

Tourism Management Information System: A Study of its Adoption and Impact on Destination Management

Dr.R. Shridhar¹ and Dr.R. Udayakumar^{2*}

¹Professor, Department of Management Studies, Kalinga University, Raipur, India

^{2*}Professor & Director, Kalinga University, India

E-mail: ¹r.shridhar@kalingauniversity.ac.in, Shridhar.pearl@gmail.com,

²rsukumar2007@gmail.com, directoripr@kalingauniversity.ac.in

ORCID: ¹https://orcid.org/0000-0003-3525-4417, ²https://orcid.org/0000-0002-1395-583X

(Received 16 June 2024; Revised 22 July 2024, Accepted 17 August 2024; Available online 30 September 2024)

Abstract - Tourism has evolved from being a luxury or daring person's occasional hobby. These days, everyone works in the tourism sector, whether it is in the hospitality, entertainment, or catering industries. In actuality, tourism has a significant economic influence on the nation it visits. From short-term to long-term improvements, it raises the growth rate, national profit, investment, and popularity of the nation. One significant trend in the travel and tourism sector is the increased focus on quality from the customer's point of view. The implementation of Tourism Management Information Systems (TMIS) has revolutionised the operational and decision-making processes of destination management organisations (DMOs). The effect of TMIS on destination management is still not well understood, though. The implementation and influence of TMIS on destination management are examined in this study, along with how it affects operational effectiveness, destination competitiveness, and decision-making. A mixed-methods approach was used, incorporating case studies of DMOs in [region/country], interviews, and surveys. The results show that the implementation of TMIS increases the capacity for making decisions, boosts operational effectiveness, and increases the competitiveness of destinations. Nonetheless, difficulties with user resistance, system integration, and data quality were noted. The report offers guidance to DMOs looking to use TMIS for efficient destination management and the growth of sustainable tourism.

Keywords: Tourism, Tourism Management Information System, Destination Management

I. INTRODUCTION

Travel is a worldwide industry. In its broadest sense, tourism is defined as the act of people travelling and spending less than a year living in places that are significantly different from their usual surroundings for leisure, business, health, or other reasons. In every society on the planet, it is a major societal trend (Della Corte et al., 2017). It is motivated by a person's natural (Llopiz-Guerra et al., 2024) desire. Nowadays, travel is a worldwide form of enjoyment. In its broadest sense, tourism is defined as the act of people travelling and spending less than a year living in places that are significantly different from their usual surroundings for leisure, business, health, or other reasons (Dijana & Jovana, 2023). In every society on the planet, it is a major social trend.

It is motivated by a person's natural desire. Nowadays, tourism is a worldwide industry that provides amusement. People go from their home country to both domestic and foreign tourist destinations in order to escape their routine and monotonous daily lives (Safari & Tourisme-IREGE, 2009). Their main draws are the breathtaking rural scenery as well as the intriguing sports, adventure, and leisure options a place has to offer. It is known that tourism affects economic activity (Surayyo et al., 2024). Over the past twenty years, the majority of the countries' economic growth has been significantly influenced by travel and tourism. With significant financial benefits and countless prospects, tourism has developed into one of the world's major service industries (Navío-Marco et al., 2018). Significant expansion in tourism has been driven by a number of factors, including increases in economic development, disposable income, leisure time, constitutional prosperity, and effective marketing. Because of this, efforts to promote tourism are made to increase the chances for economic growth in the majority of the world's 25 million tourist arrivals (Borzyszkowski, 2014). This figure 2 display has grown to 1.4 billion foreign visitor arrivals annually after sixty-nine years. The tourism business has increased by fifty-six times. The largest service sector in India is travel and tourism. Establishing and promoting tourism, maintaining India's appeal as a travel destination, and enhancing and expanding current tourism (Sánchez-Ancajima et al., 2023) offerings are the main goals of this industry in order to guarantee job creation and economic growth.

