

Exploring Material Management Perspectives: A Bibliometric Analysis in Business and Management

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Abstract: Material management is an essential aspect of corporate operations, affecting efficiency, cost optimization, and supply chain performance. This study offers a bibliometric examination of material management research in the fields of business, management, and accounting. Publications from 2020 to 2025 were systematically evaluated utilizing the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to guarantee a thorough and organized selection procedure. The analysis, derived from 5,504 English-language publications, examines critical issues like inventory management, procurement methods, supply chain efficacy, and cost control. The research delineates significant trends, notable writers, and essential journals, providing critical insights into the transforming function of material management within contemporary corporate practices. The findings underscore study deficiencies and prospects for future investigations, acting as a reference for scholars, practitioners, and policymakers seeking to improve material management techniques in a progressively dynamic global market. Keyword: Material Management, Supply Chain Management, Logistics, Risk Management

1. Introduction

Efficiently managing materials from procurement to final use is a crucial component of business and management. The relevance of material management has increased significantly because industries are changing, and worldwide supply networks are getting more complicated. Supply chain optimization, total organizational productivity, and cost efficiency are all impacted by good material management (Thoti, 2023). The topic of material management is always evolving and innovating due to its interdisciplinary character, which includes sustainability, logistics, procurement, and inventory control. Research and developments in the field of material management must be thoroughly investigated to comprehend its intellectual evolution (Kumar Thoti, 2015). A bibliometric study provides a quantitative and methodical way to sift through the mountain of literature in search of common threads, seminal works, and shifting paradigms. The purpose of this study is to create a framework for future research in the field of material management by examining citation trends, networks of co-authors, and subject clusters. Production planning, supply chain management, cost reduction, and waste minimization are just a few of the many corporate operations that rely on material management. To improve

resource utilization, cut down on lead times, and simplify processes, organizations depend on strong material management methods. Further revolutionizing material management processes, the incorporation of technical breakthroughs like data analytics, blockchain, and artificial intelligence has brought increased efficiency, transparency, and precision. To keep operations running smoothly, firms need a material management system that helps them keep track of supply and demand, (Arockia Venice et al., 2022). In addition, companies are under pressure to implement environmentally responsible procurement, and disposal processes due to sustainability concerns, which have pushed material management into the limelight. The significance of creative material management strategies is highlighted by the rising popularity of circular economy ideas, which promote the efficient use of resources and the elimination of waste. Inventory optimization, procurement techniques, and supply chain resilience are just a few of the many areas that researchers around material management have studied, (Friedrich et al., 2024). But with so much information out there, it's crucial to evaluate and synthesize what we already know. To do this, a bibliometric study is conducted to determine the significance of publications, prominent authors, and important research issues.

2. REVIEW OF LITERATURE:

Every day, people throughout the globe work to find better ways to use resources and make the switch to low-carbon building practices. To build low-carbon buildings efficiently, this article details the process of creating criteria for managing material resources. To measure how well resources are being used, several metrics including net income, gross profit, equity, and balance sheets are suggested (Pontius & McIntosh, 2024). The methodological foundation for establishing cause-and-effect linkages of the amount of construction of transport structures was provided by nonlinear regression models. Since construction businesses do not buy resources with the intention of storing them, the cost of materials used in low-carbon technological building activity is directly related to the cost of construction. Construction expenses are the determinant of output volume in the construction sector. Using low-carbon materials more efficiently lowers building costs and waste. This article has created a connection between the utilization of low-carbon materials in transport infrastructure development and an efficiency indicator for the operation of Ukrainian construction businesses. The results show a correlation between low-carbon material resource use and the construction enterprise's performance indicators (net profit, gross profit, output volume, balance sheets, and equity capital), which is useful for low-carbon construction management. We hope that future studies will build on our findings to examine how cities and regions may adopt a cost-based paradigm to make the transition to a low-carbon economy (Mykytyuk et al., 2024). Current methods of managing the supply chain in the construction industry face several obstacles, such as disjointed processes, distrust among players, and limited access to relevant data. This study presents a blockchain-based integrated system for managing inventories and building materials with the goal of improving the transparency and traceability of shared material information across the supply chain. The goal of this program is to improve operational efficiency by creating a more cooperative and transparent supply chain environment where all parties involved work together to resolve material delays. This will lead to less interruptions and more seamless project operations (Donyavi et al., 2024). The system's capacity to greatly decrease the frequency of legal conflicts is supported by the fact that information is securely and immutably stored in shared ledgers, which promotes a high degree of reliability and responsibility. Smart contracts built on the blockchain that use the Economic Order Quantity (EOQ) method simplify purchasing procedures, cutting down on unnecessary purchase orders and the expenses that go along with them. Using a Design Science Research (DSR) methodology, the research develops a distributed system for the construction supply chain, which tracks the evolution of material data as it moves through the supply chain and accounts for the unknowns that come with

