

# Bibliometric Analysis of Project Management: Exploring the Linkages Between Research and Practice

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## ABSTRACT

This study presents a comprehensive bibliometric analysis of project management research to explore its evolution, thematic trends, and the connections between academic contributions and practical applications. Utilizing data from the Scopus database, the analysis spans publications from 2000 to 2024, identifying key contributors, influential institutions, and global collaborative networks. The findings reveal a dynamic shift in project management research from traditional themes such as risk management and cost control to contemporary focuses on sustainability, innovation, and stakeholder engagement. Prominent authors and institutions were identified, with developed countries leading in research output and collaboration. However, growing contributions from developing nations highlight an emerging inclusivity. The study underscores the interdisciplinary and global nature of project management while identifying a persistent gap between academic research and practical implementation. Recommendations for future research include enhancing collaboration between developed and developing regions, focusing on practical applications of emerging themes, and adopting interdisciplinary approaches. This analysis serves as a foundation for advancing project management research to meet evolving global challenges effectively.

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## 1. INTRODUCTION

The field of project management has continually evolved, adapting to technological advancements, changing market conditions, and emerging academic insights. While project management began as a set of tools primarily used in construction and engineering, it has expanded to include a wide array of industries facing complex

project demands. The adoption of various methodologies such as Agile, Lean, and Six Sigma has significantly influenced how projects are managed today, stressing the importance of flexibility, efficiency, and continuous improvement [1]. Academic research in project management plays a crucial role in shaping professional practices by providing evidence-based findings and

theoretical frameworks. This research not only guides current practices but also helps in anticipating future trends and challenges in the field [2]. However, the extent to which academic research influences practical project management remains a subject of debate. Scholars argue that there exists a gap between the theoretical advancements in academia and the practical application of these concepts in real-world projects [3].

Bibliometric analysis has emerged as a powerful tool to quantitatively assess the impact and evolution of academic fields, including project management. By examining patterns in academic publications, citations, and co-authorship networks, bibliometric studies can provide insights into the most influential theories, authors, and articles, as well as emerging trends and under-researched areas within the discipline [4]. Despite the growing body of literature in project management, there remains a lack of comprehensive bibliometric studies that connect research outputs with practical implications. This is particularly significant in an era where project management techniques are increasingly integral to strategic business operations, and where aligning academic research with industry needs is crucial for fostering innovation and addressing contemporary challenges [5].

There is a noted discrepancy between the theoretical advancements in project management literature and their adoption in practical settings. This disconnect may hinder the potential for academic research to contribute effectively to real-world project management challenges. Given the rapid evolution of project management techniques and their critical importance in achieving strategic objectives across various industries, it is essential to understand the dynamics between academic research and practical application. Addressing this gap not only aids in enhancing the relevance of academic studies but also ensures that project management practices benefit from the latest research insights.

The objective of this study is to conduct a comprehensive bibliometric

analysis of the project management literature to explore the linkages between academic research and practical application. This analysis aims to identify the most impactful theories and methodologies, determine the trends in research topics over time, and assess the extent to which these academic endeavors align with the needs of practitioners in the field. The study will provide valuable insights into the current state of project management research and its practical implications, offering a basis for future academic and professional discourse.

### *Evolution of Project Management*

Project management as a discipline has undergone significant transformations over the past decades. Initially focused on the construction and engineering sectors, it has expanded into diverse fields such as IT, healthcare, and finance, adapting to the unique challenges of each sector [6]. The literature identifies various project management methodologies, such as Agile, Prince2, and the Waterfall model, each catering to different project needs. The Agile methodology, for instance, is highlighted for its flexibility and responsiveness, making it suitable for projects requiring adaptation to rapidly changing conditions [7]. Contrastingly, the Waterfall model is often described as more structured and sequential, ideal for projects with well-defined stages and fixed requirements [8].

