Journal of Information Systems Engineering and Management
2025, 10(61s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Ai And Information System in Construction Management: A Bibliomtric Analysis

ELAFRI Nedjwa[1], LALMI Abdallah[2], BOUMALI Badreddine[3], CHORFI Hichem[4]
[1,2,3]Uniersity of Constantine3 SALAH BOUBNIDER , project management department, AVMF Laboratory
[4]University of Boumerdes, l'Institut des Sciences et Techniques Appliquées ; Algeria

ARTICLE INFO

Received: 24 Dec 2024

Revised: 12 Feb 2025

Accepted: 26 Feb 2025

ABSTRACT

Introduction: The paper conducts a bibliometric analysis of the development and trends in Artificial Intelligence (AI) and information systems within construction management research. It underscores the growing amalgamation of AI-driven technologies with information systems that facilitate efficient project management, risk forecasting, and operational enhancement in construction.
Objectives: This study aims to do a thorough bibliometric analysis of academic articles about Artificial Intelligence (AI) and information systems in construction management from 1960 to 2025. The analysis seeks to identify principal research trends, thematic emphases, and development phases, while assessing discipline contributions and the global geographic distribution of research output. The study aims to delineate collaboration networks among authors and institutions while emphasizing emerging technologies and themes that are influencing the sector. This project aims to elucidate existing knowledge frameworks and inform future strategies for the integration of AI within construction management, sustainability, and digital transformation.

Methods: Five hundred seventy-one Scopus-indexed papers from 1960 to 2025 were evaluated utilizing bibliometric techniques, including VOSviewer. The study examined publishing patterns, discipline contributions, geographic distribution, and thematic clusters in research pertaining to AI and information systems within construction management.

Results: indicate three phases: negligible activity prior to 2016, accelerated growth post-2016 associated with advancements in AI algorithms, Building Information Modeling (BIM), and Internet of Things (IoT) technologies, alongside an expanding multidisciplinary approach encompassing computer science, engineering, social sciences, and environmental sciences. China, the United States, and the United Kingdom dominate in research production and citations, with burgeoning contributions from other regions.

Conclusions: The integration of AI and information systems has proven pivotal to innovation in construction management. The advancing interdisciplinary and global research environment indicates forthcoming prospects in sustainable, cloud-based, and data-driven construction project management.

Keywords: Artificial Intelligence, Construction Management, Information Systems, Bibliometric Analysis

Journal of Information Systems Engineering and Management
2025, 10(61s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

INTRODUCTION

Artificial Intelligence (AI) and information systems have been essential in revolutionizing multiple sectors by improving data processing, decision-making abilities, and process automation [1]. Artificial intelligence, which includes machine learning, natural language processing, and deep learning, combines with information systems to facilitate real-time analytics and intelligent support, hence enhancing efficiency and innovation across several industries [2]. The collaboration between AI and information systems has resulted in transformative advancements in intricate situations where the management of extensive data and fluctuating processes is essential [3]. The integration of AI with information systems in the construction management sector is experiencing significant growth[4]. Historically, construction management demonstrated a sluggish integration of digital and AI technologies, with minimal study and use until recent years. Since approximately 2016, there has been a significant surge in academic and industrial interest, propelled by advancements in AI algorithms and the proliferation of Building Information Modeling (BIM), Internet of Things (IoT), digital twins, and data analytics addressing construction-specific challenges [5]. Artificial intelligence and information systems are now essential for enhancing project performance, forecasting risks, allocating resources, monitoring safety, and ensuring quality control. These technologies facilitate strategic decision-making and enhance operational efficiency through intelligent automation and data-driven insights [6].

This study offers a bibliometric analysis of artificial intelligence and information technologies within the realm of construction management. It analyzes the evolution, research trends, principal contributors, and geographic distribution of knowledge production to clarify how AI is transforming the construction management domain. The report underscores the evolution of AI from a specialized research topic to a pivotal catalyst for innovation, accentuating key issues such as integration with BIM, cloud-based solutions, and sustainability in construction management [7].

