



Performance Management System: A Bibliometric Analysis of Twenty-Five Years of Research Trends

***Dr. Sona Vikas, **Geetanjali Batra, ***Nitika Kaushik**

**Professor, Asian School of Business (ASB) Noida*

*** Associate Professor, Atal Bihari Vajpayee School of Management, JNU, Delhi*

**** Research Scholar, The North Cap University, Gurugram*

*Email: *sonavikas9@gmail.com, **ms.geetanjali.batra@gmail.com, *** nitika90309@gmail.com*

ABSTRACT

Purpose – Numerous experimental, theoretical, and empirical studies on the Performance Management System (PMS) have been conducted in business, management, social science, humanities, and psychology. However, limited attempts have been made to review the literature in this field systematically. Hence, the current study aims to demonstrate the developments in PMS.

Methodology – A bibliometric analysis was conducted using an organised process to scan the Scopus database between 1978 and 2022 on a sample of 1,138 papers in PMS. The biblioshiny application used for the study provides a web interface for bibliometric analysis. It was produced in R as a part of the Bibliometrix package. Essential articles, publications, writers, and concepts were found applying the software. Furthermore, analysis of social networks, cocitation, and citations was performed.

Findings – Findings depict that in the beginning, scholars emphasised social and demographic factors. However, the field has progressively accepted topics like behavioural and psychological concepts, such as motivation, satisfaction, self-esteem, and many more, influencing PMS. The present study reveals the conceptual, social and intellectual structure. This study offers a crucial understanding of topics that require further investigation.

Limitations – Considering that this study is a bibliometric assessment, several limitations common to such studies apply. A thorough literature assessment could help upcoming scholars develop a sound conceptual framework. The Scopus database and structured formats compatible with the Bibliometric program are the only sources for the present work's scientific analysis.

Relevance – The present study focuses on key findings about PMS and their relationships with one another. It draws attention to the key issues in the field and suggests potential study areas. Outlining the domain's social and intellectual structure informs subsequent professionals on the topics, context, and potential for collaboration.

Social implications – A recent study may offer crucial data for formulating policy regarding PMS in various corporations.

Originality – Much theoretical and practical work has been completed in previous decades and spans countries and disciplines. The primary advantage of this analysis is the collection of diverse academic work on the PMS, determining its key resources, researchers, and papers, and exploring the PMS.

Keywords: Performance Management System (PMS), Measurement, Bibliometric analysis, Bibliometrics, Science mapping

INTRODUCTION

The PMS has become an interesting topic for academics and professionals in the business community. The increased complexity of PMS has attracted much academic interest, leading to a significant body of literature on this topic. Performance management methods are currently being employed by all different types of organisations, leading to an upsurge in academic research. The growing interest in the field has allowed for the development of a wide range of performance management tools, allowing organisations to tailor their PMS to meet their specific needs. This has enabled organisations to maximise the potential of their performance management programs, leading to improved performance and tremendous success (Bititci et al., 2012).

The present study intends to analyse PMS from a bibliometric perspective. It evaluates the development of literature over the years in terms of the most active and significant authors, sources, nations, and the most frequently used keywords. This study examines the growth of PMS literature using an analysis of PMS research published in academic journals in four subfields: Business Management, Social Sciences, Psychology, and Humanities. The final research sample contained only publications written in English. Using Excel and the Bibliometrics/Biblioshiny software, data linked to 1978–2023 were processed, analysed, and



visualised. In addition to the conceptual framework, thematic evolution, and trends, the future direction is also included in the current study. Examining the conceptual and intellectual framework and creating PMS across them will aid academics in positioning their research projects. The present study can help scholars position their future research work (Bititci, 2012). The study starts with a short overview of the PMS, followed by a description of the Bibliometric analysis. The study's objectives elaborate on the goals relating to bibliometric analysis. Then, it describes the methodology used to provide the literature analysis results in the PMS field. Ultimately, the conclusions and future directions offer insights into the literature and how it can be taken forward.

PERFORMANCE MANAGEMENT SYSTEM (PMS)

Considering the literary works, human resource management is crucial to accomplishing organisational strategic objectives. The PMS is regarded as a notable development in human resources management. Supervisors are accountable under performance management for integrating their workforce's actions and output as per the company's objectives. Establishing such an association enables the company to link employee performance with organizational goals. Performance management is crucial because it combines performance assessment and development while providing a comprehensive overview of how each organizational element interacts to produce the intended results (Helmold, 2022). For this, an organization needs to modify its approach to continuous improvement to enhance its workforce's progress toward strategic goals. To pursue continuous improvement, a PMS must create and implement remedial measures to address discrepancies between set targets and achieved results. Studies have depicted that when an organization's personnel are appropriately managed, their performance improves, which yields the desired outcomes.

BIBLIOMETRIC ANALYSIS

Bibliometric analysis research is based on examining trends in previously published literature. Several scientific domains study bibliometric information and discuss literary works. The present study uses bibliometric examination techniques to evaluate the progressive pattern of studies (Garengo, 2022). The survey of PMS has expanded its interdisciplinary scope over time. In light of this, it is crucial to assess the existing research to ascertain how the

studies in the field are progressing.

RESEARCH OBJECTIVES

- To understand the development of scientific output over time.
- To determine the most common phrases and produce a map of the keyword density.
- To identify the nations, organisations, and writers who have significantly impacted performance management research.

Conceptual analysis and descriptive analysis are used to accomplish the goals mentioned above. Research methods are covered in subsequent section followed by data analysis. Findings are discussed in the fourth section. The last section discusses the study's conclusion and upcoming research directions.

RESEARCH METHODS

The selection of the database and collection of information based on the search strategy are the first steps in the analysis for this study.

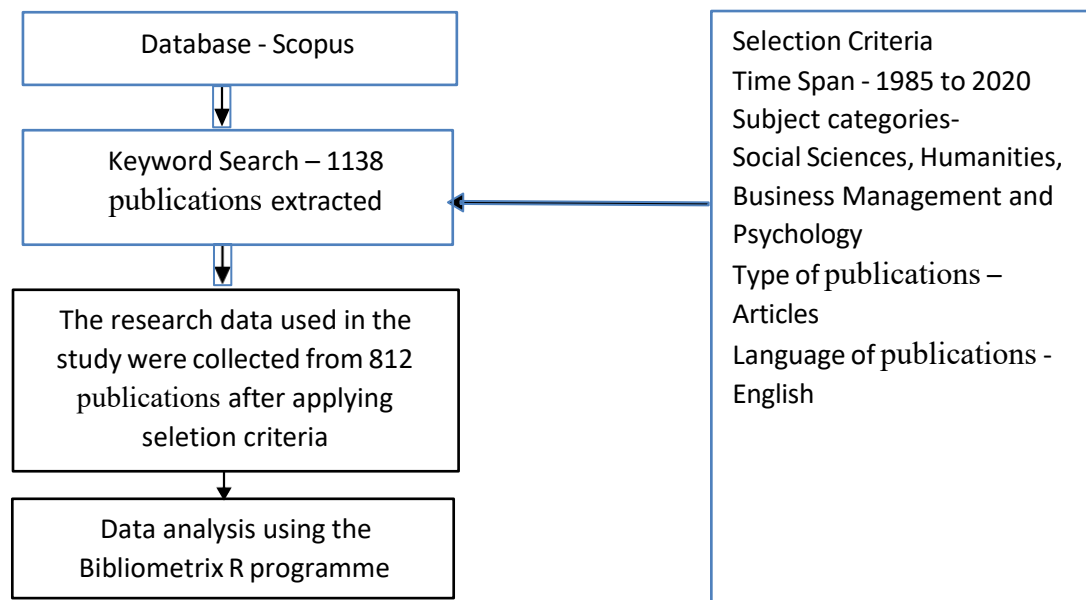


Figure 1: Process of Selecting Data for Bibliometric Analysis

After identifying and choosing an appropriate dataset, the information needed for the study was gathered (Figure 1). The subsequent stage involved a search utilising a proper combination of essential phrases. Next, the data is collected by applying appropriate criteria for inclusion and exclusion. Following this, the information is first given a descriptive analysis, and then the data is visualised with the help of network maps.