### *Academic Research and Practical Application*

Theoretical advancements in project management are widely documented; however, the integration of these theories into practical settings is less understood. Academic research often explores complex models and frameworks that, while theoretically sound, may not be readily applicable in the less controlled environments of real-world projects [9]. [10] discuss the “knowing-doing gap,” where project managers acknowledge the value of academic research but struggle with its practical implementation due to constraints not typically addressed by academic studies, such

as organizational culture, resource limitations, and stakeholder conflicts.

### ***Bibliometric Studies in Project Management***

Bibliometric analysis offers a methodological approach to quantitatively review literature and uncover patterns within academic research. In project management, bibliometric studies have been utilized to map the evolution of the field, identify key research themes, and evaluate the influence of various scholars and institutions [4]. For instance, a study by [11] employed bibliometric techniques to analyze project management literature and found a significant concentration of research focused on risk management and stakeholder analysis, indicating these areas as critical points of academic interest and potential practical importance.

## **2. METHODS**

This study employs a bibliometric analysis to systematically review project management literature, focusing exclusively on articles sourced from the Scopus database. The analysis covers publications from the year 2000 to 2024, ensuring a comprehensive overview of recent advancements and trends within the field. Key search terms utilized include "project management," "Agile," "risk management," and "methodology application," which help in refining and targeting the most relevant articles. The data collected from Scopus encompasses publication year, citation count, authorship, and journal impact factors. For the bibliometric mapping, VOSviewer software is used to create network visualizations of co-authorship and co-citation patterns.

## **3. RESULTS AND DISCUSSION**

### ***3.1 Descriptive Analysis***

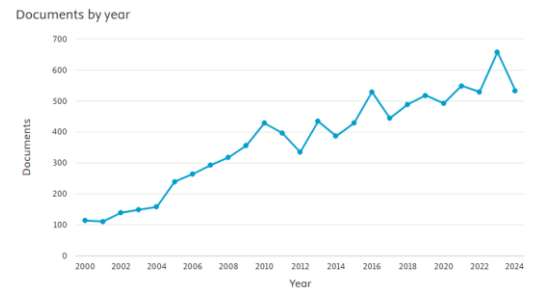


Figure 1. Documents by Year

Source: Scopus, 2024

The chart illustrates the number of documents published per year in the field of project management from the year 2000 to 2024, based on data sourced from an academic database. The graph shows a consistent upward trend in publications over the 24-year period, beginning with under 100 documents in 2000 and experiencing a sharp increase to approximately 600 by 2024. Notable increases in publication volumes can be observed particularly after 2010, indicating a growing academic interest in project management. There are a few periods of fluctuation, notably around 2012 and 2018, where the number of documents slightly declined before resuming an upward trajectory. The sharp increase in publications in the last few years, especially the peak in 2024, suggests a significant surge in research activity, possibly driven by new developments or challenges in the field of project management.

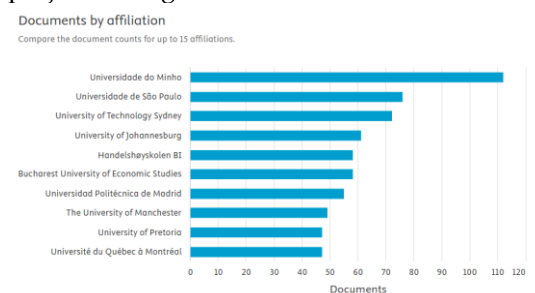


Figure 2. Documents by Affiliation

Source: Scopus, 2024

The bar chart displays the number of project management-related documents published by various academic institutions, providing a comparison of research outputs across up to 15 affiliations. Universidade do Minho leads with the highest number of publications, closely followed by Universidade de São Paulo and University of

Technology Sydney, indicating a strong focus on project management research in these institutions. Other notable contributors include the University of Johannesburg and Handelshøyskolen BI, showcasing a significant international interest and diversity in project management studies. The presence of universities from different continents such as South America, Europe, Africa, and Australia reflects the global relevance and interdisciplinary nature of project management research. Institutions like Bucharest University of Economic Studies, Universidad Politécnica de Madrid, and The University of Manchester also contribute notable document counts, underscoring their roles in advancing the field. This distribution highlights regions with active research communities in project management and potentially points to different regional focuses or specialties within the discipline.