OBJECTIVES

•To perform a systematic review and examine the evolution and trends in AI and Information Systems within construction management research throughout time using bibliometric methods. [8]
•To analyze the contributions of diverse scholars, authors, and publications within the field of study.[9]
• Determine the principal influential works and authors pertinent to this thematic contribution and its significance.
•Examine the global collaboration and emerging technologies influencing artificial intelligence in construction management to offer insights for future study and policy formulation.[10]

METHODS

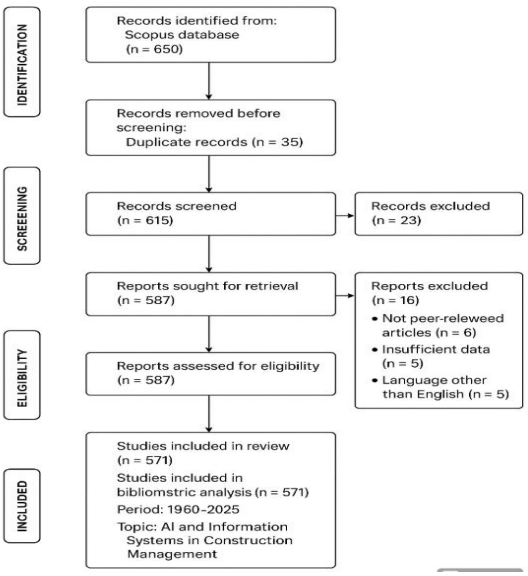

Figure 1: PRISMA FLOWCHART

Journal of Information Systems Engineering and Management
2025, 10(61s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

This PRISMA flowchart illustrates the systematic methodology employed for screening and choosing studies in a bibliometric review about "AI and Information Systems in Construction Management" from 1960 to 2025.

Identification Phase :The approach commenced with the identification of 650 entries from the Scopus database. To guarantee uniqueness, 35 duplicate records were eliminated, resulting in 615 unique records for subsequent screening.

Evaluation Phase : Of the 615 records, 23 were rejected according to preliminary screening criteria (the specifics of which are not detailed in the flowchart). This resulted in 587 reports requiring retrieval and detailed evaluation.

Eligibility Phase : Of the 587 reports requested for retrieval, 16 were excluded for the following reasons: Six articles were not subjected to peer review. Five exhibited inadequate data. Five were published in languages other than English. Following the application of these eligibility criteria, 587 reports were retained and further evaluated for eligibility.

Inclusion Phase : Ultimately, 571 studies satisfied all inclusion criteria and were incorporated into the study. The identical 571 works were subsequently included in the bibliometric study, concentrating on research published from 1960 to 2025 about AI and Information Systems in Construction Management.

Synopsis : This PRISMA flowchart illustrates a meticulous procedure of database searching, duplicate elimination, and both preliminary and comprehensive screening according to explicit exclusion criteria (peer-review status, data adequacy, and language), culminating in a precisely delineated sample for analysis. This strategy enhances methodological transparency and replicability, according to optimal principles for systematic reviews and bibliometric analyses.

RESULTS

BIBLIOMETRIC MAP

The citation data, author keywords, and bibliography of 571 publications were analyzed using Vos Viewer version 1.6.20. Scopus is accessible to the research scholars of Integral University of Constantine 3 Salah Boubnider.Vos viewer is a software application intended for the creation of bibliographic maps.We have analyzed the annual and disciplinary distribution within the Scopus database. A compilation of materials related to author keywords or nations has been assembled for this research, with additional items sourced from the bibliographic maps.[11]

PUBLICATION TRENDS OVER TIME (1960 to 2025)

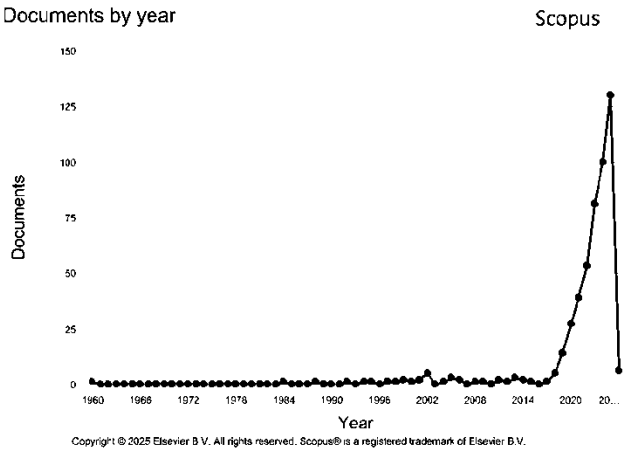

Figure 2: Documents by year

The figure illustrates a history of publications from 1960 to 2025 concerning "AI and information systems in construction management," indicating an extended duration of limited activity, succeeded by a significant increase from around 2016, culminating in recent years. This trend is a distinctive pattern identified in numerous bibliometric evaluations of AI and digital technologies within the construction industry. Initial Period (1960–2015): Minimal

