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BIBLIOMETRIC ANALYSIS OF SCIENTIFIC RESEARCH IN THE FIELD OF ARCHITECTURAL HERITAGE AND TOURISM

БИБЛИОМЕТРИЧЕСКИЙ АНАЛИЗ НАУЧНЫХ ИССЛЕДОВАНИЙ В ОБЛАСТИ АРХИТЕКТУРНОГО НАСЛЕДИЯ И ТУРИЗМА

ME'MORIY MEROS VA TURIZM SOHASIDAGI ILMIY TADQIQOTLARNING BIBLIOMETRIK TAHLILI



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Abstract. This study presents a bibliometric analysis of 506 scientific documents related to architectural heritage and tourism, based on the SCOPUS database and VOSviewer visualization. The results show that scientific interest in the topic has significantly grown over the past five years, with Italy, Portugal, Spain, and China emerging as the main centers of collaboration. Keyword analysis highlights «architectural heritage», «tourism» and «sustainable development» as core concepts. A notable shift from socio-cultural studies (2014-2017) to research involving digital technologies, GIS, and sustainability (2018-2022) is identified. The findings emphasize the integration of technological, environmental, and managerial approaches in contemporary research, pointing to digital preservation and sustainable management as key future directions.

Keywords: architectural heritage, tourism, sustainable development, bibliometric analysis, SCOPUS, VOSviewer.

Аннотация. В данном исследовании представлен библиометрический анализ 506 научных документов по теме архитектурного наследия и туризма на основе данных базы SCOPUS и визуализации VOSviewer. Результаты показывают, что за последние пять лет научный интерес к теме значительно возрос, а Италия, Португалия, Испания и Китай стали основными центрами научного сотрудничества. Анализ ключевых слов выделяет «архитектурное наследие», «туризм» и «устойчивое развитие» в качестве основных концептуальных направлений. Зафиксирован переход от социально-культурных исследований 2014-2017 годов к исследованиям, основанным на цифровых технологиях, ГИС и принципах устойчивости в 2018-2022 годах. Результаты

подчеркивают интеграцию технологических, экологических и управленческих подходов в современных исследованиях и определяют цифровое сохранение и устойчивое управление наследием как ключевые направления будущих исследований.

Ключевые слова: архитектурное наследие, туризм, устойчивое развитие, библиометрический анализ, SCOPUS, VOSviewer.

Annotatsiya. Ushbu tadqiqot SCOPUS ma'lumotlar bazasi va VOSviewer vizualizatsiyasi asosida me'moriy meros va turizm sohasiga oid 506 ta ilmiy hujjatning bibliometrik tahlilini taqdim etadi. Natijalar so'nggi besh yil ichida ushbu mavzuga bo'lgan ilmiy qiziqish sezilarli darajada oshganini, Italiya, Portugaliya, Ispaniya va Xitoy esa asosiy ilmiy hamkorlik markazlari sifatida ajralib chiqqanini ko'rsatdi. Kalit so'zlar tahlili "me'moriy meros", "turizm" va "barqaror rivojlanish" tushunchalarini markaziy kontseptlar sifatida ajratib ko'rsatadi. 2014-2017 yillardagi ijtimoiy-madaniy tadqiqotlardan 2018-2022 yillarda raqamli texnologiyalar, GIS va barqarorlik tamoyillariga asoslangan tadqiqotlar tomon siljish aniqlangan. Natijalar zamonaviy tadqiqotlarda texnologik, ekologik va boshqaruv yondashuvlarining integratsiyalashganligini ta'kidlaydi hamda meros obyektlarini raqamli saqlash hamda barqaror boshqarishni kelajakdagi asosiy yo'nalishlar sifatida belgilaydi.

Kalit so'zlar: me'moriy meros, turizm, barqaror rivojlanish, bibliometrik tahlil, SCOPUS, VOSviewer.

