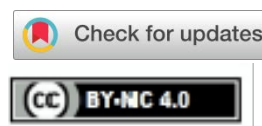


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Clustering of Regional Tourism Products Based on Bibliometric Analysis: The Case of Mangystau Region

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ABSTRACT

Despite the growing importance of interdisciplinary approaches in tourism studies, there remains a lack of structured analytical frameworks for clustering regional tourism products and aligning them with effective marketing tools. The present study aims to develop a theoretical and methodological model for clustering regional tourism products based on bibliometric analysis, followed by comparing clusters with effective marketing promotion tools. The method used is a systematic bibliometric analysis of 245 peer-reviewed publications from 2010 to 2023, selected from the Web of Science Core Collection database using the PRIS-MA protocol. The analysis was carried out using RStudio (Biblioshiny package) and VOSviewer, which allowed us to build maps of co-authorship, co-quoting and co-use of keywords. The results of the analysis revealed four thematic clusters: (1) sustainable development and innovation in tourism, (2) quality of service and tourist satisfaction, (3) cultural and event tourism, and (4) gastronomic tourism and territorial identity. Based on them, the Matrix Design model has been developed to ensure consistency between the types of travel products and specific promotion tools. As part of the empirical testing, a study of the Mangystau region of Kazakhstan was presented, confirming the model's applicability: problems of fragmented positioning of the region were identified, as well as solutions for digital segmentation, cluster management and strategic branding were proposed. Future research should explore cross-regional applications of the model and examine the integration of digital technologies, such as AI and data analytics, to further optimize marketing strategies for regional tourism development.

KEYWORDS: Region, Regional Tourism Product, Tourism, Sustainable Tourism, Systematic Review, Strategy, Marketing Strategy

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Кластеризация региональных туристских продуктов на основе библиометрического анализа: кейс Мангистауской области

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АННОТАЦИЯ

Несмотря на растущую роль междисциплинарных подходов в туризме, отсутствуют структурированные аналитические модели для кластеризации туристских продуктов и их сопоставления с эффективными маркетинговыми инструментами. Настоящее исследование направлено на разработку теоретико-методологической модели кластеризации региональных туристских продуктов на основе библиометрического анализа с последующим сопоставлением кластеров с эффективными инструментами маркетингового продвижения. В качестве метода использован систематический библиометрический анализ 245 рецензируемых публикаций за период 2010–2023 гг., отобранных из базы данных Web of Science Core Collection с применением протокола PRISMA. Анализ проведён с использованием RStudio (пакет Biblioshiny) и VOSviewer, что позволило построить карты соавторства, социцитирования и соиспользования ключевых слов. Результаты анализа выявили четыре тематических кластера: (1) устойчивое развитие и инновации в туризме, (2) качество сервиса и удовлетворённость туристов, (3) культурный и событийный туризм, и (4) гастрономический туризм и территориальная идентичность. На их основе разработана модель Matrix Design, обеспечивающая соответствие между типами туристских продуктов и специфическими инструментами продвижения. В рамках эмпирической апробации представлено исследование Мангистауской области Казахстана, подтвердившее применимость модели: выявлены проблемы фрагментарного позиционирования региона, а также предложены решения по цифровой сегментации, кластерному управлению и стратегическому брендингу. Будущие исследования должны быть направлены на апробацию модели в других регионах, а также на интеграцию цифровых технологий и искусственного интеллекта для усиления маркетинговых стратегий.

КЛЮЧЕВЫЕ СЛОВА: регион, региональный туристический продукт, туризм, устойчивый туризм, систематический обзор, стратегия, маркетинговая стратегия

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INTRODUCTION

The formulation of effective tourism development strategies at the regional level remains a complex policy challenge, particularly in the context of selecting appropriate marketing instruments for the promotion of territorial tourism products. Ill-conceived or poorly aligned marketing decisions may result in suboptimal allocation of public resources and limited socioeconomic returns. Consequently, there is an urgent need for evidence-based frameworks capable of guiding the strategic promotion of regional tourism offerings through scientifically grounded methods.

The academic relevance of this study stems from the persistent gap in the literature regarding structured methodologies that integrate empirical data into the classification and marketing of regional tourism products. Although previous studies have underscored the significance of place branding, sustainability, and visitor experience enhancement, few have systematically examined the clustering of tourism products using bibliometric techniques as a foundation for targeted marketing interventions.

The scientific novelty of this research lies in its unique integration of bibliometric cluster analysis with applied destination marketing logic. In contrast to earlier works, which tend to approach tourism segmentation through qualitative or narrative-based frameworks, this study proposes a data-driven methodology that produces replicable clusters and aligns them with strategic promotional instruments. The proposed Matrix Design model introduces an original conceptual structure that not only maps the thematic composition of regional tourism products, but also operationalizes it through actionable marketing recommendations. As such, the study offers both methodological innovation and practical value for tourism governance.

This study seeks to address this research gap by developing a comprehensive framework that enables the identification, segmentation, and strategic alignment of regional tourism products through the application of bibliometric clustering techniques. Accordingly, the central research question is articulated as follows: “How can a cluster-based, bibliometric approach inform the structuring and promotion of regional tourism products through targeted marketing strategies?”

The primary contribution of this research lies in conceptualising and operationalising a Matrix Design model that synthesizes cluster-based insights with practical marketing tools. This model facilitates a more nuanced understanding of region-

al tourism dynamics and supports informed decision-making by policymakers, destination managers, and tourism stakeholders.

To empirically demonstrate the model’s applicability, the study incorporates a case analysis of the Mangystau region in western Kazakhstan – an emerging coastal destination along the Caspian Sea. Owing to its strategic location at the crossroads of Europe and Asia, as well as its diverse tourism assets, the region presents an optimal context for testing the proposed framework in a real-world setting.