IDENTIFICATION OF THE DATASET

A fundamental requirement for the bibliometric analysis is an organised data summary. This **Keywords Search**: The phrase "performance management system" was used, and 1138 papers were extracted accordingly.

Deciding a Time Frame: The primary goal of the data collection was to identify patterns and future directions in the PMS sector. The data set covered all publications from 1978 to 2022. This was to ensure that all vital literature was included in data collection.

Category Selection for Subjects: Topics, including business, management, social sciences, psychology, and some humanities, were used to narrow the search. In this step, 1012 items were retrieved.

Choosing Publication Types: Conference proceedings were removed to refine the data further and satisfy the research objectives. As a result, 938 publications were left in the shortlisted data and used for further research.

Language Preference: To generate the final data set of 812 publications, the "English" language filter was used. Biblioshiny requires information regarding these publications, including the title, authors, abstracts, and keywords data is obtained from the Scopus database. This database is appropriate for application of RStudio's bibliometric software. The Scopus repository is popularly referred to for bibliometric analysis over other options since it includes highly regarded publications from various categories (Rodríguez-Ruiz et al., 2019).

To fulfil the research objectives, datasets were downloaded from Scopus on May 20, 2023. The search criteria used for making data ready for analysis are discussed below:

BIBLIOMETRIC ANALYSIS OF DATA

The present study employs a bibliometric methodology through scientific analysis.

Bibliometric is a freely available software for detailed literature analysis and scientific mapping. It may be combined with various software and is subject to continuous upgrades. The scientific study of the data was done using Biblioshiny.

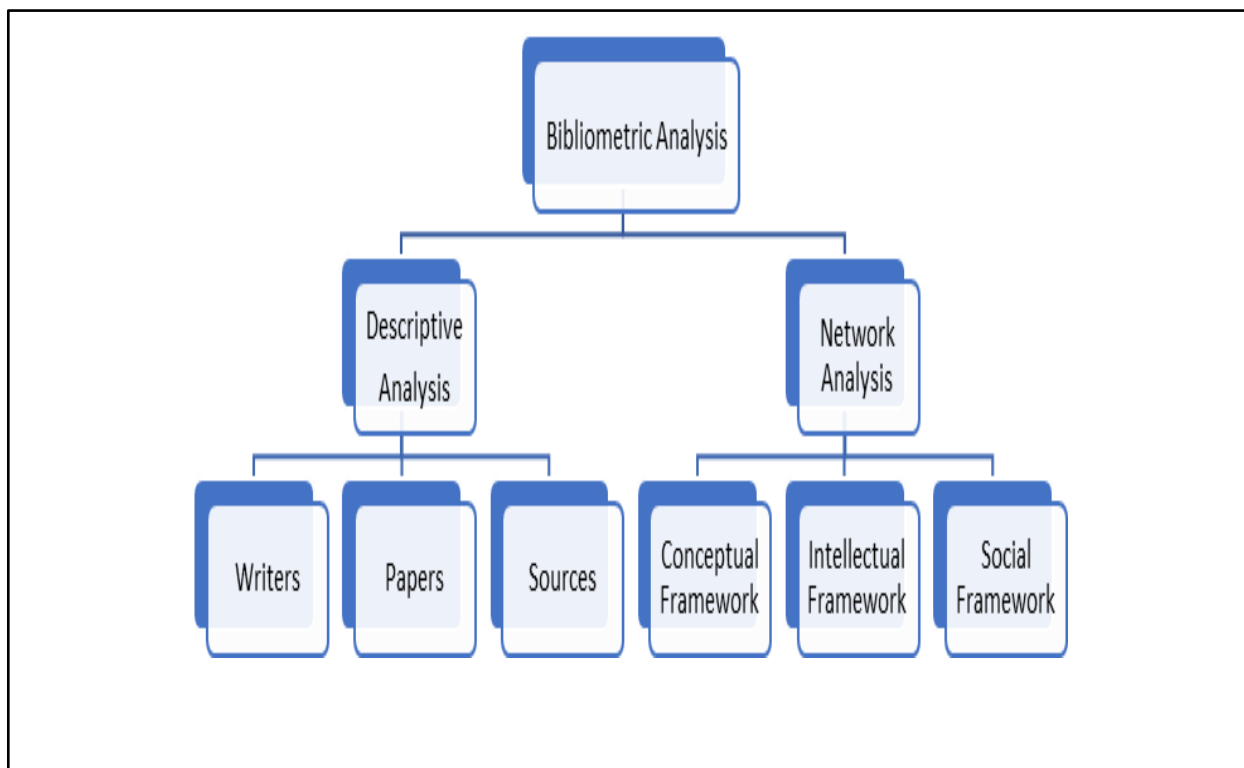


Figure 2: Bibliometric Analysis Levels

Descriptive analysis relates to analyzing bibliometric details related to the fundamental components of the information.

Scientific mapping creates the knowledge framework to stimulate research using visualization techniques.

DESCRIPTIVE RESEARCH

This part of the evaluation covers the different data-driven parameters.

Dataset: An analysis of the bibliometrics information set encompassing 812 publications from the database utilising a rational query term.

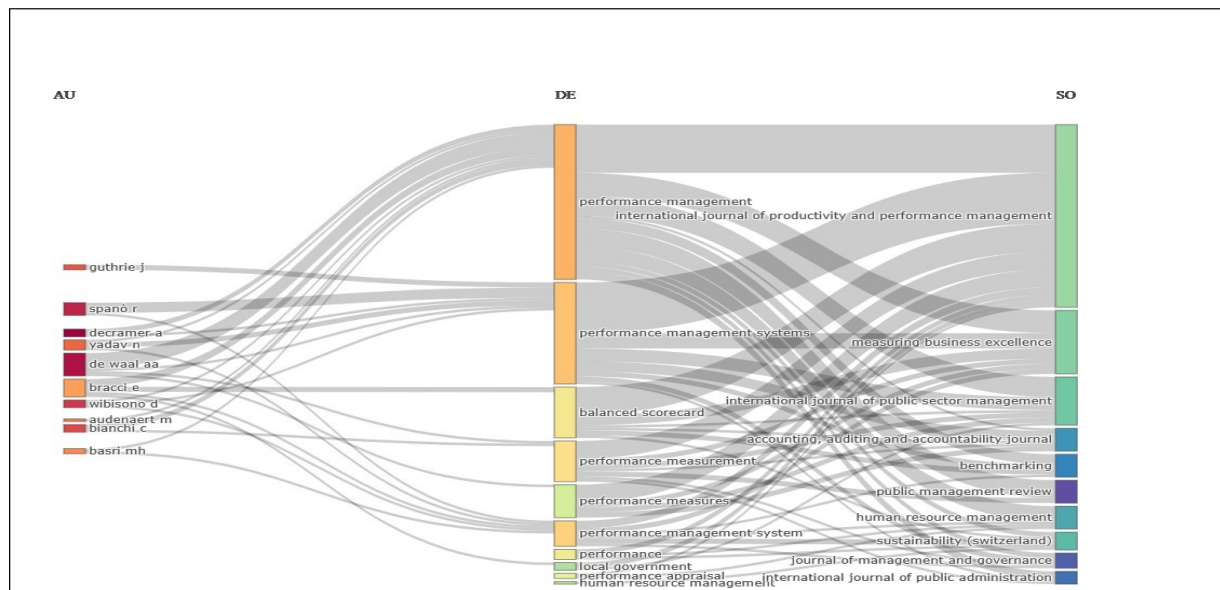


Figure 3: Sankey Plot

In Sankey plots, the size of the portion is in proportion to the node's value. It is used to depict the connection between the three fields. Authors are listed on the Sankey Plot's left side, the keywords on the Sankey Plot's middle row, and the sources used are shown on the right. These items show significant keywords such as "performance management," "balanced scorecard," and "performance measurement," as well as sources like the "International Journal of Productivity and Performance Management" and well-known authors like De Wall AA.

