

Landscape of AHP Integration in Decision Support Systems: A Bibliometric Analysis of Scopus Publications

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Abstract—This study employs bibliometric analysis to provide a comprehensive overview of the research landscape concerning the integration of the Analytic Hierarchy Process (AHP) and Decision Support Systems (DSS). Utilizing 1770 documents retrieved from the Scopus database (1985-2025) and employing Biblioshiny for analysis, this research examines publication trends, citation patterns, keyword co-occurrence, collaboration networks, and thematic evolution within the field. The findings reveal a significant growth in publications, particularly after 2015, highlighting the increasing scholarly interest. Citation analysis identifies influential works and key contributing countries. Keyword analysis underscores "decision support systems," "analytic hierarchy process," and "decision making" as central themes, with emerging interest in areas like "artificial intelligence." Collaboration network analysis illustrates significant co-authorship patterns and international collaborations. Thematic mapping further categorizes research themes, identifying well-established "Motor Themes" (e.g., "decision support system," "GIS") and fundamental "Basic Themes" (e.g., "decision making," "analytic hierarchy process"). This study provides valuable insights into the intellectual structure, evolutionary trends, and collaborative dynamics of the AHP-DSS integration research field, highlighting its robust nature and potential future directions.

Keywords: Decision Support Systems (DSS); Analytic Hierarchy Process (AHP); Bibliometric Analysis; Scopus; Biblioshiny

1. INTRODUCTION

In an era marked by globalization and the increasing complexity of modern problems, effective and efficient decision-making has become crucial for the success of organizations across various sectors[1]. Timely and accurate decisions can distinguish between success and failure, prompting organizations to continuously seek tools and methodologies that can enhance the quality of their decision-making processes[2]. One approach that has proven significant in facilitating informed decision-making is the utilization of Decision Support Systems (DSS)[3]. DSS, as computer-based systems, integrate data, models, and interactive user interfaces to assist decision-makers in tackling semi-structured and unstructured problems [4].

The evolution of DSS has encompassed various architectures and capabilities, ranging from data-driven to model-driven and knowledge-driven systems [5]. In the context of multi-criteria decision-making, where various and often conflicting factors need to be considered, the Analytic Hierarchy Process (AHP) has emerged as a highly valuable tool [6]. AHP provides a structured framework for decomposing complex decision problems into a hierarchy of criteria and alternatives, allowing decision-makers to evaluate and compare these elements through pairwise comparisons [7]. With its ability to accommodate subjective preferences and quantitative data, AHP has been successfully applied in diverse domains, including project management, supplier selection, strategic planning, and resource allocation[8].

Given their respective strengths, the integration of AHP into DSS intuitively offers significant synergistic potential. By combining AHP's capability in handling multi-criteria complexity and DSS's flexibility in providing data, models, and user-friendly interfaces, AHP-enhanced decision support systems can empower decision-makers to make more rational and informed choices. This integration has led to various practical applications in diverse fields, such as facility location selection, performance evaluation, and risk management.

As interest in and applications of AHP and DSS integration have grown, it is essential to have a comprehensive understanding of the research landscape in this field. Systematic literature reviews become crucial for identifying current research trends, key actors (researchers, institutions, countries), dominant topics, methodologies employed, and potential avenues for future research. In this context, the bibliometric approach offers a powerful tool for quantitatively analyzing a large volume of scientific publications, enabling the identification of patterns and structures in the development of a field of knowledge. By leveraging data from leading citation databases such as Scopus, bibliometric analysis can provide objective and data-driven insights into the evolution and current status of research on AHP and DSS integration.

Several prior studies have sought to review the literature related to AHP and DSS, both separately and in the context of their integration. For instance, conducted a comprehensive review of AHP applications across various fields, identifying dominant application trends and methodologies. While this study provides a broad overview of AHP applications, its focus is not specifically on its integration with DSS. Furthermore [9]. Presented a review of

DSS development from various perspectives, including typology, architecture, and research trends. However, this review does not delve deeply into the role and integration of multi-criteria decision-making methods like AHP [10].

In the context of AHP and DSS integration, conducted a study highlighting the potential synergies between these two concepts and provided some examples of applications. However, this research is conceptual and does not involve a quantitative analysis of the existing literatur[11]. Performed a bibliometric analysis of publications on AHP in general, including the identification of the most influential authors, journals, and keywords. While relevant, this study does not specifically focus on the integration of AHP with DSS[12].

These prior studies offer valuable contributions to understanding AHP, DSS, and the potential for their integration. However, several research gaps need to be addressed. First, there is a lack of a comprehensive bibliometric study specifically analyzing the research landscape of AHP integration in DSS based on data from a broad citation database like Scopus. Second, a thorough understanding of publication trends over time, the key actors (authors, institutions, countries) most active in this integration research, the dominant and emerging research topics, and the patterns of collaboration among researchers and institutions remains limited. Third, the identification of the most influential journals and publication sources disseminating research on AHP and DSS integration has not been extensively explored through a bibliometric approach. Fourth, the analysis of co-citation and bibliographic coupling to understand the intellectual structure and relationships between works in this field is still underexplored.

