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1. Introduction

The emergence of generative artificial intelligence in recent years has been one of the most significant developments within the digital marketing ecosystem and creative industries. Leveraging large language models and advanced deep-learning architectures, this technology has transformed the ways in which content is produced, personalized, and distributed, enabling capabilities that were previously unattainable within traditional content production paradigms (Kubovics, 2024). Today, GenAI can generate textual, visual, audio, and video content at scale and with a high level of coherence and quality, thereby redefining the boundaries between human creativity and computational generation, and enabling brands and consumers to engage in highly personalized, interactive, and data-driven experiences (Gabidullin & Krutina, 2025).

Based on the existing body of research, the key functions of Generative AI in content marketing can be categorized into three main domains. First are the automation and enhancement of content production, whereby GenAI—through natural language processing and its multimodal capabilities—accelerates and optimizes various production processes, including the generation of advertising copy, the creation of customized images and videos, and the reconfiguration of media assets (Hartmann et al., 2025). The second domain is deep and real-time personalization of marketing messages, enabled by the analysis of behavioral data and predictive algorithms. This capability not only enhances user experience but also increases engagement, loyalty, and the effectiveness of marketing campaigns (Babatunde et al., 2024). The third domain involves the optimization of marketing strategies through predictive analytics, real-time message adaptation, and strategic decision modeling, allowing GenAI to identify audience behavior patterns and provide data-driven recommendations for designing targeted campaigns (Mirzayi & Nobari).

2. Literature Review and Theoretical Foundations

Generative Artificial Intelligence has fundamentally disrupted the marketing industry and introduced a new paradigm in the automated production of marketing content (Peres et al., 2023). Reputable industry reports estimate the potential economic value of this technology in the marketing domain alone at more than US\$463 billion (Chui et al., 2023). Both in professional marketing practice and in academic research, substantial and compelling evidence has emerged regarding the high disruptive capacity of generative AI (Ooi et al., 2025). Accordingly, several organizations have already successfully deployed generative AI-produced content in real-world marketing campaigns (Noy & Zhang, 2023). Despite this promising outlook, the widespread and sustained organizational adoption of generative AI critically depends on two key factors: its effectiveness in achieving marketing objectives and its economic efficiency, particularly its ability to generate significant cost savings in content production (Dutt et al., 2024).

Despite these transformative capabilities, the widespread application of generative artificial intelligence is accompanied by a series of significant challenges and risks. The most prominent concerns highlighted in the scholarly and professional literature include breaches of data privacy, intellectual property and copyright violations, the generation of misleading or entirely synthetic content, embedded algorithmic biases, and excessive homogenization of produced content (Du Plessis, 2025). Furthermore, the potential displacement of human workers from creative and strategic roles represents an additional critical issue, carrying broad socio-economic and organizational implications that warrant in-depth investigation. Given the rapid pace of development and adoption of this technology, the formulation of comprehensive regulatory frameworks and clear ethical standards to ensure the responsible and sustainable use of generative AI in marketing has become an urgent and fundamental imperative (Szczepanski, 2019).

However, despite the rapid proliferation of generative AI tools and the growing body of academic and industry-focused studies, current knowledge in this domain remains fragmented and lacks a systematic, data-driven understanding of how this field has evolved, which institutions and scholars are shaping it, and what thematic structures underpin the existing research landscape. Although individual studies have examined specific use cases—such as personalization, creative automation, and strategic optimization—there is still no comprehensive bibliometric overview that maps the intellectual foundations, research clusters, and emerging trends of generative AI within the context of content marketing. Given the unprecedented growth of publications since 2023 and the strategic importance of generative AI for both industry and academia, a holistic and scientifically rigorous analysis is essential.

This section presents the results of the bibliometric review and analysis. The findings are organized into four main parts: 1) an overview of the scientific output on generative AI in digital content marketing, 2) a descriptive analysis of document types, 3) keyword co-occurrence and research hotspot identification, and 4) co-authorship and co-citation network structures. The bibliometric search and screening process resulted in 437 relevant scholarly documents published between 2019 and 2025. The annual growth trend illustrates a sharp increase in publications from 2022 onward, reflecting the rapid adoption of generative AI technologies in marketing and content-related domains. Table 1 summarizes the types of documents included in the final dataset. Research articles constitute the vast majority of the literature, indicating that the field is in a phase of rapid empirical development, while review articles remain comparatively limited.

Table 1. Types of retrieved documents

Type of Document	Frequency	Proportion (%)
Article	403	92.2%
Review	34	7.8%
Total	437	100.0%

The dominance of research articles highlights the field's strong orientation toward empirical inquiry, experimental evaluation, and model-driven investigations. The relatively small number of reviews suggests that synthesis and conceptual integration are still emerging.

The analysis aimed to identify key research areas and predict future topics. VOSviewer, developed in 2010 by van Eck and Waltman, is a tool for creating and exploring network-based visualizations. The software generates networks of publications, journals, researchers, organizations, countries, and keywords, which are connected through co-authorship, co-occurrence, or citation. It can also collect data from multiple scientific databases, including Scopus, Web of Science, Dimensions, PubMed, and reference management files (Van Eck & Waltman, 2010).

Current Status of Research on the Application of Generative AI in Content Marketing.