SOURCES

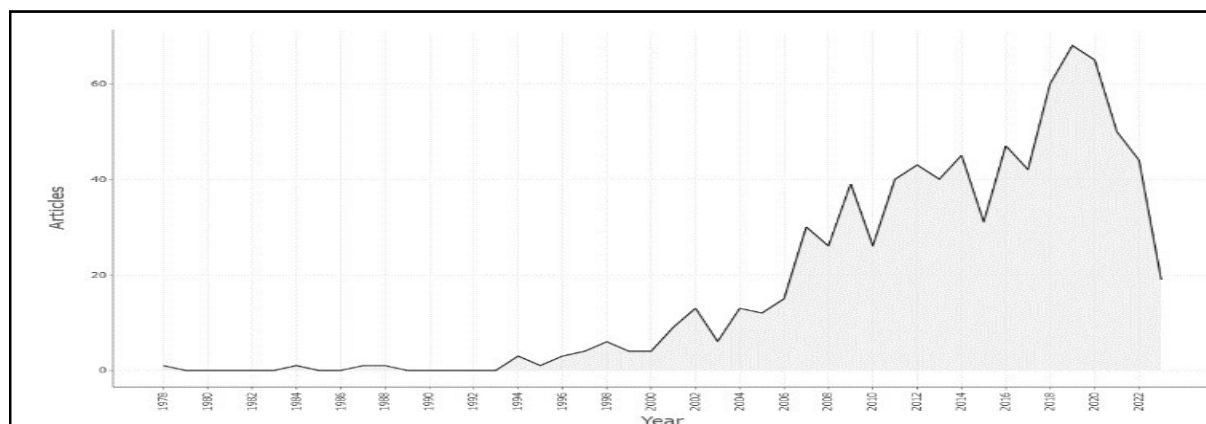


Figure 4: Production of Research Output

Figure 4 shows research output in the field between 1978 and 2022. It showed a significant decrease in volume after 2020. The issue has not yet reached a mature stage, as evidenced by the number of publications about it, which has slightly decreased.

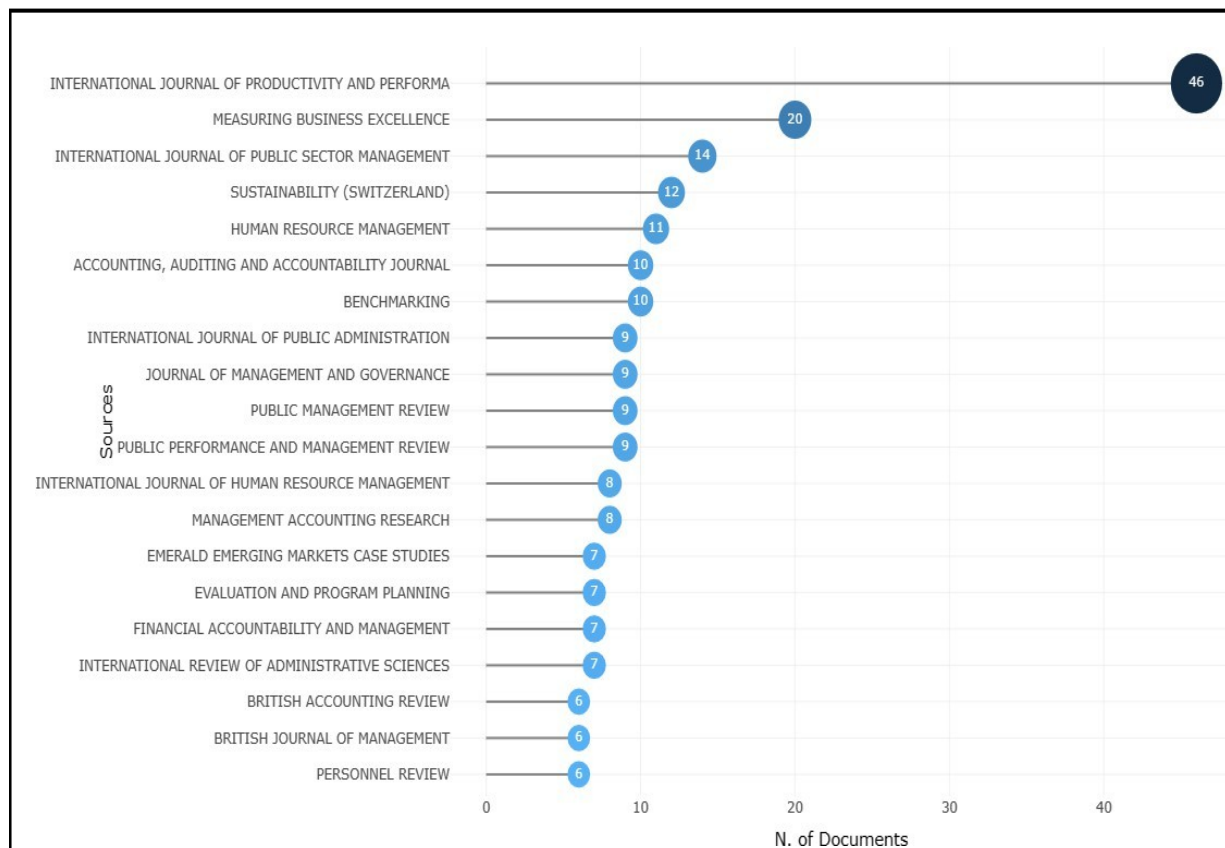


Figure 5: Top Cited Sources

The top sources based on citations reflect the quality of the sources in the field. The frequently cited sources are the ‘International Journal of Productivity and Performance Management’ and the ‘Journal of Measuring Business Excellence’. On closer examination, it becomes clear that most of the literature on PMS concentrates on psychology, business management, human resource management, and administration studies.