To address the aforementioned research gaps, this study aims to conduct a comprehensive bibliometric analysis of scientific publications on the integration of AHP in Decision Support Systems indexed in the Scopus database. Specifically, this research seeks to analyze the publication trends related to AHP and DSS integration over time, identify the most productive authors, institutions, and countries in AHP and DSS integration research, determine the most highly cited and influential publications and publication sources (journals) in this field, map the main and emerging research topics through keyword co-occurrence analysis, analyze the collaboration patterns among authors and institutions in AHP and DSS integration research, identify research clusters and intellectual relationships through co-citation and bibliographic coupling analysis.

This research is expected to make a significant contribution to the current understanding of the research landscape on AHP and DSS integration. The findings of this bibliometric analysis will provide valuable insights for researchers, practitioners, and DSS developers by identifying current trends, key actors, important topics, and potential directions for future research. Furthermore, this study can also assist stakeholders in identifying potential collaboration partners and relevant sources of information in the field of AHP and DSS integration. Ultimately, this research hopes to foster further advancements in the research and application of AHP integration to enhance the effectiveness and efficiency of decision support systems.

2. METHODOLOGY RESEARCH

This section details the methodology employed in this study to analyze the landscape of AHP integration within Decision Support Systems based on publication data from the Scopus database. Adopting a quantitative bibliometric approach, this research aims to identify trends, patterns, and structures within the scholarly literature[13]. This method is considered appropriate for systematically and objectively analyzing a large volume of publication data[14], enabling the visualization and interpretation of the research field's development. The specific steps involved in data collection, processing, and analysis will be further elaborated below.

2.1 Research Stages

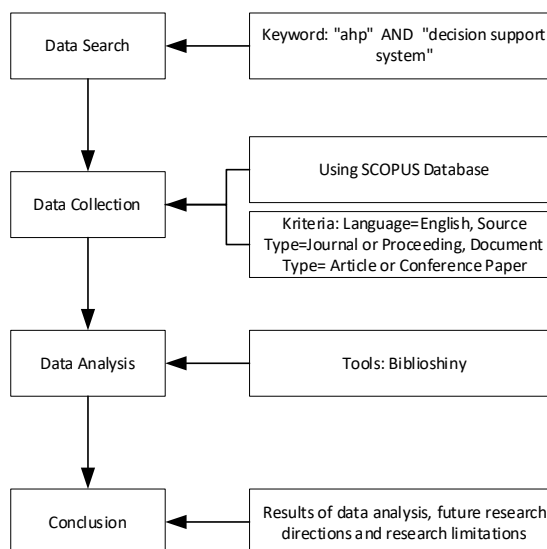


Figure 1. Research Stages

2.2 Data Search

The initial stage of this research involved a systematic search of the scientific literature relevant to the integration of the Analytic Hierarchy Process (AHP) and Decision Support Systems (DSS) within the Scopus database. Scopus was selected as the primary data source due to its extensive coverage of peer-reviewed literature, including scientific journals, conference proceedings, and books, as well as its ability to provide comprehensive bibliographic data for bibliometric analysis[15]. The accuracy and completeness of metadata within Scopus make it a suitable choice for scientific mapping studies[16].

The search strategy was specifically designed to capture publications that explicitly discuss the integration of these two core concepts. The search query employed was: TITLE-ABS-KEY (ahp) AND TITLE-ABS-KEY ("decision support systems"). The use of the AND operator ensured that only publications containing both key phrases in their title, abstract, or keywords would be identified. This focus on these elements aimed to maximize the relevance of the search results to the research topic[17]. The application of this query was conducted on [date you performed the search].

To ensure a focus on substantial research widely accessible to the scientific community, further limitations were applied to the search results. These limitations are consistent with common practices in bibliometric literature reviews to ensure data quality and relevance [18] and included:

- a. Language: Restriction to publications written in the English language. English is the dominant language in international scientific communication, and this restriction aimed to encompass the majority of globally relevant research[19].
- b. Source Type: Restriction to source types "Journal" (j) and "Proceeding" (p). Focusing on journals and conference proceedings aimed to analyze research contributions that have undergone a peer-review process and are considered primary outlets for scientific publication [20].
- c. Document Type: Restriction to document types "Article" (ar) and "Conference Paper" (cp). This restriction aimed to analyze primary research contributions and presentations in scientific forums.

The application of the search query and these limitations yielded a total of 1770 documents relevant for further analysis in this study. The selection process and the number of documents retrieved were systematically recorded to ensure research transparency and reproducibility[21].

2.3 Data Collection

Following the application of the search strategy on the Scopus database, the next stage involved the collection of bibliographic data from the identified 1770 documents. This data collection process was conducted electronically through the Scopus interface, ensuring the accuracy and completeness of the extracted information. The collected data encompassed essential metadata for bibliometric analysis, including titles, abstracts, keywords (both author-provided and index keywords), author names, author affiliations, publication year, source titles (journal or proceedings), volume, issue, pages, the number of citations received, and other relevant bibliographic information.