Journal of Information Systems Engineering and Management
2025, 10(61s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

annual publication numbers indicate restricted research or application of AI and information technologies in construction management during this timeframe. This stalemate reflects the construction industry's sluggish early integration of digital and AI technology, as emphasized in systematic reviews and bibliometric analyses. Inflection and Growth (2016 onward): Beginning in 2016, a pronounced exponential surge in research outputs is seen. This increase is associated with multiple converging factors: Significant progress in AI algorithms, machine learning (ML), and data analytics, rendering them applicable to construction-specific difficulties. The expansion of Building Information Modeling (BIM), Internet of Things (IoT), and digital twin technologies necessitates and gains advantages from the incorporation of AI in construction management processes. Augmented financing, cooperative networks, and global focus on intelligent construction and Industry 4.0 principles. The peak of over 125 documents indicates intensified research activity, potentially due to special issues or thematic calls in prominent journals, followed by a recent decline. The significant decline following the peak is likely attributable to incomplete data for 2025, since recent articles are still undergoing indexing. Findings from Contemporary Bibliometric Research and systematic reviews indicate that since 2016, construction management research has progressively utilized AI for functions such as risk prediction, cost estimation, real-time monitoring, and resource optimization. Key areas of focus are the prediction of construction project performance, resource allocation, safety and quality control, and the integration of artificial intelligence with cloud and Internet of Things systems.[12]. This picture illustrates a significant movement in academia and industry, with AI and information systems transitioning from marginal study subjects in construction management to fundamental elements of innovation and scholarly investigation since 2016. Recent bibliometric studies substantiate the exponential expansion while highlighting the field's growing problems and future research requirements.

DISCIPLINES CONTRIBUTING TO RESEARCH

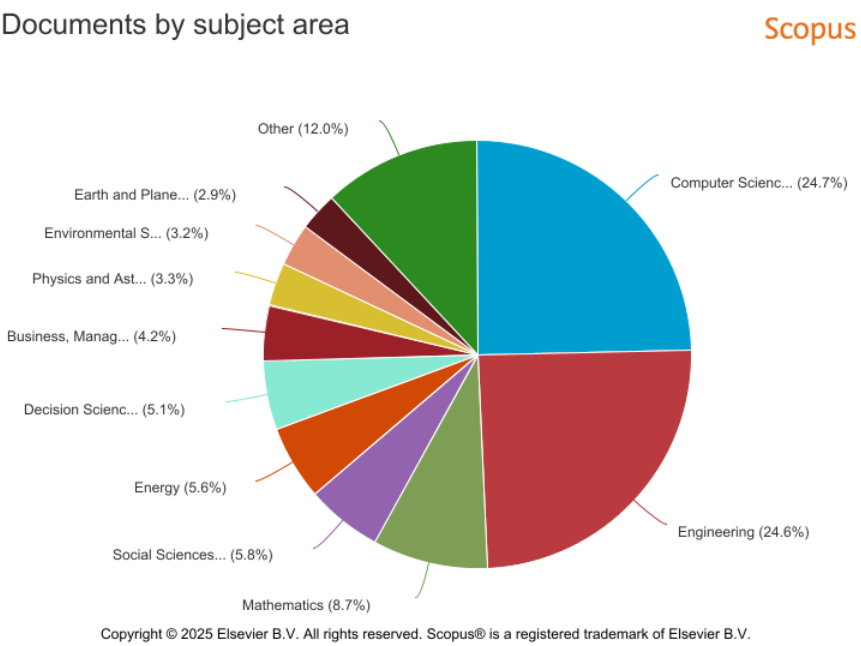

Figure 3: Documents by subject area

The pie chart entitled "Documents by Subject Area" from Scopus illustrates the allocation of research documents among diverse disciplines relevant to the theme domain of "AI and Information Systems in Construction Management: A Bibliometric Analysis." Computer Science and Engineering are the primary contributors, accounting for roughly fifty percent of the research output in this interdisciplinary domain. Principal Contributing Disciplines Computer Science (24.7%) and Engineering (24.6%) collectively represent nearly half of the documents, underscoring the pivotal importance of computational and engineering innovations in AI applications for construction management. Mathematics (8.7%) constitutes a significant portion, highlighting the critical role of mathematical modeling, algorithms, and data analysis in the advancement of AI systems pertinent to construction