By integrating theoretical insights with applied analysis, this study contributes to the evolving discourse on regional tourism governance and advances the methodological foundations for data-driven destination marketing. Thus, the present study aims to develop a theoretical and methodological model for clustering regional tourism products based on bibliometric analysis, followed by comparing clusters with practical marketing promotion tools.

MATERIALS AND METHODS

This study adopts a bibliometric and cluster-based approach to systematically investigate regional tourism products within the domains of hospitality and tourism. The methodological framework is grounded in the guidelines proposed by Donthu et al. (2021), ensuring replicability and scientific rigour. The primary objective is to identify thematic clusters and trends in regional tourism literature and to translate these findings into a structured marketing framework for destination management.

This bibliometric analysis focuses on regional tourism products within the hospitality and tourism sectors. A keyword-based search strategy was adopted as the primary method for identifying relevant literature. The search term {Regional Tourism Products} was entered in the “all fields” category to ensure the most comprehensive coverage possible.

Data were extracted from the Web of Science Core Collection database, which indexes high-quality academic journals, books, and conference proceedings. The Web of Science is widely recognized as one of the most authoritative and reliable academic databases (Clarivate Analytics, 2020; Liu et al., 2022; Norris & Oppenheim, 2007). It encompasses approximately 15,000 peer-reviewed journals and over 50 million records across 251 subject areas and 151 research domains (Merigó & Yang, 2017). To maintain the quality and credibility of the sample, the Web of Science was selected as the sole data source.

The search query found 1,565 publications between 2010 and the present. As part of the document screening process, we selected three inclusion/exclusion criteria. As the first criterion, we excluded all the documents other than journal articles (proceeding papers 420, book chapter 58, review articles 44, early access 17 and others 7 = 546). As a second

criterion, we excluded all the documents relating to sectors other than hospitality and tourism (735). As a third criterion, articles written in languages other than English were excluded (39). Finally, the bibliometric analysis was conducted on a final dataset comprising 245 articles (Figure 1).

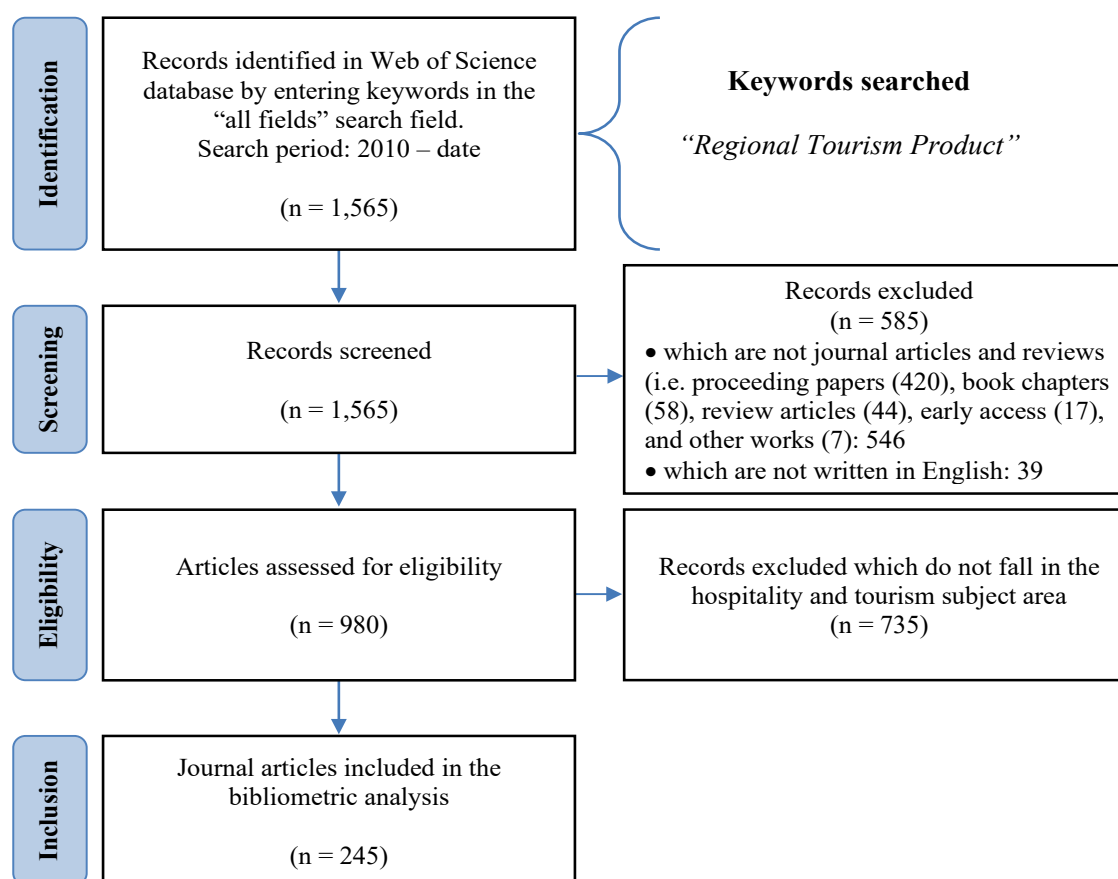


Figure 1. PRISMA flowchart of the article selection process for bibliometric analysis

Dataset analysis

Bibliometric analysis was conducted on a dataset of 245 articles from the hospitality and tourism sectors, focusing on the topic of {Regional Tourism Products}. The analysis included descriptive bibliometric analysis such as main information about the dataset, annual scientific production, most relevant corresponding authors' countries, and most cited documents and network analysis, encompassing co-citation analysis and keyword co-occurrence analysis. All analyses were performed using RStudio (with the Biblioshiny package) and VOSviewer, facilitating high-quality visualizations of citation networks, thematic clusters, and keyword maps (Mahmood et al., 2023).