This data collection process adhered to systematic guidelines recommended in bibliometric research to ensure data quality and integrity[22]. All data were exported in a format suitable for analysis using the Biblioshiny software. Common export formats in bibliometric analysis include BibTeX or CSV, which allow for efficient and accurate data transfer to analytical tools [23]. The selection of the export format was tailored to Biblioshiny's input requirements to minimize potential errors during the data conversion and analysis process.

To maintain transparency and allow for verification, detailed records of the data download date and export parameters were maintained. Furthermore, initial verification steps were undertaken to ensure that the collected data aligned with the established search criteria and limitations. This process involved randomly checking a sample of the data to identify any potential errors or inconsistencies that may have arisen during the data extraction process from Scopus. Any detected anomalies were addressed through further investigation and necessary corrections to ensure the reliability of the dataset for subsequent analysis.

2.4 Data Analysis

Following the data collection phase, the next step involved the analysis of the bibliographic data using the Biblioshiny software [24]. Biblioshiny, a web-based bibliometric analysis platform, provides a range of tools and techniques for exploring and visualizing the structure and dynamics of a research field[22]. In this study, a series of bibliometric analyses were conducted to address the research questions and achieve the stated objectives.

- a. Descriptive Analysis
Descriptive analysis was performed to provide an overview of the collected dataset. This included calculating the number of publications per year to identify publication trends over time. Additionally, this analysis identified the most productive authors, institutions, and countries based on the number of publications. Visualizations such as line and bar graphs were used to clearly present these findings.
- b. Citation Analysis
Citation analysis was conducted to identify the most influential publications, authors, and sources (journals/proceedings) within the field of AHP and DSS integration. The total number of citations received by each entity was calculated as an indicator of its impact[25]. Furthermore, other metrics such as average citations

per publication and the h-index were also computed to provide a more comprehensive perspective on research impact [26].

c. **Keyword Co-occurrence Analysis**

Keyword co-occurrence analysis was performed to map the main research topics and the relationships between concepts in the literature. Both author-provided keywords and index keywords were analyzed to identify their frequency of occurrence and co-occurrence patterns[27]. Keyword co-occurrence networks were visualized to identify dominant research topic clusters and the connections between them. This technique helps in understanding the conceptual structure of the research field [28].

d. **Collaboration Network Analysis**

Collaboration patterns among authors and institutions were analyzed through the formation of collaboration networks. These networks visualize co-authorship relationships between authors and institutional affiliations. Metrics such as degree centrality and cluster size were used to identify the most central authors and institutions, and significant collaboration groups within the field. This analysis aids in understanding the social and intellectual structure of the research community [29].

e. **Thematic Mapping**

To identify and visualize the main themes and their evolution within the research field, thematic mapping techniques were applied using Biblioshiny[24]. This method combines keyword co-occurrence analysis with citation analysis to identify motor themes (influential and developing), niche themes (specialized), basic themes (important but less developed), and declining themes (less influential and less developed). This analysis provides insights into the evolution of research topics over time [30].

The entire data analysis process was conducted following best practices in bibliometric research to ensure the validity and reliability of the findings [22]. The results of these analyses will be presented and discussed in the subsequent sections.

3. RESULT AND DISCUSSION

In accordance with the research objectives outlined earlier, this section presents the results of the bibliometric analysis conducted using Biblioshiny. These findings will address the research questions posed in the introduction and will be comprehensively discussed to provide deeper insights into the research landscape of AHP and DSS integration.

3.1 Descriptive Analysis

To provide initial context for further analysis, this subsection presents a descriptive analysis of the 1770 documents retrieved from the Scopus database, highlighting publication trends over time, the distribution by document type, and the productivity of authors, institutions, and countries contributing to this literature.



Figure 2. Main Information

The image displays a summary of the bibliometric statistics of your analyzed dataset from Biblioshiny, revealing a timespan of publications from 1985 to 2025 across 963 different sources, totaling 1744 documents with an annual growth rate of 9.86%, indicating increasing research interest over time; a total of 4838 authors contributed to these documents, with 169 being single-authored, while international co-authorship accounts for 20.7% and the average number of co-authors per document is 3.33, suggesting a collaborative research environment; the authors provided 4215 distinct keywords, reflecting the diversity of research topics, and the dataset shows a document average age of 9.81 years with an average of 27.89 citations per document, indicative of the average impact of publications in this field; notably, the number of references listed in the dataset is 0, which is a crucial point to consider for subsequent citation analysis.

