

Artificial Intelligence in Top Management : A Bibliometric Performance Analysis

Intelligence Artificielle dans la Haute Direction : Une Analyse Bibliométrique des Performances

Youssef Er-Rays

Abdelmalek Essaadi University, PFL, Économie et Gestion, Tétouan, Morocco

Ismail El Mir

Ibn Tofail University, ENCG, Laboratoire des Sciences de Gestion des Organisations, Kenitra, Morocco

Hamid Ait-Lemqeddem

Ibn Tofail University, ENCG, Laboratoire des Sciences de Gestion des Organisations, Kenitra, Morocco

Badreddine El Moutaqi

Abdelmalek Essaadi University, PFL, Économie et Gestion, Tétouan, Morocco

Ezzahir Mustapha

Université Chaouaib Eddoukali, FSJES, Laboratoire de Recherche en Gestion, Economie, et Sciences Sociales, El Jadida, Maroc

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Abstract

Context: This study examines the integration of Artificial Intelligence (AI) into top management (TM) decision-making, emphasizing its potential to improve strategic planning, operational efficiency, and competitive dynamics.

Objective: The research traces the historical evolution of AI in TM literature, identifies key institutions, authors, and funding bodies driving innovation, and highlights interdisciplinary connections and unresolved challenges.

Method: Using a PRISMA-guided bibliometric analysis of 171 peer-reviewed articles from Scopus, the study identifies three growth phases: minimal activity (1984–2003), gradual adoption (2004–2015), and exponential growth (2016–2024).

Results and Discussion: The Chinese Academy of Sciences, West Virginia University, and scholars such as Mohaghegh and Al-Sartawi are key contributors. The U.S. and China lead, driven by corporate investments and national AI strategies. Thematic analysis reveals three core clusters: AI-driven decision support systems, strategic automation, and ethical/regulatory challenges.

Conclusion: AI enhances managerial efficiency but introduces complexities, including algorithmic bias and human-AI trust gaps. Limitations include database biases and a lack of longitudinal studies on AI's organizational impact. The study recommends interdisciplinary collaboration, ethical AI frameworks for executive roles, and empirical validation of AI's long-term strategic value.

Keywords : Artificial Intelligence, Top Management, Bibliometric Analysis, PRISMA.

Résumé :

Contexte et objectif : Cette étude examine l'intégration de l'intelligence artificielle (IA) dans la prise de décision des dirigeants, soulignant son potentiel d'amélioration de la planification stratégique, de l'efficacité opérationnelle et de la dynamique concurrentielle.

Méthode : À l'aide d'une analyse bibliométrique guidée par PRISMA de 171 articles évalués par les pairs issus de Scopus.

Résultats et discussion : L'Académie chinoise des sciences, l'Université de Virginie-Occidentale et des chercheurs tels que Mohaghegh et Al-Sartawi sont des contributeurs clés. Les États-Unis et la Chine sont en tête, portés par les investissements des entreprises et les stratégies nationales en matière d'IA. L'analyse thématique révèle trois groupes principaux : les systèmes d'aide à la décision basés sur l'IA, l'automatisation stratégique et les défis éthiques et réglementaires.

Conclusion : L'IA améliore l'efficacité managériale, mais introduit des complexités, notamment des biais algorithmiques et un manque de confiance entre l'humain et l'IA. Les limites incluent les biais des bases de données et le manque d'études longitudinales sur l'impact organisationnel de l'IA. L'étude recommande une collaboration interdisciplinaire, des cadres éthiques en matière d'IA pour les postes de direction et une validation empirique de la valeur stratégique à long terme de l'IA.

Mots-clés : Intelligence artificielle ; Direction générale ; Analyse bibliométrique ; PRISMA.

Introduction

The integration of Artificial Intelligence (AI) into top management (TM) practices has emerged as a critical research area in economics, management, and organizational studies. AI's ability to transform decision-making, strategic planning, and operational efficiency has sparked growing interest in its impact on TM. Bibliometric analysis provides a robust method to map this evolving field, identifying key trends, authors, and publications. Foundational theories from scholars like Henry Mintzberg (Mintzberg, 1973b, 1973a, 1975, 1978, 1983, 1987, 1989, 1993, 1994b, 1994a, 2003, 2004, 2017; Mintzberg et al., 1976, 1997, 2009, 2020; Mintzberg & Romelaer, 1982; Mintzberg & Waters, 1985) and Michael Porter M. Porter, 1996; M. E. Porter, 1991, 1996, 1997a, 1998, 2000, 2008b, 2010, Porter, M. E., & Kramer, M. R. (2019)

on strategy and competitive dynamics offer frameworks that AI can enhance (Palos-Sánchez et al., 2022; Yang et al., 2024).

