

# Business Intelligence Research (2010–2026): A Scopus-Based Bibliometric Assessment of Publication Growth and Conceptual Development

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## ABSTRACT

This study provides an overview of the evolution of research within the Business Intelligence (BI) domain between 2010 and 2026 by employing the bibliometric method based on the Scopus database. The study was aimed at discovering publication trends, prominent authors and organizations, collaboration structures, and evolution of the scientific concepts within the BI. Data analysis was performed using VOSviewer in order to create maps of co-authors' networks, citation structures, and keyword associations. The study revealed a growing tendency to publish works on the discussed topic, especially in the recent years, which indicates increased interest in data-driven decision-making processes. As far as co-authorship is concerned, cluster structures have been discovered; some authors served as central nodes of the network. Moreover, citations were used as the indicator of relevance of certain papers, and the results showed that interdisciplinary studies focused on artificial intelligence, machine learning, and big data became dominant. Finally, the topic analysis has shown that artificial intelligence has remained the focal point, while other interesting topics like behavioral analytics and generative artificial intelligence received increased attention.

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## 1. INTRODUCTION

In the current digital age, businesses find themselves operating in a world where there is fast-paced development of technology alongside explosive data growth [1], [2]. The advent of data-based decisions has placed Business Intelligence (BI) among the key elements in today's businesses. BI is a term

used to describe various technologies, tools, and techniques through which business information can be collected, integrated, analyzed, and communicated [3]. Through data conversion to intelligence, BI helps businesses increase their efficiency levels and obtain strategic advantages in the highly dynamic market environments [4].

BI's development is directly associated with advancements made in areas such as information systems, data warehouses, and data analysis technology [5]. Traditionally, the concept of business intelligence has developed out of the ideas of automated information systems and has advanced to encompass modern platforms based on technologies of big data analysis and machine learning as well as real-time data processing [6]. The combination of these technologies has led to BI's diversification, moving away from conventional systems for reporting purposes toward predictive and prescriptive types of analysis [7].

It should be noted that during the last decade, much attention has been paid to the development of business intelligence (BI), as the importance of this tool for decision-making and digitization has become increasingly evident. Studies conducted within the framework of bibliometrics have shown that business intelligence research demonstrates dynamics and growth trends, with substantial publication productivity from 2010 until the late 2010s. At the same time, it becomes clear that the current growth of interest in BI research does not follow a straight line; rather, it is characterized by peaks and troughs associated with modern technologies like big data, cloud computing, and artificial intelligence.

Apart from the increase in publications, there have also been significant changes in the conceptualization of BI. Earlier works concentrated more on the technical aspects of BI, including the structure of the system and processing capabilities. However, current studies tend to concentrate on the organization and its strategy and adopt a people-oriented approach. This change emphasizes the evolution of BI from being a mere technological instrument to becoming a valuable tool for organizational adaptability and innovation.

Nevertheless, despite the large number of works that have been published on the topic, there is a lack of coherence among the current researches done on business intelligence as well as the differences in the methodology used, research focus, and

geographical representation. In fact, some studies revealed imbalances in terms of the research productivity and the impact of the research done by each country, where it was observed that more productive countries, such as the USA and China, dominated BI research. Besides, there are unexplored areas that need to be addressed, such as BI integration with HRM, competitive intelligence, and decision making.

Despite the growing interest in Business Intelligence from academics and practitioners, there remains insufficient insight into its trends and theoretical development for an extended period, especially between 2010 and 2026. Previous bibliometric investigations tend to be conducted over short periods or within a particular subfield, thus offering fragmentary information regarding the overall trajectory of the subject. Moreover, differences in recognizing the prominent issues, notable scholars, and potential future developments prevent the formulation of a consistent knowledge framework. As such, a systematic bibliometric analysis using a wide database like Scopus would be needed.

The purpose of this paper is to undertake a thorough bibliometric analysis of literature on Business Intelligence that appears in the Scopus database between 2010 and 2026. In particular, the research seeks to examine the trends in the number of publications, discover leading authors, affiliations, and countries that have contributed to the development of BI studies, and understand the theoretical and thematic development of the subject area. Through this systematic review of existing literature, the research aims to provide critical insights for future research efforts in Business Intelligence.