Descriptive bibliometric analysis

Table 1 presents the statistical analysis results of the 245 articles on regional tourist items obtained as a consequence of the applied criteria. Data shows the search results in the WoS database after applying the criteria. In addition, the average number of citations per document is 13.61, and there are 11,577 total references, while the average number of co-authors per document is 2.58. Moreover, results include 494 keywords plus (ID) and 976 author keywords (DE).

Furthermore, Table 1 describes the main information of the research data.

Table 1. Main information of research data

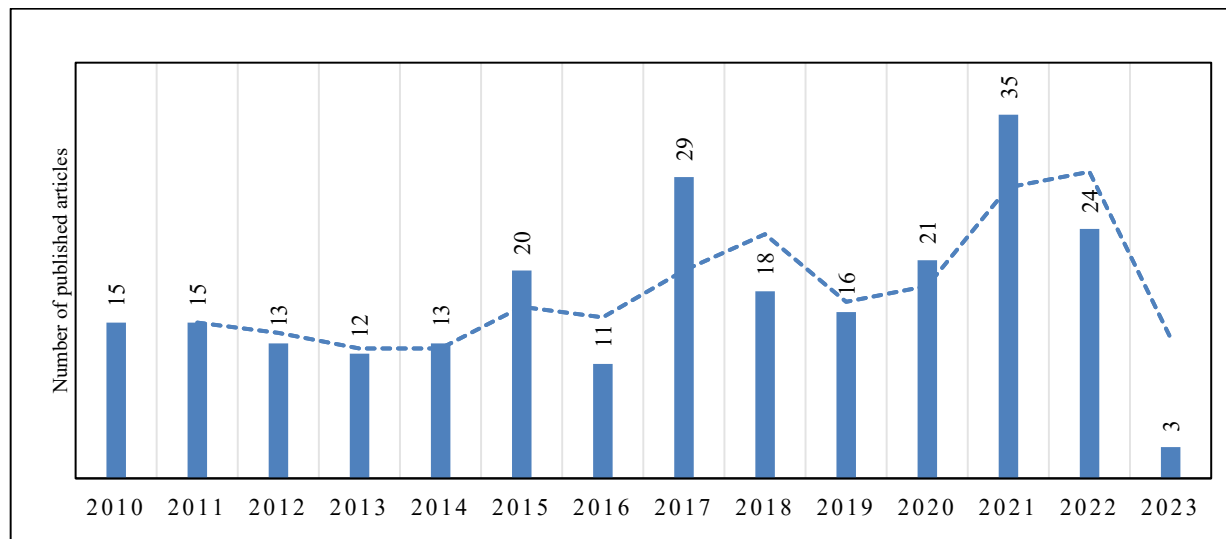
Description	Results
Timespan	2010 - 2023
Sources	65
Documents	245
Average citations per doc	13.61
References	11577
<i>DOCUMENT CONTENTS</i>	
Keywords Plus (ID)	494
Author's Keywords (DE)	976
<i>AUTHORS</i>	
Authors	585
Authors of single-authored documents	48
Authors of multi-authored documents	537
<i>AUTHORS COLLABORATION</i>	
Co-Authors per Doc	2.58
International co-authorships %	20.82

Note: compiled by authors

Annual scientific production

Additional articles have been published as more journals have been added to the WoS. However, the results were influenced by the journals' aim of expanding the number of issues released

yearly to increase visibility and citation opportunities (Hammerschmidt *et al.*, 2023). Figure 2 shows that growth has not been consistent, peaking in 2021 with 35 articles published, the most in the historical series.

**Figure 2.** Annual scientific production

Co-citation analysis links journals, authors, and multiple documents using citation tools (Zupic & Čater, 2015) to determine the field's origins and structure (Bernatović *et al.*, 2022). The analysis is founded on cited historical articles to determine the origin of a particular field (Small, 1973). To address the following research query, we performed co-cita-

tion analysis: Who are the leading, supporting, and bridging sources in the field, and how has the structure changed over time?

Figure 3 visually maps the most cited academic journals based on co-citation analysis derived from the selected corpus of 245 articles.