AI definitions vary due to differences in focus and scope. Early definitions from McCarthy (1956) and Minsky (1969) emphasized foundational concepts but lacked clarity on “intelligence.” Recent literature (2019–2022) highlights AI as a rapidly advancing technology with transformative potential (Nilsson, 1998). A global survey reveals that 85% of executives plan significant AI investments by 2026 (Volkenborn et al., 2017; Reis et al., 2020). AI is poised to reshape organizations, industries, and society, though its disruptive nature challenges traditional TM practices (Bughin et al., 2018; Davenport et al., 2019).

Top managers' attention allocation, a scarce resource, shapes organizational strategy and adaptability. By prioritizing emerging trends or regulatory shifts, managers can proactively ensure competitiveness. AI supports this by enhancing decision-making and innovation, as noted by Gil et al. (2020), provided its capabilities and limitations are understood. Schmitt (2024) advocates for specialized AI leadership, while Feuerriegel et al. (2022) highlight technical and organizational challenges in automating managerial decisions.

Executive support is vital for AI adoption. Enholm et al. (2022) and Keding (2021) emphasize the need for a supportive culture and resource allocation. AI literacy among executives, as stressed by Pinski et al. (2024), is critical for informed decisions. Lippert (2024) notes AI's disruption of middle management roles, where automation redefines responsibilities.

In specialized domains, AI shows promise:

- **HR & Organizational Culture:** AI enhances talent management and performance metrics (Er-Rays et al., 2024), building on Drucker and Schein's frameworks.

- **Financial Management:** AI-driven analytics improve risk assessment and strategic planning (Dissanayake et al., 2024; Palos-Sánchez et al., 2022), extending Fama and Kaplan's work.

Research Gaps & Future Directions: Despite advancements, challenges persist:

- Limited interdisciplinary studies connecting technology and management theory.
- Insufficient longitudinal research on AI's real-world organizational impact.
- Unresolved ethical and regulatory questions about human-AI collaboration.

This bibliometric study on Artificial Intelligence (AI) in top management (TM) decision-making follows a structured plan. The **Introduction** establishes AI's role in TM, referencing theoretical foundations and research gaps. The **Method** section details the research design, with **2.1. Materials** describing the use of 171 Scopus articles selected via the PRISMA framework, and **2.2. Search Criteria** outlining the search process (1987–2025, terms “top management” AND “artificial intelligence”) yielding 200 documents refined to 171. The **Results** section presents findings across six subsections analyzing publication trends, contributors, and thematic areas. The **Discussion** interprets the findings, addressing limitations and recommending future research directions. The **Conclusion** summarizes AI's impact, offers practical and policy recommendations, and outlines a future research agenda.

2. Method

2.1. Materials

This study conducted a bibliometric analysis to explore trends in AI applications within top management (TM). Following PRISMA guidelines (Moher et al., 2015), we retrieved 171 peer-reviewed articles from Scopus, a comprehensive database with over 97.3 million records and 2.4 billion cited references dating back to 1970 (Scopus, 2024). Scopus was selected for its extensive coverage and bibliometric capabilities, comparable to Web of Science (Meho & Yang, 2007). The analysis identified leading countries, institutions, journals, and authors, following guidelines from Block and Fisch (2020) and Er-Rays et al. (2024) (figure 01).