Documents by type

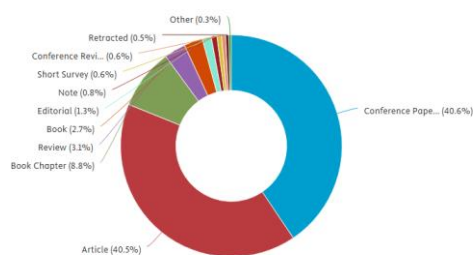


Figure 3. Documents by Type

Source: Scopus, 2024

The pie chart categorizes the types of documents published in the field of project management, revealing a balanced distribution between articles and conference papers, each constituting just over 40% of the total publications. This substantial proportion of conference papers highlights the dynamic and collaborative nature of project management research, where findings are frequently discussed and disseminated in academic and professional gatherings. Articles, making up an equivalent portion, indicate rigorous peer-reviewed research contributing to the foundational and theoretical development of the field. Book chapters account for 8.8%, suggesting the contribution of more comprehensive, in-depth analyses and discussions on specific

topics within project management. Reviews and books represent smaller segments at 3.1% and 2.7%, respectively, providing critical evaluations and aggregated knowledge. Editorial, notes, and shorter surveys collectively form about 2.7%, pointing to ongoing dialogues and updates within the academic community. The presence of retracted documents, although minimal (0.5%), is essential for maintaining the integrity and accuracy of the research field. The "Other" category, at 0.3%, likely includes less conventional document types, illustrating the diverse methods of contributing to the field's body of knowledge.

Documents by subject area

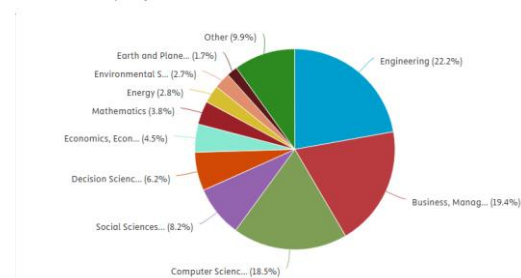


Figure 4. Documents by Subject

Source: Scopus, 2024

The pie chart provides a breakdown of the subject areas covered by documents in the field of project management. Engineering emerges as the dominant discipline, constituting 22.2% of the total documents, underscoring its foundational role in project management. Business and Management are also significant, making up 19.4% of the documents, reflecting the application of project management principles in corporate and organizational settings. Computer Science accounts for 18.5%, highlighting the increasing relevance of technology and software in managing projects efficiently. Social Sciences, with an 8.2% share, demonstrate the importance of human and societal aspects in project management. Decision Sciences and Economics contribute 6.2% and 4.5%, respectively, pointing to the critical role of decision-making and economic analysis in project management. Smaller shares are held by Mathematics, Energy, Environmental Sciences, and Earth and

Planetary Sciences, indicating the interdisciplinary nature of project management that extends into various specialized fields. The category labeled 'Other' encompasses 9.9% of the documents, which may include niche areas or emerging topics that do not fall neatly into the traditional categories, illustrating the field's expansive scope and adaptability.