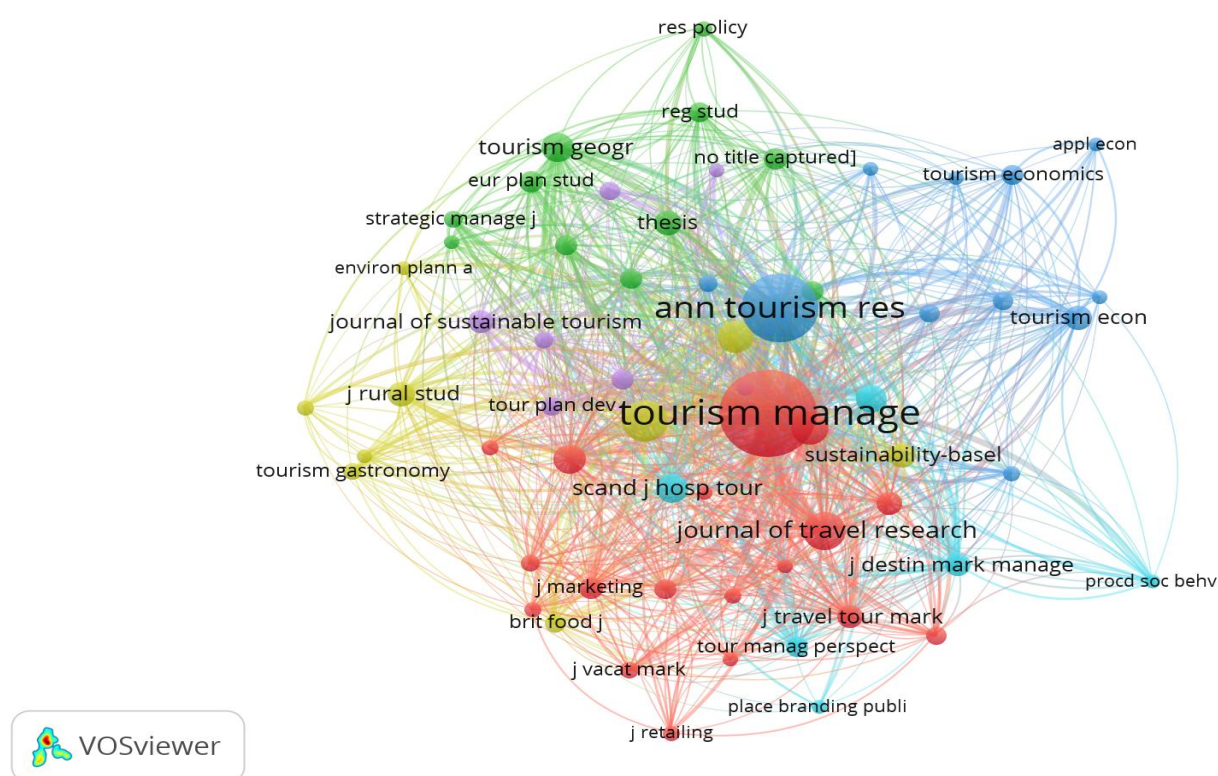


Figure 3. Most cited journals

The size of each node corresponds to the frequency of citations, while the thickness and proximity of connecting lines reflect the strength of co-citation relationships among journals. Notably, Tourism Management, Annals of Tourism Research, and Journal of Travel Research emerge as the most prominent journals in the field. Their central positions and dense connections indicate their

pivotal role in shaping the intellectual foundations and ongoing discourse on regional tourism product development.

Table 2 summarizes the 20 most influential journals according to three indicators: total number of citations, links with other journals, and total link strength.

Table 2. Top 20 journals with the highest citations, links and total link strength

Journal	Country	Citation	Link	Total link strength
Tourism Management	UK	808	61	19683
Annals of Tourism Research	UK	510	61	12344
Journal of Sustainable Tourism	UK	178	60	4353
Journal of Travel Research	UK	155	61	3742
Current Issues in Tourism	UK	109	61	3154
Scandinavian Journal of Hospitality and Tourism	UK	93	61	2695
Tourism Geographies	UK	92	59	2444
International Journal of Hospitality Management	UK	88	61	2454
International Journal of Tourism Research	UK	80	61	2441
Journal of Rural Studies	UK	67	57	1786
Tourism Economics	USA	67	61	1757
Sustainability	Switzerland	62	59	1585
Thesis	Croatia	62	56	920
Journal of Sustainable Tourism	UK	61	57	1309

Journal of Business Research	USA	57	60	1848
Journal of Destination Marketing and Management	UK	56	61	2255
Journal of Travel and Tourism Marketing	USA	56	60	2018
European Planning Studies	UK	51	57	1077
Journal of Marketing	USA	49	57	1315
Journal of Hospitality and Tourism Management	UK	46	61	1260

Note: compiled by authors

These metrics help identify the most frequently referenced sources and those with the strongest intellectual integration within the network. The dominance of UK-based journals such as Tourism Management and Annals of Tourism Research reflects the centrality of Anglo-American scholarship in tourism research. The presence of journals like Sustainability, Journal of Business Research, and European Planning Studies further illustrates the field's interdisciplinary nature.

The insights derived from co-citation patterns reveal the leading and bridging sources in the academic discourse and the historical evolution and consolidation of research themes within the field. This forms the basis for thematic cluster detection

and the conceptual organization of literature, which are critical for developing a structured marketing framework. Exploration of thematic relationships and conceptual structures was achieved through a co-occurrence analysis of author keywords and Keywords Plus (ID), enabling the detection of frequently associated terms and underlying research themes.

Co-occurrence of keywords analysis is a technique for highlighting the similarities in the content of scientific literature; essentially, it acts as a thematic index of the terms used in scientific writing (Corvo et al., 2021; Wasiq et al., 2023). Figure 4 shows the results of a co-occurrence network analysis of the author's keywords.