Journal of Information Systems Engineering and Management
2025, 10(61s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

environments. Supporting and Interdisciplinary Areas Social Sciences (5.8%) and Business Management (4.2%) demonstrate substantial involvement with human, organizational, and managerial aspects in the incorporation of AI and information technologies into construction management processes. The fields of Energy (5.6%), Decision Sciences (5.1%), Physics and Astronomy (3.3%), Environmental Science (3.2%), and Earth and Planetary Sciences (2.9%) underscore the diversity of the discipline and its intersection with sustainability, resource management, and environmental modeling in building. This distribution illustrates that research on AI and information systems in construction management is not solely driven by technology but is also progressively influenced by multidisciplinary viewpoints, integrating social, managerial, environmental, and mathematical knowledge. The significant presence of social sciences and managerial disciplines indicates a focus on implementation, acceptance, impact assessment, and the transformation of practices in the construction sector through digitization. The input from environmental, energy, and earth science fields indicates research focused on sustainable construction, resource efficiency, and climate resilience—crucial subjects in contemporary construction management research.[13]

GEOGRAPHIC DISTRIBUTION OF PUBLICATIONS

Table 1:GEOGRAPHIC DISTRIBUTION OF PUBLICATIONS

Country	Documents	Citations
Australia	16	1004
Austria	5	8
Canada	11	206
China	179	1640
Egypt	6	41
France	12	38
Germany	10	123
Greece	5	72
Hong Kong	12	139
India	25	374
Iran	5	102
Italy	19	159
Japan	11	164
Malaysia	7	73
Russian Federation	13	46
Saudi Arabia	10	142
Singapore	6	1038
South korea	10	52
Spain	11	174
Taiwan	12	208
Ukraine	6	32
United arab emirates	6	249
United Kingdom	32	1581
United states	55	962

The table of the geographic distribution of publications " reveals varying levels of research activity and impact across different countries, with certain nations excelling in both document production and citation influence. China is the leading contributor with 179 documents and 1,640 citations, demonstrating both substantial output and considerable influence in this study domain. The United States ranks next with 55 documents and 962 citations, indicating significant influence and continued involvement. The United Kingdom (32 documents, 1581 citations) and Singapore (6 documents, 1038 citations) exhibit significant citation counts in relation to their publication output, indicating the high relevance or quality of their scholarly work. Regional and Emerging Entities Additional active countries comprise India (25 documents, 374 citations), Italy (19 documents, 159 citations), Australia (16 documents, 1004

Journal of Information Systems Engineering and Management
2025, 10(61s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

citations), and Canada (11 documents, 206 citations). Countries in Southeast Asia and the Middle East, including Malaysia, Saudi Arabia, the United Arab Emirates, and Iran, exhibit increasing engagement, evidenced by moderate publication and citation metrics, indicating a burgeoning scholarly interest in the subject matter. Interpretation Global research in AI and information systems for construction management is predominantly spearheaded by China, the United States, and the United Kingdom, which generate the most publications and achieve the highest citation metrics, reflecting both research output and academic influence. Singapore, Australia, and the UAE exhibit elevated citation-to-document ratios, underscoring the global acknowledgment of their efforts. This geographic distribution exemplifies the global expansion of the field, highlighting regions with prominent expertise or significant research hubs.[14]