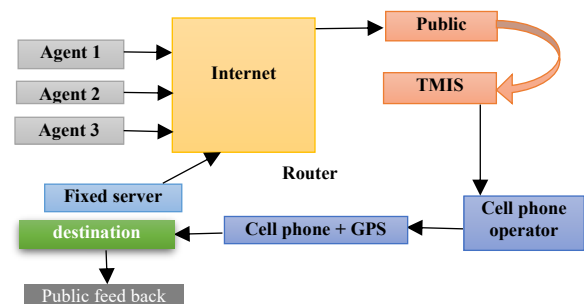


Fig. 1 Tourism Management Information System

Many different types of economic activity are related to tourism. It is a major industry in both India and the rest of the world, including planning at every level. India is one nation where tourism is developing and picking up steam gradually. Therefore, the country should have appropriate federal, state, and local scientific planning. Appropriate planning at the appropriate time and location can provide our nation's tourism economy with a boost. In one sense, tourism-related events and infrastructure must be organised to maximise profits for all parties involved; in another, it must not negatively impact the neighbourhood. As a result, tourist development ought to be done sustainably. There are two reasons behind the planning. First, the local destination environment is most affected by tourism, and second, locals are recognised as a key component of a destination's "hospitality atmosphere" (Karya et al., 2019). Working together amongst relevant stakeholders is crucial to achieving sustainable growth. Identification and proactive consideration of the transaction in regard to important stakeholder relationship orientations is the responsibility of the planning authorities. Many methods have been employed by planners and stakeholders for scientific planning in the tourist and hospitality sectors, but academics have identified the Geographic Information System as one of the most potent instruments that facilitates successful decision-making. Currently, during the busiest times of the year, popular tourist spots are packed (Sigala, 2013).

Furthermore, the majority of tourists from the younger age prefer to travel to remote locations and take in the natural beauty because of their hectic schedules. Travellers from other countries also like visiting unusual or utterly unique locations. There is also limited availability of map-based route navigation information and visual information about a destination's location. Another important issue is the internet's role in tourism promotion. Natural disasters also have an impact on the tourism sector. It is predictable, controllable, or preventable with enough advance planning. These kinds of concerns are currently plaguing the travel and tourist sector, and their resolution will require careful planning. With the increasing complexity of tourism and its involvement in planning processes, Tourism Management Information Systems are becoming increasingly important for successful management. Capturing, storing, retrieving, analysing, and displaying geographic data is the process known as TMIS (Purnomo et al., 2019). A computer system used for geographic data management, storage, analysis, and display is called a TMIS its displays in figure 1. Geographic information systems have been indispensable for professionals working in environmental disaster relief, urban planning, and natural resource management since the 1970s. For many years, TMIS was a potent instrument for resolving issues with the atmosphere, the wild regions of the planet, and the ocean. However, its application in tourism planning began in the mid-1990s, primarily in the areas of sustainable tourism and wildlife planning (Alnusairat et al., 2021). Ecosystem-related (Pöhn & Hommel, 2021) problems were plaguing the tourism industry, and the amount of visitors to places like islands and hilly regions was seriously limiting

their carrying capacity Correlating geographic data with their fundamental characteristics and altering and integrating all the factors influencing tourism planning were the main concerns during that time period. As a result, a spatial decision support system was created to help with tourism planning (Önder et al., 2017). A Geographic Information System would be a key component of the SDSS concept. The main goals of this research are:

- To analysis the necessity of vulnerability assessment and risk management in tourism planning and to conduct spatial temporal analysis with the help of multicriteria Spatial Decision Support System.
- To examine the application of destination fetching modelling in the context of different location and analyse its implication.
- To identify the best suitable site for other accommodations by using Multicriteria Spatial Decision Support System.

In this instance, section 1 of the article examines the introduction. The purpose of the work is explained in Sections 2, the analytics are displayed in Section 3, and the project is concluded in Section 4.

