Journal of Information and Knowledge Management (JIKM) Vol 2 Special Issue (2023)

WOS (2013-2023) Knowledge Graphs Analysis of Literature on Intangible Cultural Heritage

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Received Date: 20 August 2023
Acceptance Date: 15 September 2023
Published Date: 1 November 2023

Abstract. The in-depth research on intangible cultural heritage, a large amount of research literature has emerged. In order to better reveal its research trends, this research paper maps and analyses the number of publications, authors, institutions, keyword clustering, and timeline of intangible cultural heritage literature in the Web of Science core collection from 2013 to 2023 by using Citespace, a software for knowledge graphs. The map visualises the frontiers of intangible cultural heritage research, major research fields, important literature, important scholars, and research hotspots. This study found that although there is cooperation between institutions and scholars, cooperation still needs to be strengthened. The scope of research is gradually becoming increasingly extensive and combined with emerging scientific and technological developments, which will be an important direction for future research. Under the expansion of technology, intangible cultural heritage will be affected by many factors, including impact, transformation, and how to apply it. This requires scholars to carefully explore. The exchange and collision between cultures, the re understanding of national consciousness and cultural identity by different countries, ethnic groups, and groups, as well as the integration, development, and utilisation of cultural industries with other industries, and the continuous emergence of new problems are still ongoing and may never end. Scholars need to go a long way. This study analyses many notable achievements and hot areas, which are useful for future researchers to better grasp the trends in the field of intangible cultural heritage.
Keywords: Intangible cultural heritage; citespace; knowledge graphs; research rend, knowledge management.

1 Introduction

In recent years, knowledge graphs have gained rapid development with the synthesis of theories, visualisation of methods, and image depiction, and have jumped to become the research hotspot and the latest frontier of contemporary scientometrics and informetrics. It has the potential to offer robust technical assistance in uncovering the fundamental framework, historical progression, cutting-edge focal points, and comprehensive knowledge structure of the subject fields. With the development of intangible cultural heritage in the past decade, the number of related research studies has increased geometrically. Using the traditional way of combing through a large amount of literature, the workload is large and cannot intuitively show the research hotspots as well as the research trend. As a result, keen researchers have found a new research method: visual knowledge mapping, using the relevant software Citespace, VOSviewer, Bibexcel, Sci, Pajek, Netdraw, and so on (Shi & Liu, 2019). Knowledge mapping can turn complicated data and information into vivid graphs through visualisation technology, which can stimulate people's image thinking, make people find out the hidden rules from the massive data that seem to be disordered on the surface, and provide the basis for scientific discovery (Yurtsever et al, 2022). The complex literature in the field of intangible cultural heritage can be visualised through data mining, information processing, and graphic drawing, providing us with new research perspectives and research methods and revealing the dynamic development rules of intangible cultural heritage research, providing practical and effective reference value for intangible cultural heritage research.

2 Literature Review

2.1 CiteSpace

CiteSpace is a specialised software developed by Professor Chaomei Chen of Drexel University (USA), which analyses a collection of literature in a particular field in order to discover the characteristics of the academic evolution of that field. The software has been widely adopted in the field of scientometrics research worldwide. Compared with other similar software, knowledge graphs are intuitive, better visualised, and easy to interpret, making it convenient for researchers to achieve different analysis goals. Based on CiteSpace software, this study provides an overview of the current state of intangible cultural heritage research worldwide in terms of literature volume, institutions, core authors, keyword clustering, and timeline (Liao, Cun & Kim, 2023). The research aggregation points were revealed using keyword co-occurrence network mapping analysis; the research hot topics were obtained using cluster relationship analysis; and the research trends at different points in time were analysed using timeline analysis.

The overview, hotspots, and research trends in the field of intangible cultural heritage research are summarised through comprehensive analysis and speculation on the development direction and content of the field.

Figures are “float elements” which should be inserted after their first text reference and have specific styles for identification. Insert a figure and apply the “Image” paragraph style to it. For the figure caption, apply the style “FigureCaption.” To accommodate readers with color vision differences, figures should still be usable when printed in grayscale. Refer to elements of the figure with non-color terms, for example “indicated as squares” instead of “indicated in blue”.

2.2 Data sources and pre-processing

The data source of this paper is the Web of Science, and the core collection of WOS was selected while searching with "intangible cultural heritage" as the keyword. The time period was set as January 1, 2013, to September 9, 2023; the type of document was selected as an article; the language was selected as English for refinement; and finally, 1,697 documents were obtained. The 1697 documents were de-duplicated before the visual analysis was carried out. Since the article was selected at the beginning of the literature screening, the duplication rate of the literature was very low. Next, the data were imported into CiteSpace 6.2.4 for statistical analysis, and the relevant parameters of the software are shown in Table 1.