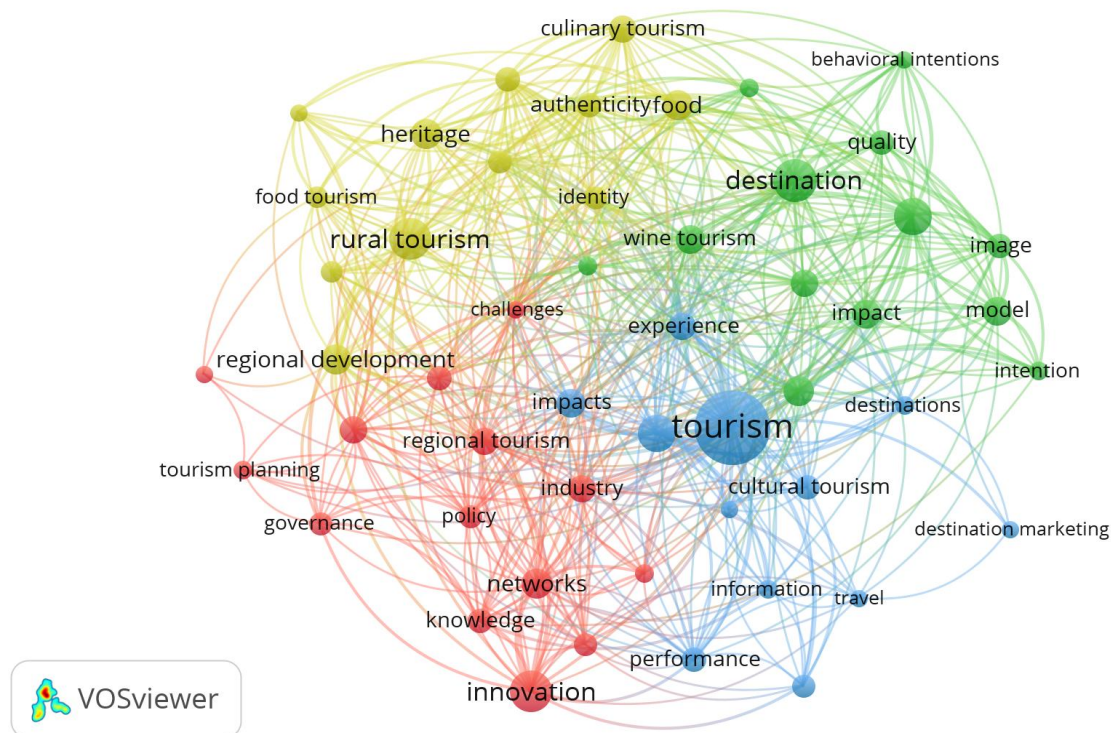


Figure 4. Co-occurrence of keywords

A keyword must appear a minimum of 5 times in the search results, only 51 keywords met the threshold out of 1,360 total keywords and were included in the network analysis. The obtained net-

work has 529 total links, 781 total link strengths and four clusters consisting of emerging themes in the area of regional tourism products.

Clusters were generated based on the strength of linkages between keywords, with each cluster representing a distinct thematic orientation. This technique was instrumental in identifying four primary clusters of regional tourism products, which were subsequently used to construct the Matrix Design model. The Matrix model operationalizes the clusters by linking them to specific promotional strategies and communication tools. It is a practical instrument for local governments and destination management organizations to align tourism resources with marketing priorities.

The outcomes of the co-citation and co-occurrence analyses form the analytical foundation for the cluster interpretation presented in the next section. These results are further elaborated in the Results and Discussion section, where the clustered themes are analysed concerning targeted marketing strategies, supported by empirical evidence from the Mangystau case study. As an emerging destination with diverse tourism assets and geopolitical significance, Mangystau offers an ideal testbed for assessing the applicability of cluster-based segmentation and marketing alignment. The case integrates official tourism programs, regional development strategies, and web-based content analysis.

RESULTS

This section presents the bibliometric and cluster analysis findings, followed by a contextualized discussion of their implications for regional tourism marketing. The interpretation of these clusters facilitates a deeper understanding of how regional tourism products can be categorized and strategically positioned within a marketing framework. In line with the research question, the findings illustrate how a bibliometric clustering approach can inform the segmentation of regional tourism offerings and their alignment with targeted promotional tools.

The keyword co-occurrence analysis yielded four distinct thematic clusters representing the prevailing conceptual priorities in the scholarly discourse on regional tourism products. These clusters, visualized in Figure 4 and detailed in Tables 3-6, form the analytical foundation for the Matrix Design model developed in this study. Each cluster reveals a specific set of interrelated concepts, offering insight into the multi-dimensional structure of regional tourism development.

Table 3 shows Cluster 1 (Red) is the largest in terms of keyword density and linkage strength.

Table 3. Cluster 1: Need for innovations and knowledge transfer for the sustainable tourism industry

Keywords	Occurrences	Links	Total link strength
Innovation	20	23	42
Networks	12	25	37
Industry	10	21	30
Regional tourism	10	26	35
Sustainability	10	26	29
Behaviour	9	19	24
Knowledge	9	20	28
Collaboration	8	19	25
Governance	8	13	19
Policy	8	22	24
Competitiveness	6	15	18
Tourism planning	6	9	9
Challenges	5	27	32
Sustainable tourism	5	5	5

Note: compiled by authors

Key terms such as “innovation”, “networks”, “governance”, and “competitiveness” indicate a shift toward systemic thinking in tourism policy and planning. It is centred on the role of innovation, institutional collaboration, and knowledge exchange in ensuring the long-term sustainability of regional tourism. Key terms such as “innovation”, “networks”, “governance”, and “competitiveness”

indicate a shift toward systemic thinking in tourism policy and planning. This cluster reflects a growing recognition that tourism, while contributing to regional economic development, can also generate socio-environmental vulnerabilities. As such, continuous technological and managerial innovation is imperative to balance growth with resilience. Information and communication technologies (ICTs),

particularly in the context of smart tourism ecosystems, are increasingly seen as enablers of decarbonized mobility, real-time visitor management, and immersive experience design (Streimikiene & Korneeva, 2020).

The presence of terms such as “collaboration”, “policy”, and “tourism planning” further emphasizes the need for cross-sectoral and multilevel coor-

dination. This cluster underpins strategic actions focused on innovation, branding, environmental certification, and smart governance mechanisms.

Cluster 2 (Green), presented in Table 4, revolves around the interconnection between destination image, perceived service quality, and visitor satisfaction – core drivers of tourist loyalty and behavioural intention.

Table 4. Cluster 2: Role of destination, service quality and tourists’ satisfaction in hospitality and tourism industry

Keywords	Occurrences	Links	Total link strength
Destination	21	31	61
Satisfaction	17	29	61
Product	12	24	38
Impact	11	15	22
Model	11	18	32
Wine tourism	11	26	39
Perceptions	10	22	32
Image	9	20	31
Quality	9	17	28
Consumption	6	13	16
Intention	6	12	20
Perspectives	6	17	23
Behavioural intentions	5	16	24

Note: compiled by authors

Prominent keywords include “satisfaction”, “destination”, “quality”, and “image”. This cluster demonstrates the centrality of customer experience design in tourism success. Studies indicate that well-maintained infrastructure, accessible amenities, and coherent service ecosystems significantly shape tourists’ emotional and cognitive evaluations (Haghighi *et al.*, 2011). Moreover, satisfaction functions as a reliable proxy for repurchase intentions and positive word-of-mouth (Khalifa & Ali, 2017; Trung & Khalifa, 2019), while dissatisfaction

leads to attrition and reputational damage (Khalifa & Fawzy, 2017; Abdulla *et al.*, 2019).