maintaining inventory of building materials. Better decision-making and less material delays are the outcomes of the suggested system's ability to provide project stakeholders access to material information in real-time. The integrated smart contract and blockchain technology used for construction material management also makes it easy for all parties involved in a project to keep track of inventories effectively, even for the most complicated projects. Using a usability test approach, participants confirmed that the suggested solution could be applied in construction contexts, assessing its usefulness. Reducing material purchase costs, improving decision-making, and reducing legal issues among project parties were some of the main benefits they emphasized (Basheer et al., 2024). For government agencies, materials management is an integral part of supply chain management; this is particularly true in the steel sector. Controlling the flow of materials requires considering demand, pricing, availability, quality, and delivery dates all at once. Effective material management and control rely on meticulous planning. Manufacturing expenses and profitability can be enhanced by reducing material input costs even somewhat. The demographic status of respondents is also examined, and the perspective of executives towards the aspects of materials management efficacy is the primary purpose of the study. Quality, convenience, and cost are significantly correlated with the demographic factors designation, education, and experience, according to the results. On the other hand, time, quantity, and human resource did not show any significant relationship. Businesses in the steel industry can benefit from a deeper comprehension of what makes materials management systems work according to this research (Kokkiligadda et al., 2024). All through the construction process, from planning to final touches, people are talking about how great Building Information Modelling (BIM) is. This includes the data-driven culture that permeates all aspects of the building process and the long-term sustainable effects. However, as a fundamental part of supply chain management, construction materials management (CMM) still has room for improvement, and here is where building information modeling (BIM) may come in. The authors evaluate BIM-enabled materials management based on three sources of data: a literature review, an online survey, and interviews with experts in the field. This is done because there has been a lack of research on the potential of BIM to improve CMM within a sustainability context. Sustainable construction materials management made possible by building information modeling (BIM) is the focus of this research (Junussova et al., 2024).

3. OBJECTIVES OF THE STUDY

- Explore the most popular and up-and-coming areas of study in the field of material management as it relates to business and management to identify important research themes.
- Examine Patterns of Citations: Examining citation metrics and seminal articles to comprehend the significance of academic work.
- Road map Collaboration Networks for Authors: Examining patterns of co-authorship to ascertain the level of cooperation among researchers in the subject.
- Determine the Influence of the Journal: The purpose of this study is to identify and evaluate the most influential journals publishing research on material management.
- Determine Where to Take Your Research Next: Drawing attention to the need for more research in the field of material management and pointing out where the current literature is lacking.

4. RESEARCH METHODOLOGY:

- Research output is systematically evaluated using statistical and computer tools in a bibliometric study, a quantitative approach. Using bibliometric methods, this research examines academic works on the topic of material management in the context of business and management.

- **Research Sources:** Google Scholar, Scopus, and the Web of Science are some of the respected academic databases used to compile the data for this study. Journal articles, conference papers, and seminal books over the last few decades are all part of the selection process.
- **Processing and Cleaning of Data:** Following data collection, any duplicate entries or publications that are not relevant are eliminated. Next, bibliometric analysis is performed on the cleaned-up dataset using dedicated software like Biblioshiny, CiteSpace, or VOSviewer.
- **Analysis of Citations and Co-Citations:** Journals, authors, and articles that have been cited the most in the field of material management may be found using citation analysis. Co-citation analysis shows how ideas have developed and impacted later study by revealing links between various pieces of literature.
- **Thematic and Keyword Analysis:** Thematic and keyword analysis helps to uncover the most popular research topics and new developments in the industry. Researchers in the field of material management might benefit from the insights provided by thematic mapping, which helps to categorize subjects into central and peripheral sections.
- **Network Mapping and Author Collaboration:** Co-authorship analysis finds prominent authors and research clusters by looking at how scholars collaborate. By using social network analysis, we can see how different academic institutions are linked to one another.

5. DATA ANALYSIS:

5.1. Identify the data from Scopus Data base through PRISM Model

The model helps for framework used to evaluate the research findings are translated with practices and considering factors like research, adoption, effectiveness, implementation and maintenance with contexts.