Table 1 Parameter settings

Parameter settings	Values
Time Slicing	2015-2023
Per Slice	1
Term Source	Title、Abstract、Author Keyword、Keyword Plus
Node Typese	Cited Reference；Cited Author；Cited Journal
Pruning	Minimum Spanning Tree
Other parameters	Defaults

In order to help understand the subsequent graph clustering results in the analysis of the relevant parameters, here are some of the main parameters of the concept of the introduction: (1) Frequency: the size of the node in the graph knowledge unit is directly proportional to its frequency, which indicates the number of current keywords; (2) Centrality: the connectivity of the graphical knowledge unit with other knowledge units, which represents its connectivity role in the network; it also indicates the importance of the current knowledge unit's transition role in the network connectivity and the structural position of the current node in the network graph; (3) Modularity: the graph clustering effect is represented by Modularity Q, which can measure the image clustering effect, and its value is located between 0.4 and 0.8, which is good.

3 Findings

3.1 Analysis of the number of literatures

The annual distribution of the number of publications about intangible cultural heritage from 2013 to 2023 is shown in Figure 1, in which 2023 is counted until September 9, which is incomplete. As can be seen from Figure 1, no relevant studies have appeared in 2013–2014, and relevant literature began to appear in 2015 and began to grow year by year from 2017, and the increase in the number of articles issued is in a wave-like progression, and the growth rate is relatively stable. There is a relatively large increase from 2017 to 2018 and from 2020 to 2021. The number of articles reached 368 in 2022, and 2023 may show a gradual slowdown.

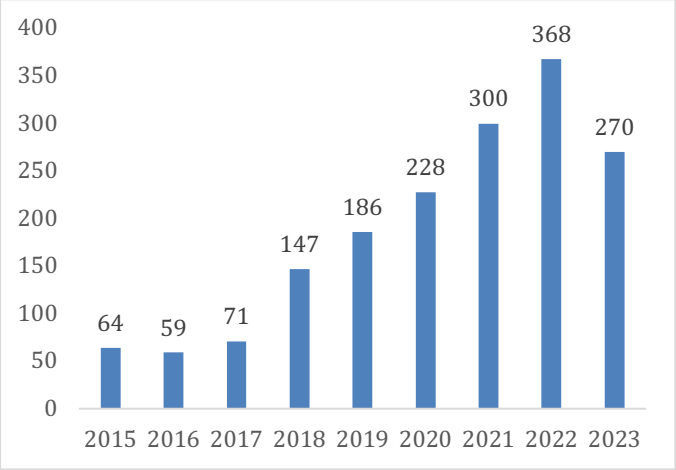

Figure 1: Annual distribution of the number of documents on the subject of intangible cultural heritage from 2015-2023

3.2 Analysis of issuing institutions

The literature was classified and counted according to the issuing institutions, and by selecting Node Labels as by citation and setting Threshold to 5, the cooperation graph of issuing institutions was obtained (Figure 2). According to the analysis of Figure 2 and Table 2, the academic institutions with the largest number of articles are the University of London (29 articles), the Polytechnic University of Milan (16 articles), the Chinese Academy of Sciences (13 articles), and so on, which are mainly distributed in the UK, Italy, and China. Overall, the number of nodes in Figure 2 is large and mostly dispersed, with fewer connecting lines between institutions, and the issuing institutions are mostly team-based and self-studying, with weak collaborative relationships with other research institutions. However, there are individual institutions with a high density of connectivity with other institutions, indicating more academic partnerships. The University of London also has more institutions with academic cooperation, with a total of seven, and has cooperation with universities in the US, Italy, and Germany. The University of California System has five publications, it has a relatively close collaboration with other institutions, such as the University of California Berkeley, University

of Wisconsin Madison, University of Wisconsin in System and so on. It also has a transnational collaboration with the Chinese Academy of Sciences.

Table 2 Top 14 Academic Institutions

No.	Institutions	Count	Centrality
1	University of London	29	0.01
2	Polytechnic University of Milan	16	0.00
3	Chinese Academy of Sciences	13	0.00
4	Jinan University	12	0.00
5	Consiglio Nazionale delle Ricerche (CNR)	12	0.00
6	Griffith University	12	0.00
7	University College London	12	0.00
8	Universidad de Cordoba	11	0.00
9	University of Sevilla	10	0.01
10	City University of Macau	10	0.00
11	Hong Kong Polytechnic University	10	0.00
12	University of Barcelona	9	0.01
13	Universidade de Lisboa	9	0.02
14	Zhejiang University	9	0.00