## 2. METHODS

The current study uses the method of quantitative bibliometric analysis to systematically investigate the dynamics of Business Intelligence (BI) research from 2010 to 2026. Bibliometric analysis is considered one of the best practices in the assessment of

scientific production and the identification of trends in the field of research [8], [9]. The data used for this study were selected entirely from the Scopus database because this source provides a rich collection of peer-reviewed scholarly literature on different subject areas. The search strategy was formulated through a search string using appropriate keywords like “business intelligence,” “BI systems,” and “data-driven decision-making” and applied to titles, abstracts, and keywords of publications. In order to maintain data homogeneity and validity, only peer-reviewed papers published in English within the mentioned period were included.

After gathering the data, the second step carried out was data cleaning and processing to ensure that the data obtained is accurate and reliable. The data cleaning process included standardizing author names, combining synonyms in keywords, and eliminating incomplete observations from the dataset. Analysis of the processed dataset was done using bibliometrics, performance analysis, and science mapping methods. Performance analysis method was used to assess publication patterns, citation behaviors, and contribution made by authors, institutions, and countries. On the other hand, science mapping was used to investigate collaborations through co-authorship, co-citation, and keywords co-occurrence. The analyses were facilitated by VOSviewer.

In order to further strengthen the reliability of results obtained, this study

utilized the techniques of descriptive and network analyses. Descriptive analysis helped demonstrate the growth in publications and citations per year, while network analysis helped reveal patterns of theme development and the formation of research groups over time. Also, there was a need to conduct a temporal analysis to determine changes in the themes of research throughout the period studied.

### 3. RESULTS AND DISCUSSION

#### 3.1 Co-Authorship Analysis

This study on co-authorship is undertaken in order to assess the trends in collaboration between various scholars working in the area of Business Intelligence. Through co-authorship network analysis, this study aims at understanding the dynamics of scientific collaboration and the most important authors, research groups and collaboration level among various universities and countries.

##### 1. Author-level Visualization

The visual representation of the co-authorship network shows the interconnectedness of scholars involved in the study of Business Intelligence. The graph uses nodes to represent authors and links to show collaborations. The result is an insight into the structure of scholarly cooperation, identifying the most prominent figures, research areas, and levels of collaboration.

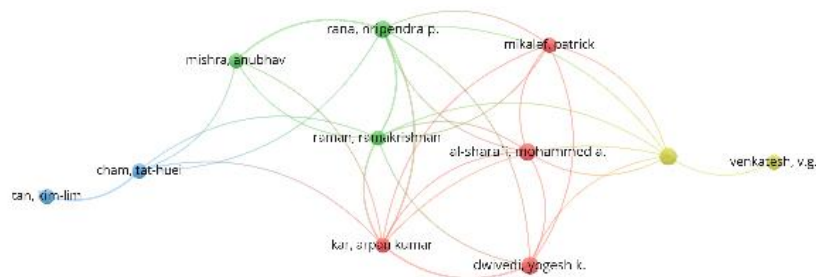


Figure 1. Author-level Visualization

Source: Data Analysis

It is evident from the graph that there are many clusters of authors, each denoted by a unique color, which implies that there are sub-networks within the overall research network. There are some authors, for example, Al-Sharhan, Mohammed A. and Dwivedi, Yogesh K., who are placed in the center of their cluster, and this implies that they play an essential role in connecting different researchers or are highly cited within their network. There are some authors who are located at the periphery of the network.

Moreover, there seems to be a lack of relationships between clusters, even though some exist; this indicates that collaboration in

the field of Business Intelligence research is largely confined to certain groups instead of being spread across the entire network. Nonetheless, there are a few links that connect different clusters, which could signify collaboration between different disciplines or institutions.

## 2. Institution-level Visualization

Visualization of Co-authorship Network in the Institutional Level illustrates the collaboration that occurs among different academic institutions involved in the study of Business Intelligence. In this visualization, institutions are considered as nodes, whereas the lines represent the collaborating ties between them.

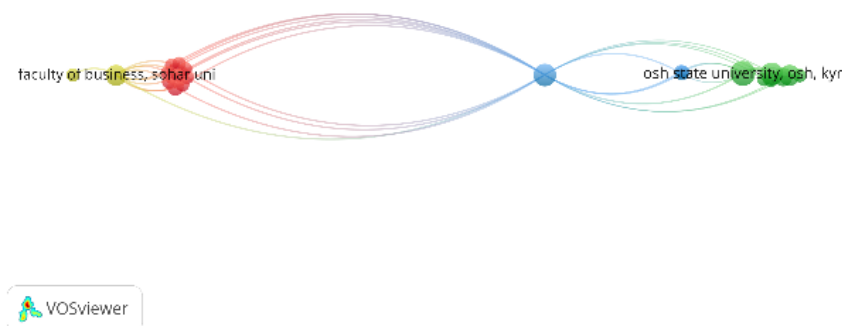


Figure 2. Institution-level Visualization

Source: Data Analysis

As illustrated above, the network graph is moderately complex but well-organized, with a middle node serving as a link between the two dominant clusters. The left cluster contains a Faculty of Business from Sohar University, which seems to be a major contributing institute in its cluster, linked by several collaboration links. The right cluster comprises Ohio State University, signifying its position as an important participating institute in BI research. The existence of a middle node linking these two clusters

implies that the institute serves as an intermediary for collaboration.