### 3.2 Keyword Co-Occurrence Network

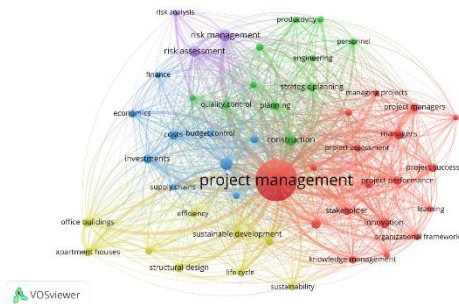


Figure 5. Network Visualization

Source: Data Analysis, 2024

The visualization provides a compelling illustration of the expansive and intricate landscape of project management research. Centered in the diagram is the term "project management," signifying its pivotal role in the network and serving as the nexus connecting various sub-disciplines and related concepts. This central placement underscores the foundational importance of project management as a discipline that permeates various aspects of organizational, technical, and strategic functions. Surrounding the core node are several clusters of terms, each distinguished by different colors and representing specific themes or focal areas within project management. The red cluster, prominently featuring terms such as "project success," "project performance," "stakeholder," and "innovation," highlights the outcome-oriented facets of project management. This cluster underscores the critical importance of achieving desirable outcomes in projects, managing performance effectively, engaging stakeholders actively, and continuously seeking innovative solutions to enhance project results.

Adjacent to this, the green cluster encapsulates terms like "engineering," "productivity," and "strategic planning." These terms reflect the technical and procedural backbone of project management, focusing on the application of engineering principles, enhancement of productivity, and the strategic alignment of projects with broader organizational goals. This cluster illustrates the necessity of integrating technical precision with strategic vision in project management, ensuring that projects are not only well-planned but also align with the long-term objectives of the organization. In contrast, the blue cluster brings together financial and economic aspects, with terms such as "finance," "economics," "costs," and "budget control." This cluster indicates the significant role financial management plays in project management, emphasizing the need for rigorous budgeting, economic analysis, and financial oversight to ensure the economic viability and success of projects. It reflects an understanding that effective financial stewardship is crucial for managing resources efficiently and achieving project objectives within the set financial constraints. The yellow cluster focuses on sustainability and efficiency, showcasing terms like "sustainable development," "efficiency," "supply chains," and "life cycle." This indicates a growing recognition within the field of the need to consider sustainability in project execution. It emphasizes optimizing processes and resources across the entire life cycle of a project, from conception through completion, and integrating sustainable practices within the supply chain to enhance overall project sustainability and efficiency.

The visualization highlights a diverse array of other interconnected terms like "risk management," "quality control," and "organizational framework," scattered across different clusters. These terms reflect the multifaceted nature of project management, where various elements such as risk assessment, quality assurance, and organizational structure play integral roles. This diverse terminology points to the complex and dynamic environment in which

project managers operate, requiring a broad skill set and a holistic approach to manage projects effectively across different sectors and disciplines.

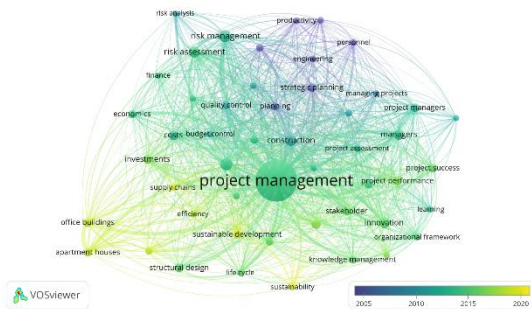


Figure 6. Overlay Visualization  
Source: Data Analysis, 2024

The VOSviewer visualization highlights the thematic evolution of project management research over time, with nodes representing key concepts and their relative importance indicated by size. The central node, "project management," reflects the core focus of the field, surrounded by a dense network of interconnected terms. The color gradient, ranging from blue to yellow, represents the temporal progression of research, with blue indicating earlier studies (circa 2005) and yellow showing more recent developments (2020). This temporal dynamic underscores the evolving priorities and areas of focus within project management research.

The upper left section of the network features terms such as "risk management," "risk analysis," and "risk assessment," predominantly in blue-green tones, indicating that these topics gained prominence in earlier stages of project management research. These terms emphasize the foundational role of risk identification, evaluation, and mitigation in projects, a focus that continues to be critical but was particularly dominant in earlier literature. The integration of financial terms like "finance" and "investments" nearby reflects the importance of economic considerations in mitigating project risks.

In the lower portion of the network, terms like "sustainable development," "efficiency," and "sustainability" appear, with their predominantly green-yellow hues signifying a relatively recent surge in interest.