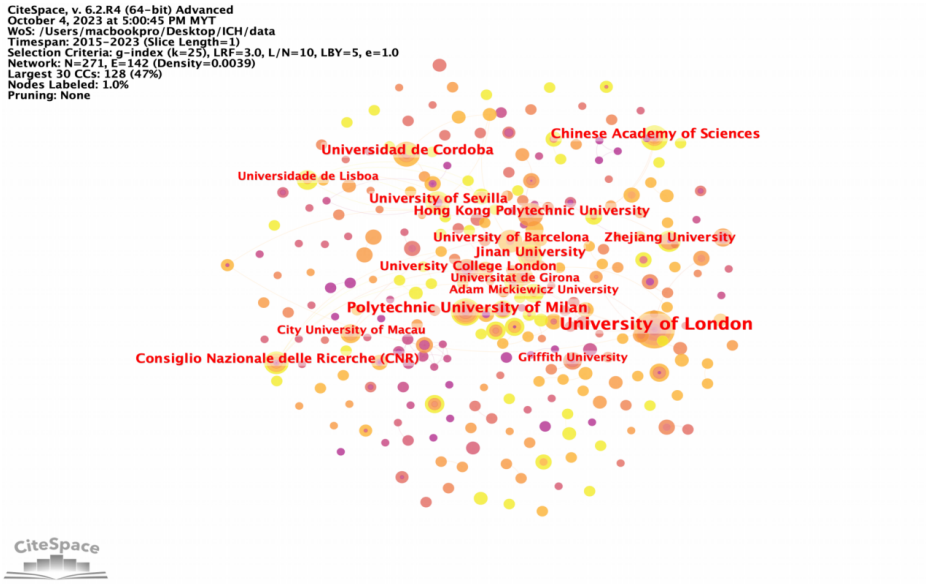

Figure 2: Collaborative graph of academic institutions

3.3 Analysis of core authors

CiteSpace was used to generate a graph of key author collaborations for analysing the scholarly contributions, academic status, and collaborations of different authors in

the field of intangible cultural heritage. By selecting Node Labels as by citation and setting Threshold to 3, the graphical representation of major author collaborations shown in Figure 3 was obtained. The node size of the authors with the largest number of publications in the figure is larger, and the academic cooperation relationship of each author is represented by a connecting line, and the stronger the relationship, the greater the width and density of the connecting line. As shown in Figure 3 and Table 3, the top 11 authors with the largest number of publications are Partarakis (9 articles), Zhang Mu (9 articles), Zabulis (8 articles), etc. in order. The data on the number of publications in Table 3 shows that a few authors have played a major role in driving academic research. The overall nodes in the atlas are scattered, indicating that there are many scholars in the field, but they do not form close collaborations and are mostly independent researchers. The authors with more publications in this graph form collaborative clusters. For example, Partarakis formed a closer collaborative network with Zabulis, Adami, Karuzaki, and six others; Luchoro-Parrilla formed a close collaborative network with Pic, Damian-Silva, and 10 others. The year of publication of the high-volume articles shows that they were all published after 2020, inclusive.

Table 3 2013-2023 top 11 authors of ICH publications

No.	Authors	Count
1	Partarakis, Nikolaos	9
2	Zhang, Mu	9
3	Zabulis, Xenophon	8
4	Wang, Hao	5
5	Adami, Ilia	5
6	Fan, Tao	5
7	Lavega-Burgues, Pere	5
8	Lopez-Guzman, Tomas	5
9	Karuzaki, Effie	5
10	Luchoro-Parrilla, Rafael	5
11	Pic, Miguel	5