Annual Trends in Publications. The temporal distribution of the **437 documents** retrieved from the Scopus database for the period **2019 to November 2025** reveals a clear pattern of exponential growth (Figure 1). Prior to 2022, the number of indexed publications in this field was extremely limited, totaling only **six** (2019: $n = 1$; 2020: $n = 1$; 2021: $n = 2$; 2022: $n = 1$). This scarcity indicates that before the widespread public release of large language models and generative AI-based visual content systems, the application of generative AI in content marketing had not yet emerged as a distinct and recognizable research domain.

Beginning in 2023, however, the volume of publications shows a sharp and sustained acceleration:

- 2023: 18 documents
- 2024: 127 documents (a 606% increase compared to 2023)
- 2025 (as of 1 November): 286 documents (a 125% increase compared to 2024)

In total, 98.9% of all documents (432 out of 437) were published within a span of less than three years (2023–2025). Such a concentration of publications is characteristic of the early stages of emerging transformative technologies, signaling the rapid transition of the field into an early-adoption phase and its rising visibility within the scientific community (Christensen et al., 2015).

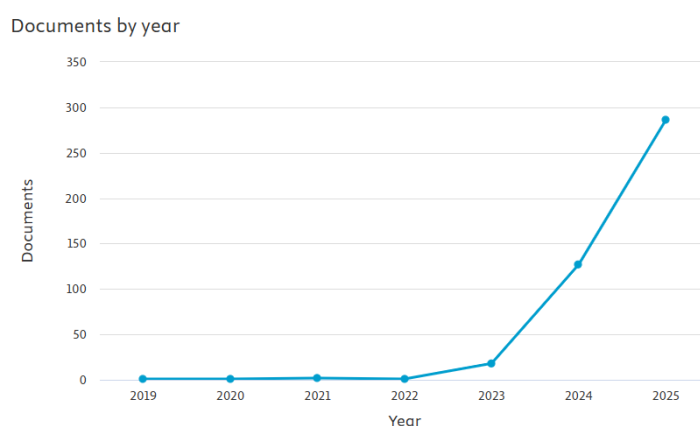


Figure 1. Annual publication trends of generative AI in content marketing (2019–November 2025)

This dramatic surge in scholarly output aligns closely with several major milestones in the development and commercialization of generative AI technologies, including:

- The public release of ChatGPT by OpenAI in November 2022
- The introduction of GPT-4 in March 2023
- The emergence of advanced image-generation systems such as Midjourney V5, DALL·E 3, and Stable Diffusion XL during 2023–2024

These technological breakthroughs substantially reduced the cost, time, and expertise required to generate high-quality text and visual content at near-human levels, thereby accelerating both the practical adoption and academic examination of generative AI in content marketing (Dwivedi et al., 2023).

The exceptionally steep rise in publications in **2025** underscores the urgent need for future systematic reviews, meta-syntheses, and integrated conceptual frameworks to help consolidate the rapidly expanding body of knowledge and maintain coherence with the pace of technological advancement.

- *Institutional and Author-Level Performance Analysis*

The institutional performance analysis indicates a clear pattern of concentrated research activity within a relatively small group of leading universities. Nanyang Technological University (NTU) in Singapore emerges as the primary knowledge hub, contributing 18 publications, the highest output among all institutions identified in this study. This level of productivity positions NTU as the central driver of scientific inquiry into the application of generative AI in content marketing, reflecting both its strategic investment in AI research and its strong interdisciplinary collaborations.

A second high-performing cluster is composed of Guangdong University of Technology, the University of Waterloo, and the Singapore University of Technology and Design (SUTD), each producing 11 publications. Their comparable research output highlights a distributed but coordinated expansion of scholarly engagement across Asia and North America. The prominence of Chinese and Singaporean institutions in particular underscores Asia's growing leadership in AI innovation and its rapid integration of generative AI technologies into marketing-related research domains.

Beyond these core institutions, several universities demonstrate moderate yet notable participation. Sungkyunkwan University and the Beijing University of Posts and Telecommunications, each with 8 publications, represent emerging contributors that, while not matching the output of top-tier institutions, nonetheless play an important role in diversifying geographic and intellectual perspectives within the field. The inclusion of major European institutions such as Technische Universität München reinforces the global diffusion of research efforts and suggests that generative AI in content marketing has quickly become an internationally distributed topic of inquiry.

Overall, the institutional landscape reflects a hub-and-cluster structure, with a small number of highly productive universities forming the core of the research network, surrounded by a broader set of moderately active institutions. This configuration mirrors patterns commonly observed in early-stage emerging technology domains, where knowledge production initially concentrates in a few leading centers before diffusing outward as the field matures.

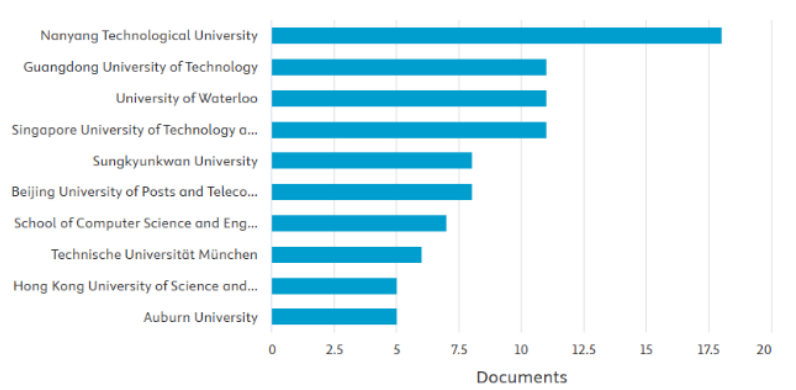


Figure 2. Distribution of documents by affiliation

- *Author-Level Performance Analysis*

In parallel with the institutional patterns, the author-level analysis reveals a similarly concentrated structure of knowledge production. Niyato, D. stands out as the most prolific and influential contributor, with 14 publications, underscoring his central role in shaping the scholarly discourse on generative AI applications in content marketing. His affiliation with the School of Computer Science and Engineering at Nanyang Technological University (NTU) directly aligns with the institutional findings, reinforcing NTU's dual prominence both as a leading research institution and as the academic home of the field's most productive scholar. This alignment suggests that NTU hosts cohesive and well-resourced research groups whose sustained output significantly drives the field's development.

