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A Comprehensive Framework for Evaluating Bibliometric Analysis Tools: A Contemporary Review

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ABSTRACT

Bibliometric analysis is now essential for assessing research output, trends, influence, and gaps, given the rapid expansion of academic publications across various fields. To facilitate such research, numerous developers have produced a variety of bibliometric software tools that vary in usefulness, user accessibility, and analytical depth. However, scientists still face difficulties in selecting the most suitable equipment for specific research objectives, particularly given the diverse technical skills and advantages and disadvantages of each instrument. By carefully evaluating three popular bibliometric tools—VOSviewer, Bibliometrix/Biblioshiny, and biblioMagika—the current study bridges this gap. These tools fall into several categories: complex network visualisation platforms; R-based analytical suites; and Excel-based, user-friendly utilities. In contrast to previous studies, this work presents biblioMagika as a useful and underutilised instrument in academic discourse. A ten-dimensional comparison framework is used to thoroughly assess each tool's interface, analytical capability, data management, pre-processing tools, and suitability for various user types. To assist librarians, researchers, and information workers in selecting suitable methods for bibliometric studies, this work provides a comprehensive and readily accessible assessment, thereby enhancing informed and efficient research evaluation processes.

KEYWORDS: Bibliometric tools, bibliometric analysis, comparative framework, tool selection, analytical software**.**

1. INTRODUCTION

Particularly in the twenty-first century, human knowledge has been growing tremendously and rapidly. According to a 2021 study published in Nature, the total growth rate of scientific publications is approximately 4.10%, indicating that it would take 17.3 years for the number of publications to double (Bornmann et al., 2021). In the field of medicine, Dr Ian Chuang, Chief Medical Officer of Elsevier, notes in "The Dynamism of Clinical Knowledge" that by 2020, medical research would only take 73 days to double, compared to the expected 50 years in 1950 (Chuang, 2020). The term "doubling of human knowledge" was first widely used by American architect, systems theorist,

novelist, and futurist Buckminster Fuller in his 1981 book "Critical Path" (Fuller, 1981). Every domain has its own rate of growth, and when circumstances necessitate it, human knowledge in any discipline advances rapidly. However, it is generally accepted that human knowledge is expanding at a remarkable rate.

Bibliometrics is essential for measuring and analysing this constantly growing body of knowledge. The use of statistical and mathematical techniques to measure recorded academic communication and offer insights into the traits and development of a topic is known as bibliometrics (Moral-Muñoz et al., 2020). E. Wyndham Hulme used the phrase "statistical bibliography" in a 1922 paper on his analysis of journal entries, prior to Alan Pritchard coining and introducing the term "bibliometrics" in 1969. Cole and Eales, who described their work as a "statistical analysis of the literature" (Ikpaahindi, 1985), conducted the first bibliometric study prior to Hulme in 1917.

The bibliographical records of published works of human knowledge are currently managed by numerous academic and scholarly databases (Gusenbauer, 2019). Scopus, Web of Science, PubMed, Dimensions.ai, Cochrane Library, IEEE Xplore, and Google Scholar are among the most prominent and widely used academic databases. Millions of bibliographical details for published scholarly communications are indexed by these databases, along with additional metadata, including citations, funding sources, publishing venues, and author affiliations (Gusenbauer, 2022). These databases' records enable academics to use bibliometric tools and techniques for quantitative analysis and science mapping.

Researchers from a variety of disciplines have tried to assess the literature in their fields in terms of productivity (Kushwaha et al., 2024), research trends (Basumatary et al., 2023), collaboration (Aksnes et al., 2019), research gaps, and underexplored areas (He et al., 2019) in response to the increasing number of records in databases. Researchers have utilised a range of commercially available, proprietary, and open-source bibliometric and scientific mapping tools on the Internet to accomplish this. Since not all researchers are proficient in programming, choosing the best tool for their analytical goals and technical skill level can be challenging, given the wide range of bibliometric tools currently available, from statistical environments to GUI-based, user-friendly visual platforms.