Table No. 1: PRISM Model for Sort the Selective Articles for Analysis the scope of Material Management:

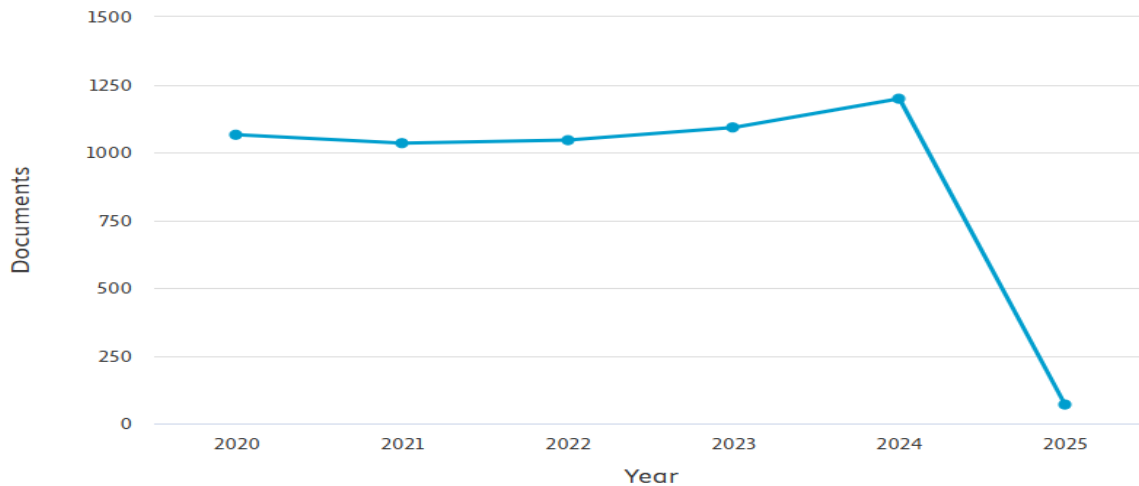
Step 1: Key word used in Scopus Portal: Material Management
Step 2: Total Number of articles related to the Material Management was 3,33,615 as on 27 th Jan 2025
Step 3: Extract the Articles with the condition Subject Area: Business, management & accounting
Step 4: Total Number of articles after extracted 19,062
Step 5: Extract the articles with the year 2020-2025 & Language: English
Step 6: Final Number of articles was 5,504 for analysis

According to the Table 1, the process of extracting the data from the Scopus database with the keyword Material Management then found 3,33,615 related articles with the keyword then the sorting options chosen with subject area Business, Management and Accounting then total number of articles are extracted was 19,062 then sorted with language English & years between 2020-2025 was 5,504 articles. The final articles 5,504 articles are considered for analysis the data related to the keyword with Business perspectives.

5.2. Data Analysis

Chart No. 1: Number of documents published from 2020-2025

Documents by year



Interpretation: According to the chart, average number of 1100 articles are published from 2020 onwards in the field of Material Management.

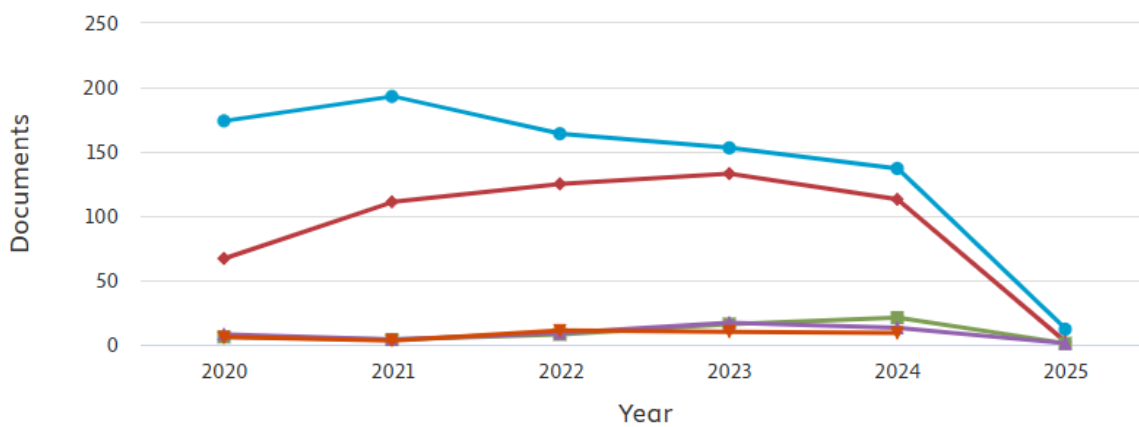
Chart No. 2: Documents per year by Sources

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Documents per year by source

Compare the document counts for up to 10 sources.