The inclusion of “wine tourism”, “behavioural intentions”, and “perceptions” signals a movement toward experiential differentiation, where products are no longer seen as isolated offerings but as interconnected elements within a holistic journey.

Cluster 3 (Blue), visualised in Table 5, emphasises the pivotal role of culture, heritage, and experiential design in regional tourism development.

Table 5. Cluster 3: Impact of cultural tourism on the hospitality sector

Keywords	Occurrences	Links	Total link strength
Tourism	50	42	92
Management	17	30	47
Impacts	11	25	32
Experience	10	31	44
Cultural tourism	9	18	20
Performance	9	24	30
Hospitality	8	12	17
Destinations	6	16	19
Information	6	16	18
Destination marketing	5	4	5
Stakeholders	5	14	17
Travel	5	12	13

Note: compiled by authors

Keywords such as “cultural tourism”, “experience”, “stakeholders”, and “destination marketing” reflect a paradigm shift from transactional to transformational tourism. Cultural tourism contributes to both demand stimulation and supply diversification. It enhances hospitality sector performance by increasing year-round visitation, encouraging product innovation, and fostering emotional engagement (Huang et al., 2017). Furthermore, it enables the integration of intangible heritage, positioning culture

not merely as a supplement to the tourism product but as a core value proposition (Mousavi et al., 2016).

The inclusion of “performance”, “management”, and “travel” illustrates that effective coordination among actors is critical to translating cultural capital into economic impact.

Cluster 4 (Yellow), visualised in Table 5, captures the nexus between gastronomy, territorial identity, and rural development.

Table 6. Cluster 4: Role of food tourism in the regional development

Keywords	Occurrences	Links	Total link strength
Rural tourism	20	22	34
Food	12	27	40
Heritage	12	25	43
Regional development	12	26	40
Culinary tourism	10	26	37
Authenticity	9	30	46
Place	9	28	42
Identity	8	22	29
Local food	8	27	42
Community	7	17	24
Food tourism	7	21	28
Regional development	5	13	19

Note: compiled by authors

Leading terms include “culinary tourism”, “local food”, “authenticity”, and “regional development”. This cluster highlights how food tourism transcends the functional role of sustenance to become a strategic tool for destination branding and socio-economic regeneration. Authentic food experiences stimulate tourist interest and support local economies, preserve culinary traditions, and enhance community cohesion (Nwokorie, 2015).

Importantly, the frequency of keywords like “rural tourism”, “heritage”, and “community” points to the embeddedness of food tourism in place-making. It offers a platform for inclusive participation by micro and small enterprises, particularly in underserved areas.

Together, the four clusters delineate a comprehensive framework for understanding the multidimensional nature of regional tourism.

Drawing on the thematic clusters identified through bibliometric co-occurrence analysis, this study introduces a novel conceptual framework – the Matrix Design model (Figure 5) – developed to

operationalize the segmentation and promotion of regional tourism products.

This model functions as a strategic mapping tool that translates empirical patterns into applied marketing logic, facilitating more structured, targeted, and context-sensitive decision-making in destination management.

The construction of the matrix is grounded in three interrelated principles. First, cluster-informed segmentation ensures that each thematic cluster identified through bibliometric analysis corresponds to a distinct segment of regional tourism products, characterized by common attributes, development priorities, and marketing challenges. Second, strategic alignment is achieved by mapping these clusters onto appropriate communication tools, stakeholder responsibilities, and visitor engagement mechanisms, thereby enhancing the effectiveness of promotional strategies. Finally, the model incorporates systemic coherence by acknowledging the interdependence of tourism sub-sectors and advocating for integrated, multi-level coordination in both planning and branding processes.