Nevertheless, each of these tool types has advantages, disadvantages, difficulties, applications, and learning curves. "What tool should a researcher choose?" is one of the primary questions that arise. Additionally, the answer depends on several variables, including the technical expertise of the researchers, their analytical objectives, and their requirements for visualisation. This study develops and applies a systematic comparative framework to evaluate three popular science mapping bibliometric analysis tools: VOSviewer, Bibliometrix/Biblioshiny, and biblioMagika, with the aim of facilitating informed decision-making. By assessing the tools across crucial aspects such as user interface, analytical capabilities, scalability, data compatibility, and visualisation features, the objective is to assist researchers in making well-informed decisions when choosing bibliometric tools.

2. REVIEW OF LITERATURE

The growing use of bibliometric analysis across various fields has led to the development of numerous software programs with distinct strengths and technological requirements. Over the years, scholars have compared these tools and proposed frameworks to help researchers match tool capabilities with analytical goals. A foundational study by

Cobo et al. (2011) analysed science mapping tools based on network types, preprocessing options, and bibliometric techniques. They found that VOSviewer was most promising for displaying co-authorship and co-occurrence networks, whereas SciMAT offered substantial preprocessing and longitudinal analysis capabilities. However, they only examined a few network-oriented technologies, ignoring user experience and learning curves. Moral-Muñoz et al. (2020) reviewed software solutions for bibliometric and scientometric analysis, building on previous work. They categorised performance analysis tools, scientific mapping software, and Bibliometrix programming libraries. They named Bibliometrix/Biblioshiny one of the most comprehensive open-source bibliometric statistical analysis systems and praised VOSviewer for network visualisations. Their assessment did not include Excel-based or descriptive analytics tools, such as BiblioMagika, which limited its coverage of non-technical tools. Ozturk et al. (2024) emphasise the importance of developing realistic and transparent approaches for comparing tools in bibliometric research. They stated that current studies focus too much on tool output without adequately addressing how it supports research design, theory formulation, or literature synthesis. Lim and Kumar (2024) advocated a sensemaking viewpoint in bibliometrics, emphasising that tool selection should consider both technical aspects and the user's ability to interpret and apply results. As more researchers without coding backgrounds use bibliometric methods, Bales et al. (2020) and Marzi et al. (2025) stressed the need for usability-focused frameworks that balance analytical depth with interface intuitiveness. Despite this emphasis, most evaluations have focused on technically advanced tools, neglecting lightweight, non-code platforms utilised in practical research. There is no formal comparison of BiblioMagika in the available literature. BiblioMagika, developed by Aidi Ahmi, is a macro-enabled Excel utility featuring simple, template-driven workflows for analysing Scopus and Web of Science data. Its simplicity and detailed output have made it popular among practitioners and early-career researchers. Peer-reviewed scientific literature has not critically examined it, despite its use in Scopus-indexed publications. This paper fills that gap by evaluating VOSviewer, Bibliometrix/Biblioshiny, and biblioMagika side by side, utilising a technical and user-centred methodology. The present study strikes a balance between depth and accessibility, offering valuable insights for researchers of all skill levels, unlike previous studies that have focused on high-level functionality or complex analytical tools. It provides a comparative perspective that includes underrepresented tools and addresses the growing demand for inclusive, functional evaluations to assist bibliometric research decision-making.

3. METHODOLOGY

To offer a focused yet insightful comparison, this study selected three widely used bibliometric analysis tools: VOSviewer, Bibliometrix/Biblioshiny, and biblioMagika. The selection was based on accessibility, popularity, practical application, and the diversity of features. While biblioMagika was relatively new and less well-known compared to the other two tools, both of which were commonly cited in bibliometric research, it gained attention and appeared increasingly in analyses published in reputable Scopus-indexed journals. However, no prior study had formally evaluated it in scholarly literature, which positioned this study as a novel contribution to the field of bibliometric tool assessment.