[Compare sources and view CiteScore, SJR, and SNIP data](#)

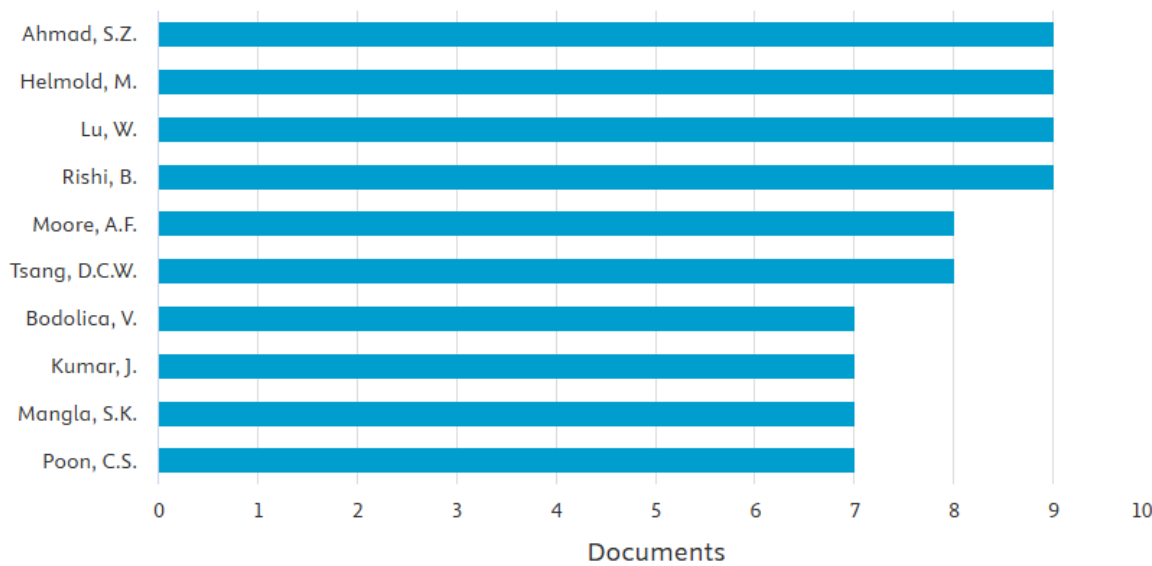


Analysis: According to the chart was analysis with number of articles published and sources of publications. Most of the journals used for publications are journal of cleaner production, Emerald emerging markets case studies, Engineering construction and architectural management, Internation journal of construction management followed by clean technologies and environmental policy.

Chart 3: Documents by Authors

Documents by author

Compare the document counts for up to 15 authors.



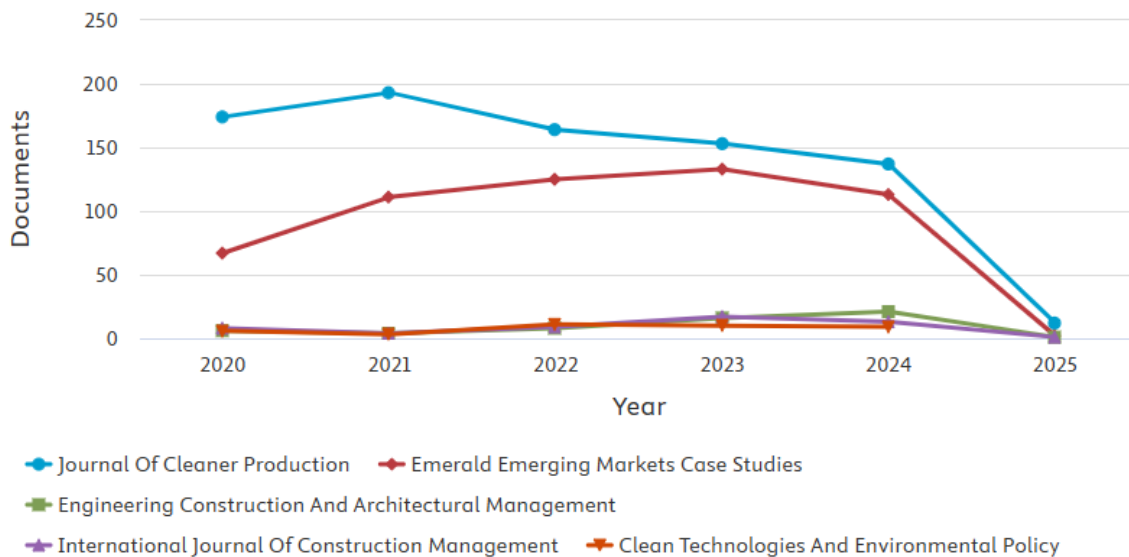
Analysis: According to the chart 3, the top 15 authors are considered for analysis, and the authors are experts in the field of Material Management. From the chart 3 the author Ahmad, Helmold, Lu, Rishi are the top authors contributing the research area to Material Management with respect to Business, Management.