II. RESEARCH METHODOLOGY

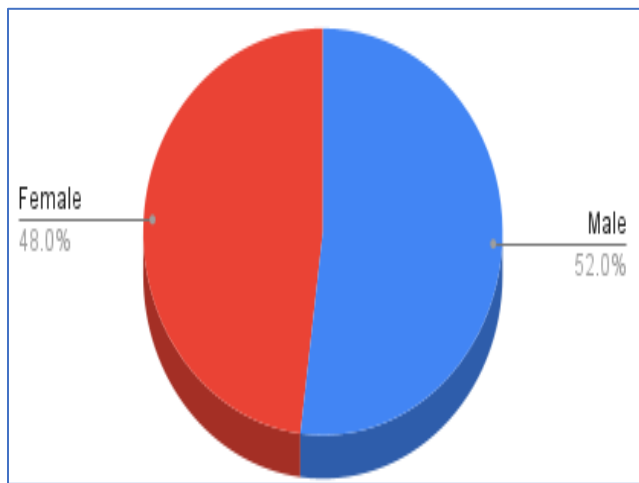
The entirety of sociocultural and economic activities carried out by travellers within their own country or abroad is referred to as tourism. In table I, People go to different places for a variety of reasons, such as pleasure, entertainment, education, seeing family and friends, etc. The combination of these varied reasons, the services provided, and the participation of other industries creates a singular experience for the tourists. According to the concept given above, people travel to different locations for a variety of reasons, with leisure time sometimes serving as their primary driver (Ivars-Baidal et al., 2019). It is also established that while travel is a part of life, it is not the main focus. When making travel plans, tourists take into account a number of aspects. Based on the stated aims and a visualisation of the research's scope, a research design was developed in order to carry out the current investigation methodically (Estêvão et al., 2014). The researcher first designed the current study to investigate the potential of TMIS in tourism planning by conducting a thorough literature review using various secondary government published data sources and reports, including journals, magazines, books, databases, the internet, government reports, and so on (Tavitiyaman et al., 2021). Datasets pertaining to tourism were gathered from many organisations and organisations and integrated with the space or places to be compatible with the TMIS system.

TABLE I DEMOGRAPHIC PROFILE

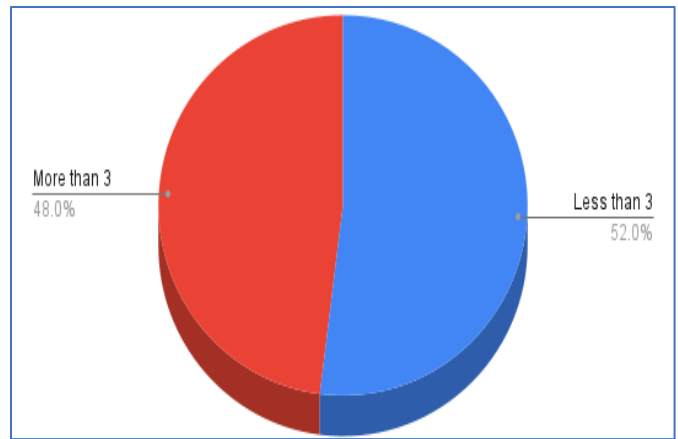
Demographic Profile	Category	No. of Respondents	Percentage
Gender	Male	39	52
	Female	36	48
	Total	75	100
Insights from the tourism perspective	Less than 3 years	39	52
	More than 3 years	36	48
	Total	75	100
Insights from the tourism risk perspective	Less than 3 years	45	60.0
	More than 3 years	30	40.0
	Total	75	100
Insights from tourism information System	Less than 3 years	57	76
	More than 3 years	18	24
	Total	75	100