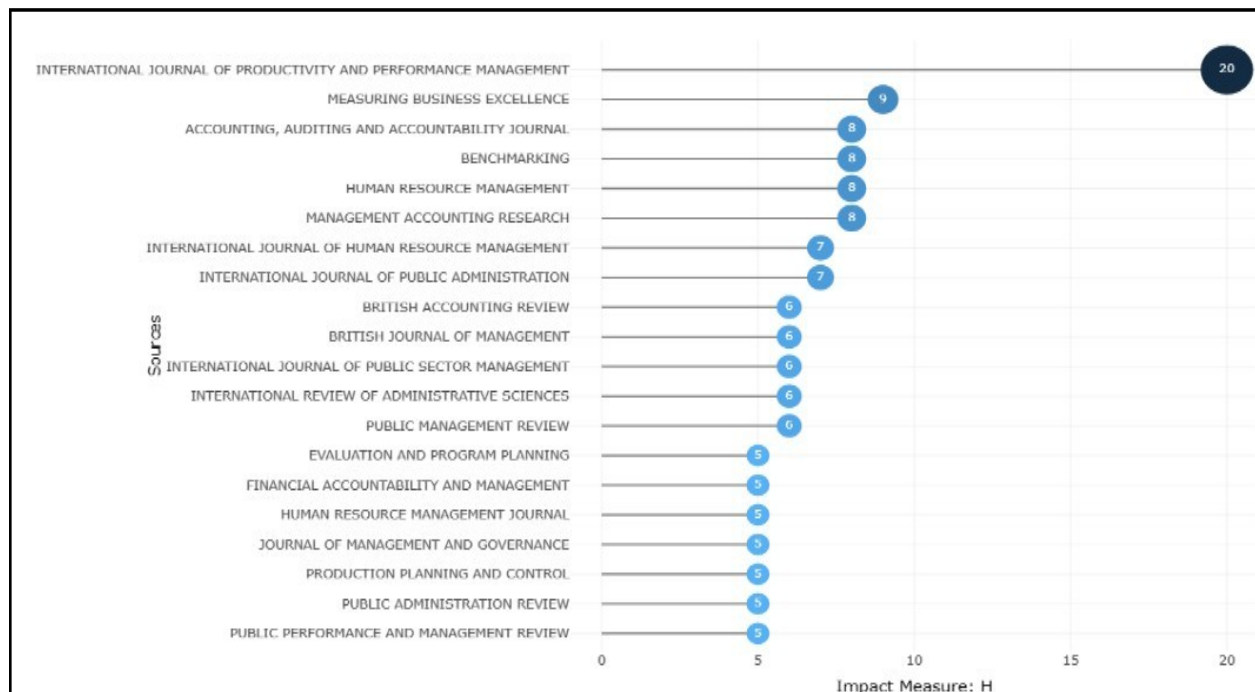


Figure 6: Prominent Sources Based on H-Index

According to the h-index, the top 20 academic publications in the field are shown in Figure 6. Considering the impact of the journals, this data analyses the journals' overall quality. The H-index is based on the value of n . The number of sources with at least n citations and n publications goes into calculating the value of ' n '. The sources with the maximum articles or highest citations cannot be the sole indicators of any source's contribution. A source's H-index is a more accurate indicator of its quality.

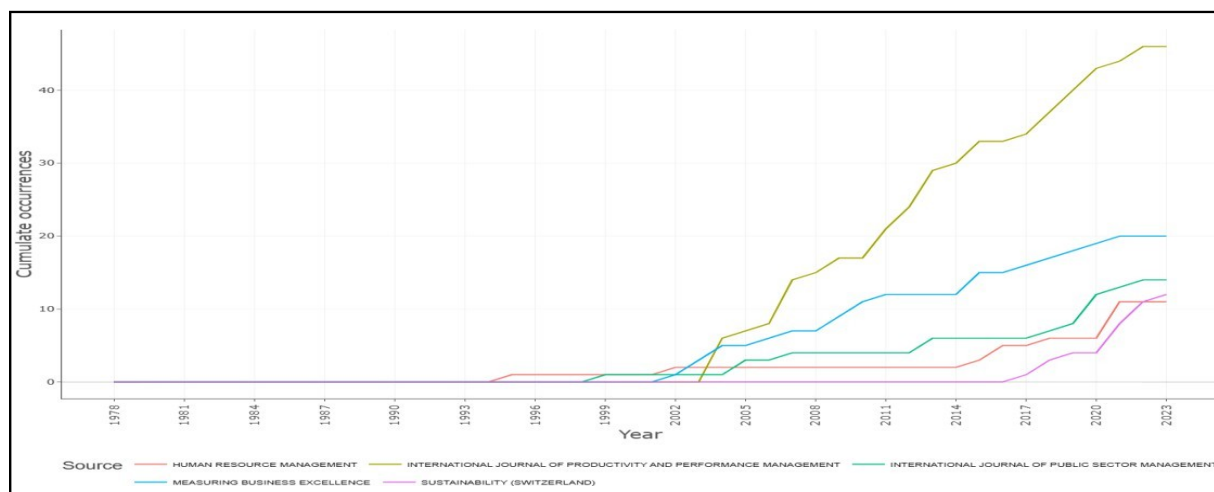


Figure 7: Source Dynamics

Figure 7 is based on LOESS (Locally Estimated Scatterplot Smoothing). It displays trends among the top five sources and the articles published in a particular period. Publications in ‘The International Journal of Productivity’ and the ‘International Journal of Performance Management’ have significantly increased after 2003. Publications in the remaining sources have also increased. This represents the rising emphasis on research in PMS and related interdisciplinary research in areas like sustainability and business excellence. Many publications show that this area is multidisciplinary and has various research concerns.

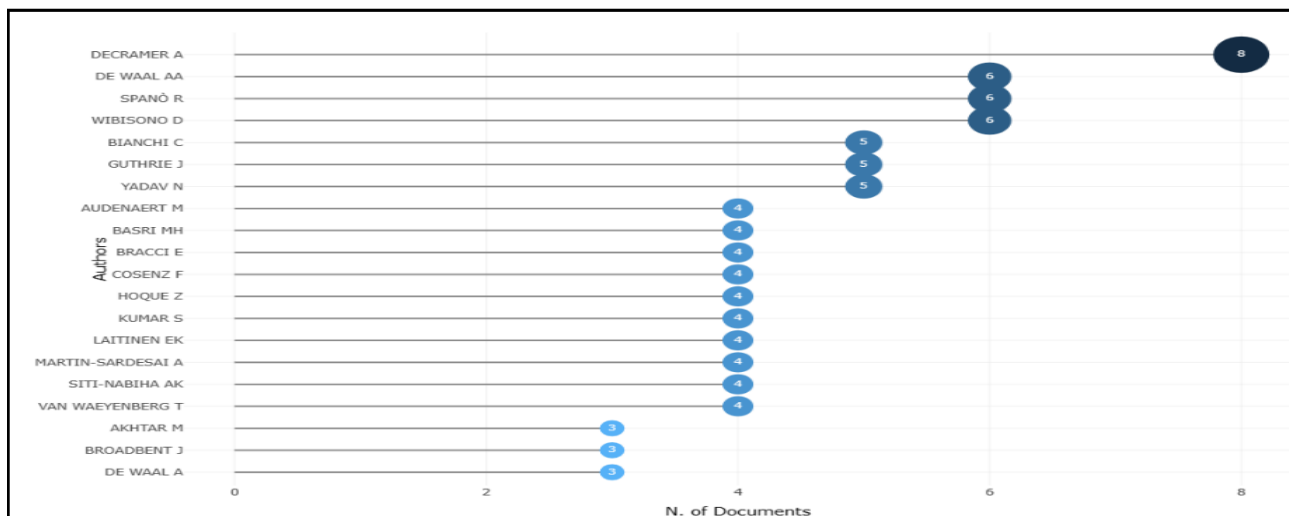


Figure 8: Prominent Authors (based on Number of Publications)

Figure 8 shows Decramer A., De Waal AA., Spand R., Wibisono D., and Bianchi C. as the prominent authors. Decramer A. published eight articles in the field.

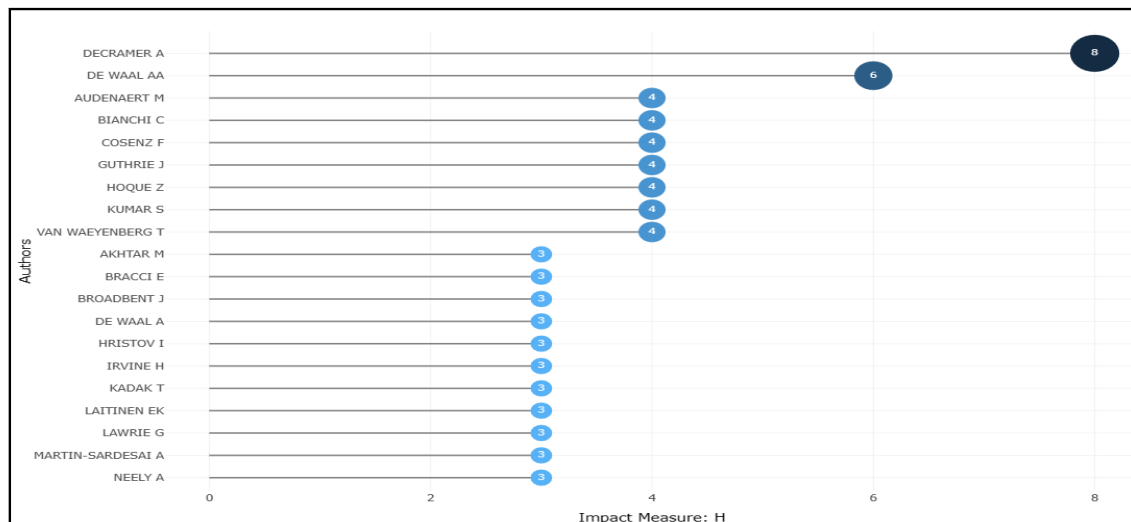


Figure 9: Prominent Authors Based on H-factor

Decramer A was the author with the most significant influence, as per the examination of the writers' h-indexes (Figure 9). These studies are crucial in light of prospective future research on this topic.