Chart 4: Documents per year by source

Documents per year by source

Compare the document counts for up to 10 sources.

[Compare sources and view CiteScore, SJR, and SNIP data](#)

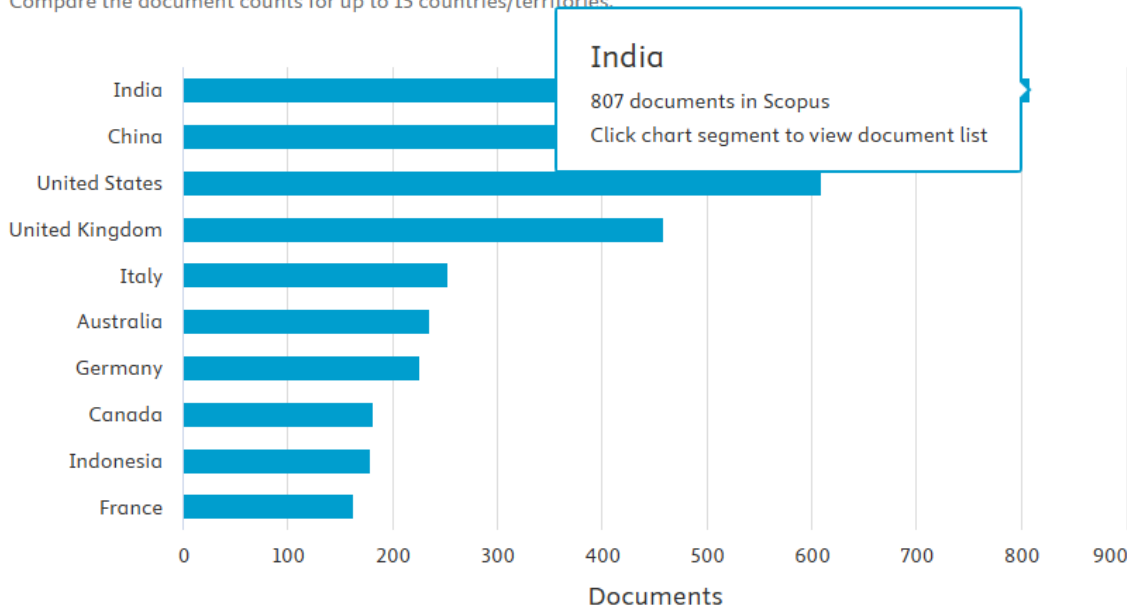


Analysis: According to Chart 4, The authors are given high priority for the following journals journal of cleaner production, emerald emerging markets case studies, engineering construction and architectural management, international journal of construction management and clean technologies and environmental policy.

Chart No. 5: Documents by Country or Territory

Documents by country or territory

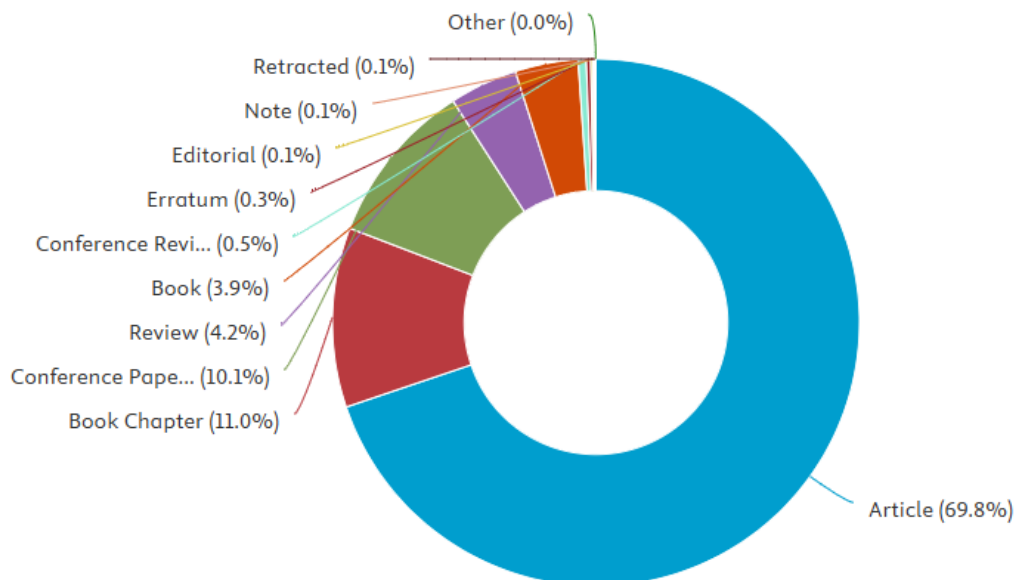
Compare the document counts for up to 15 countries/territories.