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Introduction. Architectural heritage constitutes an essential part of human civilization, and its preservation and development through tourism have become some of the most pressing issues of our time [12, 13]. The sustainable use of architectural heritage sites in tourism worldwide is significant not only for economic and cultural development but also for ensuring social stability within societies. According to research, the global cultural heritage tourism market reached a value of USD 604.38 billion in 2024, and this figure is expected to grow to USD 778.07 billion by 2030 [6]. Consequently, scientific studies are increasingly exploring the relationship between architectural heritage and tourism, the impact of tourism on heritage sites, and issues related to their preservation and management [20].

Nowadays, various approaches are emerging to safeguard cultural heritage sites and ensure their economic sustainability through tourism. Internationally, normative documents adopted by organizations such as UNESCO, ICOMOS, and others provide a critical legal foundation for heritage conservation [9]. At the same time, as tourism continues to develop, new challenges such as the overexploitation of heritage sites, the influx of tourists, and environmental and social pressures are also arising [2].

In recent years, the sustainable use of architectural heritage sites in tourism has been widely studied across various scientific sources. It is of great importance to comprehensively analyze this process, identify research directions, and highlight existing scientific gaps [3, 5]. Therefore, within the scope of this study, the aim is to

determine the development dynamics and contemporary trends in the relationship between architectural heritage and tourism based on a bibliometric analysis of scientific literature.

The use of international scientific databases is considered crucial for conducting research and systematically studying existing knowledge. Through these databases, researchers can find scientific articles, assess their quality and relevance, and collect data for analytical developments [4]. There are several major international databases that cover scientific articles. Each of them possesses unique capabilities and indexes scientific research across various fields (Table 1).

Table 1

Main scientific databases

Scientific Database	Description
SCOPUS	One of the largest databases managed by Elsevier, encompassing the indexing of the world's leading scientific articles.
Web of Science (WoS)	A prestigious database operated by Clarivate Analytics, recognized for its high-quality scientific research indexing.
Google Scholar	A freely accessible search engine for scholarly articles, covering scientific papers, conference proceedings, and dissertations.
ScienceDirect	A scientific article platform operated by Elsevier, including numerous high-impact journals.
IEEE Xplore	Provides access to scientific articles and conference proceedings in the fields of technology, engineering, and IT.
SpringerLink and Wiley Online Library	Serve as significant sources for academic research, archiving scientific articles related to natural and social sciences.

Source: author work based on the data

Among these scientific databases, SCOPUS is considered one of the largest and most comprehensive scientific platforms. Today, SCOPUS stands as a leading database encompassing scientific research conducted in the fields of social and natural sciences, technology, engineering, medicine, arts, and culture [1]. Scientific articles published in SCOPUS meet high-quality standards and include numerous internationally indexed journals. This platform covers more than 24,000 scientific journals from over 194 countries and thousands of scientific institutions and publishers, providing researchers with access to the latest developments across various fields of science [19]. By utilizing the SCOPUS database, it is possible to systematically study scientific research on the sustainable use of architectural heritage sites in tourism, identify existing scientific gaps, and determine relevant research directions. In this article, the current state and development trends of scientific research on architectural heritage and tourism have been analyzed using data from the SCOPUS database.

Methodology. The stages of conducting the research methodology are presented in Figure 1. The first stage of the research involved conducting a search in the SCOPUS database using topic-specific keywords and collecting the relevant documents. The search for articles was carried out using specifically selected

keywords, composed of the terms most closely related to the topic, combined with Boolean operators (AND, OR, NOT) in SCOPUS. As a result of this search, the most significant scientific articles relevant to the topic were identified.

At the next stage, the data on the scientific articles downloaded from the SCOPUS database were analyzed using the VOSviewer 1.6.20 application. This stage represents the final part of the research methodology, aimed at visual analysis of the relationships between scientific articles and the identification and conclusion of scientific trends [19]. VOSviewer is a specialized software used for bibliometric analysis and visualization, enabling the graphical representation of relationships between scientific publications, keywords, and citations [11]. VOSviewer version 1.6.20 is one of the latest stable versions of this software, offering extensive capabilities for clustering scientific data, creating network diagrams, and conducting scientific collaboration analyses.