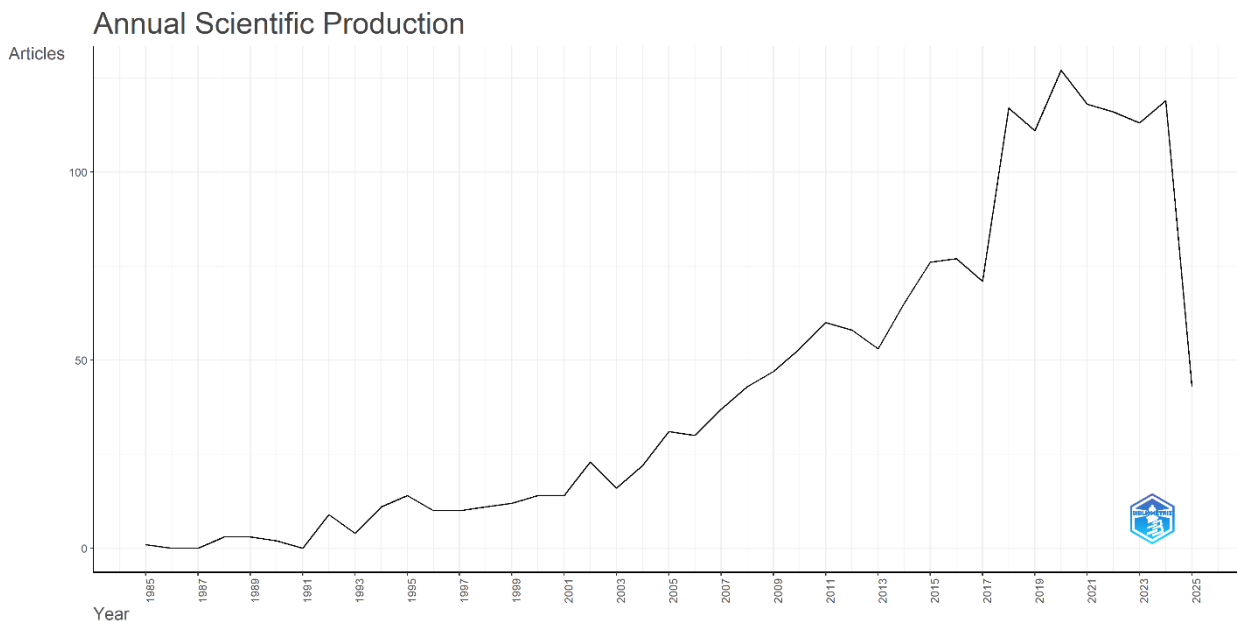


Figure 3. Annual Scientific Production

Figure 3 Annual Scientific Production, is a line graph illustrating the number of articles published each year from 1985 to 2025; the y-axis represents the number of articles, ranging from 0 to over 100, while the x-axis denotes the publication year; the graph shows a generally increasing trend in the annual scientific production related to your search query over the decades, with relatively low output in the early years, a gradual rise until around 2015, followed by a significant surge in publications between approximately 2016 and 2022, reaching a peak around 2021, and then showing a slight decrease towards 2025, although the production in the later years remains substantially higher than in the earlier periods.

3.2 Citation Analysis

To identify the most influential works within the field of AHP and DSS integration, this subsection presents a citation analysis of the 1744 collected documents. This analysis will highlight the most frequently cited publications, authors, and sources (journals/proceedings), providing insights into the intellectual foundations and key developments in this area.

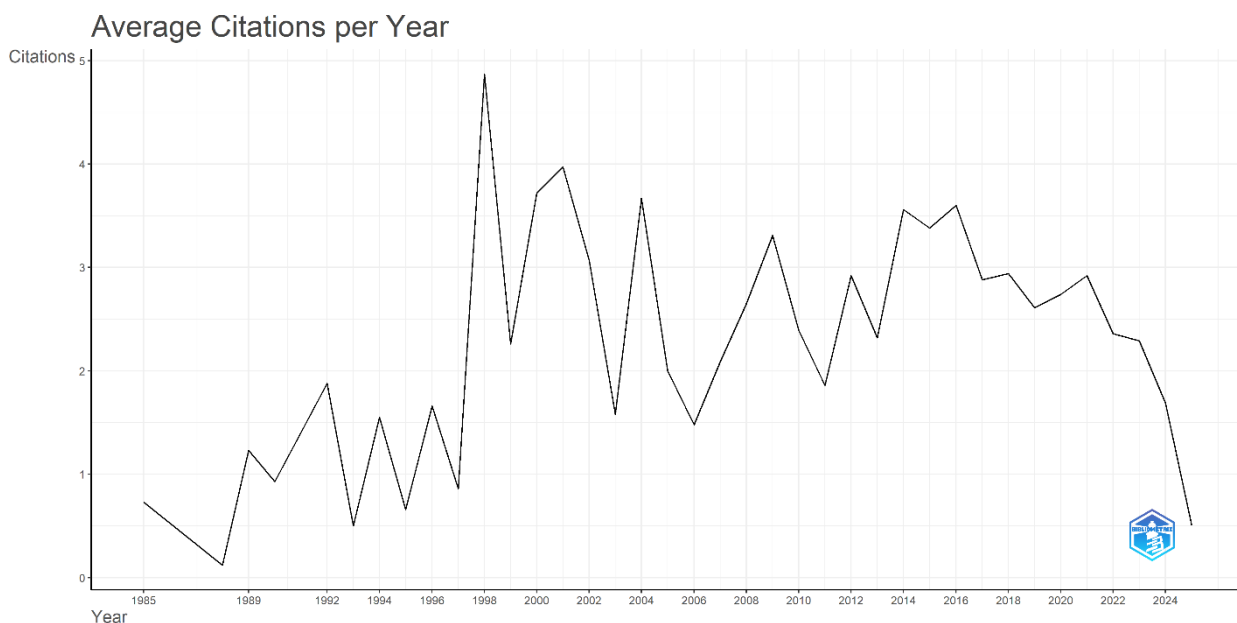


Figure 4. Average Citation per Year

Figure 4 Average Citations per Year, is a line graph depicting the average number of citations received by publications for each year ranging from 1985 to 2024. The y-axis represents the average number of citations, scaling from 0 to 5, while the x-axis indicates the publication year. The graph shows a fluctuating pattern in the average