Analysis: The chart 5, was discussed with documents by country or territory; the maximum number i.e., 807 research articles was contributed from India and it is leading from other countries followed by China, US, UK, Italy.

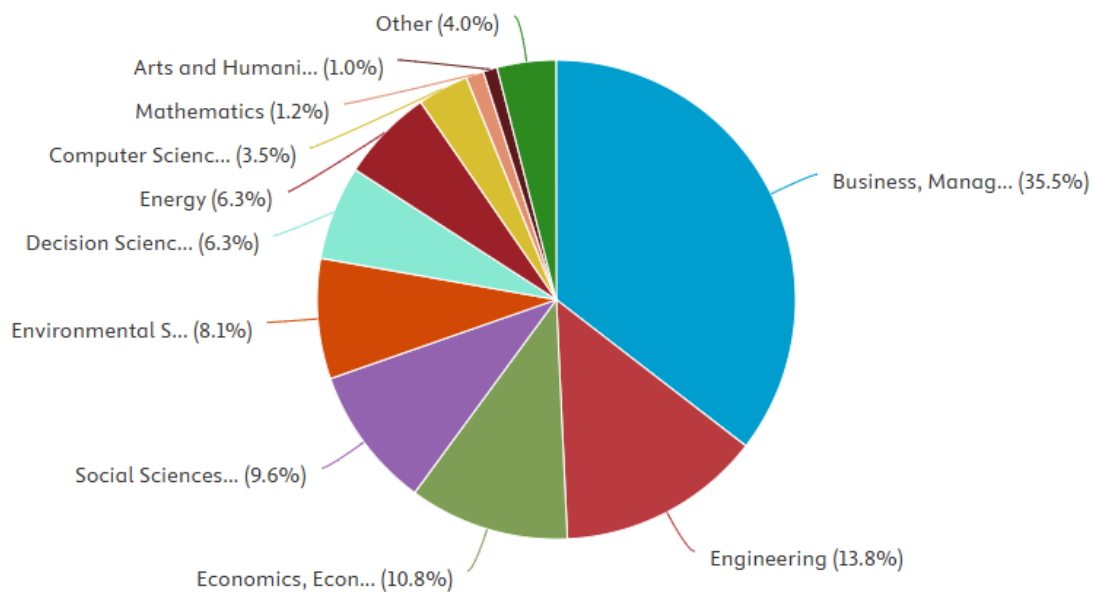
Chart No. 6: Documents by type of article chosen by authors

Documents by type



Analysis: According to the Chart No. 6, The authors are choosing articles or full paper to publish in journal i.e., 69.8% followed by 11% of the author chosen as book chapter then conference papers, review, books, other sources for publication of the research work.

Chart No. 7: Documents by subject area
Documents by subject area

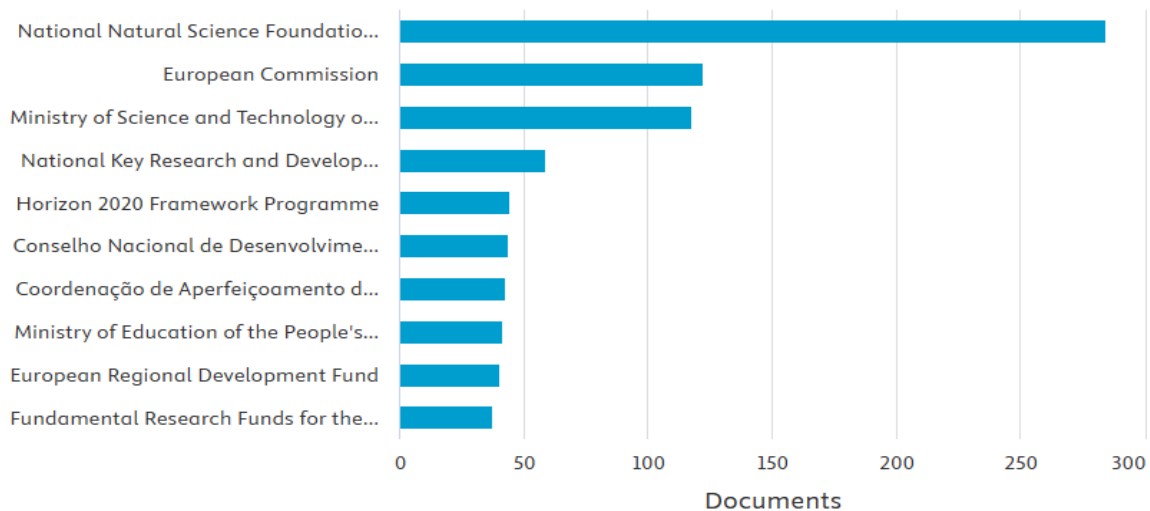


Analysis: According to the chart 7, According to Material Management perspective towards Business, Management & Accounting subject area i.e., 35.5% of the articles are published matching with the business, Management followed by 13.8% of the articles are chosen with subject area of engineering then Economics, Social Sciences, Environmental, Decision Science.