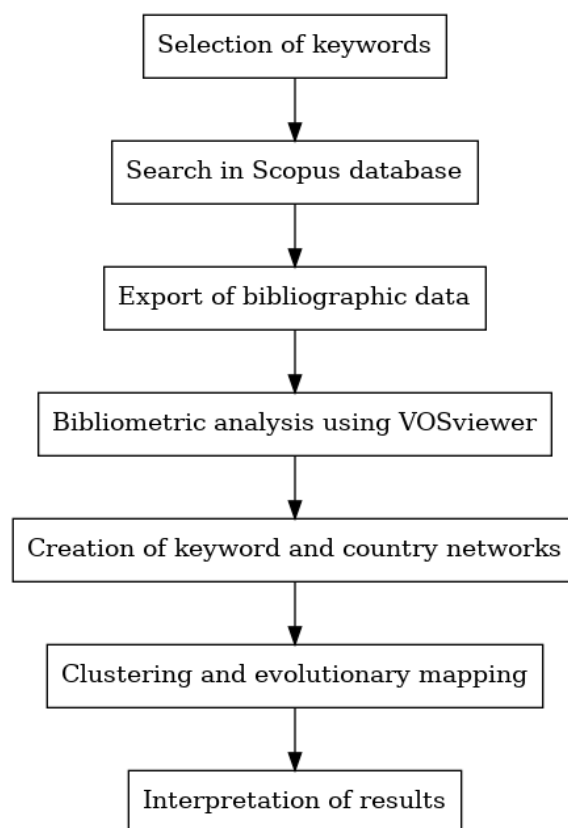


Fig. 1. Stages of the research methodology

Source: author work

Results and discussion. Several terms are used to express the concept of architectural heritage in English, among which «built heritage» and «architectural heritage» are the most common and widely accepted in academic literature. The choice of these terms is not arbitrary but rather related to their semantic scope, scientific application, and conceptual clarity.

The term «built heritage» refers to a collection of human-made material objects that hold historical, cultural, and aesthetic value [17]. This concept includes not only

individual buildings but also entire urban formations, infrastructure elements, industrial monuments, and other types of anthropogenic spaces. In academic literature, «built heritage» is often associated with urbanistic approaches, the preservation of historical urban environments, and engineering heritage. Additionally, it is frequently used in discussions on socio-economic sustainability, identity, and the integration of heritage within planning policies [7, 8, 18].

In contrast, «architectural heritage» more specifically refers to architectural monuments such as religious buildings, palaces, historic houses, towers, and caravanserais [14]. It relates to heritage objects evaluated through traditional architectural history, form, style, and aesthetic criteria [16]. The term «architectural heritage» is predominant in studies focused on conservation theory, restoration, reconstruction of architectural monuments, and their use in tourism [15].

It is important to emphasize that these terms complement each other, although they differ somewhat in meaning and scope. «Built heritage» encompasses a broad system related to space and environment, while «architectural heritage» represents a narrower but deeper category based on art and architecture, requiring detailed aesthetic analysis.

Therefore, both terms are used together in this study, as the complex nature of architectural heritage and its relationship with tourism involves not only individual structures (architectural heritage) but also their location, environmental context, and functional integration (built heritage). The selection of «built heritage» and «architectural heritage» as keywords in the SCOPUS database aims to capture these scientific and semantic distinctions, ensuring thematic precision, depth, and consistency.

For effective searching and result optimization, the keyword combination «built heritage» OR «architectural heritage» AND «tourism» was chosen.

In this study, formulating keywords in English is both a scientifically and practically justified necessity. This approach is essential for effective analysis of scientific articles in the SCOPUS database, aligning with the international scientific community, and improving the accuracy of bibliometric analysis results. First, SCOPUS is a major platform compiling international scientific articles, most of which are published in English, so selecting keywords in English allows for comprehensive coverage. Second, bibliometric analysis tools like VOSviewer are designed to work with English keywords, making their use crucial for research accuracy and consistency.