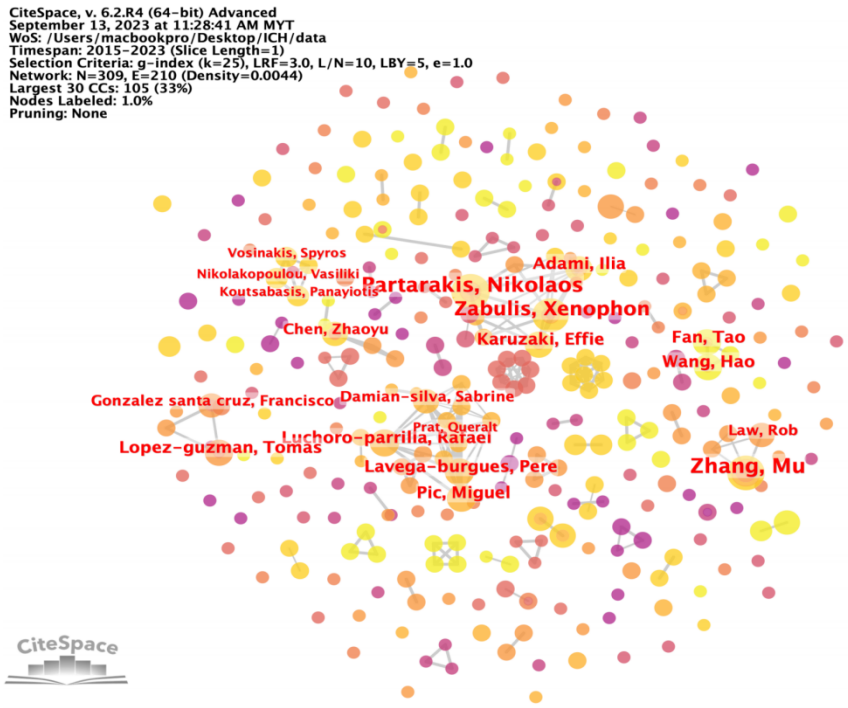

Figure 3: Collaborative graphical of key authors

3.4 Keyword co-occurrence network graphical analysis

The keywords are set as node types, then visualised and analysed. The keyword labels are set to By Freq, where Threshold is set to 20, and the keywords with frequency of occurrence below 20 are filtered out in the graph to get the keyword co-occurrence network graph in Figure 4. Research hotspots reflect the research focus and research direction of the research domain and are of great significance in analysing the research vein of the domain. Keywords, as the main characteristic words of the research hotspots in the literature, can effectively reveal the research gathering points in the domain of intangible cultural heritage research, which is conducive to the discovery of the research hotspots and changing trends in the domain. Keywords with large nodes such as intangible cultural heritage, cultural heritage, intangible heritage, tourism, authenticity, heritage, management, conversation, sustainable development, and world heritage appeared in Figure 4, indicating that these keywords appeared with the highest frequency in the 1697 documents. Due to the lack of uniform standards for keyword labelling, it is possible to see intangible cultural heritage, cultural heritage, intangible heritage, heritage, intangible cultural heritage (ich), etc. with similar meanings. The keywords appear to be scattered from the graph, and there is crossover between the keywords of related topics. In Figure 4, intangible cultural heritage has the highest frequency (403 times) and the strongest centrality (0.15). Since the frequency of keywords appearing

is all higher than 20, these keywords belong to the topics that are of more interest to scholars in the field.

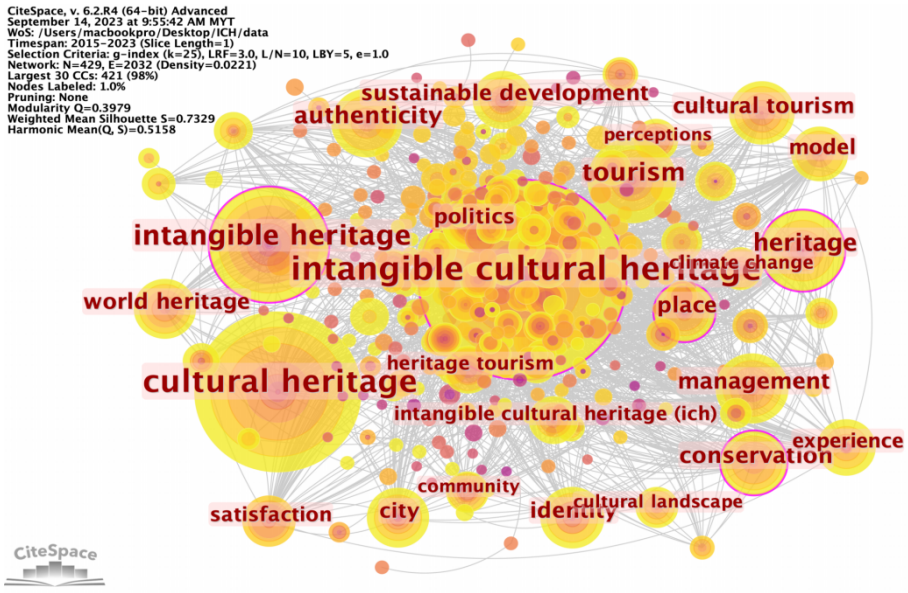

Figure 4: Keyword co-occurrence network graph

In order to more intuitively display and discover the changes of keywords and the research fields of intangible cultural heritage, the clustering method was set to the LLR algorithm (log-likelihood rate; the larger the LLR, the more representative the words are of the cluster) after the clustering by "Clustering" command. The maximum clustering value was set to 8, and the results of the cluster analysis were obtained (Figure 5). The eight main clusters were intangible cultural heritage, cultural heritage, sustainable development, climate change, heritage management, virtual reality, and management. management, virtual reality, sense of place, and sustainable tourism (Table 4). CiteSpace provides modularity (Q) and silhouette (S) metrics based on the clarity of network structure and clustering, which are used as a basis for judging the effectiveness of mapping. The Q value is generally in the interval [0, 1), and Q>0.3 means that the delineated association structure is significant; when the S value is 0.7, the clustering is efficient and convincing. According to the automatic clustering results, with reference to the keyword timeline graph clustering labels, the graph Modularity Q=0.3979, which is greater than 0.3, and Mean Silhouette=0.7329, which is greater than 0.7, which indicates that the structure of the clustering graph is significant, and the results are highly credible.