Furthermore, the intensity and direction of these connecting lines show that cooperation does not solely depend on isolated efforts but involves selected cooperation as well. Nevertheless, the low number of nodes and links implies that institution-level cooperation remains relatively concentrated in nature rather than being widely spread out in this case. Such an

observation might be associated with intense bilateral cooperation or teamwork.

### 3. Country-level Visualization

This figure is an example of a co-authorship network of countries, which demonstrates collaboration across the world on the study of business intelligence. The use of nodes representing countries and links representing connections between them helps visualize the pattern of international collaboration within the business intelligence area.

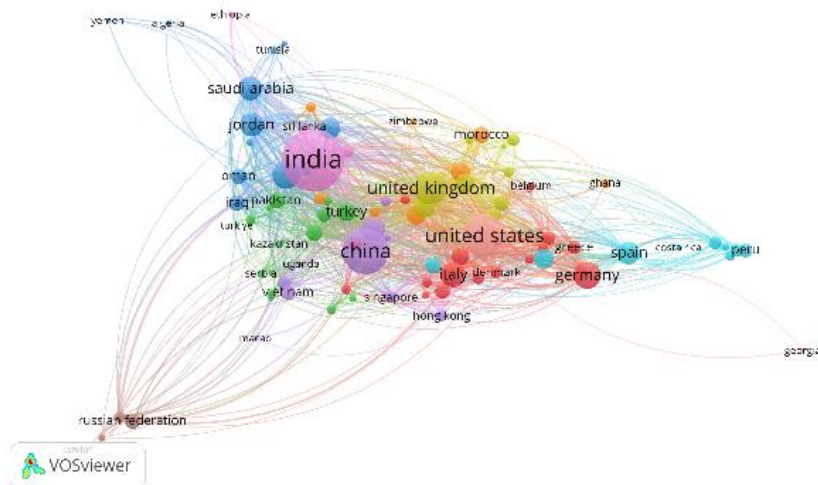


Figure 3. Country-level Visualization  
Source: Data Analysis

This graph highlights a well-connected global business intelligence network where some nations play significant roles in the research process. Specifically, the US, India, China, and the UK stand out as the major centers in the network, denoted by the large size of the nodes and numerous links. The four countries function as main actors of collaboration, ensuring that there is cooperation between the countries and various other nations. For example, the US collaborates with various nations in Europe, including Germany, Italy, and Spain, while at the same time collaborating with Asian countries such as China and India.

Furthermore, the existence of various clusters, which are characterized by different

colors, shows cooperation between regions or on a thematic basis. Nations from Asia, the Middle East, and Europe seem to have developed their own network sub-groupings while still being connected through a central node; thus, proving that leading countries play a crucial role as intermediaries in the exchange of information around the world. Several peripheral nations like Georgia and Costa Rica find themselves on the periphery of the network.

### 3.2 Citation Analysis

Citation analysis is employed to evaluate the intellectual influence and impact of publications and author within the Business Intelligence domain.

Table 1. The Most Impactful Literatures

Citations	Authors and year	Title
7069	[10]	A powerful and efficient algorithm for numerical function optimization: Artificial bee colony (ABC) algorithm
4873	[11]	Business intelligence and analytics: From big data to big impact

Citations	Authors and year	Title
4487	[12]	Machine Learning: Algorithms, Real-World Applications and Research Directions
3411	[13]	Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy
3333	[14]v	"So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy
2899	[15]	Heuristic decision making
2466	[16]	Big Data in Smart Farming – A review
2332	[17]	Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal
2138	[18]	Deep learning applications and challenges in big data analytics
1924	[19]	Modeling the world from Internet photo collections

Source: Scopus, 2026

Literatures with the highest citations contributing to the advancement of BI literature are shown in Table 1. As can be observed from the table, the literature list is composed of both foundational literature and inter-disciplinary literature, given the level of integration between BI and other fields, including but not limited to artificial intelligence, machine learning, big data analytics, and decision science. For example, one of the top papers in this context has been conducted by Karaboga and Basturk (2007) in relation to the optimization algorithm and shows that computational intelligence is an essential element of the data process. Chen et al. (2012) contribute to the field by establishing the link between analytics and big data and its impact on organizations. Furthermore, more recent contributions by Dwivedi et al. (2021, 2023) have contributed to the advancement of the field through their contribution towards artificial intelligence, generative AI, and future research directions and policy issues.