NATION-WISE PUBLICATIONS

The contribution to publications made by each country is shown in Table 2. The most substantial additions to the literature in PMS have come from developed nations. The maximum number of publications in the field of PMS was from the United States of America, followed by the United Kingdom. With a publishing frequency above 140, Italy and India are included in the table in the third and fourth spots, respectively. The number of articles published also correlates with the total number of citations obtained. The United Kingdom exceeds the rest of the globe by receiving more than 30% of all citations in the field. According to bibliometric statistics, the United States came in second with 14%. India is one of the top 10 nations, which might imply that developing nations are making slow but steady progress towards high-quality research in the subject. Still, the country receives less than 5% of the total citations, which suggests that the research is not concentrated in India. Comparatively, fewer citations were given to developing nations than to industrialized countries.

Region	Scientific Production	Region	Total Citation
USA	289	UK	2969
UK	237	USA	1204
Italy	153	Australia	924
India	144	Italy	697
Australia	136	Canada	688
South Africa	69	China	475
Netherlands	61	Netherlands	454
Canada	55	India	389
China	54	Belgium	368
Belgium	52	Germany	355

Table 2: Country's Scientific Production (frequency of publication) and Total Citation

MOST CITED PUBLICATIONS

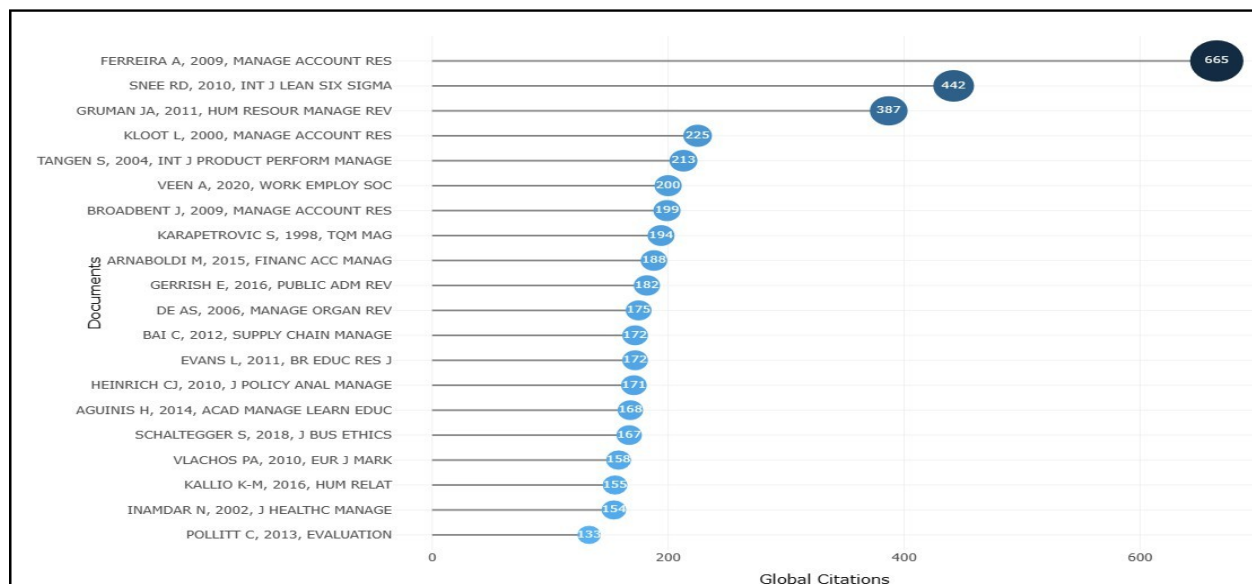


Figure 10: Citation Count of Publications

Figure 10 shows the top 20 publications in the field based on citations. The highly cited article in PMS was Ferreria A (2009), which had more than 650 citations. These highly cited publications are essential references in the field.

KEYWORDS

The term "Performance management system" was the main keyword, followed by the terms "performance measurement," "balance scorecard," "performance," "human resource management," and "higher education."



Figure 11: Word dynamics

[illegible]

54

TRENDING RESEARCH TOPICS

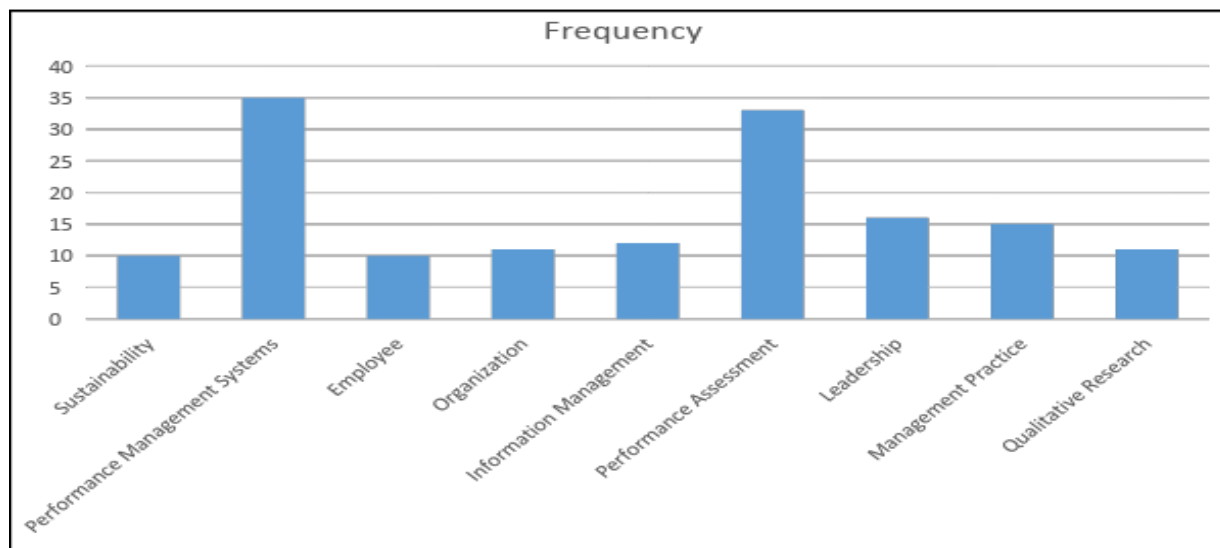


Figure 13: Trend Research Topics

Figure 13 shows the top trending topics on a two-dimensional scale. Logarithmic frequency value is on the vertical axis, and publishing years are on the horizontal axis. A look at the themes over the previous ten years revealed an intriguing pattern. The main issues were PMS, measurement, human resources, and management techniques.

DATA VISUALISATION

PMS as a field of research has attracted attention and interest during the last few years. The field's thematic development is shown in this section. Network analysis is used in data visualisation to quantitatively evaluate the number of emergent clusters, the frequency and linkages between different units of study, the overall link strengths, and the number of citations (Low and Siegel, 2019). Several methodologies must be used to extract the networks based on various analysis units, such as several publications, authors, and keywords. The nodes in these networks are linked together through links. It applies statistical analysis to maps produced to show various network metrics (Ariaa, 2018). Three different types of knowledge structures result from the scientific mapping carried out through network analysis.