III. EXPERIMENTAL RESULTS

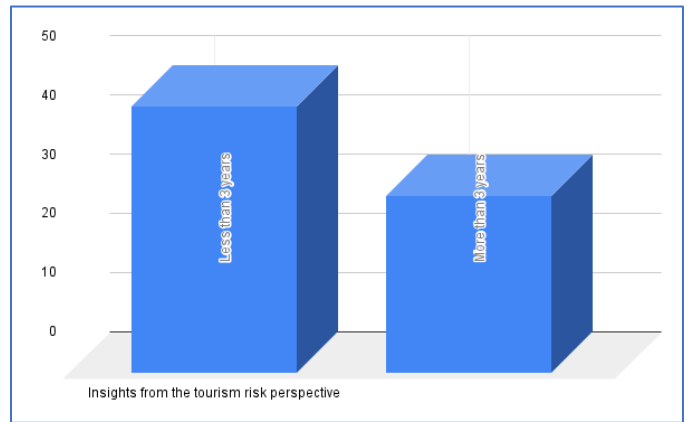
Relevant objectives had already been developed based on a review of the literature and the identification of research gaps. Primary and secondary data were taken into consideration by the researcher in order to methodically tackle the suggested study challenge. Primary data was gathered by field surveys, published station data, and satellite data. Secondary data was gathered from a number of sources, including publications, government websites, and the internet. In order to fulfil the first objective's expected outcome, the researcher thoroughly examined the issues pertaining to tourism (Ammirato et al., 2018).



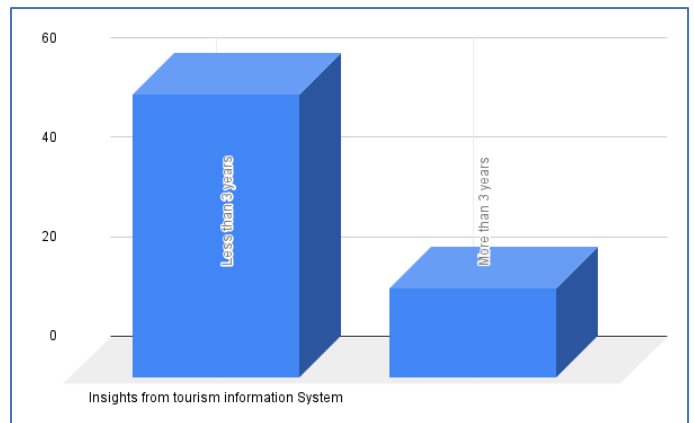
(a)



(b)



(c)



(d)

Fig. 2 Demographic Variables

To determine the fundamental tourism-related difficulties the state faces and the steps taken to address them, a SWOT analysis of the relevant components was conducted. To determine the potential of tourism in the state, a thorough analysis of the industry was conducted. It demonstrated the robustness of the tourism offerings and the locals' dependency on the sector. Potential risks to tourism were also noted in the study (Louillet et al., 2021). It was discovered that the state has a plethora of opportunities provided tourism is promoted and planned in a systematic manner in table II.

TABLE II TOTAL VARIANCE EXPLAINED- TOURISM MANAGEMENT

Component	Initial Eigen values ^a			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings			
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
Rescaled	1	3.631	19.960	19.960	5.164	18.444	18.444	3.473	12.403	12.403
	2	1.907	10.481	30.442	2.027	7.239	25.683	2.405	8.588	20.991
	3	1.237	6.800	37.241	1.684	6.016	31.699	1.564	5.584	26.575
	4	.973	5.349	42.590	1.233	4.405	36.104	1.538	5.492	32.067
	5	.850	4.671	47.261	1.071	3.826	39.929	1.513	5.403	37.470
	6	.744	4.088	51.349	1.051	3.753	43.683	1.378	4.921	42.391
	7	.660	3.629	54.977	.985	3.518	47.200	1.346	4.809	47.200
	8	.625	3.437	58.414						
	9	.593	3.257	61.671						
	10	.546	2.999	64.670						

Extraction Method: Principal Component Analysis.
 a. When analyzing a covariance matrix, the initial eigen values are the same across the raw and

Based on the KMO, the Bartlett's Test score of 0.834 shows that the sample data is good enough for analysis. The variables were broken down into components, and then factor analysis was used to choose them using the principal component analysis method. Consequently, the ultimate dimensions selected were given experimental titles. The entire variance is explained in Table III below.

TABLE III KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.834
Bartlett's Test of Sphericity	Approx. Chi-Square	2306.878
	Df	378
	Sig.	.000

a. Based on correlations

Validity was checked using principal component analysis. Scale reliability was checked using Cronbach's Alpha. The following sections present the results of the preliminary analysis in table IV.