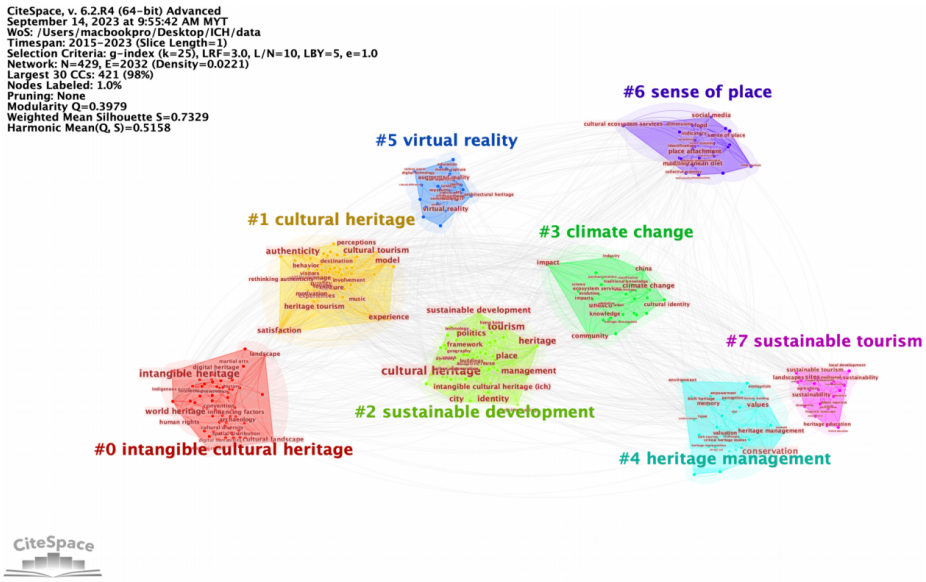

Figure 5: Knowledge graph for keyword clustering

Table 4 Key words co-occurrence network clustering of intangible cultural heritage

Cluster	Label	Size	Silhouette	Label (LLR)
0	intangible cultural heritage	74	0.661	intangible cultural heritage; public folklore; african american heritage; branding structure; periodic reports | intangible heritage; cultural heritage; cultural resources; amazonian kichwa nationality; thematic heritage space
1	cultural heritage	72	0.747	intangible cultural heritage; tourism experience; experience economy; behavior intention; path analysis | cultural tourism; flamenco art; flamenco tourism; lean canvas; lean startup
2	sustainable development	70	0.66	cultural heritage; coastal communities; deliberative governance; branding structure; tourism place | intangible cultural heritage; branding structure;

				tourism place; digital placemaking; cultural diversity
3	climate change	37	0.727	cultural heritage; marine protected areas; agricultural heritage; tieguanyin tea; agricultural landscape | climate change; climate resilience; territorial planning; education level; information fusion technology
4	heritage management	36	0.832	heritage management; community empowerment; ngorongoro conservation area; cultural tourism; sustainable conservation | intangible heritage; yuexiu hill; cultural services; information services; historic urban landscape
5	virtual reality	31	0.808	intangible cultural heritage; 3d technologies; literature analysis; knowledge base; 3d representation | virtual reality; cultural heritage; 3d replicas; critical design; historical thinking
6	sense of place	28	0.828	cultural ecosystem services; urban green space; nonmaterial benefits; social capital; community development | place attachment; place dependence; place identity; sea level rise; adaptation planning
7	sustainable tourism	21	0.837	intangible cultural heritage; yellow river basin; tourism utilization potential; spatial-temporal distribution; experience quality | sustainable tourism; intangible heritage; research trend; experience quality; multifunctional agrarian systems

Based on the connotation of basic concepts of intangible cultural heritage, research methodology, the expansion of the research field, and the analysis of the characteristics of the main body of the development trend, the eight clusters are grouped into six major categories of clusters. Category 1 consists of cluster #0 and cluster #1. Cluster #0 has the tag word intangible cultural heritage with a cluster size of 74 and a silhouette value of 0.661, where intangible cultural heritage, public folklore, African American heritage,

branding structure, periodic reports | intangible heritage, cultural heritage, cultural resources, Amazonian Kichwa nationality, and thematic heritage space appear with high frequency and are key hot words and research hot spots in the domain of intangible cultural heritage. The tag word for cluster #1 is cultural heritage, with a cluster size of 72 and a silhouette value of 0.747, and the main key hot words are intangible cultural heritage, tourism experience, experience economy, behaviour intention, path analysis | cultural tourism, flamenco art, flamenco tourism, lean canvas, and lean startup. These two clusters cover the basic connotations of intangible cultural heritage.