CONCEPTUAL STRUCTURE

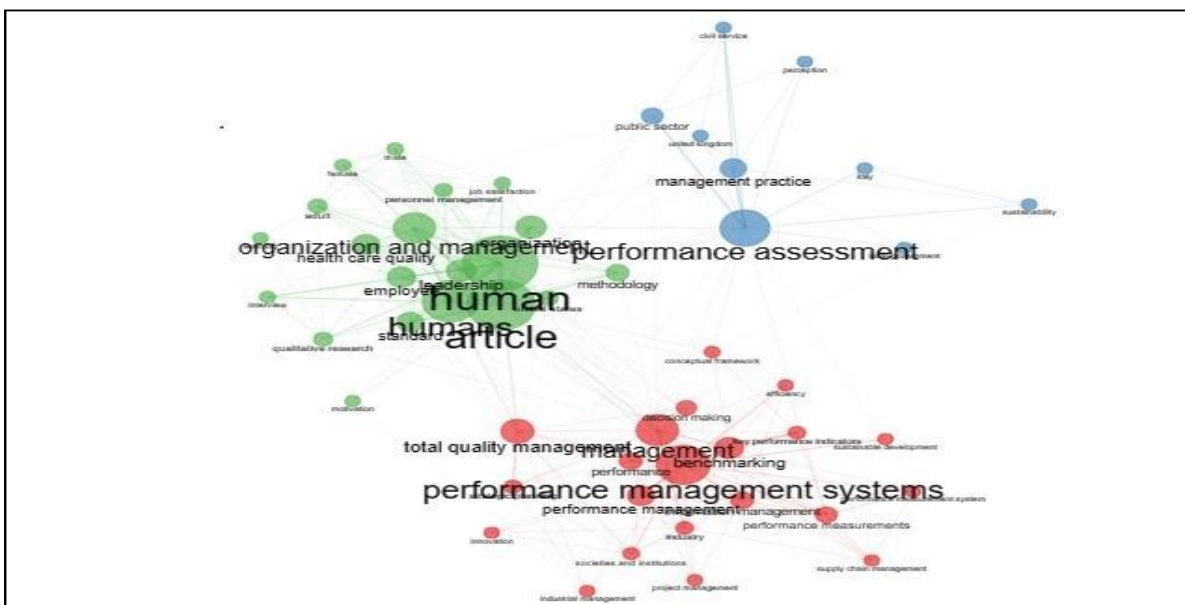


Figure 14: Co-occurrence Network

Co-occurrence network is a part of a conceptual framework that illustrates the relationship between in the academic data content.

The keyword co-occurrence network based on "keyword plus" as the unit of the analysis is displayed in Figure 14. The algorithm extracted the term "Keyword Plus" among words commonly appearing in publication titles and references. They convey the information in publications more precisely (Zhang et al., 2019). The data resulted in three clusters, which are represented in red, blue, and green (as shown in Figure 14). Phrases denote the point of intersection, connections are inferred by their distance, and the dimension of the node is proportional to the number of nodes in the cluster. Colours differentiate clusters. The red cluster emphasises PMS, the blue cluster incorporates performance assessment, and humans dominate the green cluster.

THEMATIC MAP

A thematic map plots the typological themes on a two-dimensional plot. Using the co-word analysis, themes are created in the research area by identifying keyword clusters (Cobo et al.,

2011). According to their centrality and density, which act as the two dimensions, these themes can be divided into four quadrants on a two-dimensional graph. On the map, a bubble denotes each theme.

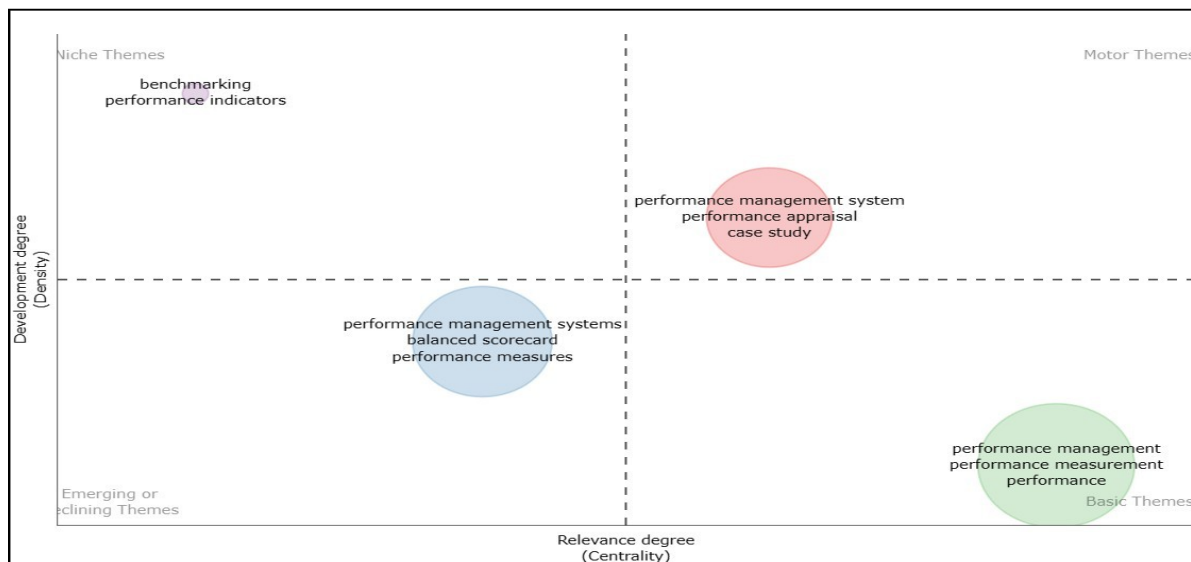


Figure 15: Thematic Map

On the graph (Figure 15), the terms "performance management system," "performance indicators," "performance measurement," and "benchmarking" are represented by bubbles. A motor theme, "performance management system," and "performance appraisal" are the topics most often discussed in the upper right quadrant of the diagram, which has high density and centrality. The core topic of performance management, which is shown in the lower right quadrant, denotes a crucial yet underdeveloped area. The "benchmarking" and "performance indicators" niche subject, which is well-developed with weak external relations but strong internal ties, is indicated in the upper left quadrant. The topic of riches in the lower left quadrant is underdeveloped and given less weight. It represents emerging as well as declining ties (Huang et al., 2020)

1.1.1 Thematic Evolution: Thematic evolution in the region evaluates the big picture of the area's development by cutting the period into multiple sections across time (Chen et al., 2019). Using a minimum cluster frequency of five words per cluster and cut points in 2015 and 2019, theme progression was used in this study throughout three time slices (Figures 16–19).