TABLE IV STATISTICS OF RELIABILITY - TOURISM STRATEGY

Cronbach's Alpha	Quantity
.864	33

Regression analysis is a dynamic method that uses the known values of one or two variables—also known as the predictors—to forecast an unknown variable's value. More precisely, a regression analysis aids in the prediction of the value of Y given the values of X1, X2,..., Xk. Regressions are models with one dependent variable and two or more independent (exploratory) variables in table V. Independent (exploratory) variables are those whose values must be measured or predicted, and dependent variables are those whose values are known and utilised in the prediction process.

TABLE V T-TEST RESULT

Demographic Profile	Category	Awareness					Sig.
		Mean	SD	N	t	df	
Gender	Male	3.27	1.048	751	-.665	1132	.506
	Female	3.33	1.000	383			
Insights from the tourism perspective	Less than 3 years	3.28	.967	180	-.195	1132	.845
	More than 3 years	3.30	1.041	954			
Insights from the tourism risk perspective	Less than 3 years	3.30	1.029	873	.420	1132	.675
	More than 3 years	3.26	1.032	261			
Insights from tourism information System	Less than 3 years	3.30	1.029	873	.420	1132	.675
	More than 3 years	3.26	1.032	261			

To elucidate, the tourist sector is dynamic and subject to shifts. Numerous external influences in the corporate environment have an impact on the industry. Such circumstances in an organisation necessitate the adoption of knowledge and knowledge skills in order to take advantage of market opportunities, function in an intelligent market, expand operations, meet consumer demands, boost productivity, and boost profitability. Because of this, the ANOVA approach has been employed to compare the methods employed by various tactics supplied by the study's participant visitors in table VI.

TABLE VI ANOVA TEST

		Sum of Squares	Df	Mean Square	F	Sig.
Travel websites can search most airlines/hotels more accurately.	Between Groups	17.649	3	5.883	37.447	.000
	Within Groups	63.625	405	.157		
	Total	81.273	408			
I only make use of well-known travel websites.	Between Groups	10.365	3	3.455	24.945	.000
	Within Groups	56.096	405	.139		
	Total	66.461	408			
When I book online, suppliers can use my personal details without my consent.	Between Groups	82.785	3	27.595	51.007	.000
	Within Groups	219.105	405	.541		
	Total	301.890	408			
I get the needed expert advice in choosing between hotels/airlines.	Between Groups	12.632	3	4.211	10.550	.000
	Within Groups	161.633	405	.399		
	Total	174.265	408			
Nowadays, Travel websites are offering additional services such as assistance with currency exchange which prompts me to choose dealing with a travel website.	Between Groups	43.055	3	14.352	10.916	.000
	Within Groups	532.466	405	1.315		
	Total	575.521	408			
The online websites offer superior and trustworthy information while planning a trip.	Between Groups	11.508	3	3.836	11.267	.000
	Within Groups	137.890	405	.340		
	Total	149.399	408			
Trust analysis of tourism management	Between Groups	25.251	3	8.417	9.491	.000
	Within Groups	359.150	405	.887		
	Total	384.401	408			

The travel, hotel, and retail industries may all benefit greatly from the tourism sector, which is known for its "service orientation," which puts the needs of its clients first for the prosperity of its businesses. The management and staff in the tourist business have faced challenges due to the industry's growing competitiveness and ongoing shifts in client demand. In this case, being aware of the business environment and procedures helps the company thrive in a cutthroat market. For this reason, in order to effectively fulfil the shifting needs of clients, companies need to maintain knowledge for the company and continuously update the database shows in table VII. (Sigala, 2009).