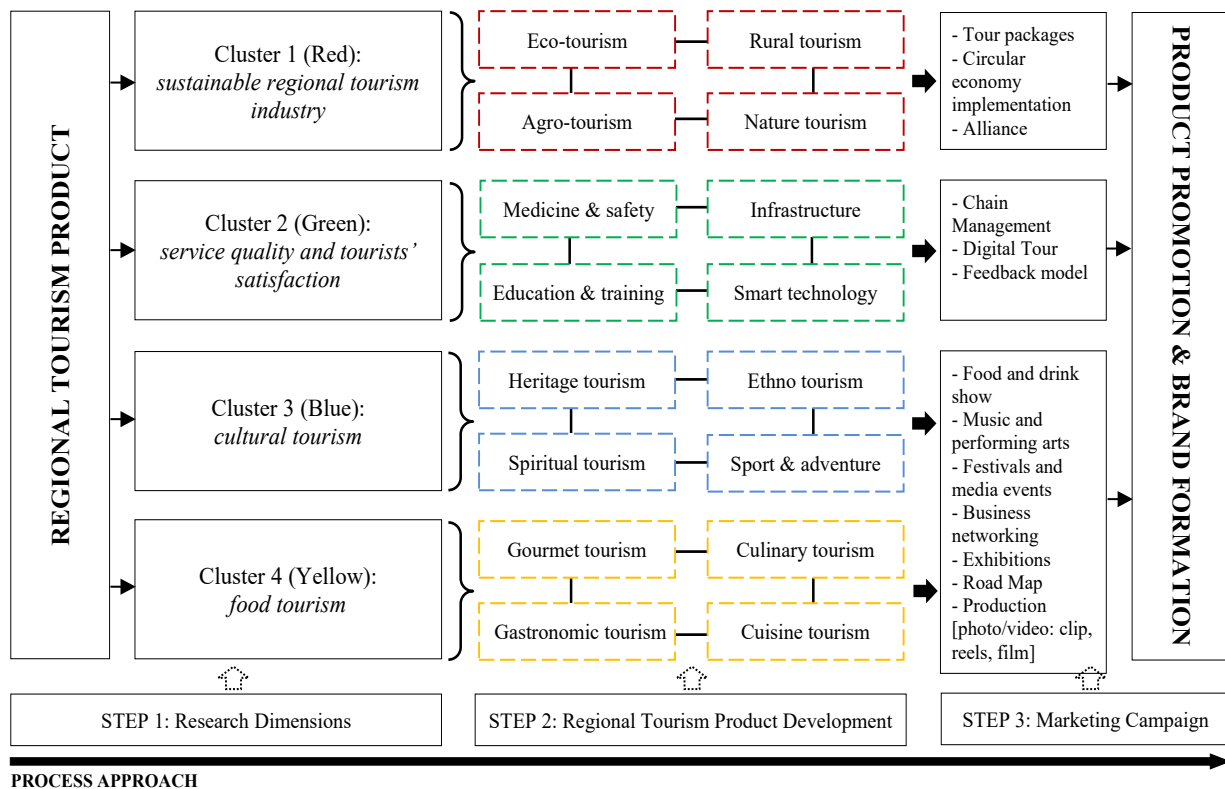


Figure 5. Matrix of regional tourism products

Rather than adopting a product-centric or administrative zoning approach – common in traditional destination models – the matrix offers a semantic, experience-based framework that reflects how tourists perceive and engage with regional tourism offerings. The Matrix Design model is structured as a cross-tabulated visual tool. This dual-axis configuration enables multi-layered analysis, where each cell reflects a tailored marketing solution – i.e., the most effective way to communicate and develop a specific type of tourism product. The model constitutes an original intellectual contribution of this study. Unlike prescriptive models in tourism marketing that rely on linear customer journey frameworks or generic destination branding principles, this matrix integrates: empirical data-driven clustering (grounded in co-occurrence analysis); strategic marketing logic (grounded in segmentation theory); visual modularity for real-world application.

Its novelty lies in offering a visual synthesis of academic insight and managerial applicability, bridging the persistent gap between scholarly research and regional tourism practice. This model addresses an unmet need in tourism planning literature – the lack of a flexible, cluster-responsive marketing framework that accommodates the complexity of re-

gional tourism ecosystems. From a practical standpoint, the Matrix Design model provides several key managerial advantages. It facilitates prioritization by enabling destination management authorities to allocate resources effectively toward tourism clusters demonstrating high strategic potential or market readiness. The model also supports differentiation by developing unique value propositions tailored to each tourism segment's specific characteristics and positioning. Furthermore, it enhances consistency by providing a coordination framework that aligns stakeholder communication and branding efforts across multiple channels. Lastly, the model ensures scalability, as it can be applied across various regional contexts and remains adaptable to evolving tourism demands and policy transformations.

In particular, for emerging or structurally fragmented destinations such as the Mangystau region, the matrix provides a unifying platform for integrating disparate tourism narratives, aligning stakeholder efforts, and shaping cohesive marketing strategies. The following section presents an empirical case application of the model in Mangystau, demonstrating how the matrix can be leveraged to transition from fragmented promotion to integrated, evidence-informed tourism governance.

For decades, the Mangystau region in western Kazakhstan has been primarily associated with industrial development, energy logistics, and hydrocarbon extraction. Tourism, although rich in natural and cultural resources, remained on the periphery of regional policy and investment agendas (Mamutova et al., 2023). The region's attractions – ranging from sacred pilgrimage sites such as Beket-Ata to desert landscapes like the Boszhira Valley – were promoted sporadically, with little strategic cohesion. Promotional materials focused on isolated features of the territory without structuring them into coherent thematic or experiential categories. As a result, the region suffered from low international visibility, seasonal concentration of tourist flows, and limited diversification of tourist offerings (UNWTO, 2022).

Recent efforts by local authorities have sought to reposition Mangystau as a multidimensional tourism destination. This includes the development of seaside infrastructure near Aktau, conservation initiatives in geosites such as Sherkala and Torysh, and increased promotion of cultural routes (Mangystau Regional Tourism Development Plan, 2023). Nevertheless, several structural gaps persist:

- infrastructure constraints, especially outside the coastal zone, inhibit mobility and comfort (Ministry of Tourism and Sports RK, 2023);

- digital platforms lack segmentation by tourist types (e.g., cultural, eco, gastronomic), offering generic content for all;

- tourism statistics show that 78% of arrivals are domestic, and the average length of stay remains below 1-2 nights (Bureau of National Statistics, 2023);

- there is limited coordination among stakeholders, and almost no integration of local SMEs into regional branding.

These challenges suggest the absence of a data-driven strategic model that aligns tourism products with targeted marketing tools and policy planning. The proposed Matrix Design model, developed through bibliometric cluster analysis, provides an opportunity to realign Mangystau's tourism strategy with international best practices.

Table 7 presents how the four identified thematic clusters apply to the region's context and guide future marketing interventions.

Table 7. Strategic application for Mangystau region

Cluster	Strategic application
Sustainable Tourism & Innovation	Position Mangystau as a Caspian eco-geopark; collaborate with international geotourism networks (UNESCO Global Geoparks); implement digital solutions for desert tourism (smart trails, AR-based eco guides)
Service Quality & Satisfaction	Introduce region-wide quality standards, implement mobile feedback platforms, and invest in road and accommodation infrastructure through PPPs
Cultural & Experiential Tourism	Create immersive cultural trails (e.g., “Silk and Sand” route), support traditional festivals, and train local guides with storytelling techniques
Culinary & Food Tourism	Brand Mangystau cuisine (camel milk, dried fish, boursaq) as a tourism product; launch food festivals, support culinary startups in Aktau and Zhanaozen

These initiatives, mapped onto the four clusters, represent an evidence-based framework for stakeholder alignment and communication strategy.