CO OCCURRENCE KEY WORDS

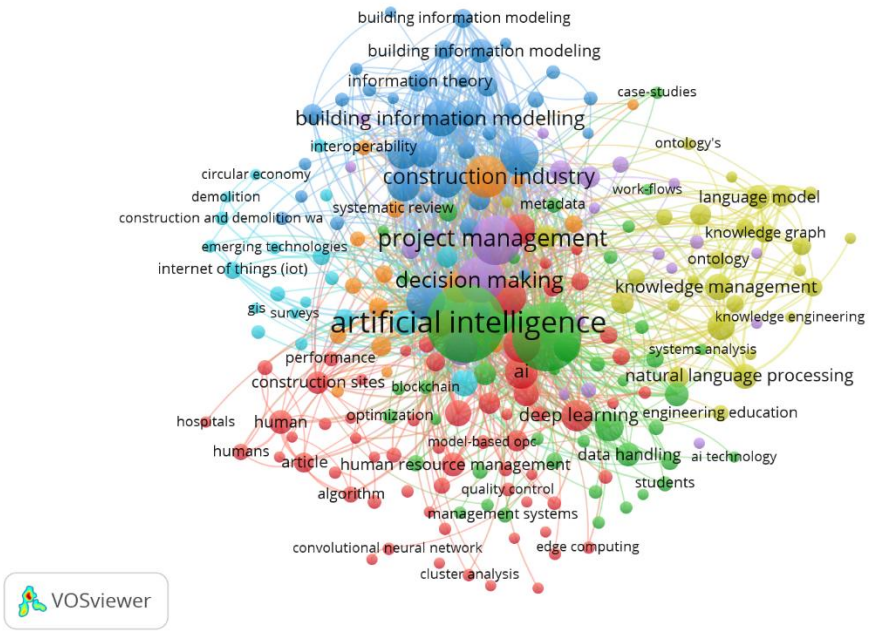

Figure 4:The co-occurrence keyword map

the co-occurrence keyword map for the theme "ai and information systems in construction management: a bibliometric analysis" illustrates the interrelations and principal subjects within the research domain. key concepts such as "artificial intelligence," "project management," and "decision making" prevail, underscoring their fundamental significance in the domain. fundamental clusters and interconnections artificial intelligence constitutes the predominant node, closely associated with "project management," "decision making," "deep learning," and "building information modeling," signifying that ai methodologies are thoroughly embedded in project management practices and decision support systems in construction management. building information modelling (bim) is a highly interconnected domain, intricately linked to the "construction industry," "interoperability," and "information theory." this illustrates bim's function as a digital foundation for ai integration in construction. knowledge management, natural language processing, and language models are heavily featured, indicating significant research in knowledge engineering and semantic information management within construction workflows. thematic subdivisions subjects such as optimization, human resource management, convolutional neural networks, and quality control highlight the operational and methodological dimensions currently under examination. the convergence of emerging technologies, the internet of things (iot), circular economy, and sustainability illustrates the growing interdisciplinary focus on digital transformation and environmental effect within the construction sector. analysis this map illustrates that research on ai and information systems in construction management is diverse, with a significant focus on decision support, project optimization, digital modeling, and knowledge engineering. the interrelation of central and peripheral keywords indicates a collaborative and dynamic domain, wherein

Journal of Information Systems Engineering and Management
2025, 10(61s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

advancements in ai techniques (deep learning, nlp) are intricately linked to digital management frameworks and sustainability efforts. the frequent co-occurrence emphasizes the integration of technical, managerial, and human-centric subjects, highlighting the complexity and practical significance of this research domain.[15]

DISCUSSION

CONCLUSION

This bibliometric study covers the research on AI and Information System in Construction management, We identified major trends, disciplines, geographic contributions, and thematic priorities by evaluating 571 Scopus papers from 1960 to October 2025. We find that :

Trends in Publication Between 1960 and 2015, there was negligible academic engagement, indicating a sluggish integration of AI and information technologies in construction management. Post-2016, research outputs surged dramatically, propelled by advancements in AI algorithms, the emergence of BIM and IoT, and heightened global collaboration concerning intelligent construction and Industry 4.0 principles. This increase indicates a shift of AI and information systems from specialized subjects to fundamental catalysts of innovation in construction management. **Contributions to Disciplinary Knowledge Research** is profoundly interdisciplinary, with Computer Science and Engineering collectively accounting for around fifty percent of all publications, highlighting the field's robust technological foundation. Mathematics underscores the significance of modeling and algorithms, although major input from Social Sciences and Business Management emphasizes the increasing focus on administrative, organizational, and human factors in the use of AI and information systems in construction.

The variety of disciplines engaged—from Energy and Environmental Sciences to Decision Sciences—demonstrates the sector's extensive involvement in sustainability, resource management, and performance optimization. Spatial Distribution Global research leadership is predominantly held by China, the United States, and the United Kingdom, which together generate the greatest volume and impact, as indicated by publications and citations. Singapore, Australia, and the UAE have elevated citation-to-publication ratios, demonstrating the global acknowledgment of their research excellence. Simultaneously, rising contributions from India, Italy, Canada, and regional entities in Southeast Asia and the Middle East indicate an expanding geographic dispersion and heightened academic interest.