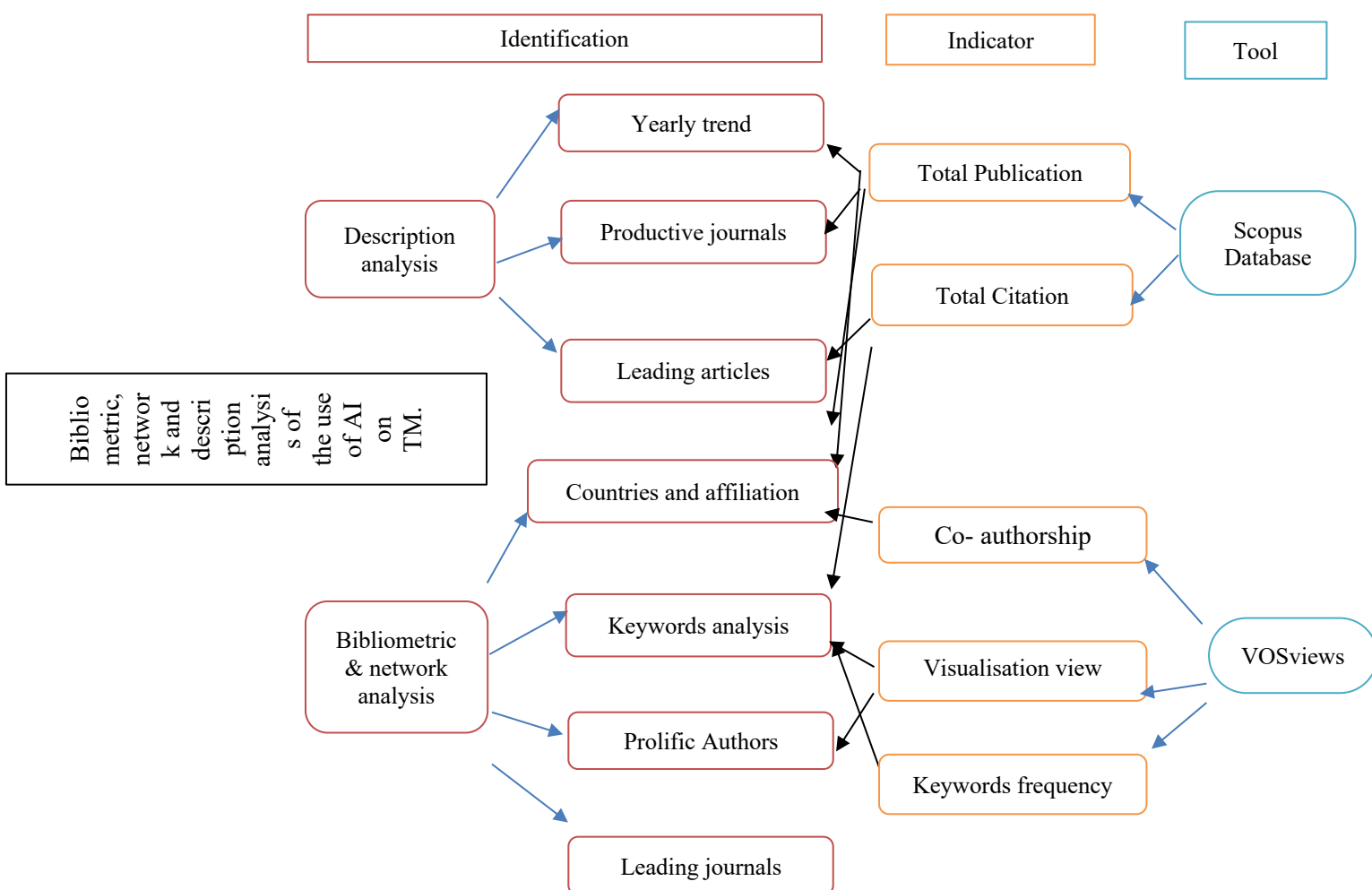


Fig. 01. Analytical structure of the current paper

2.2. Search Criteria

In February 2025, we conducted a bibliometric analysis of Artificial Intelligence (AI) applications in top management (TM) using the Scopus database. We searched for publications from 1987 to 2025 using the query terms “top management” AND “artificial intelligence.” The search returned 200 documents, from which 171 peer-reviewed articles were selected for analysis following the PRISMA framework (Moher et al., 2015).