All three tools were freely available, which makes them easy to access and use. They represented distinct categories: VOSviewer served as a powerful network visualisation tool, Biblioshiny is a shiny app providing a web interface for Bibliometrix, a set of tools for quantitative research, and biblioMagika offered a lightweight, Excel-based environment focused on descriptive statistics. This mix enabled a balanced comparison across platforms with

differing strengths and user expectations. The comparative evaluation framework was constructed by synthesising criteria from previous review studies and tool evaluation frameworks proposed by Cobo et al. (2011), Moral-Muñoz et al. (2020), Donthu et al. (2021), Öztürk et al. (2024), and Marzi et al. (2025). Ten core dimensions were defined to guide the evaluation, ensuring both functional and user-centred perspectives. This framework strikes a balance between technical depth and user experience, aiming to support both novice and experienced users in selecting the right tool. Each tool was evaluated independently using the framework described above. Evaluation criteria were derived from a combination of firsthand usage and exploration of each tool, as well as review of official documentation and tutorials, academic literature, and user forums.

4. COMPREHENSIVE BIBLIOMETRIC ANALYSIS FRAMEWORK

A comprehensive bibliometric analysis framework maps the intellectual structure and evolution of a research field by quantitatively analyzing metadata (authors, citations, keywords) from databases like Web of Science and Scopus. It involves seven key steps: defining research objectives, selecting databases, data retrieval, cleaning, analysis (performance/mapping), visualization, and interpretation. Key tools include VOSviewer, Bibliometrix/Biblioshiny, and biblioMagika to identify research trends, clusters, and collaborations.

Stage	Process Step	Key Components / Techniques
I. Preparation	1. Research Design	Define objectives and research questions.
	2. Data Collection	Search databases (Scopus, Web of Science, Google Scholar).
	3. Data Cleaning	Remove duplicates and correct metadata (using R, Python, or Excel).
II. Analysis	4. Performance Analysis	**Measurement and Classification:** Evaluate contributions of authors, journals, and institutions (e.g., publication count, h-index, total citations).
	5. Science Mapping	**Relationships and Structure:** Explore connections between research constituents. • **Co-citation analysis** • **Bibliographic coupling** • **Co-word analysis (keyword co-occurrence)**
III. Output	6. Visualization	Create network maps and thematic clusters using tools like **VOSviewer**, **Bibliometrix/ Biblioshiny**, or **biblioMagika**.
	7. Interpretation	Synthesize findings to identify research gaps, trends, and future directions.

5. BRIEF INTRODUCTION TO SELECTED TOOLS UNDER STUDY

5.1 VOSviewer: VOSviewer is a Java-based software tool for constructing and visualising bibliometric networks and maps (Van Eck & Waltman, 2010). It was developed by Nees Jan Van Eck and Ludo Waltman of Leiden University (Netherlands) in 2009. It is open-source software distributed under the MIT License. Networks and maps on VOSviewer are constructed using data on journals, authors, or individual articles retrieved from scholarly databases and built via citation, bibliographic coupling, co-citation, or co-authorship relationships (Figure 1).

VOSviewer also features text mining capabilities, enabling users to create and display co-occurrence networks of key phrases extracted from scientific literature.

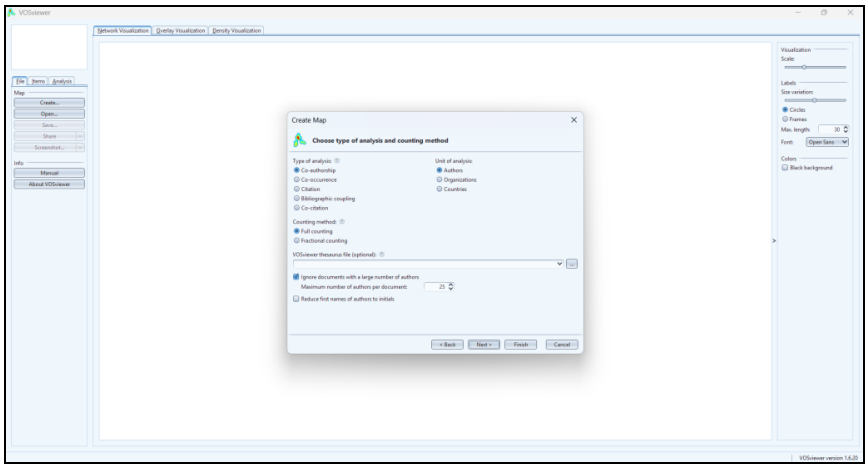

Figure 1: Map and network creation window of VOSviewer, displaying options for the type of analysis, unit of analysis, and filtering method.