Content analysis of official regional tourism portals (visitmangystau.kz; gov.kz; inaktau.kz) reveals a fragmented promotional logic that lacks consistency in segmentation, experience design, and emotional appeal. The implementation of the Matrix Design allows for:

- Strategic prioritization of tourism products aligned with cluster typologies;
- Identification of value chains within each thematic group;
- Smart budget allocation according to visitor expectations and return potential;
- Enhanced capacity to build long-term branding through integrated messaging.

Moreover, comparative benchmarking with other Caspian destinations such as Baku (Azerbaijan) and Atyrau (Kazakhstan) reveals that Mangystau lags in terms of digital presence, MICE infrastructure, and international partnerships (UNDP Regional Report, 2022). Applying the Matrix Design could thus help close competitiveness gaps and create a multiplicative effect across sectors such as culture, agriculture, and hospitality.

The case of Mangystau illustrates how cluster-informed strategic design can shift a region from fragmented, resource-driven tourism toward a coordinated, market-responsive, and culturally embedded model. The transformation requires funding, digitalisation, and conceptual restructuring – a move from location-centred thinking to value prop-

osition design consistent with the needs of diverse tourist segments.

The Matrix Design model, supported by bibliometric analysis and case validation, offers a scalable tool for regional authorities across Central Asia aiming to professionalize tourism governance.

CONCLUSION

This study addresses a central and persistent challenge in regional tourism development: the lack of a systematic, data-informed framework for structuring and promoting regional tourism products. We posed the following research question: “How can a cluster-based, bibliometric approach inform the structuring and promotion of regional tourism products through targeted marketing strategies?”

Applying bibliometric methods, thematic clustering, and strategic modelling enabled a comprehensive answer to this question, combining theoretical depth with practical clarity. The development of the Matrix Design model serves as a direct response to this question, offering a replicable, visual, and managerial framework that bridges academic segmentation logic with real-world marketing application.

Key contributions and conceptual advances: (1) the bibliometric analysis of 245 peer-reviewed articles revealed four dominant clusters that define the intellectual and applied landscape of regional tourism; (2) these clusters were synthesized into the Matrix Design model, an original conceptual innovation that provides a tool for destination managers to: map product types to appropriate promotion tools; strategically allocate budgets; define audience personas; ensure message consistency across levels of governance.

The model advances existing literature by moving beyond abstract typologies or descriptive mapping – it provides a functional interface between knowledge, management, and communication. The Matrix Design model was tested through a case study of the Mangystau region in Kazakhstan – a destination characterized by rich cultural and natural heritage, but historically fragmented promotion and infrastructural gaps. The region’s tourism assets were reclassified and aligned with strategic tools by applying cluster-based segmentation. The model demonstrated how even structurally underdeveloped regions can: identify high-potential tourism products; integrate stakeholders into strategic clusters; develop value-driven campaigns (e.g., eco-experience, culinary heritage); shift from episodic branding to ecosystem-based destination marketing.

Notably, the matrix provided a unifying framework for transforming disconnected offerings into a coherent, layered tourism identity. This case illustrated how data meets place and how analytics translate into governance.

For local executive authorities responsible for tourism development at the regional level, the following actionable steps are recommended:

- Adopt the model as a foundational framework for developing tourism strategy, investment programs, and promotional campaigns.
- Conduct a regional product audit using the four clusters to classify existing tourism assets and identify content, infrastructure, and visibility gaps.
- Establish working groups per cluster, engaging relevant stakeholders – from hospitality and cultural sectors to community organizations and SMEs.
- Embed matrix logic into tourism grant criteria, prioritizing initiatives that align with one or more clusters and demonstrate strategic fit.
- Develop a unified digital tourism platform structured around the matrix, helping tourists navigate offerings thematically and strengthening the region’s brand coherence.
- Monitor cluster-specific indicators (visitor satisfaction, economic impact, stakeholder engagement) to inform adaptive policy cycles and funding priorities.

These steps will allow local governments not only to professionalize their tourism systems but also to ensure long-term resilience, inclusivity, and competitiveness. Ultimately, this study answered its core research question and introduced a replicable, actionable, and scalable framework for advancing regional tourism. The Matrix Design model offers researchers, policymakers, and marketers a common language, enabling more intelligent decisions, stronger destination identity, and systemic collaboration. As regional tourism faces increasing complexity and competition, this model provides the strategic clarity needed to turn potential into performance.

Future research may explore the cross-regional applicability of the Matrix Design model by conducting comparative case studies in other emerging or structurally diverse tourism destinations. Additionally, there is scope to incorporate advanced analytical tools, such as machine learning and real-time visitor data, to enhance the granularity and predictive capacity of cluster segmentation. Researchers could also examine the long-term impact of matrix-based planning on destination branding, stakeholder engagement, and visitor behaviour. Lastly, the integration of this framework into digital tourism platforms and smart city initiatives remains an underexplored but promising direction, especially in

the context of AI-driven personalization and adaptive marketing.

LIMITATIONS AND FUTURE PATHWAYS

We acknowledge certain limitations: the scope is restricted to English-language literature indexed in Web of Science; cluster dynamics may evolve over time; and the case study is illustrative, not exhaustive. Future research can enhance the model by integrating: real-time tourist behaviour analytics; comparative applications across multiple regions and countries; AI-assisted segmentation and digital strategy integration.

AUTHOR CONTRIBUTIONS

Conceptualization and theoretical framework: ZB and MA; research design and methodology: ZB and MA; data collection and processing: MA and ZB; bibliometric analysis and interpretation: MA; case study analysis and visualization: ZB and NU; draft writing and manuscript structure: MA and ZB; editing and critical revision: ZB and NU; final review and approval: NU and MA. All authors have read and agreed to the published version of the manuscript.

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