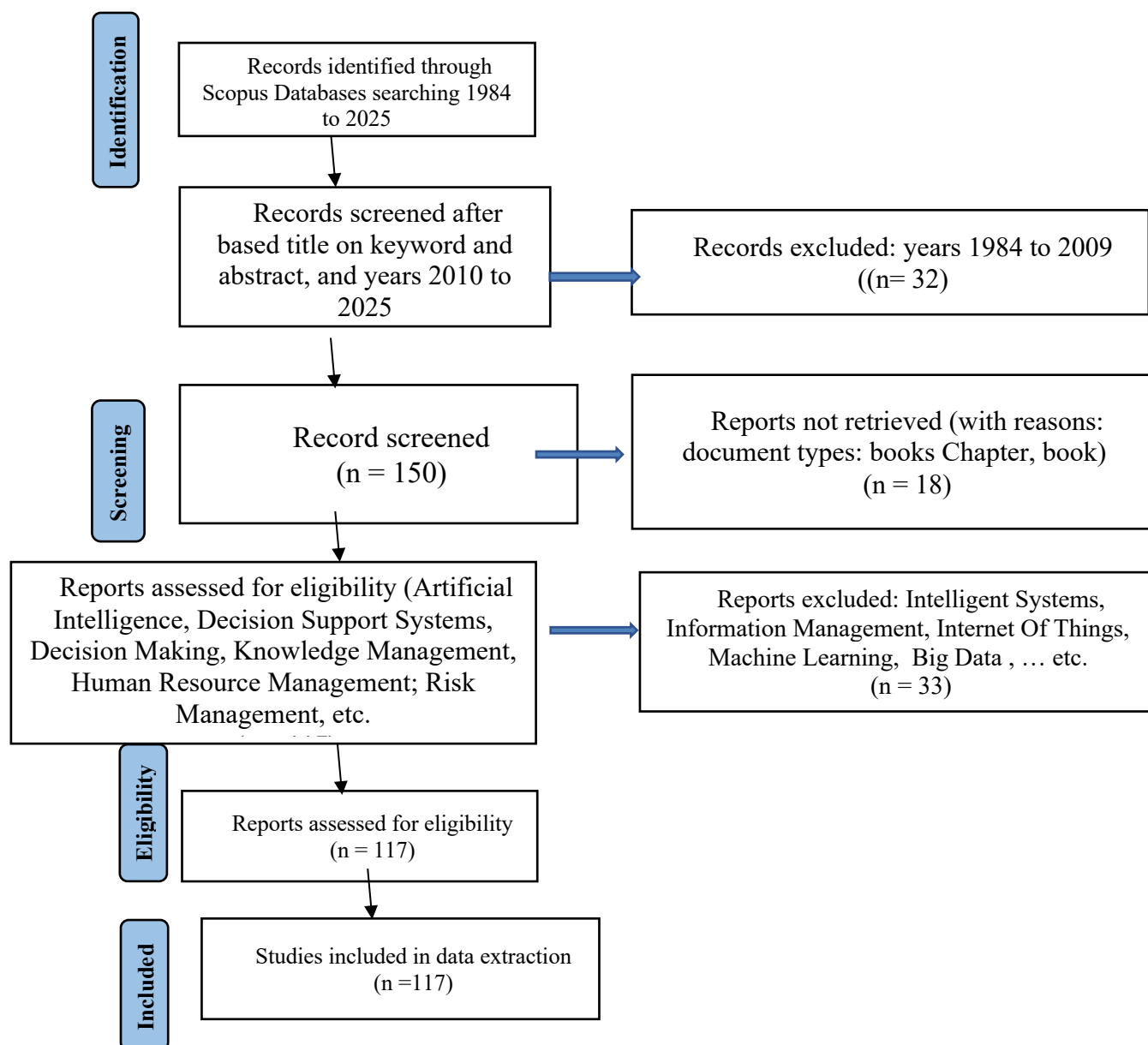


Fig. 2. PRISMA flow chart for selecting documents for this study.

The PRISMA process included four stages: identification, screening, eligibility assessment, and inclusion (see Figure 2). Firstly, **Identification**: The initial search identified 200 relevant documents. Secondly, **Screening**: We screened these documents for relevance to AI and TM, reducing the dataset to 168 articles. Thirdly, **Eligibility**: We included articles and reviews published between 2010 and 2025 that focused on AI applications in decision-making, decision support systems, knowledge management, human resource management, or risk management. Book chapters and books were excluded to maintain scholarly rigor. Finally, **Inclusion**: The final 117 articles underwent bibliometric analysis, ensuring the study's academic quality and relevance.

To ensure precision, we excluded documents outside the scope of AI in TM, such as those unrelated to the specified domains. The analysis focused on trends from 2010 to 2025, capturing the field's evolution during this period.

Scopus was selected for its comprehensive coverage, with over 97.3 million records and 2.4 billion cited references dating back to 1970 (Scopus, 2024). Comparable to Web of Science (Meho & Yang, 2007) and (Archambault et al., 2009), Scopus supports longitudinal bibliometric analysis with data from over 7,000 publishers, 28,300 serial titles, and 368,000 books. Its 19 million author profiles and 94,000 affiliation profiles offer insights into research contributions, while 24.6 million open-access items enhance accessibility (Merigó et al., 2016). The search query used keywords “artificial intelligence” and “top management” for publications between 1987 and 2025, ensuring a robust dataset for analyzing AI's impact on TM.

3. Results: Performance analysis

3.1. What is the distribution from 1984 to 12/10/2025?

The number of publications on Artificial Intelligence (AI) in top management (TM) from 1984 to October 12, 2025, has grown steadily, with significant acceleration in recent years. Analysis of Scopus data reveals three distinct phases of research activity, reflecting advancements in AI technology and its application to managerial innovation:

- **Early Phase (1984–2003):** Publications were sparse, with minimal activity and sporadic contributions between 1989 and 2003, totaling fewer than 10 documents.
- **Development Phase (2004–2015):** Research gained traction, averaging 1–7 documents annually, with peaks in 2011 and a cumulative total of 48 documents by 2015.
- **Growth Phase (2016–2025):** Publication output surged, increasing annually to 16 documents in 2021 and reaching 103 documents by 20.

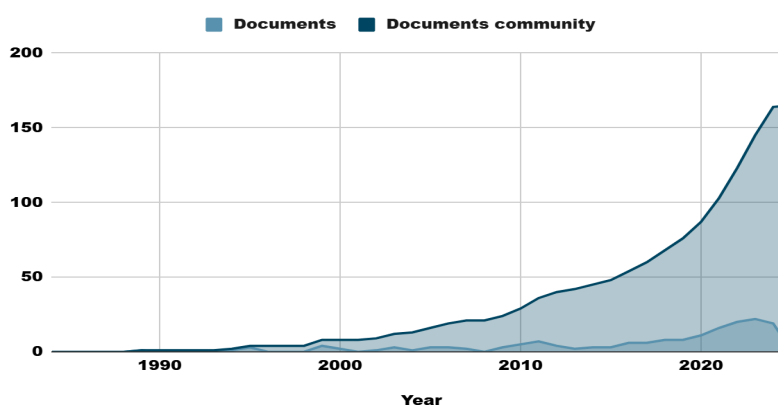


Fig. 3: Distribution between 2025 and 2010 to 2025

Source: Scopus.