5.2 Bibliometrix/Biblioshiny: An R-based library package called Bibliometrix utilises RStudio for science mapping analysis. The RStudio Desktop edition is distributed under the GNU Affero General Public License, version 3, and is available under various licenses. Massimo Aria and Corrado Cuccurullo of the University of Naples Federico II (Italy) created it in 2017. "Bibliometrix for non-programmers" is what Biblioshiny is. It is a web-based graphical user interface (GUI) tool that facilitates various performance and science mapping studies without requiring programming knowledge (Aria & Cuccurullo, 2017). Any of the most recent web browsers can run it (Figure 2). However, it must be executed using the RStudio IDE, and basic instructions are needed to install it for the first time. It can be used on systems running Windows, Linux, or macOS.

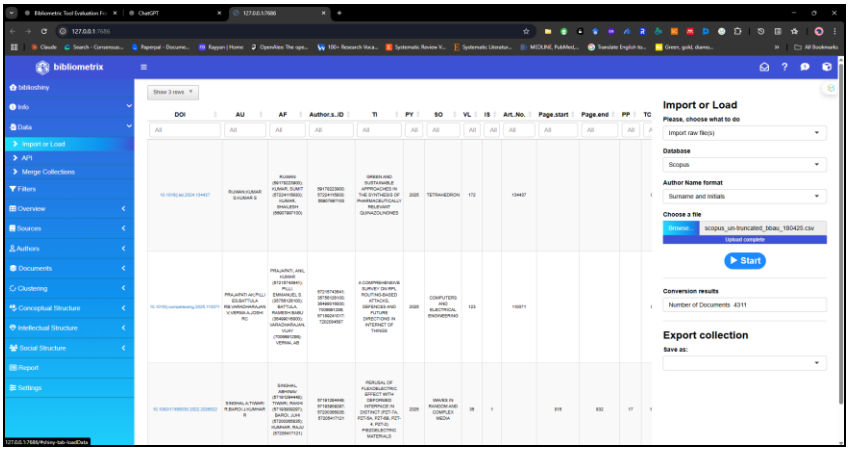

Figure 2: Biblioshiny app running on Chrome browser, displaying import and load options (right) and filters and other options for running analysis and creating visualisation (left)

5.3 biblioMagika: An Excel-based application called biblioMagika® was created for bibliometric analysis, with an emphasis on measuring scholarly influence and publication output (Ahmi, 2024). Total publications (TP), contributing authors (NCA), cited publications (NCP), total citations (TC), average citations per publication (C/P), average citations per cited publication (C/CP), h-index, g-index, m-index, citations sum within the h-core,

cumulative total publications, and other metrics are among the computations it offers (Figure 3). Numerous variables, such as publication year, source names, authors, affiliations, and nations, can be analysed. Aidi Ahmi of Universiti Utara Malaysia (Malaysia) created it in 2023. Although it is a proprietary tool, it is freely accessible. Only the most recent versions of Microsoft Excel, such as 2021 or 365, are compatible with it. General information about all three selected bibliometric tools is presented in Table 1.