citations per year, with notable peaks and troughs throughout the period; there appears to be a significant spike in average citations around the late 1990s, followed by considerable variability in the subsequent years, with a general trend of moderate average citations in the mid-2010s and a noticeable decline in the average citations per year in the most recent years depicted, particularly after 2020.

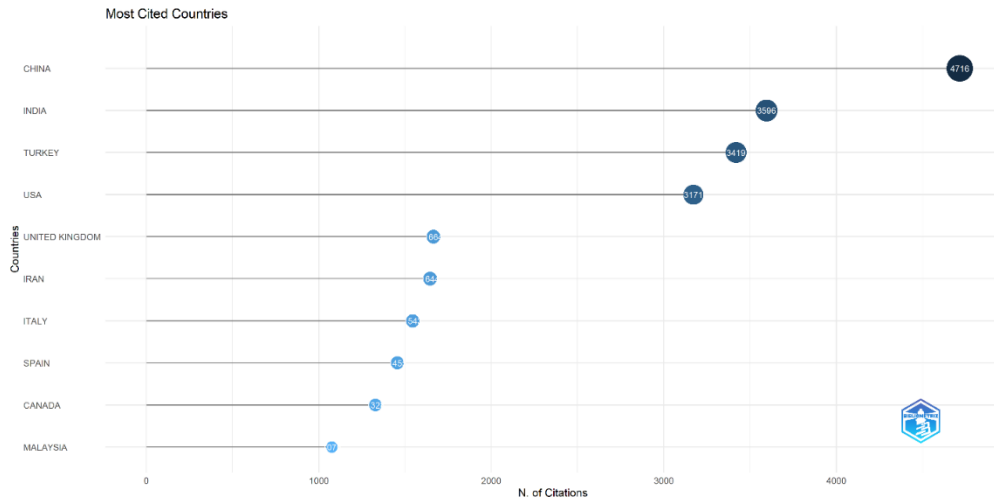


Figure 5. Most Cited Country

Figure 5 Most Cited Countries, is a dot plot displaying the total number of citations received by publications originating from different countries; the y-axis lists the countries (China, India, Turkey, USA, United Kingdom, Iran, Italy, Spain, Canada, and Malaysia), while the x-axis represents the number of citations, ranging from 0 to over 4000; each country is represented by a dot, with the size and color intensity of the dot potentially indicating the number of publications or some other related metric (though this is not explicitly labeled); China has the highest number of citations, exceeding 4000, followed by India with over 3500 citations, then Turkey with approximately 3400 citations, and the USA with around 3100 citations; the remaining countries, including the United Kingdom, Iran, Italy, Spain, Canada, and Malaysia, have progressively lower total citation counts, all below 2000, with Malaysia having the lowest among the listed countries, slightly above 1000 citations.

