SEO professionals, who has experienced how the traditional SEO algorithms used to work and with the advent of AI how has it all changed. Through purposive sampling eight open ended questions were asked from the field professionals through a questionnaire .

3.3 Survey Questions

The survey is divided into two major parts and then among each of these parts are further questions. These two categories are deployment and integration, and performance and authority.

3.3 a Deployment and Integration

Under the category of deployment and integration there are four questions. The first question studies the workflow evaluation, the second question analyzes the velocity quality tension, the third one studies the Human-AI collaboration Models and the last one studies the methods for optimization for Agentic searches.

- a. How the usage of Large Language Models i.e. Gemini, Perplexity, ChatGPT, Claude, Blackbox.ai changed the creation of technical documentation and optimization of workflows in the past two years?
- b. How have you managed to keep the content creation velocity and quality both balanced after using AI Models?
- c. Highlight the step wise procedure that you have adopted over the period of time to keep human oversight of AI content generation and the stages where the AI usage helps to optimize the velocity of the content generation?
- d. What writing styles have you adopted to help AI agents to crawl and rank the web better?

3.3 b Performance and Authority

The questions in this section revolves around perceived ranking dynamics, the experience differentiator in both the traditional and AI content generation era, the change in user engagement and the risk of Ouroboros effect.

- a. As an SEO expert what are your observation of the content ranking after the integration of AI in the process of content generation.
- b. With the advent of AI in the process of content generation how do you make sure your AI generated content abides by the rules of E-E-A-T to search engines?
- c. What are your analysis based on the time a customer scrolls on your website and the bounce rate, to analyze if AI integration has increased the user engagement and trust or is it otherwise?
- d. Since it is observed that AI models cite other AI systems, how do you make sure your content is original, provides quality and is credible?

3.4 Data Analysis Methodology

The data collected from the survey was analyzed using Everett Rogers theory of ‘‘Diffusion of Innovation’’. The analysis of the data collected was carried in three steps,

a. The Deductive Coding

The answers provided in the survey were analyzed using the concept of DOI, i.e. relative advantage, compatibility, complexity of adoption, trialability and observability. Using this method, it was studied how the SEO professionals use the AI and their experience with the benefits and lacking of the AI Models.

b. Inductive Coding

During the data analysis some new themes and ideas were recorded where the SEO experts shared their knowledge and experience of how to strategically use AI to better rank in AI powered search engines. Moreover, they also highlighted tips and tricks to overcome the phenomena of citation aristocracy and ouroboros effect.

c. Thematic Analysis

As a solution the findings from the above both approaches were used to create a solution that promotes the usage of AI but also makes sure the content generated is authoritative. To do so it was advised by the SEO experts to keep mandatory expert reviews and fact checking as part of the content generation process before publishing.

Following these three analysis steps helped the researchers develop a Human in the Loop (HITL) framework, in human field experts review the content generated by AI and verify the numbers and analysis before making the data public. In the chapter below we will study what is that framework.

4. Findings

The analysis of the survey shows that SEO professionals working in software technology companies agree that AI does create content faster but that content has low quality and misleading or incorrect data. Moreover, the search engine algorithms have completely changed the criteria for web ranking and the traditional methodologies of SEO does not apply anymore.

4.1 AI Content Hallucination and Fabrication of Statistical Data

Participants highlighted that AI models generate incorrect information and fabricates actual statistical data leading to incorrect numbers just to support the main idea of the prompt given. This was highlighted by an example in the software technology companies where it creates fake software features, API functions and technical specifications that does not exist or is offered by the company itself.

These errors can be difficult to highlight as AI generates data to support such incorrect information in the follow up prompt responses. Therefore, it's mandatory to keep a human field expert in the loop while creating content for factual accuracy.

4.2 Citation Aristocracy and Lack of Data, leading to Model Collapse

A repeated pattern is observed by search engine optimization professionals where AI powered search engines rank websites with higher domain authority that are well known and highly trusted. Which makes it difficult for the newer websites to rank, even if the content is of good quality.

The survey participants also highlighted that when there is lack of original well researched data available online, the AI systems rely heavily on older information from it's training data. This creates a constant loop of AI citing AI, leading to poor data quality and no factual checking of the data. Overtime, this can lead to Ouroboros effect or model collapse. Therefore, businesses should conduct their own researches and factual check before uploading any AI generated data online.