Statistical analysis of scientific documents. As a result of the keyword-based search, 506 documents were identified. These documents include various scientific publications and conference proceedings (Table 2).

The majority of these documents are scientific articles, totaling 306 documents (60.5%). This indicates that research on the topic is mainly published in the form of theoretical and applied articles. Conference papers also represent a significant portion, with 114 documents (22.5%), demonstrating active discussion at scientific meetings and conferences. Book chapters account for 50 documents (9.9%), reflecting detailed scientific developments on the subject.

Review articles (3.4%), books (1.4%), and conference reviews (1.4%) indicate comprehensive approaches and broader research efforts. Editorials, data papers, and errata are very rare, making up less than 1% of the total documents.

Table 2

Distribution of documents by type

Document type	Number	Percentage (%)
Article	306	60.5%
Conference Paper	114	22.5%
Book Chapter	50	9.9%
Review	17	3.4%
Book	7	1.4%
Conference Review	7	1.4%
Editorial	3	0.6%
Data Paper	1	0.2%
Erratum	1	0.2%

Source: author work based on the data

Overall, these results show that architectural heritage and tourism have become a strong focus of scientific interest in recent years, with research activities predominantly conducted through scientific articles and conference presentations (Figure 2).

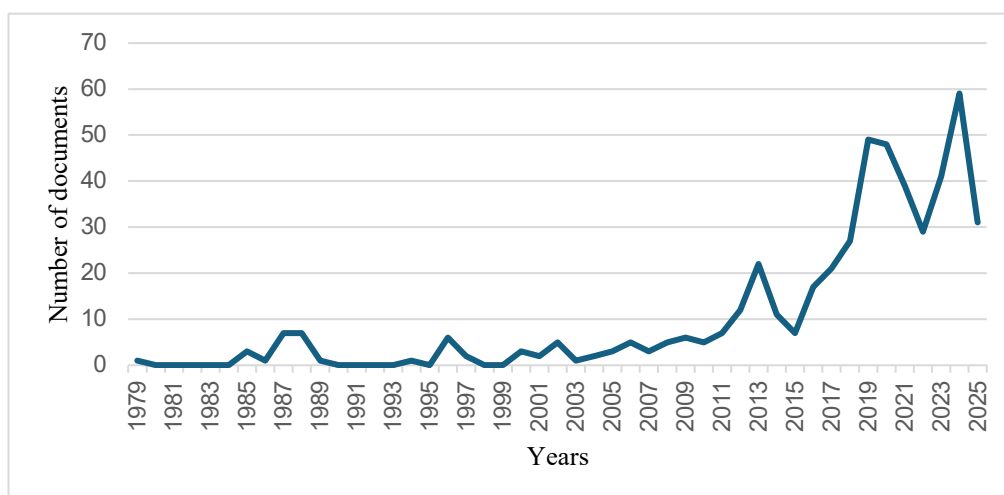


Fig. 2. Distribution of the number of documents by year

Source: author work based on the data

An analysis of the distribution of documents by year reveals a clear trend in the development of scientific research in the field of architectural heritage and tourism.

During the early years, particularly from 1979 to 2000, the number of published documents was very low, with only 1-2 documents per year at most, indicating limited scientific interest in the topic.

However, from the 2000s onwards, especially starting in the 2010s, there has been a significant increase in scientific activity related to this field. Between 2012 and 2015, the number of publications remained relatively stable but moderate, while from 2018 onward, a consistent upward trend in document numbers became evident.

The highest number of documents was recorded in 2022 and 2024, with 59 documents published in each year. In 2023, 41 documents were published, and preliminary data for 2025 already shows 31 documents, further confirming the growing importance of this topic in scientific circles.

These results demonstrate that over the past five years, the sustainable use of architectural heritage sites in tourism has become a key focus of scientific research. This trend reflects, on one hand, the global strengthening of the concept of sustainable development, and on the other hand, the increasing attention of the scientific community to the integration of cultural heritage with the tourism sector.