This trajectory underscores AI's growing relevance in TM, driven by technological advancements and strategic adoption in organizational contexts (see Figure 3).

3.2. Which higher educational institutions have made the most notable contributions to the study of top management and artificial intelligence?

Several higher education institutions have made significant contributions to the study of AI in top management. Based on Scopus data, the following institutions stand out:

- **Chinese Academy of Sciences:** Leads with six publications, including works on logic programming for multi-agent systems and modeling shale gas reservoirs (e.g., [Author, Year]).
- **West Virginia University:** Contributed four documents, focusing on AI applications in energy sector management.
- **Institute of Automation, Chinese Academy of Sciences, and University of Oxford:** Each produced three documents, exploring decentralized systems and federated intelligence for smart mobility.
- **Alma Mater Studiorum Università di Bologna, Ahlia University, and University of Calgary:** Published research on AI-driven decision support systems and anomaly detection for 6G networks. These institutions have advanced the field through interdisciplinary approaches, addressing AI's role in strategic decision-making and operational efficiency (see Figure 4 and Table 1).

Documents

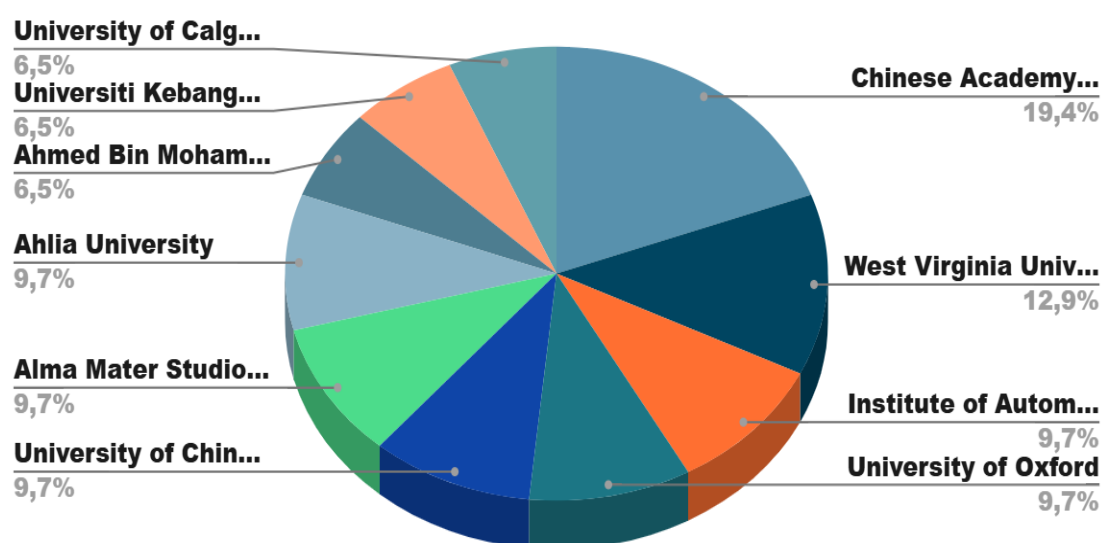


Fig. 04: Contributions of higher educational institutions

Source: Scopus

Table 01: 10 top higher education institutions

Affiliation	Doc ume nts	most cited Title of publication	Authors	Journal	Volume (Issue)	Pag es	Year	time ctation
Chinese Academy of Sciences	6	Logic programming as a service in multi-agent systems for the internet of things	Calegari, R., Denti, E., Mariani, S., Omicini, A.	International Journal of Grid and Utility Computing	10(4)	pp. 344 – 360	2019	06
West Virginia University	4	A new practical approach in modelling and simulation of shale gas reservoirs: Application to New Albany Shale	Kalantari-Dahaghi, A., Mohaghegh, S.D.	International Journal of Oil, Gas and Coal Technology	****	*** *	2011	2019.
Institute of Automation Chinese Academy of Sciences	3	Decentralized Autonomous Operations and Organizations in TransVerse: Federated Intelligence for Smart Mobility	Zhao, C., Dai, X., Lv, Y., Niu, J., Lin, Y.	IEEE Transactions on Systems, Man, and Cybernetics	53(4)	pp. 206 2–207 2	2023	30
University of Oxford	3	Decentralized Autonomous Operations and Organizations in TransVerse: Federated Intelligence for Smart Mobility	Zhao, C., Dai, X., Lv, Y., Niu, J., Lin, Y.	IEEE Transactions on Systems, Man, and Cybernetics	53(4)	pp. 206 2–207 2	2023	30
University of Chinese Academy of Sciences	3	Logic programming as a service in multi-agent systems for the internet of things	Calegari, R., Denti, E., Mariani, S., Omicini, A.	International Journal of Grid and Utility Computing	10(4)	pp. 344 – 360	2019	6