The second most prolific contributor, Du, H., with 11 publications, is affiliated with the University of Hong Kong, indicating that influential research efforts extend beyond NTU while still remaining concentrated within leading Asian academic centers. Other prominent authors include Xiong, Z. (10 publications) and Kang, J. and Shen, X. (each with 9 publications). Collectively, this group constitutes the core intellectual network advancing theoretical and empirical knowledge in this emerging domain.

The strong overlap between the most productive author and the most active institution provides evidence of a centralized expertise structure, where leading scholars are embedded in high-performing institutions that serve as hubs of innovation. Such configurations are characteristic of early-stage research domains, where pioneering groups often accelerate knowledge accumulation before broader global participation unfolds.

In summary, the author-level data reinforce the overarching pattern of geographically concentrated and institutionally anchored knowledge production, predominantly within Asia. To further understand the evolution of this research field, future studies could employ co-

authorship and collaboration network analyses, which would help illuminate the structural dynamics, cross-institutional linkages, and potential future trajectories of scholarly interaction.

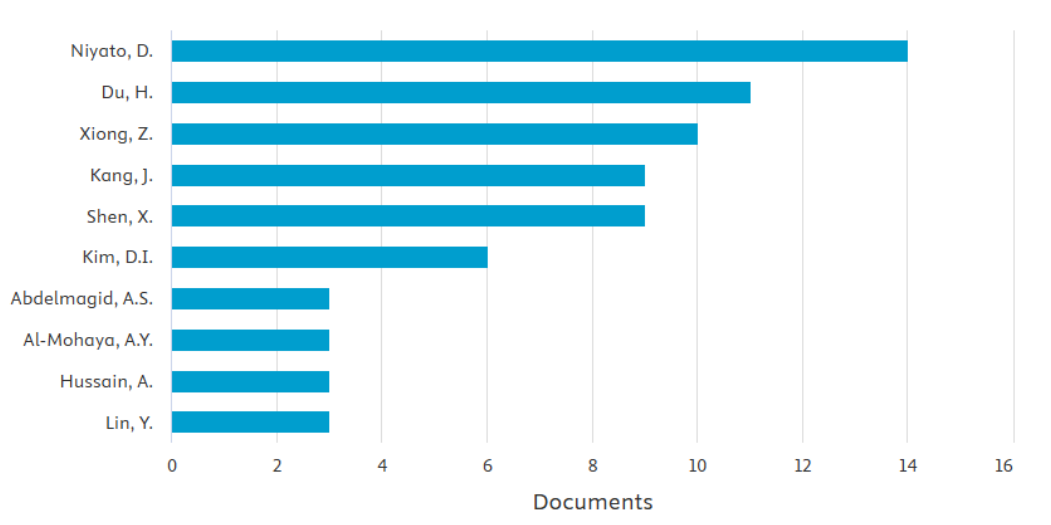


Figure 3. Distribution of Publications by Authors

- *Country- or Region-Level Analysis*

The country- and region-level distribution of publications reveals that research on generative AI applications in content marketing is geographically concentrated within several well-established global scientific hubs. The United States, with 96 publications, leads by a clear margin, reaffirming its dominant position in the global AI research ecosystem. This prominence reflects the U.S.'s strong academic-industry linkages, extensive research infrastructures, and early adoption of generative AI technologies across commercial and scholarly domains.

China (81 publications) and India (50 publications) follow as major contributors, underscoring the pivotal role of large, research-intensive economies in advancing scholarship in this emerging area. Their rapid growth in AI-related research—supported by substantial national investments in digital transformation—aligns with broader global patterns in technology-driven fields. Notably, there is a significant decline in publication volume after these top three countries, indicating a steep concentration of research output among leading economies.

Beyond these global powerhouses, several Asian countries demonstrate noteworthy engagement. Singapore (28 publications) and South Korea (27 publications) stand out as significant contributors relative to their size. This pattern is consistent with the organizational analysis, which identified Nanyang Technological University (Singapore) as the most productive institution. The alignment between national output and institutional leadership highlights the presence of highly concentrated research clusters, shaped by targeted government policies and strategic university investments in AI, data science, and digital innovation.

European countries also maintain a visible footprint in the field. The United Kingdom (29 publications) and Germany (18 publications) represent the most active European contributors, reflecting their long-standing academic traditions and strong emphasis on AI regulation, digital economies, and marketing technologies. Meanwhile, Australia (24 publications) and Canada (23 publications) signal substantial scholarly engagement from Oceania and North America beyond the United States.

At the lower end of the distribution, Saudi Arabia (16 publications) shows emerging but still limited participation, suggesting growing but early-stage engagement with generative AI research within the marketing domain.