### 3.3 Keyword Co-Occurrence Analysis

The keyword co-occurrence approach is applied to examine the conceptual framework and development of themes within Business Intelligence literature. In this process, connections between commonly used keywords are discovered, allowing one to understand the key areas of research and upcoming areas. Through the use of visualization techniques, this approach provides an insight into the evolution of the subject matter of BI research.

#### 1. Network Visualization

The keyword co-occurrence network visualization presents the conceptual structure of Business Intelligence research by mapping the relationships among frequently used keywords in the literature. Each node represents a keyword, while the links indicate how often these terms appear together in publications. This visualization helps identify major research themes, emerging topics, and the intellectual organization of the field over time.



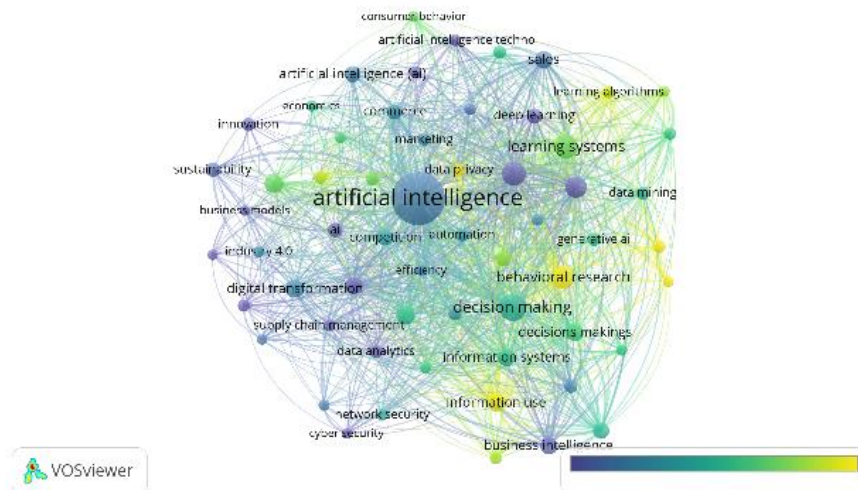


Figure 5. Overlay Visualization

Source: Data Analysis

As can be seen from the figure above, the topic of Artificial Intelligence is still the major one, situated centrally and linked directly to many other terms. The color of this term belonging to the mid- to recent period supports the idea that this area of study is still under active investigation and is quite relevant nowadays. Other close terms like learning systems, data mining, and decision-making are also situated centrally, which demonstrates their relevance as key elements of Business Intelligence.

The tendency towards more recent subject matters can be seen from keywords in lighter shades of yellow and green like learning algorithms, behavioral studies, and consumer behavior. It demonstrates that the field of BI is increasingly becoming interested in the integration of technology with human factors. It implies that advances in the field of BI are not just technical anymore but are now also concerned with behavioral aspects.

Alternatively, the darker blue-colored keywords like “information systems,” “digital transformation,” and “supply chain management” have been areas of focus for earlier literature in the development of this discipline. Even though these are relevant to the present study, their coloring denotes their having received more attention in previous research.

### 3. Density Visualization

Density mapping of the keywords co-occurrence shows the overall picture of the concentration and level of research topics discussed in the Business Intelligence field. On the map, the areas having high density (warm color, e.g., yellow) show that those topics have been studied more often and intensively. However, areas colored in cool colors (green/blue) denote that those topics have not received enough attention.