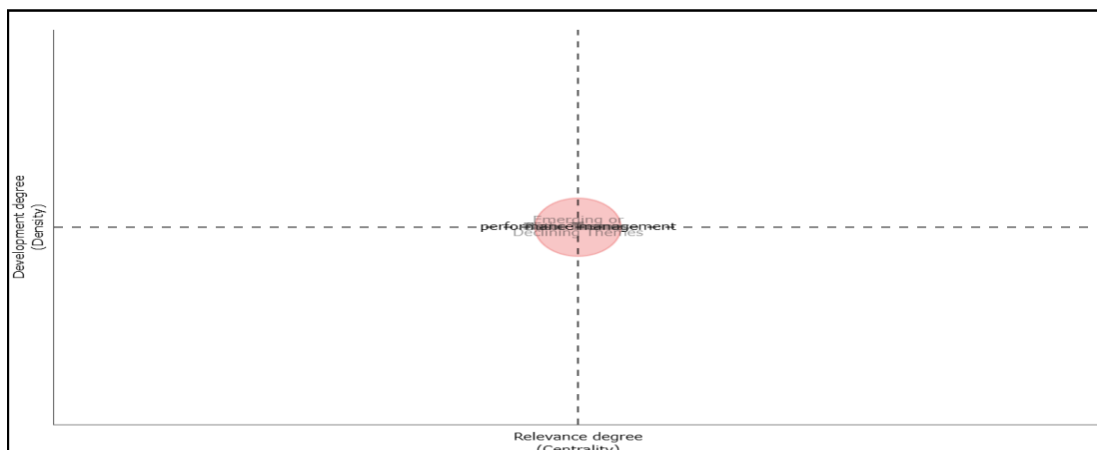


Figure 16: Time slice 1

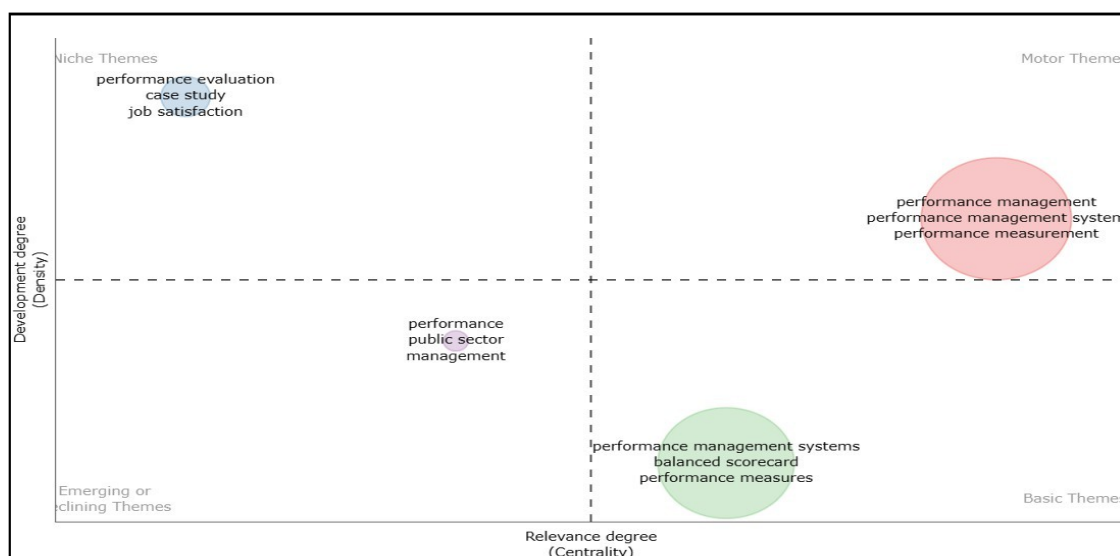


Figure 17: Time slice 2

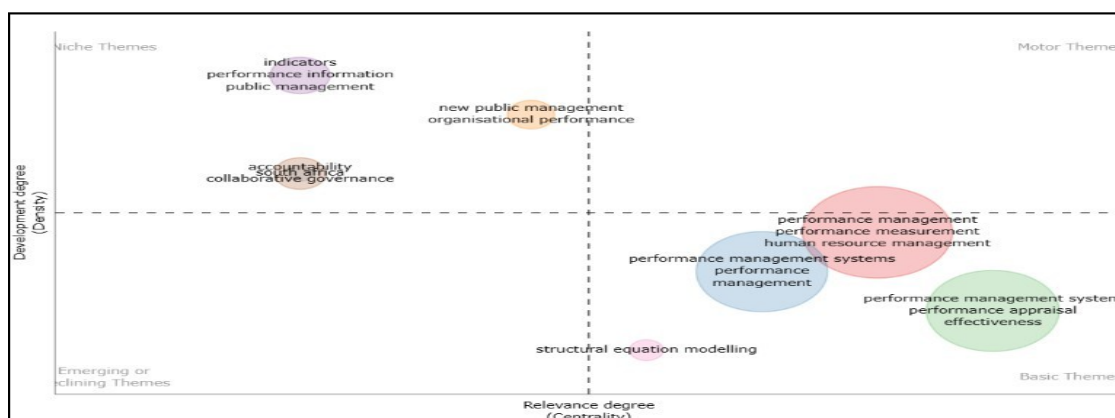
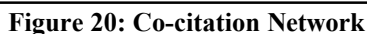


Figure 18: Time slice 3

It has been shown that "performance management" declined between 1989 and 2015. Between 2015 and 2019, as it approached the midpoint of the motor and basic themes, the PMS emerged and began to draw more attention. At this time, the theme of public sector management began to decline, while the specialist topics of performance evaluation and job satisfaction started to gain popularity. PMS emerged as a fundamental theme from 2019 to 2022. The PMS is an essential subject that unites the subthemes of performance measurement, management practice, human resource management, and effectiveness. Third-time slices saw a niche subject emerge under the themes of "public management," "performance information," "organisational performance," and "collaborative governance." The three-field plot (Figure 19) illustrates how broad and basic ideas arise. To examine the relationships between the themes, the period is divided into three chronological periods: 1979 to 2015, 2016 to 2018, and 2019 to 2023, underscoring the evolution of the themes. Performance management becomes one of the first period's four primary themes, along with conduct. Performance management, performance evaluation, and a PMS are among the themes in the second period. This acknowledges the PMS's increasing relevance and importance. In the second period, the key subject, "PMS," highlights its tight ties to performance evaluation and indicators, meaning it is relevant to performance interventions.

Intellectual structure: It analyses the association between authors and nations. It shows how different affect the scientific community. It displays how much research groups communicate with one another and the scientific community and how many other institutions they are affiliated with (Mendes et al., 2017).

Citation analysis: As per usual practice, authors cite only those papers that are relevant and related to their research topic. Citation count is a reflection of a publication's relevance and quality. When a publication appears in the reference list of another publication, the two are related (Egghe & Rousseau, 1990). Co-citation analysis studies the association between the publications that are citing and ones that being cited. The frequency with which a group of publications are cited together shows that they share a common subject. This statistic is known as the frequency of co-citation. The diagram shows three clusters of authors. A distinct colour represents each cluster. The co-citation strength is measured by the degree of relationship between publications as perceived by the citing authors (Hu et al., 2013).



SOCIAL NETWORK ANALYSIS

60

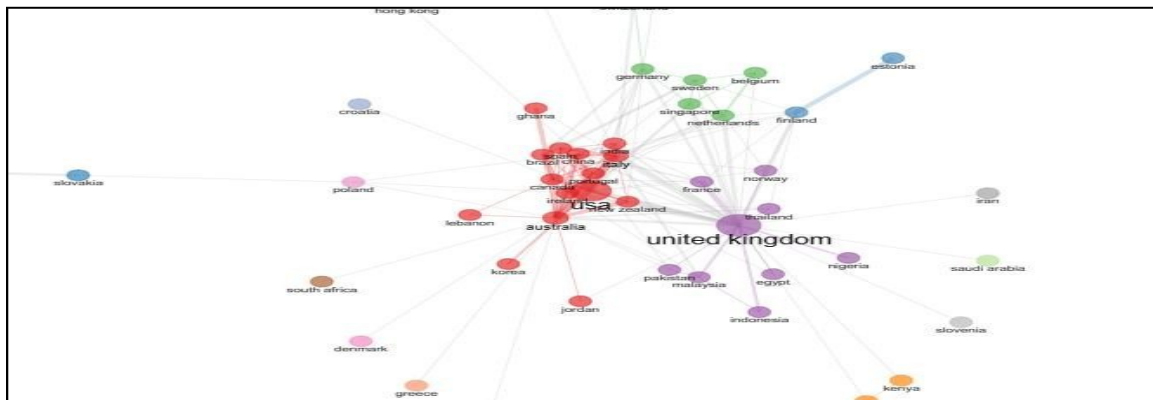


Figure 21: Geographical Distribution

From Figure 21, it was discovered that American researchers collaborate closely with academics in countries like Australia, New Zealand, Korea, Italy, Jordan, etc. In the second cluster, the United Kingdom is the dominant nation, along with Egypt, Nigeria, Indonesia, Thailand, Pakistan, France, and others. Leading the third cluster are Sweden, Belgium, and Singapore.