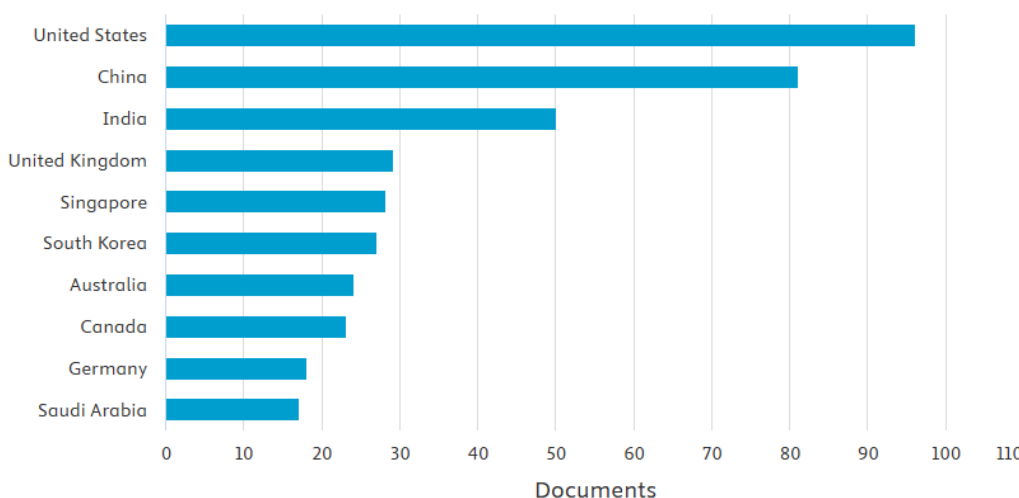


Figure 4. Distribution of documents by country or territory

- *International Collaboration and Co-authorship Network*

The country-level co-authorship network (Figure 5) provides a deeper understanding of the structural dynamics underlying international collaboration in research on generative AI for content marketing. While the United States remains the most prolific contributor in terms of publication volume (96 documents), Singapore emerges as the most central and structurally influential actor within the global network. Its high betweenness centrality and bridging role underscore Singapore's critical function in connecting Eastern and Western research communities—particularly through strong collaborative ties with the United States, South Korea, Hong Kong, and Australia.

A dense collaboration corridor is evident across North America and East/Southeast Asia, linking countries such as Singapore, South Korea, Hong Kong, the United States, and Canada. This cluster reflects long-standing, well-integrated transnational research partnerships that facilitate knowledge exchange and support the joint advancement of AI-driven marketing scholarship. In contrast, European countries—including Germany, Italy, the United Kingdom, and the Netherlands—as well as Middle Eastern countries such as Saudi Arabia, the United Arab Emirates, and Qatar, tend to form smaller, less interconnected clusters or remain

relatively peripheral within the broader network. This pattern suggests that despite their growing research output, international co-authorship linkages in these regions are still comparatively underdeveloped. The disparity between publication volume and network centrality—most notably Singapore’s disproportionately high structural influence relative to its absolute output—highlights the strategic importance of cross-border collaboration. Countries that foster openness, institutional connectivity, and active participation in global research networks can significantly amplify their scholarly impact even without leading in total publication counts.

Figure 5 presents the international co-authorship network based on a minimum threshold of five co-authored documents per country. Out of the 77 countries identified in the dataset, 33 met this criterion and were included in the visualization. Node size corresponds to the number of publications, while link thickness represents the strength of collaborative ties between countries.

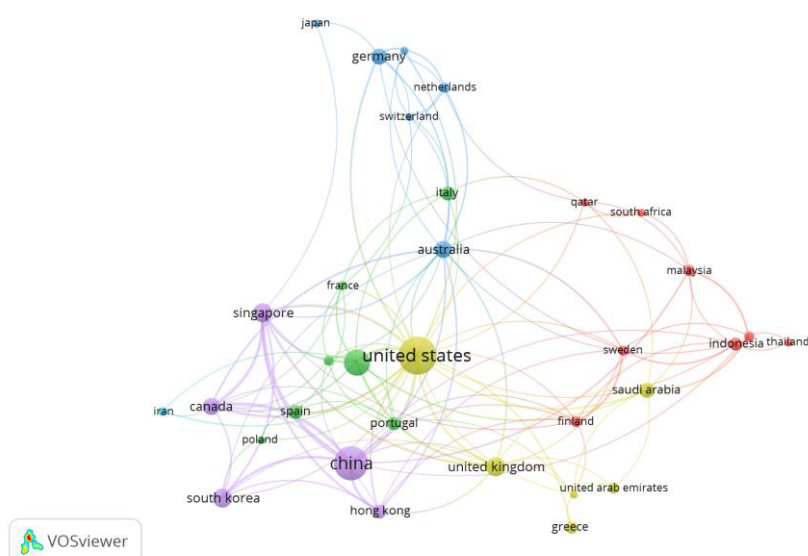


Figure 5. International co-authorship network among countries

- *Keyword Co-occurrence and Thematic Structure*

Figure 6. presents the keyword co-occurrence network, constructed using all author and indexed keywords with fractional counting and a thesaurus applied for term normalization. A minimum threshold of five occurrences was used; of the 4,921 identified keywords, 168 met this criterion and were included in the final map. For improved readability, only keywords appearing at least twelve times are labeled. The visualization reveals four major thematic clusters, automatically identified using VOSviewer:

Cluster 1 (Red) – Technical Foundations and Generative Mechanisms: Characterized by keywords such as large language models, machine learning, diffusion models, computational linguistics, AI-generated content, deepfakes, and metaverses. This cluster represents the underlying technological infrastructure and advanced generative processes that drive developments in the field.