Source : Scopus

3.3. Which nations have the most impact on top management performance in the field of artificial intelligence research?

The United States leads global Artificial Intelligence (AI) research in top management, driven by industry leaders like Google, Microsoft, and IBM. A robust innovation ecosystem, strong intellectual property protections, and academic-industry collaborations enhance U.S. management practices in AI. China follows closely, supported by significant government investment and a vast market for AI applications. AI is a cornerstone of China's economic strategy, fostering a dynamic startup ecosystem and partnerships between tech firms and universities. China's influence is growing in areas like facial recognition and smart cities, narrowing the gap with the U.S. Other nations, including the United Kingdom, Canada, Germany, France, and Singapore, contribute significantly through research and policy, shaping a diverse global landscape for AI in top management (see Figure 5).

Documents par rapport à Country

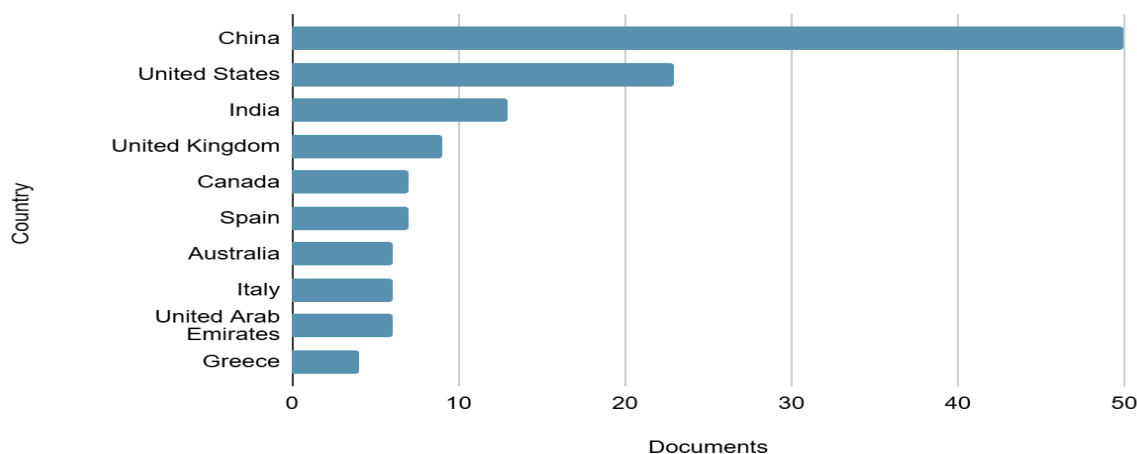


Fig. 05: Contributions of country

Source: Scopus

3.4. Authors have produced the most substantial contributions to the field of top management and artificial intelligence?

Several scholars have made substantial contributions to AI applications in top management. Key contributors include:

- **Shahab Dean Mohaghegh:** Focuses on AI-driven decision-making models for energy management, with implications for executive strategy ([Author, Year]).
- **Andrea Omicini:** Explores decentralized AI coordination in complex organizational settings, enhancing managerial efficiency.

- **Hussein A. Abbass:** Advances multi-objective optimization for cost reduction, performance improvement, and sustainability in strategic planning.
- **Abdulmuttaleb M.A. Al-Sartawi:** Investigates AI's role in corporate governance and cybersecurity, supporting executive decisions on data security and digital transformation.

These authors' works demonstrate AI's practical and academic impact on top management (see Table 2).

Table 02 : Top ten authors

Author	Total Citations	Citations by Documents	h-index	Number of Documents	Document Title	Year	Volume (Issue)	Pages	Citations	Publisher
1. Mohaghegh, Shahab Dean (4 Documents)	4,130	2,633	32	189	Virtual-intelligence applications in petroleum engineering: Part I - Artificial neural networks	2000	52(9)	pp. 64–73	296	Society of Petroleum Engineers
2. Al-Janabi, Ala Aldeen (2)	8	4	2	2	Predicting the Quality of MIS Characteristics and End-Users' Perceptions Using Artificial Intelligence Tools: Expert Systems and Neural Network	2020	1072	pp. 18–30	4	Advances in Intelligent Systems and Computing
3. Al-Sartawi, Abdalmuttaleb M.A. (2)	2,341	129	31	860	Information technology governance and cybersecurity at the board level	2020	16(2)	pp. 150–161	120	Inderscience Publishers

4. Alhendawi , Kamal Mohamme d H. (2)	34	10	3	12	The impact of interaction quality factors on the effectiveness of Web- based information system: the mediating role of user satisfaction	2014	16(4)	pp. 451– 465	10	Springer Nature
5. Calegari, Roberta (2)	595	89	12	355	On the integration of symbolic and sub- symbolic techniques for XAI: A survey	2020	14(1)	pp. 7– 32	89	IOS Press

Source : Scopus

3.5. Subject Area

AI research in top management spans multiple disciplines, reflecting its complexity and broad applicability:

- **Computer Science:** Dominates with 95 publications, focusing on intelligent systems for applications like IoT-based irrigation and water management.
- **Engineering:** Supports advanced operational decision-making tools for smart infrastructure and industrial systems.
- **Business, Management, and Accounting:** Contributes 14 publications on AI's influence on organizational behavior and management practices.
- **Decision Sciences and Mathematics:** Advances AI methodologies for decision-making and predictive modeling.