Bibliometric analysis by country (based on VOSviewer). In the VOSviewer software, bibliometric analysis by country was conducted using bibliographic data exported from the SCOPUS database. At the first stage, the mapping was performed based on the unit «country». Initial identification showed that at least one document related to the topic was present in a total of 88 countries.

At the next stage, thresholds were applied with the following criteria:

- countries with at least 5 documents;
- countries with at least 0 citations.

As a result, 34 countries meeting these criteria were selected for the final analysis.

This approach allows the identification of countries with consistent and significant scientific activity on the topic. The results of the analysis are clearly illustrated in Figure 3, generated by VOSviewer based on the co-authorship network among countries.

From Figure 3, it is evident that scientific research in the field of architectural heritage and tourism has established active collaboration networks worldwide. According to the analysis, Italy, Portugal, Spain, and China stand out as the main centers of collaboration. These countries demonstrate high numbers of scientific publications and strong co-authorship links, forming the core of the network. Italy shows the strongest scientific collaboration ties, particularly maintaining active exchanges with Portugal and Spain. Additionally, China has developed a robust scientific network both regionally and globally, with strong collaborative connections with Thailand and other Asian countries.

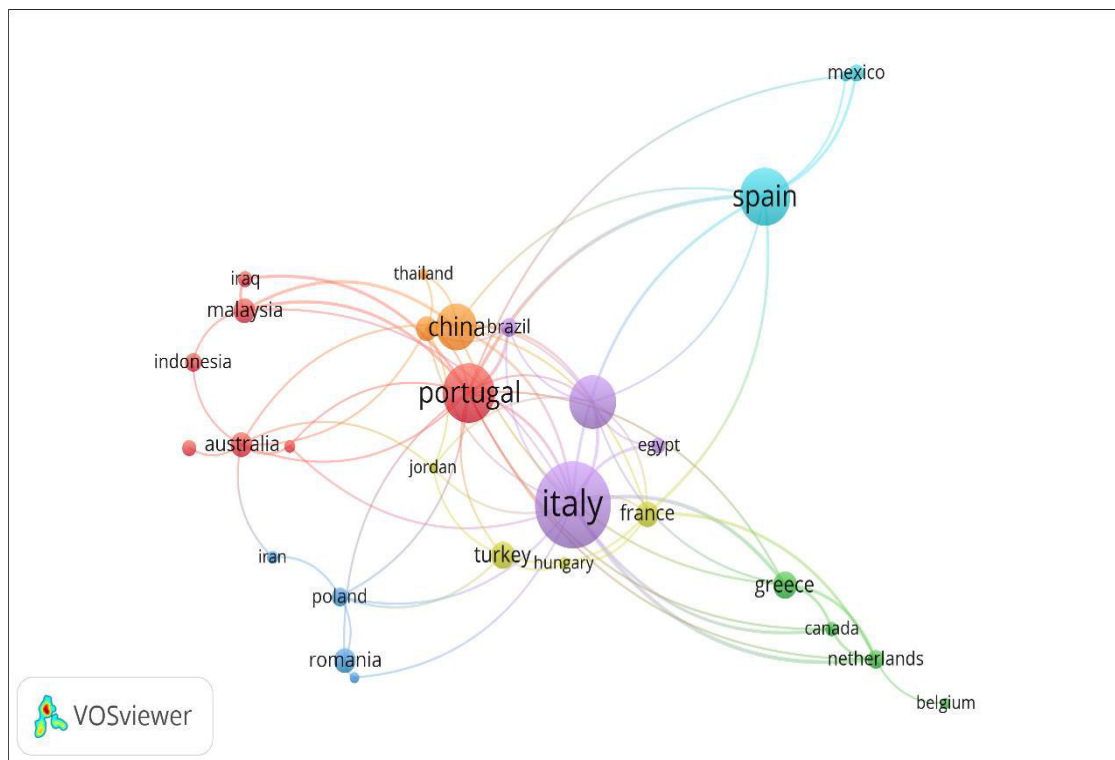


Fig. 3. Scientific Collaboration Network Between Countries on the Topic of Architectural Heritage and Tourism