Chart No. 8: Documents by funding Sponsor

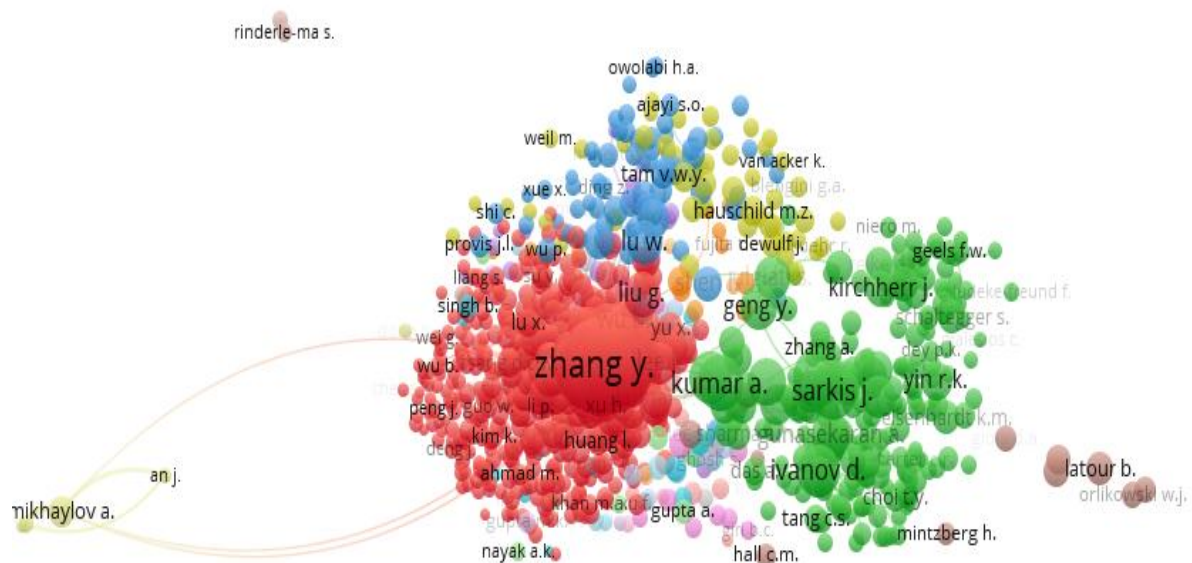
Documents by funding sponsor

Compare the document counts for up to 15 funding sponsors.



Analysis: According to the Chart 8, The top funding sponsor for the field of Material Management are National Natural Science Foundation, European Commission, Ministry of Science and Technology, National Key Research and Development, Horizon 2020 framework, Conselho Nacional, Ministry of Education of the People, European Regional Development Fund and Fundamental Research Funds.

Figure 3, Network diagram between Co-citation and Cited Authors: Co-Citation Vs Cited Authors



Analysis: According to the figure 3, The network diagram was drawn between co-citation of the articles with respect to the cited authors shown most of the articles are co-cited Zhang Y research work followed Sarkis J, Kumar A.

Table No. 2: Top Cited Authors in the File of Material Management in Scopus Database

Authors Full Name	Authors with affiliations	Year	EID	Count	Cites
Amenta, Francesco (35594184800)	Amenta F., University of Camerino, Italy	2020	2-s2.0-85088864473	1	76
Battineni, Gopi (57209566116)	Battineni G., University of Camerino, Italy	2020	2-s2.0-85088864473	1	76
Chintalapudi, Nalini (57209580244)	Chintalapudi N., University of Camerino, Italy	2020	2-s2.0-85088864473	1	76
Fadhil, Ahmed (57191505029)	Fadhil A., Centro Ricerche GPI, Italy	2017	2-s2.0-85055679789	1	75
Gabrielli, Silvia (8883252000)	Gabrielli S., Centro Ricerche GPI, Italy	2017	2-s2.0-85055679789	1	75
Mooney, Sean D. (57207721730)	Mooney S.D., University of Washington Seattle, United States	2021	2-s2.0-85107126908	1	40
Haristiani, Nuria (57193796810)	Haristiani N., Universitas Pendidikan Indonesia, Indonesia	2019	2-s2.0-85076406020	1	31
Lin, Chi-Jen (57193812263)	Lin C., National Taiwan University of Science and Technology, Taiwan	2021	2-s2.0-85117899910	1	18
Mubarok, Husni (57211415316)	Mubarok H., National Taiwan University of Science and Technology, Taiwan	2021	2-s2.0-85117899910	1	18
Mihalcea, Rada (8619220500)	Mihalcea R., University of Michigan, United States	2020	2-s2.0-85108298831	1	14

Analysis: According to the table 2, the maximum cites source was 76 by Amenta, Battineni, Chintalapudi Nalini research was referred by most of the authors followed by 75 cited sources by Fadhil, Gabrielli.