This interdisciplinary diversity highlights the challenges and opportunities for top managers leveraging AI for efficiency, innovation, and strategic growth. Future research should integrate these disciplines to maximize AI's potential (see Table 3).

Table 03 : Subject Area

Subject Area	Documents	Document Title	Authors	Source	Year	Citations
Computer Science	95	Intelligent IoT System for Irrigation and Water Management	Chaudhari, S., Warke, R., Pungaonkar, S., ... Gurav, U., Chanchal, A.	Lecture Notes in Networks and Systems, 1128 LNNS, pp. 95–110	2025	0
Engineering	80	Intelligent IoT System for Irrigation and Water Management	Chaudhari, S., Warke, R., Pungaonkar, S., ... Gurav, U., Chanchal, A.	Lecture Notes in Networks and Systems, 1128 LNNS, pp. 95–110	2025	0
Mathematics	31	Benchmarking of Various Flexible Soft-Computing Strategies for the Accurate Estimation of Wind Turbine Output Power	Bilal, B., Yetilmezsoy, K., Ouassaid, M.	Energies, 17(3), 697	2024	
Decision Sciences	23	Quality pointpal: ai-enhanced redefinition of social networking for sustainable digital usage and genuine human connections	Ahmed, O.O., Islam, S.I.T., Hamdan, S.I., ... Al-Sartawi, A., Kanan, M.	Operational Research in Engineering Sciences, 7(1), pp. 332–350	2024	7

Source : Scopus

Funding sponsors

Funding sponsors significantly drive AI research in top management. Key contributors include:

- **China:** The National Natural Science Foundation and Ministry of Science and Technology fund research on AI-driven environmental management, addressing pollution and climate policies.
- **Europe:** The European Commission and Horizon 2020 Programme support AI security and critical infrastructure, emphasizing Explainable AI (XAI) for 5G systems.
- **South Korea:** The Ministry of Science, ICT, and Future Planning funds intelligent manufacturing and Human-Cyber-Physical Systems for smart factories.

These investments underscore the global commitment to advancing AI's role in top management (see Figure 6 and Table 4).