Cluster 2 (Green) – Educational Applications and AI-Supported Learning: Centered around keywords including ChatGPT, educational technology, teaching, learning systems, chatbots, and students. This theme captures the expanding integration of generative AI—especially LLM-based tools—into educational environments, curriculum design, and instructional practices.

Cluster 3 (Yellow) – Digital Marketing and Consumer-Facing Applications: Comprised of terms such as social media, digital marketing, content marketing, electronic commerce, marketing, and digital transformation. This cluster reflects the widespread commercial adoption of generative AI for personalized content creation, social media strategy optimization, and enhanced customer engagement.

Cluster 4 (Blue) – Human–AI Interaction and Sociotechnical Implications: Includes keywords such as human–AI collaboration, creativity, ethics, performance, and copyright. Although smaller, this emerging cluster highlights concerns surrounding ethical governance, augmented creativity, and the changing nature of human roles in AI-driven content production.

The central positioning of generative artificial intelligence within the network and its strong cross-cluster linkages demonstrate its role as a unifying paradigm connecting foundational technologies (Cluster 1) with downstream applications in education (Cluster 2), marketing (Cluster 3), and sociotechnical discourse (Cluster 4). The prominence of ChatGPT and large language models further indicates that LLM-based generative systems currently dominate both academic research and practical discussions in this domain.

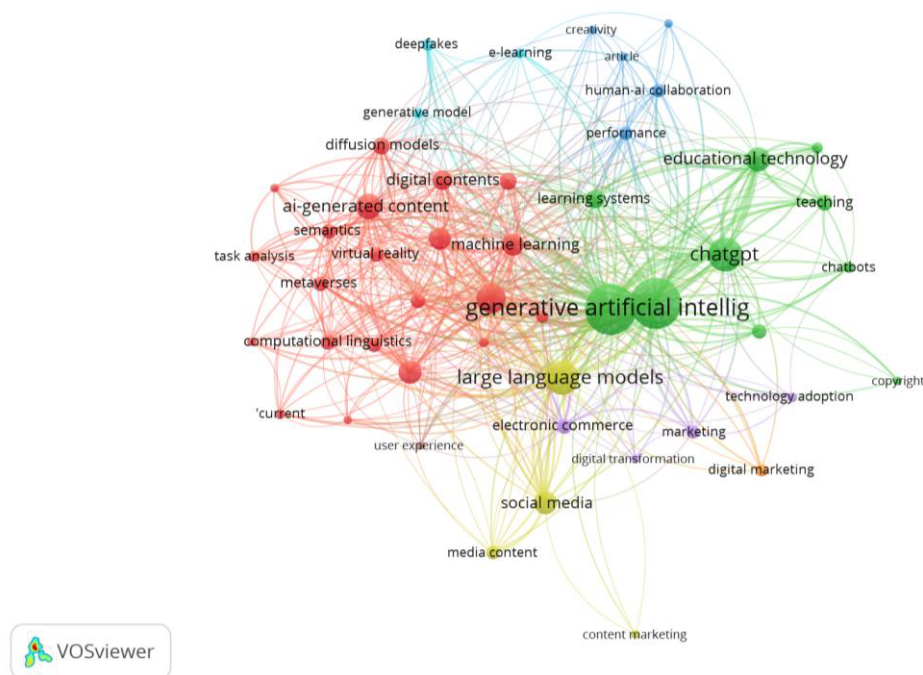


Figure 6. Co-occurrence Map of Keywords

Figure 6. Keyword co-occurrence network (all keywords, fractional counting, thesaurus applied). Minimum threshold: 5 occurrences; 168 of 4,921 keywords met the criterion. Only

keywords with ≥ 12 occurrences are labeled. Four thematic clusters were automatically identified.

- *Intellectual Structure: Reference Co-citation Analysis*

Reference co-citation analysis was conducted to identify the intellectual foundations and core thematic streams shaping the field (Figure 7). Applying a minimum threshold of four co-citations, 39 references—out of 3,442 cited sources—met the inclusion criteria and were visualized using VOSviewer with association-strength normalization.

The resulting network reveals four clearly delineated and cohesive intellectual clusters, reflecting the rapid consolidation of scholarly discourse on generative artificial intelligence:

Cluster 1 (Red – Technical and Architectural Foundations):

This cluster is the most technically oriented and comprises seminal works on foundational models and algorithms. Central references include (Brown et al., 2020) on large language models, the GPT-4 Technical Report (OpenAI, 2023), (Ramesh et al., 2021) on zero-shot text-to-image generation, and (Ho et al., 2020) on denoising diffusion probabilistic models. Collectively, these works constitute the technological substrate that underpins advances in generative AI research and applications.

Cluster 2 (Green – Conceptualization and Managerial Implications):

Representing the dominant knowledge base in business, management, and marketing scholarship, this cluster is anchored by (Dwivedi et al., 2023)—the most central and heavily co-cited reference in the network. Closely associated works include Harvard Business Review (2023), (Kasneci et al., 2023), and other influential contributions that translate generative AI capabilities into organisational strategies, managerial frameworks, and marketing opportunities as well as emerging risks.