4.3. Human-in-the-Loop (HITL) step by step Framework

To bring a balance to content creation velocity and content accuracy, this study proposes a Human in the Loop framework. In this approach, AI models are used as a supporting system rather than replacing human expertise. In this process humans are involved before, during and after the content generation to ensure the content published is relevant, accurate, original and suitable for publication. This five step approach includes human research, content planning, AI content creation, fact and source checking and expert review and approval.

Stages	Purpose	Process	Role
Human Research	To collect authentic data	Field experts conduct research by conducting surveys and interviews to collect data and review all the sources to make sure it's reliable.	Human (Subject expert Researcher)
Content Planning	To create a clear content strategy/Structure	SEO experts organize the data to make it easier for both users and AI search systems to understand.	SEO Strategist
AI Content Creation	AI efficiently generates content	AI using the human provided first draft creates content	AI Content creation Tools/ Human Prompt engineering skill
Fact and Source Checking	Look for errors and fact checking	The content editor/Specialist cross checks the statistical numbers, technical information and links for content accuracy.	Editor and Content Specialist
Expert review and content publication	Ensuring the final accuracy of content	The field expert reviews the content one last time before publication	Field Expert

4.3 a Stage 1: Human Research

This process starts with a human conducting field research by collecting data via interviews and surveys. This step ensures that the data collected offers a new information and contributes to a useful set of data that does not previously exist online or was not quite in detail, ultimately bringing value to the readers/users.

4.3 b Stage 2: Content Planning

At this stage the SEO strategist creates a clear outline to the content. This outline includes a heading with required keywords, sub headings, clearly explained important concepts that can easily be searched by the users and understood by the AI search engines.

4.3 c Stage 3: AI-Assisted Content Creation

At this stage the SEO strategist gives the right prompt with the outline drafted in the previous stage, to the AI content generating tool. This way the AI is only allowed to create content on the basis of specific instructions and only a set of verified data. This protects the data generated from citation aristocracy and ouroboros effect.

4.3 d Stage 4: Fact and Source Checking

After the content is generated by the AI content generating tool, the content is then verified by the subject field experts for any errors or factual inaccuracy. Incase, of any invalid links or data fabrication the content is further edited by the subject matter expert.

4.3 e Stage 5: Expert Review and Content Publication

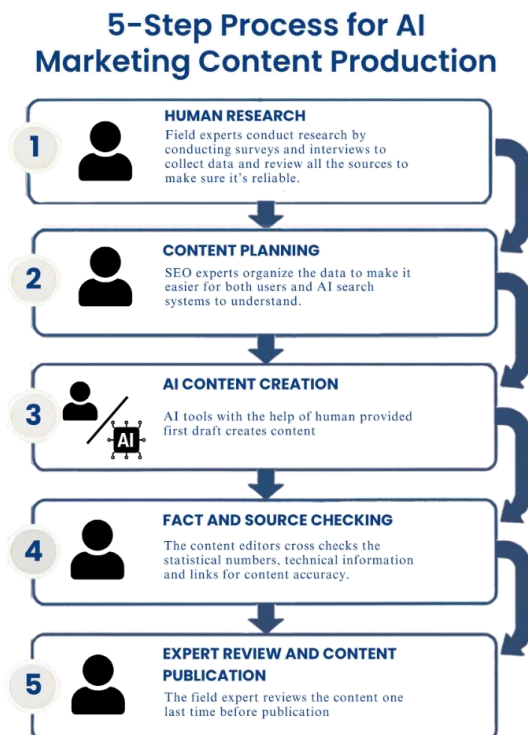
After the final draft is created by the AI model the content is reviewed by the subject matter expert for technical evaluation. When the content is approved for factual accuracy, field technicality and being appropriate for the industry, it is then published online. This entire process makes sure that automation speeds up the content but the content authority stays intact due to the involvement of human expertise.

5. Conclusion and Suggestions

This study highlights the shift from traditional SEO practices to the Generative Engine Optimization. The usage of GEO and AI tools accelerate the velocity of content generation saving time and giving better visibility to the business. Moreover, the AI search engines are more conversational and provides to the point summarized answers. However, there are some drawbacks to this new system of content search and content generation. It is observed by SEO field experts that AI generated content has factual inaccuracy, creates links that does not exists and software features that company does not actually offer. AI systems also fabricate data just to align the data generated to the prompt given.