Source: author work (Based on SCOPUS database, VOSviewer visualization)

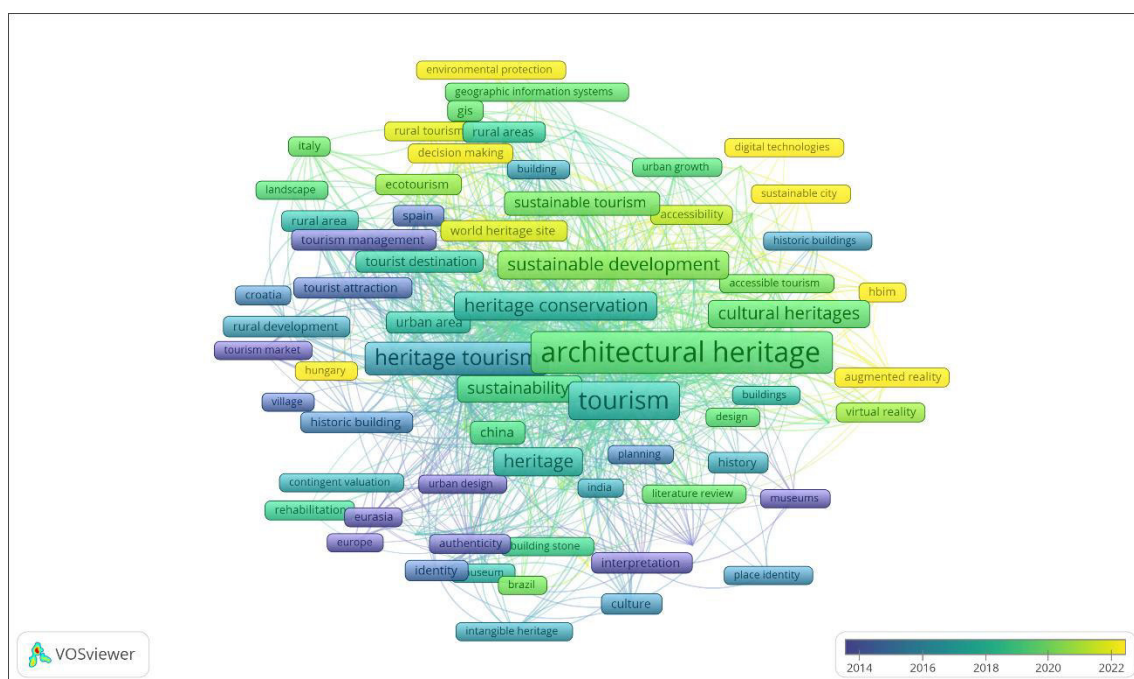
Analysis based on keywords. The keyword analysis was carried out using the VOSviewer software. At this stage, among the 2,445 keywords obtained from the SCOPUS database, those that appeared at least five times were selected. According to the selection criteria, a total of 109 keywords met this threshold and were chosen for further visual analysis. These keywords enable the identification of the most important scientific directions and conceptual foundations related to the topic.

The keyword network formed as a result of the analysis reflects the complex and multidisciplinary structure of scientific research related to the topic. The major nodes located at the center of the network, particularly «architectural heritage», «tourism», and «sustainable development», define the main conceptual pillars of the topic. The other keywords clustered around these terms demonstrate their broad scientific relevance and show that research directions within the topic are developing around these core concepts (Figure 4).

The colored clusters on the map represent groups of terms that are semantically related. The red cluster includes concepts such as «architectural heritage», «cultural heritages», «digital technologies», «sustainable city», «HBIM», and «virtual reality», representing heritage research integrated with modern technologies. The terms presented in this cluster indicate that research related to the preservation, representation, and presentation of architectural monuments and cultural assets through digital tools is actively developing.

integration within the topic: technological approaches are intertwined with social values, regional management is linked with environmental issues, and tourism is closely connected with identity and cultural interpretations. Thus, through the keyword network, it is possible to understand the complexity, broad scope, and methodological diversity of scientific research related to the topic.