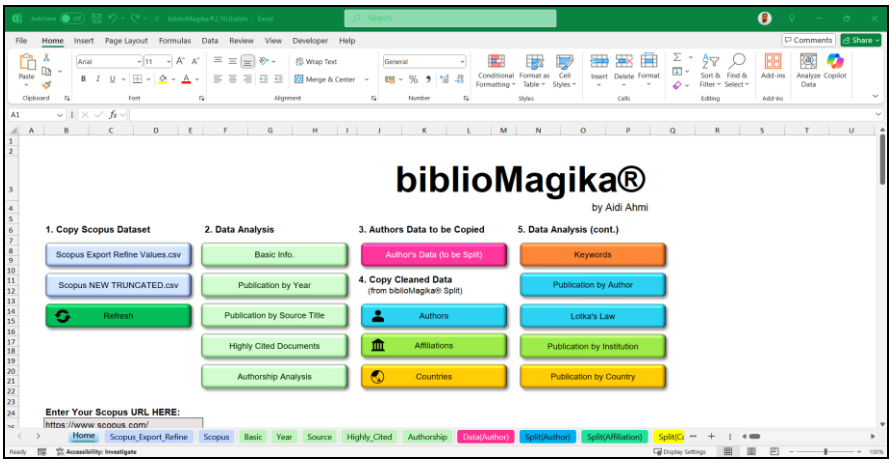

Figure 3: Home tab of biblioMagika running on MS-Excel 365 edition, displaying its main menu for performing various bibliometric analyses, and its unique data cleaning tools

6. STRUCTURED COMPARATIVE EVALUATION OF BIBLIOMETRIC TOOLS BASED ON TEN CORE DIMENSIONS

A detailed, structured, and evaluative comparison of the three selected bibliometric tools across ten core dimensions is presented in Table 2, followed by their descriptive analysis below.

Table 1: General information of the selected bibliometric tools

Sr.	Characteristics	VOSviewer	Bibliometrix/Biblioshiny	biblioMagika
1	Developer Name(s)	Nees Jan Van Eck & Ludo Waltman	Massimo Aria and Corrado Cuccurullo	Aidi Ahmi
2	Affiliating Institution	Leiden University (The Netherlands)	University of Naples Federico II (Italy)	Universiti Utara Malaysia (Malaysia)
3	Initial Release Year	2009	2017	2023
4	Latest version & Year	1.6.20 (October 2023)	4.3.3 (March 2025)	2.10 (April 2025)
5	Type	Java-based GUI tool (Desktop)	R package with Shiny GUI (Web-based)	MS-Excel-based tool (Desktop)
6	Source nature	Open Source	Open Source	Free to use but Proprietary
7	Supported OS	Windows, macOS, Linux	Windows, macOS, Linux (via RStudio)	Windows, macOS (via MS-Excel only) and Office version 2021 or 365

8	Link	https://www.vosviewer.com/	https://www.bibliometrix.org/home/	https://biblioMagika.com/

Table 2: Structured Comparative Analytical Framework

Sr. No.	**Evaluation Dimensions**	**VOSviewer**	**Bibliometrix/Biblioshiny**	**biblioMagika**
1	Supported Databases	WoS, Scopus, Dimensions, Lens, PubMed	WoS, Scopus, OpenAlex, Dimensions, Lens, PubMed, Cochrane Library	Scopus, WoS (Excel format)
	Supported APIs	OpenAlex, Crossref, Europe PMC, Semantic Scholar, OCC, COCI, WikiData	PubMed, Dimensions, OpenAlex	None
2	Supported Input Formats	RIS, CSV, TXT	XLSX, CSV, TXT	CSV, XLSX
	Supported Export Formats	BMP, EMF, GIF, JPG, PNG, SVG, PDF, SWF, TIFF	PNG, XLSX	XLSX, JPEG, JPG, PNG, and other image file formats.
3	Preprocessing Capabilities	Basic filtering	Deduplication, time slicing, advanced filtering, Synonyms, stop words	Data cleaning and harmonisation, identifying missing data
4	Analytical Capabilities	Science mapping analysis	Performance analysis and Science mapping analysis	Performance Analysis
5	Visualization Types	Network, Overlay, and Density Maps	Multiple visualisations (tables, network, charts, graphs, strategic diagrams, maps)	Line, Bar and Pie Charts, Dynamic bubble chart, Frequency tables
6	Customization Options	Low	Moderate in Biblioshiny and High in bibliometrix (via R customisation)	Moderate (Dashboard-driven Keyword Customisation)
7	Ease of Use	Beginner-friendly	Moderate (easy via GUI, advanced in R)	Very easy to use
8	Documentation and Tutorials	Manuals, videos, website FAQs	Comprehensive documentation and community support	Paid user guide PDF for download, Paid workshop and Bootcamps
9	Scalability and Performance	Handles large datasets efficiently	Slows down with very large datasets in Shiny GUI, performs best with a high computing power system using coding via the bibliometrix library	Best for small to mid-size datasets