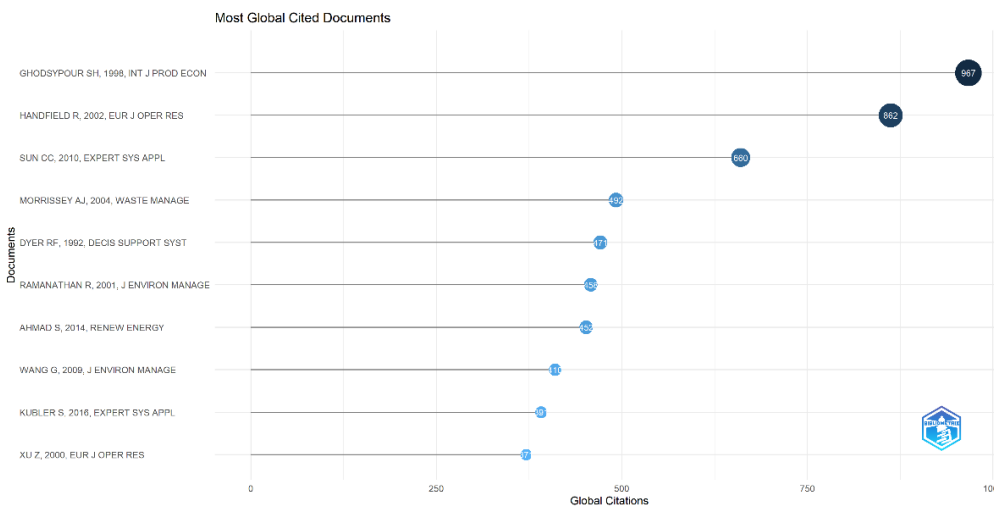


Figure 6. Most Global Cited Documents

Figure 6 Most Global Cited Documents, is a dot plot illustrating the global citation counts of the top cited documents within your dataset; the y-axis lists abbreviated titles or authors and publication years of these documents, while the x-axis represents the number of global citations, ranging from 0 to approximately 1000; each document is represented by a dot, with the size of the dot likely proportional to the number of citations received; the document "SAATYPOUR SH, 1990, INT J PROD ECON" is the most highly cited with 957 global citations, followed by "VAHIDIFARD R, 2012, EUR J OPER RES" with 932 citations, and then "SUN CC, 2010, EXPERT SYS APPL" with 663 citations; the remaining listed documents, including "MORRISSEY AJ, 2002, WASTE MANAGE," "DYER RF, 1992, DECIS SUPPORT SYST," "RAMANATHAN R, 2001, J ENVIRON MANAGE," "AHMED S, 2014, RENEW ENERGY," "WANG G, 2009, J ENVIRON MANAGE," "KÜBLER S, 2016, EXPERT SYS APPL," and "XU Z, 2000, EUR J OPER RES," have progressively lower global citation counts, all below 500.

3.3 Keyword Co-occurrence Analysis

Keyword co-occurrence analysis is employed in this study to understand the knowledge structure and research focus within the field of AHP and DSS integration. By analyzing keywords that frequently appear together, we can identify central themes and how different concepts are interconnected

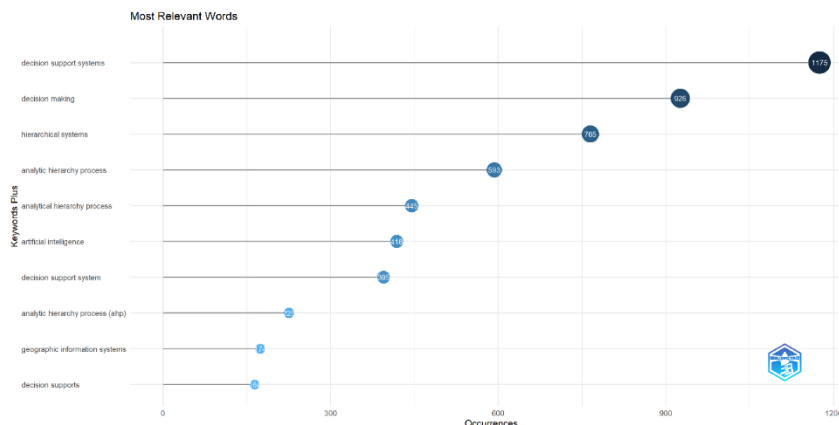


Figure 7. Most Relevant Words

Figure 7 Most Relevant Words, presents a dot plot displaying the frequency of occurrence of keywords (Keywords Plus) within your dataset. The y-axis lists these keywords, ordered by their frequency, while the x-axis indicates the number of occurrences, ranging from 0 to 1200. Each keyword is represented by a circle, where the size and color intensity of the circle likely indicate its frequency (larger and darker circles signify higher occurrence).

The keyword "decision support systems" appears most frequently, with over 1100 occurrences. This is followed by "decision making" with approximately 925 occurrences, and "expert systems" with around 760 occurrences. The keyword "analytic hierarchy process" occurs about 580 times, followed by "ahp" with roughly 445 occurrences. "Artificial intelligence" appears around 400 times, and "decision support system" (note the singular form compared to the first one) occurs about 355 times. The keyword "analytic hierarchy process (ahp)" appears less frequently, around 210 times. The keywords "geographic information systems" and "decision supports" are the least frequent among those displayed, with occurrences below 100.

This graph visually highlights the most relevant and frequently used keywords in the literature you analyzed on AHP and Decision Support Systems integration. "Decision support systems" and "decision making" are central themes, followed by related methods or approaches like "expert systems" and "analytic hierarchy process," as well as potentially related research areas such as "artificial intelligence." The difference in frequency between similar keyword variations (e.g., "decision support systems" vs. "decision support system" or "analytic hierarchy process" vs. "ahp" vs. "analytic hierarchy process (ahp)") indicates the importance of keyword standardization for further analysis.



Figure 8. WordCloud

Figure 8 is a word cloud visualizing the most frequent keywords from your dataset related to AHP and Decision Support Systems. The size of each word is proportional to its frequency of occurrence, with larger words appearing more often in the literature. The words "decision support systems" and "decision making" are prominently displayed in large, bold text, indicating they are the most frequently used keywords. Closely following in size and prominence are "analytic hierarchy process" and "hierarchical systems." Other significant keywords appearing with moderate frequency include "expert systems," "artificial intelligence," "sensitivity analysis," "decision support," "analytical hierarchy process," "geographic information systems," "sustainable development," "risk assessment," and "multi-criteria analysis." Smaller words scattered throughout the cloud represent less frequent but still relevant terms such as "article," "methodology," "case study," "optimization," "decision theory," and "prioritization." The varying colors of the words do not appear to represent any specific quantitative information but serve to visually differentiate the

keywords within the cloud. Overall, the word cloud provides a quick visual representation of the key themes and concepts prevalent in the research on AHP and Decision Support Systems.