Evolution of Keywords: Dynamic Analysis by Year. When keywords are analyzed along a time axis, it becomes possible to determine how scientific directions have evolved and which topics have become more relevant in recent years. The presented map (Figure 5) is color-coded based on the average year of appearance for each keyword: dark purple and blue colors represent research from earlier periods, while yellow and light green colors indicate keywords that have become more frequent in recent years.

**Fig. 5. Temporal usage of keywords**

Source: author work (Based on SCOPUS database, VOSviewer visualization)

According to the analysis results, during the period from 2014 to 2017, research on the topic focused more on socio-cultural approaches, such as «identity», «intangible heritage», and «authenticity». In contrast, between 2018 and 2020, the main emphasis shifted to management, planning, and sustainability issues, represented by terms such as «heritage conservation», «sustainable tourism», «tourist destination» and «urban area».

Additionally, in 2021-2022, keywords such as «digital technologies», «virtual reality», «augmented reality», «GIS» and «accessibility» emerged as the newest areas on the map. This indicates that in recent years, the scientific community has placed strong emphasis on the role of digital technologies in the preservation and presentation of cultural heritage. Furthermore, concepts such as «environmental

protection», «sustainable city» and «decision making» suggest the emergence of new analytical approaches.

By analyzing this evolutionary dynamic, the historical stages, theoretical shifts, and methodological updates of the topic have been identified. The keywords and their temporal distribution serve as important sources for defining contemporary scientific directions and promising research topics. In particular, it is evident that studies based on digitization, digital visualization, and spatial analysis methods have become the leading direction of research in the subsequent stages.

Conclusion. The results of the bibliometric analysis clearly demonstrate the breadth, thematic complexity, and developmental dynamics of scientific research in the field of architectural heritage and tourism. The analysis of scientific collaboration between countries confirms that Italy, Portugal, Spain, and China occupy central positions, with research on the topic being conducted most intensively in European and Asian countries. The clusters within the co-authorship network also reveal the regional and global integration of the topic (Table 3).

Table 3

Main Scientific Findings Identified Through the Analysis

№	Research direction	Main conclusion	Specific scientific significance
1	Analysis of scientific collaboration	Italy, Portugal, Spain, and China occupy central positions	Concentration of topic-related scientific research in Europe and Asia
2	Thematic centers	«Architectural heritage», «Tourism», and «Sustainable development» are the main keywords	Defines the conceptual and methodological priorities of the topic
3	Thematic diversification	Various directions such as digital technologies, management, ecology, and cultural identity have emerged	Indicates the multidisciplinary and cross-sectoral nature of research
4	Evolutionary dynamics	In 2021-2022 and beyond, digital technologies and GIS fields became prominent topics	Methodological renewal of the topic through modern approaches
5	Scientific trend	Research is based on innovations and oriented towards sustainable development principles	Highlights the relevance of digital preservation of cultural heritage, ecological monitoring, and management

Source: author work

As a result of the keyword network analysis, it was revealed that the scientific landscape of the topic is divided into several main directions. The terms «architectural heritage», «tourism» and «sustainable development» occupy central positions, around which specialized areas such as tourism management, heritage conservation, the use of digital technologies, and cultural identity have formed. The semantic structure of the clusters shows that the topic is explored across various

aspects, including technological, environmental, managerial, and humanitarian approaches.

The evolutionary analysis of keywords over the years made it possible to determine how scientific interests in the topic have shifted over time. While earlier research primarily focused on cultural identity and social heritage, recent years have seen a predominance of approaches centered on digital technologies, spatial analysis tools, and ecological sustainability.

The analysis results indicate that scientific research in architectural heritage and tourism is increasingly developing based on multidisciplinary, innovative, and sustainable development principles. In particular, the introduction of digital technologies and GIS systems is creating new methodological opportunities in this field. Therefore, future research areas such as the digital preservation of heritage sites, their virtual presentation, ecological monitoring, and sustainable management will hold significant importance as relevant and promising topics for the scientific community.

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