The main keywords of public folklore, cultural heritage, cultural resources, cultural tourism, tourism experience, and experience economy, as well as exclusive intangible cultural heritage keywords such as African American heritage, Amazonian Kichwa Nation, and flamenco, form the research network of this category. Cultural inheritance has become an important topic nowadays. With the economy as the leading force of social transformation, what role will culture play and what role will cultural inheritance play, has become a hot topic of concern in the academic field. In the conflict and collision between traditional culture and the development of modern society and the integration and reconstruction of national culture and world culture, the intangible cultural heritage, as a collection of traditional culture and national culture, rebuilds its protection and inheritance system, which deserves our deep thoughts (Zhang et al, 2022; Baron, 2016). The importance attached by modern society to the transmission of intangible cultural heritage, and in particular the endangered situation of "cultural diversity", is currently being emphasised (Chen et al., 2021). The main issues in the transmission of intangible cultural heritage are: the main body of transmission, rights, safeguards, objects, systems, scope, and methods. When scholars face these problems, they need to take scientific development as the guiding principle, examine the problems from a cultural strategic perspective, and analyse the problems from a global, macroscopic, historical, and human cultural development perspective.

1) Category 2 consists of cluster #2 and cluster #7. Cluster #2 is labelled sustainable development, with a cluster size of 70 and a silhouette value of 0.66, and the main key hotspot words are cultural heritage, coastal communities, deliberative governance, branding structure, tourism place | intangible cultural heritage, branding structure, tourism place, digital placemaking, and cultural diversity. The tag word for cluster #7 is sustainable tourism, with a cluster size of 21 and a silhouette value of 0.837, and the main key hotspot words are intangible cultural heritage, yellow river basin, and tourism utilisation potential, spatial-temporal distribution, experience quality | sustainable tourism, intangible heritage, research trend, experience quality, and multifunctional agrarian systems. These two clusters focus on the long-term development of intangible cultural heritage and tourism development from a sustainable perspective. Globalisation and the accelerated pace of modernisation have destroyed the cultural ecology of humanity's own existence, leading to the disappearance of its cultural diversity and a cultural crisis for humanity. The sustainable development of the "intangible cultural heritage" is mainly the result of the application for the inscription of representative works of the intangible cultural heritage, and it is important to reflect on how to achieve long-term development in the face of this situation (Dastgerdi & De Luca, 2018). In order to avoid this kind of thing, scholars, together with the uniqueness, ethnicity, regionality,

and diversity of "intangible cultural heritage", make it necessary to take into account the protection of "intangible cultural heritage" to achieve sustainable development on the basis of maintaining its authenticity and integrity (kim et al., 2021). This process provides us with a critical picture for understanding the diversity of human cultures and the sustainable development of societies. With the booming development of tourism, the unique cultural and artistic value of intangible cultural heritage is an important carrier for tourists to view and experience different cultures and an important way for tourists to obtain cultural identity and cognition, which has gradually become an important resource for tourism development (Zhang, 2020). At the same time, tourism development is an innovative means of safeguarding, transmitting, and adding value to intangible cultural heritage. Tourism development of intangible cultural heritage, the effective protection and transmission of heritage resources, and the sustainable development of heritage tourism are equally important. However, if economic benefits are pursued excessively in the process of tourism development, negative impacts will occur. The safeguarding of the intangible cultural heritage aims, on the one hand, to preserve traditional culture and, on the other hand, to promote its proper use to realise the immense economic and social value embedded in it (Zhang, 2020).

1) Category 3 includes cluster #3. Cluster #3 has the tag word climate change, a cluster size of 37, a silhouette value of 0.727, and the main key hotspot words are cultural heritage, marine protected areas, agricultural heritage, Tieguanyin tea, agricultural landscape | climate change, climate resilience, territorial planning, education level, information fusion technology. This category encompasses intangible cultural heritage with different characteristics and in different regions as a result of climate change, and the fact that changes in weather patterns can lead to destabilisation of social and environmental conditions, thus affecting cultural diversity and socio-cultural interactions (Dastgerdi et al., 2019). Marine Protected Areas (MPAs) are hotter in this cluster because they have become one of the main legislative initiatives for the protection of the marine environment and are recognised as a holistic management mechanism to combat climate change, and some consider them to be a driver for sustainable community development (Breen et al., 2021). Therefore, while these areas are primarily used for the protection of the natural environment, it is also necessary to include cultural heritage in this protection. Tourism in agricultural heritage systems has achieved significant growth over the past decade or so and is expected to continue to grow in the future. Based on environmental and cultural objectives, with political and social support, and by achieving the core objectives of economic development, tourism in agricultural heritage systems will be sustainable and agricultural heritage systems will be well preserved (Sisto& Cresta, 2023; Tian et al., 2016).