Table 3: Bibliometric analysis with respect to index count:

Author's Name	TP	NCP	TC	C/P	C/CP	h-index	g-index	Citation sums within h-core	Citable Year	Pub. Year Start	m-index
Fadhil, Ahmed (57191505029)	2	2	85	42.50	42.50	2	0	85	9	2017	0.222

Gabrielli, Silvia (8883252000)	2	2	85	42.50	42.50	2	0	85	9	2017	0.222
O'Brien, Nicole (57189866836)	1	0	0	0.00	0.00	0	1	0	5	2021	0.000
Mihalcea, Rada (8619220500)	1	1	14	14.00	14.00	1	0	14	6	2020	0.167
Kim, Minsub (57271878800)	1	1	14	14.00	14.00	1	0	14	5	2021	0.200
Singanamala, Hareesh (55975547300)	1	1	6	6.00	6.00	1	0	6	8	2018	0.125
Nguyen, Phan-Anh-Huy (57193827237)	1	1	1	1.00	1.00	1	1	1	5	2021	0.200
Hara, Hideki (49561190200)	1	1	8	8.00	8.00	1	0	8	8	2018	0.125
Kang, Inho (57271596100)	1	1	14	14.00	14.00	1	0	14	5	2021	0.200
Kurachi, Yoichi (56602470400)	1	1	8	8.00	8.00	1	0	8	8	2018	0.125
Muller, Michael (7404688942)	1	1	1	1.00	1.00	1	1	1	6	2020	0.167

Analysis: According to the table 3, Total Publication (TP), Total Citation (TC), NCP: Number of Cited Papers, C/P: Citation per paper, C/CCP: Citation per Cited Paper, m-index, h-index, g-index. Fadhil & Gabrielli are top index authors in the filed of Material Management.

Table No. 4: Author's total publication count

Author's Name	TP
Wongsim, Manirath (36563094900)	6
Rushinek, Avi (7003573012)	5
Rushinek, Sara F. (7004287012)	5
Gao, Jing (55702655700)	4
Choe, Jong-Min (7201515400)	3
Grabski, Severin V. (6603443269)	3
Worrell, James L. (23490880600)	2
Peters, James (7404189725)	2
Chalos, Peter (6507381658)	2
Kaplan, David (55574122349)	2
Al-Dabbagh, Balsam (54082823300)	2

Analysis: According to the table 4, Wongsim, Manirath was contributed 6 documents i.e., articles followed by Rushinek, Avi & Rushinek, Sara F contribute 5 each then Gao, Jing contribute 4 from the period 2020-2024.

6. KEY FINDINGS

Research in the field of material management has expanded substantially, according to early bibliometric results. This expansion is most noticeable in the subfields of supply chain sustainability, digital transformation, and risk management. Work on improving inventory management, streamlining procurement processes, and implementing technological advancements in this area is prominent among the most referenced publications. Collaboration networks also show that studies combining IT, environmental science, and operations management are becoming increasingly popular. Important venues for the dissemination of research in material management have arisen, including prestigious publications like the International Journal of Production Economics, Journal of Supply Chain Management, and Business Strategy and the Environment. There should be more empirical studies on sustainable procurement techniques, and the report points out that there has been little investigation into the use of artificial intelligence in material management. These findings

provide light on material management, pointing the way for further study and having real-world consequences for those working in the commercial world.

7. CONCLUSION

Effective material management is critical to the success of any organization because it determines the longevity, efficiency, and profitability of daily operations. This bibliometric study outlines recent advances in the subject of study, highlighting seminal works and new directions for future research. Researchers, practitioners, and policymakers may all benefit from this study's intellectual landscape map of material management research, which aims to maximize material management methods. The results highlight the significance of integrating cutting-edge technology into material management, working across disciplines, and continuously innovating. Research in the future should look at new ways to make material management more efficient, resilient, and sustainable considering how the business world is changing. In the field of business and management, this study lays the groundwork for future academic investigations that will add to our understanding of material management.

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