10	Unique Features	Excellent for network visualisations and cluster analysis	Merge collections of different databases, Thematic evolution and Factorial analysis, Clustering, and Historiograph	Excellent for data cleaning and harmonisation, MS-Excel-based, Compatible with VOSviewer and Biblioshiny

7. SUPPORTED DATABASES AND APIS

The use and importance of bibliometric tools in research are influenced by their compatibility with several databases and APIs. Web of Science (WoS), Scopus, OpenAlex, Dimensions, Lens, PubMed, and the Cochrane Library are all supported by Bibliometrix/Biblioshiny, which is the most extensive and adaptable in this dimension. Additionally, it enables sophisticated users conducting large-scale or cross-disciplinary studies to collect data using APIs from PubMed, Dimensions, and OpenAlex, facilitating quicker, automated, and real-time data integration. VOSviewer supports WoS, Scopus, Dimensions, Lens, PubMed, and additional APIs, including OpenAlex, Crossref, Europe PMC, Semantic Scholar, OCC, COCI, and WikiData. It has sufficient power to display data from linked data resources, open citation ecosystems, and carefully selected exporters.

Only Excel-exported Scopus and WoS datasets are supported by biblioMagika; APIs are not integrated. It is helpful for focused datasets and planned or centralised data collection; however, this restricts its utility to offline and manually generated datasets. This dimension shows that BiblioMagika performs better on simpler tasks, whereas Bibliometrix and VOSviewer excel in data-intensive or multi-source projects.

8. SUPPORTED INPUT AND EXPORT FORMATS

Input and export file types determine interoperability with databases, other software, and publication workflows. Three widely used file formats for exporting bibliographic information from Scopus, WoS, and PubMed are supported by VOSviewer: RIS, CSV, and TXT. Bitmap (BMP), vector (SVG), image (PNG, JPG, GIF), and document (PDF, TIFF) export file types are all supported. It works well for producing excellent photos for scholarly publications. Database outputs can be easily converted thanks to Bibliometrix/Biblioshiny's support for XLSX, CSV, and TXT files. PNG and XLSX are suitable for internal analysis and simple presentation, despite their limited export options; however, they may require additional processing for images suitable for publication. BiblioMagika is an Excel-based application that matches Scopus and WoS Excel exports and accepts CSV and XLSX inputs. It is possible to export JPEG, PNG, JPG, and other Excel-native formats. While VOSviewer offers more export options, these are particularly useful for creating fast reports and presentations. For Microsoft Office users, however, BiblioMagika offers a smooth workflow. This dimension is dominated by VOSviewer for input processing and output quality, Bibliometrix for compatibility with analytical formats, and biblioMagika for ease of use and familiarity with the Excel ecosystem.

9. PREPROCESSING CAPABILITIES

Bibliometric analysis requires substantial preprocessing to organise, clean, and evaluate bibliographic data. Combining robust preprocessing capabilities with an accessible Excel-based interface is advantageous for

biblioMagika. By interfacing with OpenRefine, it simplifies synonym merging, data harmonisation, and metadata refining for author names, affiliations, keywords, and more. Strong preprocessing features, including deduplication, temporal slicing, filtering, and term unification, are provided by Bibliometrix/biblioshiny. Although it excels in analytical depth and automation, it could be difficult for non-technical users. VOSviewer only uses external preprocessing and rudimentary filtering. Although it requires data cleansing, it has a good co-authorship and citation network. Researchers use BiblioMagika or Bibliometrix to preprocess their VOSviewer datasets before viewing. Thus, biblioMagika has the advantage in this area.