2) Category 4 includes cluster #4. The tag word for cluster #4 is heritage management, with a cluster size of 36 and a silhouette value of 0.832. The main key hotspot words are heritage management, community empowerment, Ngorongoro conservation area, cultural tourism, sustainable conservation | intangible heritage, Yuexiu hill, cultural services, information services, and historic urban landscape. This category includes approaches to heritage management through community empowerment, information services, cultural services, etc., but also sees keywords such as cultural tourism, historic urban landscapes, etc. combined with tourism. The integration of cultural resources with tourism not only provides opportunities for their restoration, conservation,

and transmission but also opens up more possibilities for the development of intangible cultural heritage when economic activity is stimulated in the area where it is located (Ramírez-Guerrero, 2021). Cultural heritage management is undergoing a change, with the focus shifting from the management of tangible or intangible cultural heritage to the cultural meanings they convey, such as the tangible or intangible values and attributes that drive them (Muchenje, Mtengwa & Kabote, 2023). Cultural heritage managers need to ensure the management techniques and methods that they follow are adequate or can be brought up to date so that cultural heritage can be preserved correctly and completely.

3) Category 5 includes cluster #5. Cluster #5 has the tag word virtual reality, a cluster size of 31, a silhouette value of 0.808, and the main key hotspot words are intangible cultural heritage, 3D technologies, literature analysis, knowledge base, 3D representation | virtual reality, cultural heritage, 3D replicas, critical design, and historical thinking. In the 21st century, with the rapid development of visual reality technology and the continuous improvement of software development systems, these emerging technologies have gradually been applied to various subject areas, including cultural heritage. Several studies have shown that the use of integrated media can enhance people's experience of culture (Seyfi, 2022). It has been an inevitable trend to adopt emerging multimedia to disseminate and pass on cultural heritage. In this cluster, it covers the combined application of 3D technology, VR technology, and AR technology with cultural heritage, which is mainly embodied in the way and method of combination, expression form, creative thinking, design method, and so on. These technologies enable user-centred presentations that make cultural heritage digitally accessible to a wider range of people (Bekele, 2018), as well as technologies that allow humans to establish a close connection with the past through cultural heritage (Hein, 2023). In the future, with the development of emerging technologies and their widespread use in cultural heritage, the way the process is applied, the problems encountered, and the solutions will be explored.

4) Category 6 includes cluster #6. The tag word for cluster #6 is sense of place, with a cluster size of 28 and a silhouette value of 0.828. The main key hotspot words are cultural ecosystem services, urban green space, nonmaterial benefits, social capital, community development | place attachment, place dependence, place identity, sea level rise, and adaptation planning. Sense of place is always associated with place attachment, place dependence, and place identity (Tan et al., 2018), and is expressed in the way people and groups are connected to a place, and the nature of the psychological interactions that occur between the environment and the individual, among other things. Differences between locations are magnified over time, resulting in a historical memory unique to a piece of land. Tangible heritage, such as historic buildings, archaeological sites, and monuments, as well as intangible heritage, are legacies left behind by history that not only give residents a sense of place, identity, and aesthetic well-being (Sesana, 2021), but at the same time, people can experience special or unique characteristics of a place by means of interconnected internet images, especially tourist experiences (Gillespie et al, 2022). However, while the development of local heritage tourism has brought economic gains, it has also had some impact on the cultural heritage of these places. The upscale nature of tourism has forced residents of heritage cities to leave, while the standardisation of some tourism products has started to homogenise these cities around the world (Tan et al., 2018). Our future places need culture and nature to

be perfectly intertwined so that there is room for and abundance of both, and this will be a focus for researchers to explore.

3.6 Analysis of research trends

Keyword timeline graphs are used to reflect the main research content of a research topic over time and the research trends within a certain time period. There is a close correlation between the keyword timeline graph and the keyword cluster graph. The keyword timeline graph label names are the main keyword cluster names, and the keyword sequences are displayed in chronological order on the timeline to the left of each label name. Through Timeline View, keyword timeline graphs were generated by 1-year time segments. Labels with frequency as the option of keyword appearance, set threshold to 8, that is, keywords with frequency lower than 8 do not appear in the graph, and finally obtained an intangible cultural heritage timeline view (Figure 6). The eight previously generated clusters in Figure 6 appear on the right side of the timeline in vertical order according to serial number, and horizontally the clusters contain keywords arranged according to time, which are the hot keywords in the keyword clusters of Figure 5. The figure shows the different research focuses on different periods, and according to the keyword evolution, the research on intangible cultural heritage is divided into two main phases, 2015–2020 and 2020–2023. The studies of hot keywords in clusters #0, #1, #2, #3, #4, and #7 appeared earlier, especially the keywords of intangible heritage, cultural heritage, and tourism, which are more central, in 2015. And there are various periods of time when there is continuous and intensive research on hot keywords. Due to the development of emerging technologies in recent years, which have become popular in various disciplines, the keywords in Cluster #5 and Cluster #6 appeared later, and the keywords appeared more loosely in the time nodes and did not form nodes with strong correlation and centrality.