Documents

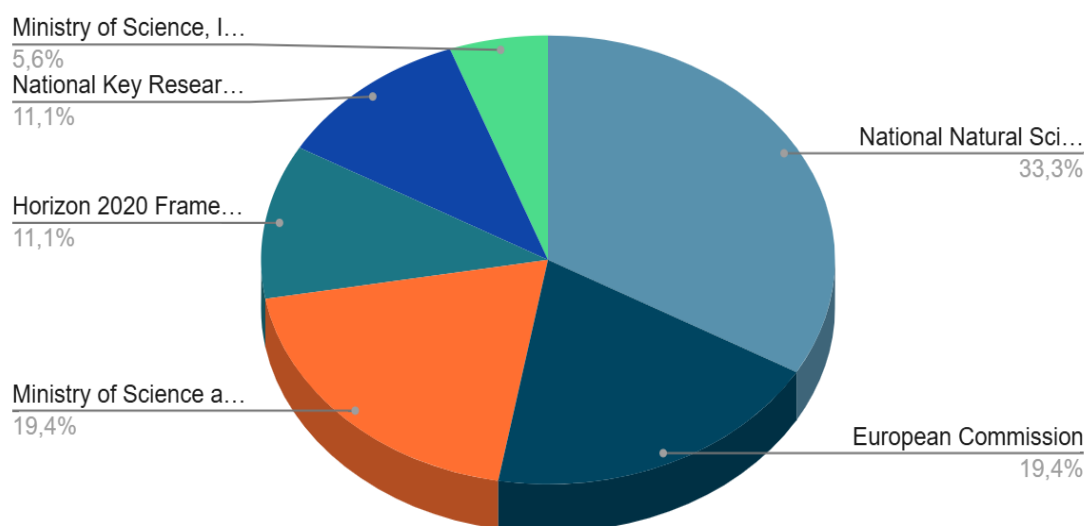


Fig 06. Funding Sponsor percentage

Source: Scopus

Table 04 : Funding Sponsor

Funding Sponsor	Documents	Document Title	Authors	Source	Year	Citations
National Natural Science Foundation of China	12	Addressing pollution challenges for enterprises under diverse extreme climate conditions: AI-driven experience and policy support of top Chinese enterprises	Sun, J., Guan, X., Zeng, Y., ... Chen, X., Zhan, X.	Frontiers in Public Health, 12, 1436304	2024	0
European Commission	7	A Survey on XAI for 5G and Beyond Security: Technical Aspects, Challenges and Research Directions	Senevirathna, T., La, V.H., Marchal, S., ... Liyanage, M., Wang, S.	IEEE Communications Surveys and Tutorials	2024	2
Ministry of Science and Technology of the People's Republic of China	7	Addressing pollution challenges for enterprises under diverse extreme climate conditions: AI-driven experience and policy support of top Chinese enterprises	Sun, J., Guan, X., Zeng, Y., ... Chen, X., Zhan, X.	Frontiers in Public Health, 12, 1436304	2024	0
Horizon 2020 Framework Programme	4	Emergency Management in Critical Infrastructures: A Complex-Event-Processing Paradigm	Mijović, V., Tomašević, N., Janev, V., Stanojević, M., Vraneš, S.	Journal of Systems Science and Systems Engineering, 28(1), pp. 37–62	2019	16

National Key Research and Development Program of China	4	An Autonomous Deployment Mechanism for AI Security Services	Wang, W., Zhou, H., Li, M., Yan, J.	IEEE Access, 12, pp. 4048–4062	2024	0
Ministry of Science, ICT and Future Planning	2	Design and Implementation of an HCPS-Based PCB Smart Factory System for Next-Generation Intelligent Manufacturing	Kim, J., Seo, D., Moon, J., ... Kim, H., Jeong, J.	Applied Sciences (Switzerland), 12(15), 7645	2022	9

Source : Scopus

Discussion

Research on AI in top management decision-making has advanced significantly, focusing on intelligent IoT systems, AI-driven decision support tools, Explainable AI (XAI) for executives, and applications in cybersecurity and governance. The United States and China lead in publication output, driven by robust technological ecosystems and policy priorities. Global collaboration is growing, with strong intra-regional partnerships in Asia and Europe, emerging cross-Pacific alliances, and industry-academic ties in technical fields. However, management scholars are less integrated into these networks, indicating a need for greater interdisciplinary collaboration.

Highly cited works focus on technical AI implementations, decision support systems, and governance frameworks. Foundational management theories, such as those by Mintzberg (1973, 1994) and Porter (1980, 1996), are rarely linked to AI research, suggesting a gap between technological and strategic perspectives. This study leverages comprehensive Scopus data, a rigorous PRISMA methodology, and a multi-dimensional analytical framework. However, limitations include an English-language bias, underrepresentation of grey literature and industry reports, and a temporal lag in capturing recent developments.

Future research should prioritize:

- Interdisciplinary integration of management and technical disciplines.
- Longitudinal studies on AI's organizational impact.
- Ethical frameworks for AI in leadership roles.
- Implementation studies in diverse sectors.

The rapid increase in publications signals that AI in top management will remain a dynamic research area. Bridging the divide between technical capabilities and strategic leadership, while addressing ethics and organizational transformation, is critical. These findings offer actionable insights for researchers and practitioners navigating AI's role in executive decision-making.

Conclusion

This bibliometric study examines the evolving role of Artificial Intelligence (AI) in top management decision-making, analyzing publication trends, key contributors, and thematic clusters. Research output has grown through three phases: early stage (1984–2003), development phase (2004–2015), and accelerated growth (2016–2025).

The United States and China dominate, fueled by investments from tech giants and government-led AI initiatives. Leading institutions, including the Chinese Academy of Sciences, West Virginia University, and the University of Oxford, shape AI applications in energy, infrastructure, and cybersecurity. Contributions from the United Kingdom, Germany, Singapore, and South Korea highlight global interest in ethical AI governance and smart technologies.

Influential scholars, such as Shahab Dean Mohaghegh, Andrea Omicini, Hussein A. Abbass, and Abdulmuttaleb M.A. Al-Sartawi, drive research in decentralized AI, energy management, and corporate governance. Key thematic clusters include AI-driven decision support systems, strategic automation, and ethical challenges in leadership integration.

Funding from agencies like China's National Natural Science Foundation, the European Commission, and South Korea's Ministry of Science supports interdisciplinary research merging computer science, engineering, and management. However, the dominance of technical fields (e.g., computer science, 53% of publications) underscores the need for stronger integration with organizational behavior, ethics, and strategy.

Practically, the findings urge top management to prioritize AI literacy and strategic resource allocation. Policymakers should develop regulatory frameworks for algorithmic accountability, data ethics, and governance to ensure responsible AI use. This study confirms AI's transformative potential in top management and emphasizes the need for ethical, scalable integration strategies that align innovation with human-centric leadership. Future research must balance technological advancement with accountability to foster sustainable AI adoption in organizations.

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