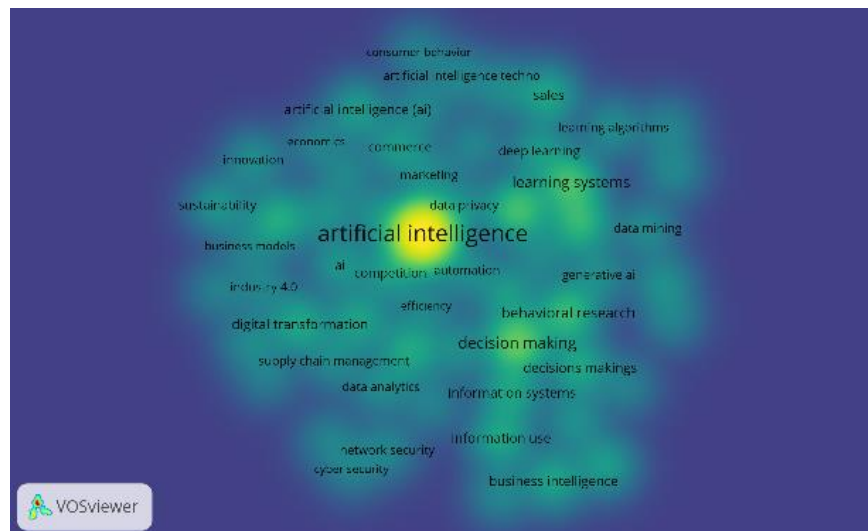


Figure 6. Density Visualization

Source: Data Analysis

It is evident from the figure above that the keyword 'artificial intelligence' is by far the most dominant and clustered keyword among all, represented by the bright yellow area at the center of the map. It can be seen that AI is the area of study which is most researched upon and talked about in the Business Intelligence literature. Some other closely related keywords that have considerable density around the dominant AI keyword include 'learning system,' 'decision making,' 'data mining,' and 'behavioral research.' On the other hand, keywords found in the peripheral parts of the map like "cyber security," "network security," "sustainability," and "supply chain management" are shaded in colder colors because they are less researched than the central nodes. They might be considered either highly specialized fields or newly developing disciplines that do not have the same prominence as the main themes. However, their inclusion demonstrates the broadening of research areas covered by Business Intelligence studies.

### Discussion

The results obtained through this bibliometric analysis show that the area of Business Intelligence (BI) studies has developed into an extremely multi-disciplinary and rapidly growing research domain, highly associated with developments

in digital technologies. It can be seen from the continuous increase in the number of publications, especially during the years following the mid-2010s, that BI has become highly relevant in both theoretical and practical research areas. This development corresponds to the worldwide movement towards using advanced information and analytical techniques in order to support decision-making processes, helping businesses gain competitive advantage through data processing and analysis.

Analysis on co-authorship shows that co-operation in the field of business intelligence research revolves around certain networks of collaborators. Even if there are connections between researchers in different countries and institutions, there is some form of network fragmentation implying that scientific research tends to happen among some particular groups or even areas. On the other hand, the involvement of connecting agents shows that it is possible to develop more integrated networks of collaboration. This kind of a pattern of research collaboration is consistent with the process of scientific cooperation at large.

From a literature review perspective, this field can be said to revolve around a collection of groundbreaking works which belong to many different disciplines, such as computer science, management, and decision sciences. The significance of publications

dealing with topics like artificial intelligence, machine learning, and big data analysis stresses the technological basis of business intelligence, while those focusing on decision-making and digital transformation underscore the managerial and strategic aspects. Recent research on generative AI and new technologies indicates that this discipline keeps up with new trends and embraces innovations.

The keyword co-occurrences and overlay analysis offer further information regarding the development of ideas in BI research. The centrality of artificial intelligence suggests that it is becoming the major engine of innovation, bringing together many other concepts such as learning algorithms, data mining, and decision-making. On the other hand, the appearance of new topics such as behavioral research, consumer behavior, and generative AI shows a turn towards human-centered research in BI studies. In addition, it also points to the fact that BI is being applied in areas other than just data processing to understand complicated human behaviors.

This paper demonstrates the importance of understanding the fact that the current state of Business Intelligence research is changing dramatically, with a combination of various innovations being introduced into the process. Even though much has been achieved, there are possibilities for

cooperation between regions, and for investigating issues like sustainability, cybersecurity, and ethics of the usage of artificial intelligence. Future work should concentrate on building stronger global research networks, considering social impacts of BI solutions, and adopting a more integrated approach towards studying business intelligence technologies.

#### 4. CONCLUSION

This bibliometric analysis proves that Business Intelligence studies have significantly changed and developed between 2010 and 2026 due to the emergence of new trends in this field and its evolution into an interdisciplinary discipline influenced by artificial intelligence, big data, and analytics. This paper shows the importance of major authors, organizations, and countries in forming this field of studies while at the same time indicating that collaborations exist yet require further improvement. Moreover, conceptual developments show that modern Business Intelligence studies have become more focused on intelligent, predictive, and behavioral aspects. Though being relatively mature, this sphere of knowledge has potential for further development through expanding international cooperation and exploring new themes.

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