2015-2020: As shown in Figure 6, keywords that reflect larger nodes, a higher frequency of appearance, and a stronger correlation with other nodes appear in earlier periods of this phase. Looking at the history of appearance for intangible heritage, the keyword appears consistently between 2015 and 2023, with a frequency of 12 occurrences in 2015 and a maximum frequency of 25 occurrences in 2021. Looking at the history of appearance for cultural heritage reveals that the keyword shows a year-on-year increase in frequency from 2015 to 2023, with 5 occurrences in 2015 and reaching a maximum frequency of 57 in 2021. This indicates that the keywords with larger nodes appeared earlier and appeared every year. This indicates that these keywords have maintained a certain level of popularity since their appearance. In addition, the research in this period mainly focuses on the general direction of world heritage, cultural tourism, heritage tourism, etc., exploring the model and identity of intangible cultural heritage, as well as its management, conservation, impact, climate change, etc. The overall scope is relatively large, and the interconnectivity is strong.

2020-2023: The research nodes appearing in this phase are relatively small, overall, more scattered, and not closely connected, indicating that the research hotspots in this phase have not yet formed a certain scale and that there is still room for research. However, combining with Figure 6 and Figure 1, 2021 and 2022 are the years with a higher number of articles in intangible cultural heritage, and the fields of management,

cultural tourism, place, model, conversation, climate change, values, etc., which have already appeared in the previous years, will gradually form a research scale in these two years. The hot words with high frequency in this stage in Figure 6 are architectural heritage, values, quality, influencing factors, mediterranean diet, sustainability, etc. In addition, at this stage, intangible cultural heritage research gradually favours new technologies and theories, such as digital heritage, deep learning, spatial distribution, sense of place, etc.

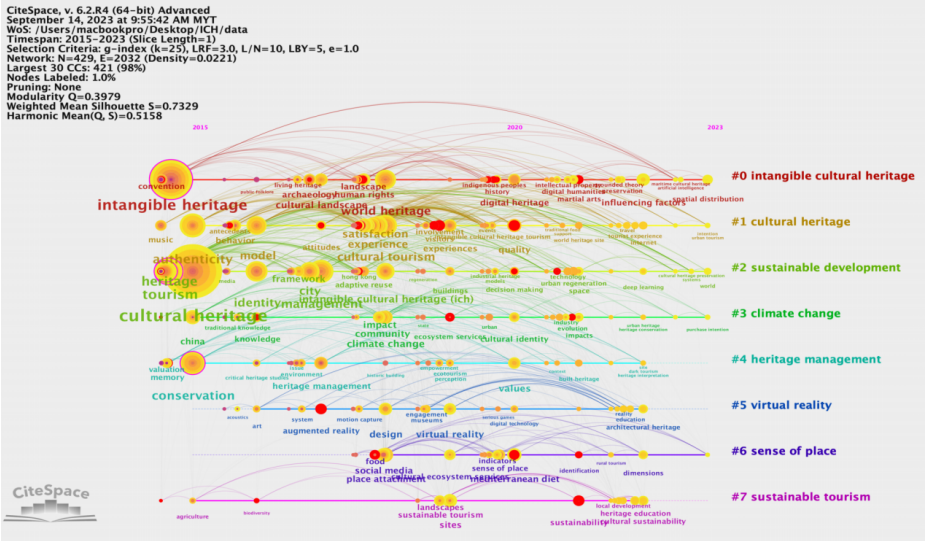

Figure 6: intangible cultural heritage timeline view

4 Conclusion

Using the WOS core collection of intangible cultural heritage literature for the period 2013–2023 as a sample, the knowledge graph tool was used to visualise the interactions between the knowledge units of the intangible cultural heritage disciplines through the use of visual graphs. In the face of globalisation, years of research by scholars in folklore, anthropology, culture, and sociology around the world have laid the theoretical foundations for the safeguarding of intangible cultural heritage today. Over the past decade or so, scholars have made continuous efforts to explore issues related to intangible cultural heritage, which have been permeated by multiple dialogues of conflict, debate, communication, reflection, negotiation, compromise, and inclusion. There is cooperation between institutions, as well as between scholars, but cooperation still needs to be strengthened. The scope of research is gradually becoming increasingly broad and combined with emerging scientific and technological developments, which will be an important direction for future research. Under the expansion of technology, there will be many impacts on intangible cultural heritage, including the impact,

transformation, and how to apply them. Intercultural exchanges and collisions, different countries, nationalities, and groups re-understanding national consciousness and cultural identity, along with the combination of cultural industries and other industries to develop and utilise, the successive emergence of new issues are still extending, perhaps never coming to an end. Scholars need to take a long way to go.

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