These terms indicate a growing focus on integrating sustainable practices into project management, reflecting global trends toward environmental consciousness and long-term resource efficiency. The adjacency of terms such as "supply chains" and "life cycle" highlights the increasing attention to sustainable project execution across entire project lifecycles.

On the right side of the network, terms like "project success," "stakeholder," "innovation," and "knowledge management" are represented in green-to-yellow tones, suggesting that research on these topics has gained traction in recent years. This cluster emphasizes outcome-oriented and stakeholder-focused perspectives, underscoring the importance of collaboration, innovation, and learning in achieving successful project planning outcomes. These findings demonstrate a shift in project management research toward aligning strategic goals, innovation, and sustainability, balancing technical rigor with evolving global demands.

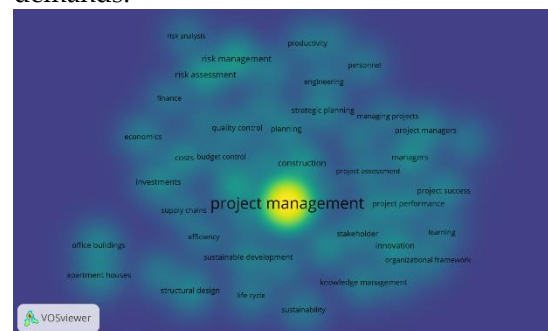


Figure 7. Density Visualization  
Source: Data Analysis, 2024

The heatmap visualization from VOSviewer highlights the intensity and relevance of terms associated with project management research, with brighter areas indicating higher density or focus within the field. At the center of the map, "project management" appears as the most prominent term, reflecting its foundational role and widespread application across various research areas. Closely connected terms like "project success," "stakeholder," "innovation," and "project performance" form a cluster of high activity, emphasizing key themes such as achieving outcomes, managing stakeholders,

and fostering innovation in project execution. These areas signify the importance of practical and strategic considerations in project management research.

Moving outward from the core, terms such as "risk management," "sustainable development," "efficiency," and "supply chains" are also highlighted, albeit with slightly less intensity. This suggests significant but somewhat specialized attention to topics related to risk assessment, sustainability practices, and supply chain

integration in project management. The distributed presence of terms like "quality control," "construction," and "organizational framework" indicates a diverse research focus that spans technical, structural, and managerial domains. Overall, the heatmap reveals a balance between core project management concepts and specialized themes, demonstrating the field's interdisciplinary nature and its adaptability to emerging challenges.

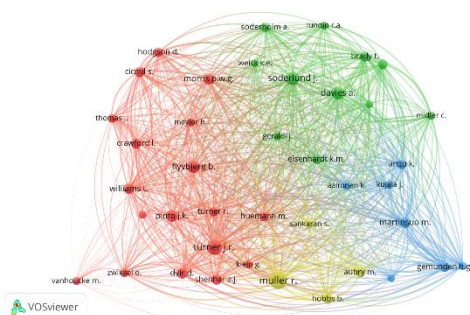
3.3 Citation Analysis

Table 1. Top Citation

Citations	Author	Title
1492	[12]	Project management: Cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria
857	[13]	Application of the AHP in project management
639	[14]	On uncertainty, ambiguity, and complexity in project management
608	[15]	Directions for future research in project management: The main findings of a UK government-funded research network
575	[16]	Project management by multimoora as an instrument for transition economies   Projektų vadyba su multimoora kaip priemonė pereinamojo laikotarpio ūkiams
555	[17]	Portfolios of Control Modes and IS Project Management
527	[10]	The role of project management in achieving project success
490	[18]	Fundamental uncertainties in projects and the scope of project management
479	[19]	Inquiring into the temporary organization: New directions for project management research
473	[11]	Rethinking Project Management: Researching the actuality of projects