The Co-occurrence keywords Examination The co-occurrence map indicates that "artificial intelligence," "project management," and "decision making" are pivotal, often appearing with subjects such as "deep learning," "building information modeling," "knowledge management," and "natural language processing." This indicates that AI is intricately woven into construction management techniques, serving not only for automation but also for strategic decision-making, optimization, and collaborative digital frameworks like BIM. Knowledge management, natural language processing, and language models demonstrate that the management of semantic information and data-driven decision-making are prominent academic goals. The prevalence of terminology such as "sustainability," "IoT," and "circular economy" underscores the developing linkages with environmental and resource issues. Combination **These results indicate** a rapidly transforming field: construction management is evolving due to advanced AI techniques, interdisciplinary collaboration, and international research networks. Although technology advancement is vital, effective implementation increasingly relies on management innovation, human elements, and sustainability principles. The integration of technical and non-technical fields indicates forthcoming prospects for cohesive, data-driven, and intelligent construction management research and practice.

REFRENCES

[1] V. C. Storey, W. T. Yue, J. L. Zhao, and R. Lukyanenko, “Generative artificial intelligence: Evolving technology, growing societal impact, and opportunities for information systems research,” *Inf. Syst. Front.*, pp. 1–22, 2025.

[2] S. O. Abioye *et al.*, “Artificial intelligence in the construction industry: A review of present status, opportunities and future challenges,” *J. Build. Eng.*, vol. 44, p. 103299, 2021.

[3] A. Z. Far *et al.*, “Artificial intelligence for secured information systems in smart cities: Collaborative iot computing with deep reinforcement learning and blockchain,” *arXiv Prepr. arXiv2409.16444*, 2024.

[4] N. C. Obiuto, R. A. Adebayo, O. K. Olajiga, and I. C. Festus-Ikhuoria, "Integrating artificial intelligence in construction management: Improving project efficiency and cost-effectiveness," *Int. J. Adv. Multidisc. Res. Stud*, vol. 4, no. 2, pp. 639–647, 2024.

[5] K. K. Myneni, "Analyzing the Transition from Traditional Methods to Digitalization and Automation in Construction Material Procurement," *Int. J. Manag. Humanit. ISSN*, pp. 913–2394, 2025.

[6] A. Johri, "Impact of artificial intelligence on the performance and quality of accounting information systems and accuracy of financial data reporting," in *Accounting Forum*, Taylor & Francis, 2025, pp. 1–25.

[7] K. Chen, X. Zhou, Z. Bao, M. J. Skibniewski, and W. Fang, "Artificial intelligence in infrastructure construction: A critical review," *Front. Eng. Manag.*, vol. 12, no. 1, pp. 24–38, 2025.

[8] I. Passas, "Bibliometric analysis: the main steps," *Encyclopedia*, vol. 4, no. 2, 2024.

[9] R. Kumar, "Bibliometric analysis: comprehensive insights into tools, techniques, applications, and solutions for research excellence," *Spectr. Eng. Manag. Sci.*, vol. 3, no. 1, pp. 45–62, 2025.

[10] R. Li, Z. Shari, and M. Z. A. Ab Kadir, "A review on multi-objective optimization of building performance-Insights from bibliometric analysis," *Heliyon*, vol. 11, no. 4, 2025.

[11] J. J. Lee and G. Chi, "Five Decades of Eating Disorder Research: A Bibliometric Analysis of Publication Trends, Research Themes, and the Relationship Between Public and Academic Attention (1975–2024)," *Int. J. Eat. Disord.*, 2025.

[12] J. Dumrak and S. A. Zarghami, "The role of artificial intelligence in lean construction management," *Eng. Constr. Archit. Manag.*, vol. 32, no. 1, pp. 131–155, 2025.

[13] M. Ghodosi, M. Zeinalnezhad, and A. Kazemi, "Bibliometric Analysis for Modeling in Construction Risk Management: A Literature Review," *Manag. Strateg. Eng. Sci.*, pp. 1–10, 2025.

[14] A. O. Adediran *et al.*, "Artificial Intelligence Adoption in Housing: A Bibliometric Analysis," in *2025 21st IEEE International Colloquium on Signal Processing & Its Applications (CSPA)*, IEEE, 2025, pp. 343–348.

[15] A. Baik, "Three Decades of Innovation: A Critical Bibliometric Analysis of BIM, HBIM, Digital Twins, and IoT in the AEC Industry (1993–2024)," *Buildings*, vol. 15, no. 10, p. 1587, 2025.