10. ANALYTICAL CAPABILITIES

The breadth and depth of insights generated by bibliometric tools are determined by their analytical capabilities. Bibliometrix/Biblioshiny offers the most comprehensive capabilities in this area, covering both performance analysis and science mapping analysis. In addition to assessing productivity metrics like author production, publishing trends, and source impact, this dual capability enables researchers to examine intellectual structures through co-citation, co-word, and topic evolution studies. It is suitable for both exploratory and explanatory bibliometric research due to its broad methodological scope. On the other hand, VOSviewer focuses solely on science mapping analysis and highlights the visualisation of bibliometric networks, such as co-authorship, co-citation, bibliographic coupling, and keyword co-occurrence.

Its significance is in its ability to produce highly readable and aesthetically pleasing maps, which are frequently quite important for network-driven research, even though it does not include performance analysis (such as h-index tracking or annual publication trends). BiblioMagika, on the other hand, focuses more on performance analysis, but its capabilities go beyond simple metrics. It offers publishing trend analysis by year, source, author, institution, and nation, as well as Lotka's Law, keyword frequency analysis, and identification of frequently cited works, all of which are indicative of its dashboard capabilities. These built-in analytical options make biblioMagika a valuable tool for institutional bibliometric evaluations and literature reviews, especially for non-programmers.

11. VISUALIZATION TYPES

Visualisation, a fundamental component of bibliometric study, makes trends, correlations, and patterns easier for scientists to comprehend. VOSviewer Science mapping is well-liked for its flexible and thorough visual results as well as its powerful network-based visualisations, such as network maps, overlay maps, and density maps, which are excellent for examining co-authorships, keyword linkages, and citation ties. Bibliometrix/biblioshiny offers a variety of visualisation approaches, such as charts, graphs, tables, strategic diagrams, and many types of bibliometric maps, although it is somewhat less specialised in network aesthetics. These options are suitable for both descriptive and inferential presentations, covering a wide variety of bibliometric objectives. Despite being built on Excel, biblioMagika provides a very helpful visualising toolkit that includes frequency tables, dynamic bubble charts, bar and pie charts, and line charts. These are quite useful for combining publication trends, productivity metrics, and distribution patterns, especially for presentations or institutional reporting.

12. CUSTOMIZATION OPTIONS

Aligning bibliometric data with research objectives, formatting constraints, and institutional needs is greatly aided by customisation. Of the three tools, Bibliometrix/Biblioshiny offers the greatest degree of customisation. While Biblioshiny, the GUI, offers minimal built-in customisation, the fundamental Bibliometrix R package allows R programmers to modify analytic filters and display parameters. Included are the label, layout, colour design, data filters, and potentially new analytical techniques. Only minimal visual customisations, including node size, colour gradients, and clustering resolution, are possible with VOSviewer. Complex usage scenarios are limited by a lack of analytical reasoning or interface behaviour modification. BiblioMagika's dashboard controls allow for some customisation, although it is not script-based. It streamlines user-driven data improvement by enabling users to do keyword cleaning, merging, and filtering using interactive Excel tools. This approach provides users seeking straightforward, point-and-click editing for data harmonisation and output presentation with some useful flexibility, but it is not as comprehensive as code-based customisation. Overall extensibility is led by Bibliometrix, accessibility is led by BiblioMagika, and VOSviewer maintains its tuning for rapid and reliable visual output with minimal user configuration.