3.4 Co-Authorship Network

Figure 8. Author Visualization



Source: Data Analysis, 2024

The network visualization illustrates the co-authorship relationships among prominent researchers in project management, highlighting key clusters of collaboration. The different colors represent distinct groups of authors who frequently

work together or share similar research focuses. For example, the red cluster prominently features authors like Turner J.R., Pinto J.K., and Flyvbjerg B., indicating a focus on foundational theories and methodologies in project management. The green cluster, with contributors like Söderlund J. and Lundin R.A., appears to emphasize organizational and strategic aspects of project management. Meanwhile, the blue cluster, led by authors such as Artto K., Kujala J., and Martinsuo M., likely centers on advanced topics such as project portfolios and innovation management. The dense interconnectivity of the network reflects the collaborative and interdisciplinary nature of project management research, where authors build upon each other's work across domains.

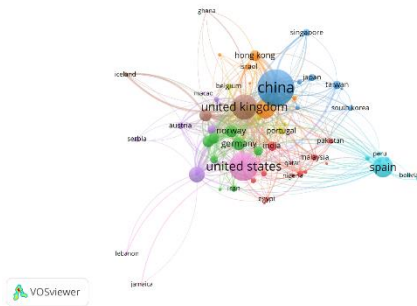


Figure 9. Country Visualization  
Source: Data Analysis, 2024

The network visualization illustrates the international collaboration in project management research, with nodes representing countries and links indicating co-authorship relationships between researchers from different nations. Larger nodes, such as those for the United States, China, the United Kingdom, and Spain, indicate these countries' significant contributions to the field and their central roles in fostering global collaboration. Dense connections between these countries highlight strong research partnerships, particularly between nations like China, the United States, and the United Kingdom. The presence of other notable countries, such as Germany, India, and Norway, showcases the geographically diverse nature of project management research. Smaller nodes like Ghana, Serbia, and Lebanon suggest emerging contributions, with fewer but growing connections to major research hubs. Overall, the visualization underscores the interconnected and collaborative nature of project management research on a global scale, with developed and developing nations increasingly engaging in joint studies to advance the field.

## DISCUSSION

### *Evolution of Project Management Research*

The temporal analysis indicates that project management research has experienced steady growth since 2000, with significant acceleration in recent years. This trend reflects the increasing recognition of project management as a critical discipline across various industries. Earlier studies predominantly focused on traditional methodologies, risk management, and cost

control, as seen in the earlier prominence of terms such as "risk management," "budget control," and "finance." These themes align with the foundational priorities of managing uncertainty and ensuring resource efficiency in projects.

In recent years, the focus has shifted toward innovation, sustainability, and strategic integration. Terms like "sustainable development," "stakeholder," and "innovation" have gained prominence, suggesting that researchers are increasingly addressing broader challenges beyond operational efficiencies. This shift mirrors global trends emphasizing environmental sustainability, stakeholder engagement, and organizational transformation. The growing interest in these areas highlights the dynamic nature of project management and its ability to adapt to changing global priorities.

### *Key Themes and Theoretical Contributions*

The co-occurrence network revealed several prominent clusters, each representing critical themes in project management research. The red cluster, focused on "project success," "performance," and "stakeholders," highlights the ongoing emphasis on achieving desirable outcomes and the role of stakeholder collaboration. These findings align with established theories such as the Stakeholder Theory, which underscores the importance of managing diverse interests to achieve project success [20], [21].

The green cluster, emphasizing "engineering," "planning," and "strategic management," demonstrates the integration of technical expertise and strategic vision in managing projects. This cluster aligns with the increasing adoption of strategic project management frameworks, which seek to align project goals with organizational objectives. The blue cluster, featuring "sustainability," "supply chains," and "efficiency," reflects the growing emphasis on sustainable practices. This focus aligns with concepts like the Triple Bottom Line, which highlights the importance of balancing economic, environmental, and social factors in project management [22].