To deal with these issues, the SEO field experts adopted ways to accelerate the content generation process but meanwhile keep the content credibility, accuracy and authority. This study suggests a solution after collecting data from SEO professionals and analyzed how they deal with this prevailing problem. The study suggests adopting Human in the Loop framework for content generation, to avoid citation aristocracy, ouroboros effect and model collapse phenomena.

For future research, researchers can study the concept in various other industries where the stakes are very high if the content generated is inaccurate. For instance, the medical field where, human life is involved and AI models used in various government organizations, where inaccurate analysis or misleading information can have serious consequences.



Source: Author's Suggestion/Contribution

References

1. Alex Lindley, C. S. (2025). 62 SEO Interview Questions. SEMRUSH.
2. Anand, A. (2026). SEO Specialist Interview Questions. Hiring Guide.
3. BrainTrust. (2024). AI Content Creator Interview Questions. BrainTrust.
4. Chrystal. (2026, July 31). What are AI hallucinations? IBM Articles.
5. Ciubotaru, B.-I. (2025, April). The hallucination problem in Generative Artificial Intelligence: accuracy and trust in digital learning. Research Gate.
6. Clay Halton, R. C. (2026). Understanding the Diffusion of Innovations Theory with Examples. Investopedia.
7. Joseph Vukov, G. L. (2025, August). The Ouroboros effect and heterodox domains. Ethics and Information Technology.
8. Joshi, S. (2025, May). Comprehensive Review of AI Hallucinations: Impacts and Mitigation Strategies for Financial and Business Applications. International Journal of Computer Applications Technology and Research.
9. Khan, M. (2026). Generative Engine Optimization (GEO): Teach AI Who You Are. Salesforce.
10. Narayan, K. M. (2026, Feb 12). The AI Ouroboros: When Language Models Train on Their Own Output. LinkedIn Articles.
11. Omid Tajik, J. G. (2024, December). Purposive Sampling. Research Gate.
12. Paruch, Z. (2025). GEO vs. SEO: A Comparative Guide for Digital Marketers. SEMRUSH.
13. Paul Usmany, R. R. (2024, July). The Effectiveness Of Search Engine Optimization (SEO) In Marketing: A Meta-Analysis Study. Journal of Economic Bussines and Accounting.
14. Peretti, G. d. (2023, Nov 19). Ouroboros of AI: The peril of generative models feeding on their creations. Medium.
15. Pooler, D. (2026). How SEO and PPC build trust across search: Case study. Search Engine Land.
16. Rajeshwari Krishnamurthy, V. B. (2025, Nov 20). Will GEO Overtake SEO? California Review Management.
17. Rayhan, A. (2025, November 30). Generative Engine Optimization (GEO): The Mechanics, Strategy, and Economic Impact of the Post-Search Era. Research Gate.
18. Rayhan, A. (2025, Nov). Generative Engine Optimization (GEO): The Mechanics, Strategy, and Economic Impact of the Post-Search Era. ResearchGate.
19. Rayhan, A. (2025, Nov 30). The Great Decoupling: Transitioning from Search Engine Optimization (SEO) to Generative Engine Optimization (GEO). Research Gate.
20. Shravika Mittal, S. L. (2026, June 10). Learning by Chatting? Investigating the Impact of Generative AI on Information Seeking and Learning. arXiv.
21. Smith, L. C. (2002). Artificial intelligence in information retrieval systems. Science Direct.
22. Tera. (2026). How to Do Content Analysis in the Age of AI. Content Marketing by Tera.
23. Turner, R. (2007, December). Diffusion of Innovations, 5th edition, Everett M. Rogers. Free Press, New York, NY (2003), 551 pages. Journal of Minimally Invasive Gynecology.
24. Xiaojun Zhang, P. Y. (2015, February 21). Using diffusion of innovation theory to understand the factors impacting patient acceptance and use of consumer e-health innovations: a case study in a primary care clinic. PubMed.
25. Yulia Deda, A. K. (2025). SEO Interview questions and Answers. SE Ranking.
26. Zhang, A. (2025, Aug 1). Information Retrieval in the Age of Generative AI: A Mismatch That Matters. Taylor & Francis.