Cluster 3 (Cyan/Blue – Education and Professional-Task Applications):

This cluster focuses on the transformative impact of generative AI on learning, creativity, and knowledge-intensive work. Key references include empirical and conceptual studies on ChatGPT in educational contexts (Li et al., 2023), writing and ideation support and the broader enhancement of professional productivity (Barrot, 2023).

Cluster 4 (Purple – Review and Synthesizing Studies):

Consisting primarily of integrative reviews and high-level surveys, this cluster attempts to map the rapidly expanding literature on AI-generated content and generative AI ecosystems. Examples include (Ooi et al., 2025) and comprehensive surveys published between 2023 and 2025 that delineate research trajectories, methodological patterns, and emerging domains.

The pronounced separation between the technically oriented cluster and the conceptually/application-driven clusters indicates an ongoing divergence—yet persistent interdependence—between engineering-centered and management-centered research streams. Crucially, the central bridging role of Dwivedi et al. (2023) across clusters reinforces

search was conducted on 1 November 2025. To ensure the broadest possible coverage of relevant literature, a structured search query was developed within the TITLE-ABS-KEY field. The query was designed to link various terms related to generative artificial intelligence (GenAI, LLMs, foundation models, AI-generated content, text-to-image/video models) with key concepts in content marketing. To maintain both comprehensiveness and precision, the following restrictions were applied:

- Document type: Research articles and systematic or narrative reviews only
- Subject area: Business and management, social sciences, computer science, arts, and decision sciences
- Publication years: 2019–2025 (reflecting the emergence of GenAI from 2019 onward)
- Language: English

Despite the breadth of the query, no irrelevant document types—including conference abstracts, letters, editorials, book reviews, or corrections—were included in the analysis. To ensure the relevance of the retrieved documents to the core topic of the study, a two-stage screening process was implemented:

1. Title–abstract screening: All retrieved documents were examined based on their titles, abstracts, and keywords to determine whether they explicitly connected “generative artificial intelligence” with “content marketing.”
2. Full-text assessment (for ambiguous cases): Documents whose relevance could not be confirmed through the initial screening were evaluated through full-text review.

Duplicate records (e.g., print versions and online-first versions) were removed during the deduplication process. Additionally, synonymous keywords (e.g., “Generative AI” and “GenAI”) were standardized.

After applying all inclusion criteria and relevance screening steps, a total of 437 scholarly documents were retained as the final dataset. All documents were academically valid, thematically relevant, and contained at least one explicit link between GenAI and content-related themes (content creation, personalization, strategy, production, or marketing).

4. Discussion and Conclusion

The findings of this bibliometric analysis reveal that research on generative artificial intelligence in content marketing has undergone exceptionally rapid expansion since 2023, driven by the widespread commercialization of large language models, multimodal generative systems, and the declining costs of AI-based content creation (Wahid et al., 2023). The exponential growth of publications—coupled with the concentration of scholarly activity within a limited number of institutions, countries, and thematic areas—provides important insights into the current maturation trajectory and emerging knowledge structures of this field.

The dramatic shift in publication output after the release of ChatGPT and subsequent foundational models indicates a paradigm shift from exploratory conceptual work to intensive empirical and application-oriented investigations. The near-exclusive clustering of scholarly

output between 2023 and 2025 suggests that generative AI has rapidly transitioned from a technological novelty into a core research domain that spans marketing, management, computer science, education, and digital communication (Cillo & Rubera, 2025). This transition mirrors patterns typically observed in early-stage disruptive technologies: a period of conceptual incubation followed by explosive applied research as technical capabilities mature. The observed patterns also demonstrate that the marketing discipline is actively integrating computational and algorithmic perspectives, reflecting a broader trend toward data-driven creative work and automated content pipelines (Rogers et al., 2014).

The analysis of institutional and geographical patterns reveals a highly asymmetric research landscape dominated by a small number of global hubs. The United States, China, and India produce the majority of publications, yet Singapore emerges as the most structurally influential actor in international collaboration networks. This divergence between output volume and network centrality highlights a critical insight: structural influence in scientific collaboration is not solely determined by publication count but by the ability to bridge disparate research communities. Singapore's role as a knowledge broker—supported by institutions such as Nanyang Technological University—suggests that small but strategically positioned countries can exert disproportionate influence within emerging research ecosystems. In contrast, European and Middle Eastern clusters appear comparatively fragmented, indicating untapped potential for broader integration into global research networks (Ooi et al., 2025).

The keyword co-occurrence analysis reveals a field structured around four interconnected thematic clusters: (1) technical foundations of generative AI, (2) educational and learning applications, (3) digital marketing and consumer-facing applications, and (4) human–AI interaction and sociotechnical implications. This distribution indicates that generative AI in content marketing is no longer confined to purely commercial or managerial concerns but intersects deeply with computational linguistics, pedagogy, psychology, and creative cognition. The central role of “generative artificial intelligence,” “ChatGPT,” and “large language models” demonstrates that LLM-centric technologies are defining both the methodological approaches and conceptual narratives that structure the field (Cillo & Rubera, 2025; Ooi et al., 2025).