13. EASE OF USE AND DOCUMENTATION & TUTORIAL SUPPORT

The availability of tutorials and documentation, along with the simplicity of use of the tools, has a significant impact on a user's overall experience with bibliometric tools. In this sense, biblioMagika is the most user-friendly tool because it offers a straightforward Excel-based interface that even novice users can comprehend. However, the training boot camps, user manuals, and support materials are monetised and available through paid choices, which may limit access for institutions or consumers on a tight budget. In comparison, VOSviewer offers a user-friendly interface, along with free and trustworthy documentation, including FAQs, video lessons, and user manuals, on its own website. For novices who wish to quickly create network visualisations without complicated setup or configuration, this makes it perfect. Its simplicity is its strength for quick visual examination, even though it lacks the depth of analysis of its competitors. Bibliometrix/Biblioshiny provides a dual experience: the Bibliometrix R program requires coding expertise, while the Biblioshiny web interface is reasonably simple to use. The vast and open support infrastructure, which comprises in-depth vignettes, academic articles, video tutorials, GitHub repositories, and a thriving user community, mitigates this complexity. It offers a fulfilling and scalable analytical environment for individuals who are prepared to dedicate time to learning.

14. SCALABILITY AND PERFORMANCE

For large bibliometric datasets, scalability and performance are essential, particularly for long-term research mapping and literature reviews. Because VOSviewer is designed to handle large datasets without compromising responsiveness, it performs exceptionally well in this regard. It is ideal for large-scale scientometric research due to its lightweight, Java-based architecture, which accelerates data parsing and visual rendering, even with tens of thousands of entries. The performance of Bibliometrix/Biblioshiny varies. Large datasets can cause the Shiny GUI to slow down, which may impede workflow during intensive analysis. On the other hand, the Bibliometrix R package can handle large datasets in code and is compatible with high-performance computing platforms. Scalability is possible, but R scripting and computer resources can only be used effectively by technically proficient individuals. Small to medium-sized datasets are preferred by BiblioMagika. Because it uses Microsoft Excel, the size of the spreadsheet and processing capability may limit its performance.

15. UNIQUE FEATURES

Every bibliometric instrument has features that are specific to user profiles and analytical priorities. VOSviewer is a popular option for science mapping because of its network visualisations and cluster analysis. It generates beautiful, analytically rich maps of keyword co-occurrence, co-authorship, and co-citation. The integrated clustering algorithms produce distinct visual narratives essential for scholarly communication by exposing field-specific topic clusters and intellectual structures. But when it comes to integrated workflows and analytical depth, Bibliometrix/Biblioshiny shines. It enables users to combine datasets from several databases, which is helpful for multidisciplinary research and systematic reviews. Additionally, it provides factorial analysis, historiographic mapping, and subject evolution analysis, which go beyond bibliometric indicators to show the cognitive structure and historical development of study topics. However, BiblioMagika has advantages due to its Excel-based ease and interoperability. It is excellent at harmonising and cleaning data to prepare it for VOSviewer or Biblioshiny analysis. Before exporting clean datasets to more sophisticated tools, the interface enables users to identify, correct, and normalise metadata problems. BiblioMagika is ideal for researchers who lack technological expertise or who desire rapid descriptive insights with exportable data.

CONCLUSION

This work described an organised comparison of three widely used bibliometric tools: VOSviewer, Bibliometrix/Biblioshiny, and biblioMagika, in response to the growing complexity and scope of bibliometric research. To provide a balanced, feature-oriented approach, the study employed a ten-dimensional evaluative framework that took into consideration the technical skills, analytical objectives, and visualisation requirements of researchers. No single tool is better than the others; VOSviewer excels in network visualisation, Bibliometrix in analytical depth and flexibility, and biblioMagika in pre-processing efficiency and user accessibility. Rather, the user's objectives, abilities, and level of analysis determine the value they derive. A significant contribution of this research is BiblioMagika, a tool that has not been fully examined in scholarly comparisons. It is particularly helpful for inexperienced researchers and those with limited resources due to its Excel-based environment, OpenRefine integration, and compatibility with VOSviewer and Biblioshiny. This comparison approach enhances methodological rigour, transparency, and impact by enabling researchers, librarians, and information professionals to select bibliometric approaches that align with their research plans. To improve the bibliometric environment, evaluate tool interoperability in real-time procedures, and gather user input, future research may include new or commercial platforms.

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