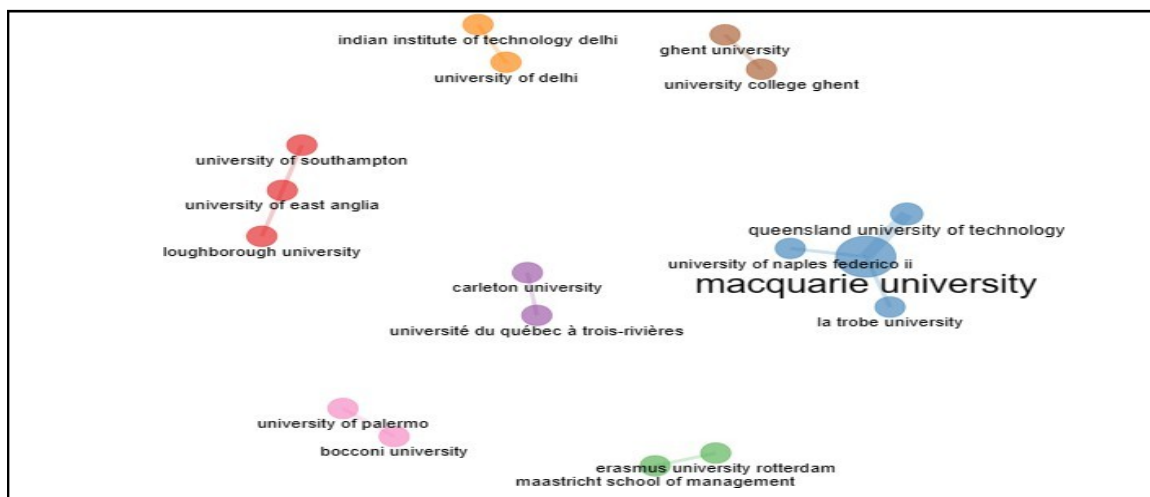


Figure 22: Institutional Collaboration Network

his network depicts the supremacy of the cluster in Figure 22, which is led by ‘Macquarie University of Penn’ and collaborates with the ‘Queensland University of Technology’, ‘LaTrobe University’, and the ‘University of Naples Federico’.

CONCLUSION

The evolution of the performance management behaviour domain from 1978 to 2022 is highlighted in this article. Also included is a thorough examination of the philosophical and social underpinnings of the study's topic. The study's primary outcome is consolidating the intermittent literature in the field and identifying essential sources of information, researchers, and papers. The Bibliometrics tool was used because of its flexibility and simplicity. The study's data was collected using the Scopus database because of its formal organisation and software compatibility. The data shows a gradual publication growth, followed by a surge in articles from 2010 to 2012. The USA produced most of the literature in this sector, followed by the United Kingdom, Italy, and India. The conceptual framework shows the relationship between performance management variables like total quality management, performance measurement, job performance, human resources, performance appraisal, performance indicators, and benchmarking. Most publications were from humanities, psychology, and social science sources, followed by business management. This simplifies the transition to a multidisciplinary strategy from a domain-focused approach. This study uses bibliometric analysis to examine publication patterns regarding authors, citations, sources, and nations.

FUTURE DIRECTIONS FOR RESEARCH

The research gaps of this study are discussed.

- This bibliometric analysis makes use of the Scopus database. Data collection from further databases could be used. To gain a thorough grasp of the topic, scholars may choose to continue with a meta-analysis and a review of the literature in the future.
- Investigating the relationships between PMS and work performance, employee satisfaction, attrition rate, and turnover intentions is possible.
- Performance indicators, PMS, and benchmarking are emerging themes for additional research.

With the rising influence of PMS, it is essential to understand how these variables relate. It covers a range of human resource management choices, including performance standards, goals, measurements, improvements, and feedback on performance.



REFERENCES

- Bititci, Umit, Paolo Garengo, Viktor Dörfler, and Srinivas Nudurupati. "Performance Measurement: Challenges for Tomorrow." *International Journal of Management Reviews* 14, no. 3 (2012): 305–327.
- Chen, X., Y. Lun, J. Yan, T. Hao, and H. Weng. "Discovering Thematic Change and Evolution of Utilising Social Media for Healthcare Research." *BMC Medical Informatics and Decision Making* 19, suppl. 2 (2019): 50.
- Cobo, M. J., A. G. López-Herrera, E. Herrera-Viedma, and F. Herrera. "An Approach for Detecting, Quantifying, and Visualising the Evolution of a Research Field: A Practical Application to the Fuzzy Sets Theory Field." *Journal of Informetrics* 5, no. 1 (2011): 146–166.
- Cuccurullo, C., M. Aria, and F. Sarto. "Foundations and Trends in Performance Management: A Twenty-Five-Year Bibliometric Analysis in Business and Public Administration Domains." *Scientometrics* 108, no. 2 (2016): 595–611.
- Egghe, Leo, and Ronald Rousseau. *Introduction to Informetrics: Quantitative Methods in Library, Documentation and Information Science*. Amsterdam: Elsevier Science Publishers, 1990.
- Garengo, Paolo, Alessandra Sardi, and Srinivas S. Nudurupati. "Human Resource Management (HRM) in the Performance Measurement and Management (PMM) Domain: A Bibliometric Review." *International Journal of Productivity and Performance Management* 71, no. 7 (2022): 3056–3077.
- Helmold, Marc. *Strategic Performance Management: Achieving Long-Term Competitive Advantage through Performance Excellence*. Cham: Springer Nature, 2022.
- Hu, C. P., J. M. Hu, S. L. Deng, and Y. Liu. "A Co-Word Analysis of Library and Information Science in China." *Scientometrics* 97, no. 2 (2013): 369–382.
- Huang, L., X. Shi, N. Zhang, Y. Gao, Q. Bai, L. Liu, and B. Hong. "Bibliometric Analysis of Trends and Issues in Traditional Medicine for Stroke Research: 2004–2018." *BMC Complementary Medicine and Therapies* 20, no. 1 (2020): 1–10.
- Low, M. P., and Donald Siegel. "A Bibliometric Analysis of Employee-Centred Corporate Social Responsibility Research in the 2000s." *Social Responsibility Journal* 16, no. 5 (2019): 691–717.
- Mendes, G. H. S., M. G. Oliveira, E. H. Gomide, and J. F. D. Nantes. "Uncovering the Structures and Maturity of the New Service Development Research Field through a Bibliometric Study (1984–2014)." *Journal of Service Management* 28, no. 1 (2017): 182–223.



Rodríguez-Ruiz, F., P. Almodóvar, and Q. T. K. Nguyen. “Intellectual Structure of International New Venture Research: A Bibliometric Analysis and Suggestions for a Future Research Agenda.” *Multinational Business Review* 27, no. 4 (2019): 285–316.

Van Eck, Nees Jan, and Ludo Waltman. *Manual for VOSviewer Version 1.6.18*. Accessed July 18, 2022. https://www.vosviewer.com/documentation/Manual_VOSviewer_1.6.18.pdf.

Zhang, D., Z. Zhang, and Shunsuke Managi. “A Bibliometric Analysis on Green Finance: Current Status, Development, and Future Directions.” *Finance Research Letters* 29 (2019): 425–443.