### *Impact of Key Authors and Institutions*

The co-authorship analysis identified leading contributors to project management research, such as Turner J.R., Flyvbjerg B., and Söderlund J., whose work has significantly shaped the field. Turner's contributions to defining project success criteria and Flyvbjerg's studies on megaproject risks exemplify foundational research areas that remain highly relevant. Similarly, institutions like the Universidade do Minho, University of Technology Sydney, and Universidade de São Paulo emerged as major hubs of project management research. These institutions' prominence reflects their active engagement in producing high-quality publications and fostering international collaboration.

The collaborative nature of project management research is evident in the co-authorship networks, which show dense connections among researchers from different regions and institutions. These collaborations enhance the cross-pollination of ideas and contribute to the development of universally applicable project management principles. However, the analysis also highlights disparities in research contributions, with most outputs concentrated in developed nations. This finding suggests the need for greater inclusion of perspectives from developing countries, where unique project challenges may offer valuable insights for the global community.

### *International Collaboration and Regional Trends*

The analysis of global collaborations reveals that countries like China, the United States, and the United Kingdom dominate project management research. These countries' leadership is attributed to their significant investments in research infrastructure and their strong academic-industry linkages. The network also highlights emerging contributions from countries like India, Brazil, and South Africa, indicating a growing interest in project management research in developing regions.

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### *Practical Implications*

The findings of this study have several practical implications for the field of project management. First, the increasing focus on sustainability and stakeholder engagement highlights the need for practitioners to adopt a holistic approach that integrates environmental, social, and economic considerations into project planning and execution. Tools such as Life Cycle Assessment and Sustainability Balanced Scorecards can help practitioners address these multidimensional challenges effectively. Second, the prominence of terms like "knowledge management" and "innovation" underscores the importance of fostering learning and creativity within project teams. Practitioners should focus on creating organizational cultures that encourage knowledge sharing and experimentation. Adopting collaborative technologies and agile methodologies can facilitate these practices, enabling teams to adapt to dynamic project environments. Third, the study's findings emphasize the critical role of stakeholder management in achieving project success. Practitioners should prioritize stakeholder engagement throughout the project lifecycle, ensuring that diverse perspectives are considered in decision-making processes. Techniques such as stakeholder mapping and engagement plans can help project managers navigate complex stakeholder dynamics.

### *Future Research Directions*

This study also identifies several gaps in the literature that warrant further investigation. First, there is a need for more research on the practical application of emerging themes such as sustainability and innovation. While these topics are gaining

prominence in academic discourse, their adoption in practice remains limited. Future studies should explore strategies for bridging the gap between research and practice, such as action research and case studies. Second, the analysis highlights the underrepresentation of research from developing countries. Given the unique challenges faced in these regions, future research should focus on understanding how project management principles can be adapted to resource-constrained environments. Collaborative initiatives that involve researchers from both developed and developing countries can help address this gap. Third, the field would benefit from longitudinal studies that track the evolution of project management practices over time. Such studies can provide valuable insights into how global trends and technological advancements influence the field. For example, the impact of digital transformation and artificial intelligence on project management is an emerging area that requires further exploration. Lastly, future research should prioritize interdisciplinary approaches that integrate insights from fields such as sociology, psychology, and environmental science. This approach can enrich project management research by providing a deeper understanding of human behavior, organizational dynamics, and environmental sustainability.

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## 4. CONCLUSION

This bibliometric analysis of project management research highlights the field's dynamic evolution, emphasizing its responsiveness to emerging global challenges such as sustainability, innovation, and stakeholder engagement. The study identifies key contributors, influential institutions, and thematic clusters, showcasing the interdisciplinary nature and practical relevance of project management research. While developed nations like the United States, China, and the United Kingdom lead in research output and collaboration, the growing contributions from developing countries indicate a promising shift toward inclusivity. The analysis also underscores the need to bridge the gap between academic research and practical applications, particularly in integrating sustainability and innovation into project practices. By fostering global collaboration, addressing regional disparities, and prioritizing interdisciplinary approaches, project management research can continue to advance, ensuring its relevance and impact across industries and geographies. This study provides a foundation for future research aimed at enhancing the alignment between theory and practice in project management.

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