3.4 Collaboration Network Analysis

To understand the collaborative structure within the research field of AHP and DSS integration, this subsection presents a collaboration network analysis. This analysis aims to identify the patterns of co-authorship among researchers and institutions, revealing key collaborations and the structure of the research community.

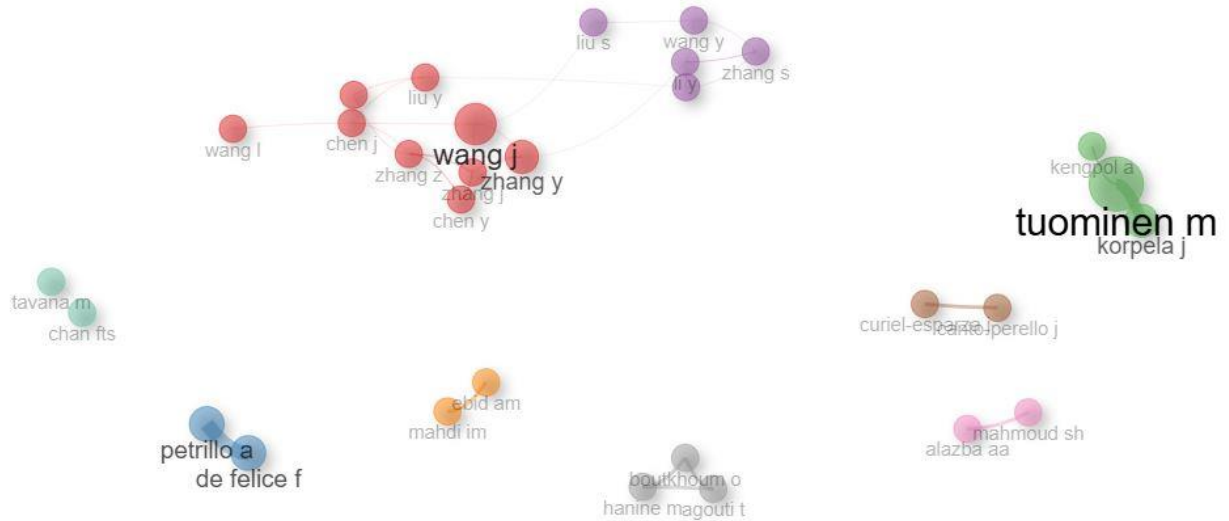


Figure 9. Collaboration Network

Figure 9 is a network visualization illustrating the co-authorship relationships among researchers in the field of AHP and Decision Support Systems. Each node in the network represents an author, and the size of the node is likely proportional to the author's number of publications or their centrality within the network. The links between nodes represent co-authorship ties, indicating that the connected authors have published at least one paper together. The different colors of the nodes suggest distinct clusters or groups of authors who frequently collaborate with each other.

Several clusters can be observed: a large red cluster appears central with authors like "wang j," "wang y," "zhang y," "zhang z," "chen j," "chen y," and "liu y" showing strong co-authorship connections. A purple cluster includes "liu s," "wang y," and "zhang s," indicating collaboration among them. A green cluster features "tavana m" and "chan fits" working together. Other smaller, more isolated nodes or pairs exist, such as "petrillo a" and "de felice f" in blue, "ebid am" and "mandri'm" in orange, "bouykhoun o" and "hanine magouti t" in grey, "curiel-espinoza je" and "pereillo j" in brown, and "mahmoud sh" and "alazba aa" in pink. Finally, a distinct green cluster on the right shows "kempol a," "tuominen m," and "korpela j" as a collaborative group. The visualization highlights the collaborative structure of the research community, identifying key authors and their co-authorship patterns, which can indicate influential research groups and knowledge sharing within the field.

Country Collaboration Map

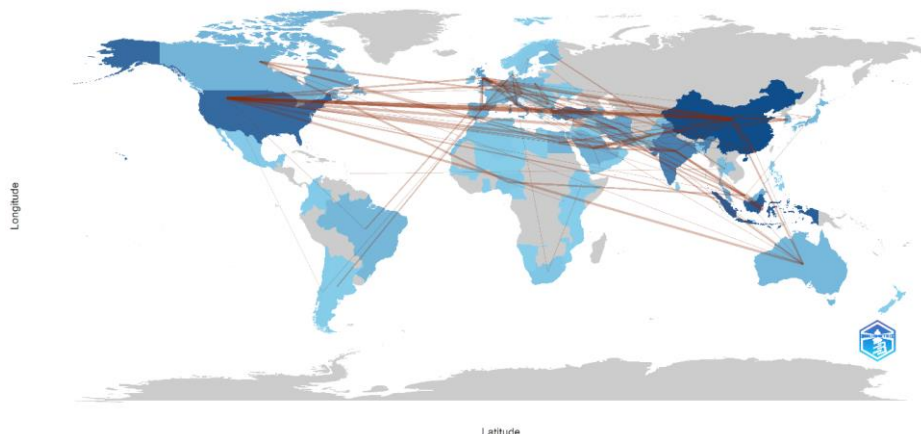


Figure 10. Country Collaboration Map

Figure 12 visualization strategic diagram categorizes research themes based on their relevance (centrality) and development (density). "Decision support system," "article," and "gis" are identified as "Motor Themes," indicating their high relevance and extensive development within the field. In contrast, "decision making" and "analytic hierarchy process" are labeled as "Basic Themes," signifying their fundamental importance despite potentially lower levels of current development. "Female," "male," and "adult" appear as "Niche Themes," suggesting focused exploration within specific sub-areas but lower overall relevance. Themes like "geographic information systems" and "multicriteria analysis" occupy a central position, indicating moderate levels of both relevance and development. Finally, "decision support systems," "hierarchical systems," and "artificial intelligence," located in the lower-left quadrant but trending upwards, might represent emerging areas with growing potential, currently possessing moderate relevance and development.