The co-citation analysis provides evidence of a persistent yet productive tension between engineering-driven research (e.g., diffusion models, LLM architecture) and management-driven research (e.g., strategic adoption, organizational value, ethical governance). The pronounced separation of these clusters—combined with their interdependence—implies that advancements in content marketing applications remain tightly coupled to breakthroughs in core generative AI technologies. The centrality of (Dwivedi et al., 2023) as a bridging reference demonstrates that integrative frameworks linking technical capabilities with managerial implications are essential for unifying the field. This bridging work is likely to remain critical as generative AI becomes increasingly embedded in content production workflows.

While a significant portion of the literature focuses on technical and marketing-oriented applications, the emergence of a dedicated cluster on human–AI interaction, creativity, ethics,

and copyright suggest growing awareness of the broader sociotechnical challenges. Issues such as the authenticity of AI-generated content, algorithmic bias, the protection of creative labor, and the governance of synthetic media represent areas of rising scholarly attention (Gupta et al., 2024). Given the increasing deployment of generative AI in commercial content pipelines, addressing these challenges will be essential for ensuring sustainable and responsible adoption. The results of this study reveal several important implications: There is a need for integrated frameworks that connect computational advances with marketing strategy, creativity theory, and consumer behavior. Current research streams remain partially siloed. The dominance of empirical and model-driven studies signals a shift toward experimental and data-intensive research designs, requiring interdisciplinary skillsets and new measurement tools. Organizations can leverage generative AI for personalization, cost reduction, and workflow optimization, but must also manage risks relating to authenticity, copyright, and ethical use.

Taken together, the findings indicate that generative AI is reshaping not only content marketing practices but also the epistemological foundations of marketing scholarship. The convergence of computational linguistics, multimodal modeling, and strategic communication suggests that marketing is entering a phase where creative processes, consumer engagement, and market analytics are mediated by increasingly autonomous generative systems. This transformation requires marketing scholars to rethink traditional assumptions about creativity, human agency, value co-creation, and content authenticity in a world where machines can produce persuasive, adaptive, and context-sensitive content at scale (Cillo & Rubera, 2025; Gupta et al., 2024).

Conclusion. The study provides the first comprehensive bibliometric examination of generative artificial intelligence in the context of content marketing, drawing on 437 scholarly publications indexed in Scopus between 2019 and 2025. Through descriptive analysis, keyword co-occurrence mapping, co-authorship network visualization, and reference co-citation analysis, the research offers a holistic overview of how this rapidly evolving field is structured, who its key contributors are, and which thematic and intellectual trajectories define its current development.

The findings reveal an exceptionally rapid acceleration of research activity beginning in 2023, coinciding with the public release and widespread adoption of large language models and multimodal generative tools. This surge reflects a profound transformation in both marketing practice and academic inquiry, as generative AI technologies begin to reshape content creation workflows, personalization strategies, and creative decision-making processes. The concentration of scholarly output within a small group of institutions—most notably Nanyang Technological University—and leading countries such as the United States, China, India, and Singapore underscores the emergence of new global hubs of expertise and innovation.

The science-mapping analyses identify four major thematic domains: (1) technical and architectural foundations of generative models, (2) educational applications and AI-supported learning, (3) digital marketing and consumer-facing use cases, and (4) human–AI interaction and sociotechnical implications. These clusters highlight the multidimensional nature of generative AI scholarship, spanning engineering, marketing, education, and ethical

governance. The reference co-citation analysis further demonstrates a structural divide—yet strong interdependence—between technical and managerial research streams, with Dwivedi et al. (2023) serving as a central integrative reference that links algorithmic advances to organizational and marketing perspectives. The overall intellectual structure suggests that generative AI is moving beyond a technological innovation toward a foundational paradigm reshaping the theory and practice of content marketing. However, the findings also expose gaps in the existing literature, including fragmented collaboration networks in parts of Europe and the Middle East, limited synthesis of interdisciplinary insights, and insufficient attention to long-term ethical, regulatory, and socio-economic implications.

Future research should address these gaps by developing integrative frameworks, conducting longitudinal studies, and exploring cross-cultural perspectives on adoption, creativity, trust, and consumer behavior in AI-mediated environments. Expanding collaboration across regions and disciplines will also be essential for fostering a more cohesive and globally representative knowledge base. In summary, generative artificial intelligence is redefining content marketing at conceptual, operational, and technological levels. As the capabilities of generative models continue to grow and their adoption becomes more embedded in organizational practice, scholars and practitioners must develop new theoretical lenses, governance models, and methodological approaches to harness the potential of these technologies while mitigating their risks. This study provides a foundational map for navigating this emerging landscape and offers a structured basis for future academic inquiry and practical innovation.

References

1. Babatunde, S. O., Odejide, O. A., Edunjobi, T. E., & Ogundipe, D. O. (2024). The role of AI in marketing personalization: A theoretical exploration of consumer engagement strategies. *International Journal of Management & Entrepreneurship Research*, 6(3), 936-949. <https://doi.org/10.51594/ijmer.v6i3.964>
2. Barrot, J. S. (2023). Using ChatGPT for second language writing: Pitfalls and potentials. *Assessing Writing*, 57, 100745. <https://doi.org/10.1016/j.asw.2023.100745>
3. Brown, T. B., Mann, B., Ryder, N., Subbiah, M., Kaplan, J., Dhariwal, P., Neelakantan, A., Shyam, P., Sastry, G., Askell, A., Agarwal, S., Herbert-Voss, A., Krueger, G., Henighan, T., Child, R., Ramesh, A., Ziegler, D. M., Wu, J., Winter, C., ... Amodei, D. (2020). Language models are few-shot learners. *Advances in Neural Information Processing Systems*, 33, 1877–1901. <https://doi.org/10.48550/arXiv.2005.14165>
4. Christensen, C. M., Raynor, M., & McDonald, R. (2015). 17. Disruptive innovation. *Harvard business review*, 93(12), 44-53.
5. Chui, M., Hazan, E., Roberts, R., Singla, A., & Smaje, K. (2023). *The economic potential of generative AI: The next productivity frontier*. McKinsey Global Institute.
6. Cillo, P., & Rubera, G. (2025). Generative AI in innovation and marketing processes: A roadmap of research opportunities. *Journal of the Academy of Marketing Science*, 53(3), 684-701. <https://doi.org/10.1007/s11747-024-01044-7>
7. Du Plessis, C. (2025). Ethical requirements for generative AI in brand content creation: a qualitative comparative analysis. *Frontiers in Communication*, 10, 1523077.
8. Dutt, D., Beena, A., & Perricos, C. (2024). Now decides next: Insights from the leading edge of generative AI adoption. Deloitte's State of Generative AI in the Enterprise Quarter One Report.
9. Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., & Ahuja, M. (2023). "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy.

International Journal of Information Management, 71, Article 102642.

10. Gabidullin, R. R., & Krutina, E. V. (2025). How generative artificial intelligence is impacting marketing. In *Big Data and Artificial Intelligence for Decision-Making in the Smart Economy* (pp. 199–205). Springer.
11. Gupta, R., Nair, K., Mishra, M., Ibrahim, B., & Bhardwaj, S. (2024). Adoption and impacts of generative artificial intelligence: Theoretical underpinnings and research agenda. *International Journal of Information Management Data Insights*, 4(1), 100232. <https://doi.org/https://doi.org/10.1016/j.ijime.2024.100232>
12. Hartmann, J., Exner, Y., & Domdey, S. (2025). The power of generative marketing: Can generative AI create superhuman visual marketing content? *International Journal of Research in Marketing*, 42(1), 13-31. <https://doi.org/https://doi.org/10.1016/j.ijresmar.2024.09.002>
13. Ho, J., Jain, A., & Abbeel, P. (2020). Denoising diffusion probabilistic models. *Advances in neural information processing systems*, 33, 6840-6851.
14. Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., & Hüllermeier, E. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, Article 102274..
15. Kubovics, M. (2024). Innovative content production in marketing communication through AI. *European Conference on Innovation and Entrepreneurship*.
16. Li, B., Kou, X., & Bonk, C. J. (2023). Embracing the disrupted language teaching and learning field: Analyzing YouTube content creation related to ChatGPT. *Languages*, 8(3), Article 197.
17. Martins, J., Gonçalves, R., & Branco, F. (2024). A bibliometric analysis and visualization of e-learning adoption using VOSviewer. *Universal Access in the Information Society*, 23(3), 1177-1191.
18. Mirzayi, S., & Nobari, N. How generative AI is reshaping entrepreneurial marketing. *Journal of Marketing Theory and Practice*, 1-19. <https://doi.org/10.1080/10696679.2025.2571634>
19. Noy, S., & Zhang, W. (2023). Experimental evidence on the productivity effects of generative artificial intelligence. *Science*, 381(6654), 187–192. <https://doi.org/10.1126/science.adh2586>
20. Ooi, K.-B., Tan, G. W.-H., Al-Emran, M., Al-Sharafi, M. A., Capatina, A., Chakraborty, A., Dwivedi, Y. K., Huang, T.-L., Kar, A. K., Lee, V.-H., Loh, X.-M., Micu, A., Mikalef, P., Mogaji, E., Pandey, N., Raman, R., Rana, N. P., Sarker, P., Sharma, A., . . . Wong, L.-W. (2025). The Potential of Generative Artificial Intelligence Across Disciplines: Perspectives and Future Directions. *Journal of Computer Information Systems*, 65(1), 76-107. <https://doi.org/10.1080/08874417.2023.2261010>
21. Peres, R., Schreier, M., Schweidel, D., & Sorescu, A. (2023). On ChatGPT and beyond: How generative artificial intelligence may affect research, teaching, and practice. *International Journal of Research in Marketing*, 40(2), 269–275. <https://doi.org/10.1016/j.ijresmar.2023.03.001>
22. Ramesh, A., Pavlov, M., Goh, G., Gray, S., Voss, C., Radford, A., Chen, M., & Sutskever, I. (2021). Zero-shot text-to-image generation. In *Proceedings of the 38th International Conference on Machine Learning* (pp. 8821–8831). PMLR.
23. Rogers, E. M., Singhal, A., & Quinlan, M. M. (2014). Diffusion of innovations. In D. W. Stacks, M. B. Salwen, & K. C. Eichhorn (Eds.), *An integrated approach to communication theory and research* (2nd ed., pp. 432–448). Routledge.
24. Szczepanski, M. (2019). *Economic impacts of artificial intelligence (AI)*. European Parliamentary Research Service.
25. Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538. <https://doi.org/10.1007/s11192-009-0146-3>
26. Wahid, R., Mero, J., & Ritala, P. (2023). Editorial: Written by ChatGPT, illustrated by Midjourney: generative AI for content marketing. *Asia Pacific Journal of Marketing and Logistics*, 35(8), 1813-1822. <https://doi.org/10.1108/apjml-10-2023-994>