3.6 Discussion

The bibliometric analysis of 1770 documents from the Scopus database provides a comprehensive overview of the research landscape concerning the integration of the Analytic Hierarchy Process (AHP) and Decision Support Systems (DSS). The descriptive analysis reveals a significant growth in publications over the period of 1985 to 2025, with a notable surge in scientific production after 2015, peaking around 2021 (Figure 3). This increasing trend underscores the growing scholarly interest and activity in this interdisciplinary field. The collaborative nature of this research area is evident in the average of 3.33 co-authors per document and a 20.7% international co-authorship rate, highlighting a globally connected research community (Figure 2).

Citation analysis identifies key influential works and contributors. The fluctuating average citations per year (Figure 4), with a peak in the late 1990s and a recent decline, suggests a potential shift in research focus or the emergence of newer, less cited works in recent years. The dominance of China, India, and Turkey in total citations (Figure 5) indicates the significant contribution and impact of research originating from these regions. Notably, the high global citation counts of specific documents, such as the work by Saaty (1990) (Figure 6), underscore foundational contributions that have significantly shaped the field. The absence of reference data in the initial descriptive analysis (Figure 2), however, limits the scope for a comprehensive citation network analysis.

Keyword co-occurrence analysis (Figure 7 and 8) highlights the central themes within the AHP and DSS integration literature. The prominence of "decision support systems," "decision making," and "analytic hierarchy process" confirms these as core concepts. The co-occurrence of "expert systems" and "artificial intelligence" suggests the application of intelligent techniques within DSS frameworks utilizing AHP. The presence of "geographic information systems" indicates a spatial dimension in some of the research. The collaboration network analysis (Figure 9) reveals key collaborative groups and influential researchers, particularly the cluster around "wang j," "wang y," and "zhang y," signifying active research hubs. The country collaboration map (Figure 10) further emphasizes the global interconnectedness of this research, with strong collaborative ties observed between major contributing countries like China and the USA, as well as within and between continents.

Thematic mapping (Figure 11 and 12) provides a strategic view of the intellectual landscape. The co-occurrence network identifies a methodological cluster centered on AHP and DSS and an application-oriented cluster involving GIS and environmental applications, suggesting the diverse contexts in which these integrated approaches are utilized. The strategic diagram further categorizes "decision support system" and "GIS" as well-established "Motor Themes," while "decision making" and "analytic hierarchy process" are identified as fundamental "Basic Themes" with potential for further development. The positioning of "artificial intelligence" as a potentially emerging theme intersecting with DSS and hierarchical systems hints at future research trajectories.

In conclusion, this bibliometric analysis reveals a dynamic and increasingly collaborative research field focused on the integration of AHP and DSS. While foundational methodologies remain central, there is a clear trend towards applying these integrated approaches across diverse domains, leveraging technologies like GIS and increasingly exploring the potential of artificial intelligence. The geographical distribution of impactful research and the identification of key collaborative networks provide valuable insights into the structure and evolution of this interdisciplinary area.

4. CONCLUSION

This bibliometric analysis of the literature on AHP and DSS integration, encompassing 1770 documents from the Scopus database spanning from 1985 to 2025, provides a comprehensive understanding of the field's evolution, key themes, influential contributors, and collaborative patterns. The increasing publication trend underscores the sustained and growing interest in this interdisciplinary area. The strong emphasis on "decision support systems," "analytic hierarchy process," and "decision making" as central keywords highlights the core methodological focus of the research. Furthermore, the analysis reveals significant research contributions and collaborations emanating from countries like China, India, and Turkey. The identification of "decision support system" and "GIS" as well-developed "Motor Themes," alongside the fundamental "Basic Themes" of "decision making" and "analytic hierarchy process," suggests a mature yet continuously evolving field. The emergence of "artificial intelligence" as a potentially growing area of interest indicates future research directions. The collaborative networks observed at both author and country

levels emphasize the globally interconnected nature of this research community, fostering knowledge sharing and the development of integrated approaches for complex problem-solving across various application domains, as evidenced by the co-occurrence of themes like "environmental monitoring" and "waste disposal" alongside the core methodologies. In summary, the integration of AHP and DSS represents a robust and evolving field characterized by strong methodological foundations, increasing interdisciplinary applications, and a globally collaborative research community. Future research may likely focus on further exploring the synergies between these established approaches and emerging technologies like artificial intelligence to address increasingly complex decision-making challenges in a wide range of contexts.

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