TABLE VII ANOVA ON VARIABLES RELATED TO TOURISM RISK MANAGEMENT

		All Quadrants	df	Square Mean	F
I prefer the internet- I can read reviews and view photos of my hotel online.	Between Groups	10.365	3	3.455	24.945
	Within Groups	56.096	405	.139	
	Total	66.461	408		
I don't use a travel agent- I can make my own arrangements online.	Between Groups	10.365	3	3.455	24.945
	Within Groups	56.096	405	.139	
	Total	66.461	408		
The convenience of researching and making travel bookings online anytime, anywhere is important in deciding to book through internet.	Between Groups	.002	1	.002	6.008
	Within Groups	9.998	47	.213	
	Total	10.000	48		
Searching for information and making my bookings online saves me time.	Between Groups	10.365	3	3.455	24.945
	Within Groups	56.096	405	.139	
	Total	66.461	408		
Travel information obtained online, for example visa requirements or best time to visit is trustworthy.	Between Groups	.150	1	.150	7.145
	Within Groups	48.667	47	1.035	
	Total	48.816	48		
Finding specific travel information online is easy.	Between Groups	.076	1	.076	12.491
	Within Groups	7.271	47	.155	
	Total	7.347	48		33.068

It is acknowledged that tourism "drives economic growth of a country." Local, state, and federal governments have made tourism a major planning priority (Hannam & Knox, 2010). Tourism also contributes to the creation of new jobs. Businesses and the government collaborate to manage and promote locations as the tourist sector grows. The Ministry of Tourism acknowledges domestic tour operators, adventure tour operators, travel agencies, and inbound tour operators as providers of "quality services" for visitors. Based on minimum paid-up capital, turnover, years of operation, availability of qualified personnel, minimum office space, and tax payments, tour operators are selected. In an effort to boost tourism in India, the ministry has a program for approving travel agencies, tour operators, adventure operators, and tourist transport operators in accordance with quality, standards, and services. The program is available to

all legitimate agencies. A "Web-based Public Delivery System" (PDS) has been established by the MoT to acknowledge travel service providers who want to apply for ministry recognition (Bédard et al., 2008; Sigala, 2013). This study focusses on applying TMIS to tourist development, management, promotion, and planning—an area of growing interest as a means of resolving issues facing the sector at large. Numerous scholars have attempted to apply TMIS to tourism planning, but to yet no such conceptual or physical model has been created. It has been discovered that there are still a number of TMIS applications unexplored for tourism planning. Therefore, additional analysis is required to determine TMIS's possible usefulness for tourism planning in order to construct a comprehensive conceptual architecture.

IV. CONCLUSIONS

This work's primary goal is to conduct research in various areas, which may have made it easier for the researcher to comprehend why the results varied due to cross-cultural factors and variations in work habits. The study's smaller sample size means that conclusions should be extrapolated with caution. TMIS can therefore be utilised to support the tourism management process, which in turn affects the performance of the tourism industry. The survey's findings will provide an empirical basis for understanding how TMIS is being implemented in tour operations. The report also highlights the methods used by tour operating companies for knowledge development, storage, transfer, and application. Furthermore, the research delves into the human, organisational, and barrier factors that impact the use of TMIS technologies and the tourism management process within businesses. The study's findings will add to the body of knowledge and serve as the foundation for more research. Tour operating companies would become more aware of the findings and be able to implement.

REFERENCES

- [1] Alnusairat, S., Elnaklah, R., Ab Yajid, M. S., Johar, M. G. M., & Khatibi, A. (2021). Information system, geography, information management system and tourism planning: a geographical perspective from Malaysia. *PalArch's Journal of Vertebrate Palaeontology*, 18(2), 42-60.
- [2] Ammirato, S., Felicetti, A. M., Della Gala, M., Raso, C., & Cozza, M. (2018). Smart tourism destinations: can the destination management organizations exploit benefits of the ICTs? Evidences from a multiple case study. *In Collaborative Networks of Cognitive Systems: 19th IFIP WG 5.5 Working Conference on Virtual Enterprises, PRO-VE 2018, Cardiff, UK, Proceedings 19*, 623-634. Springer International Publishing.
- [3] Bédard, F., Louillet, M. C., Verner, A., & Joly, M. C. (2008). Implementation of a destination management system interface in tourist information centres and its impact. *In Information and Communication Technologies in Tourism 2008*, 220-231. Springer, Vienna.
- [4] Borzyszkowski, J. (2014). Information technologies in the activities of destination management organizations. *Tourism and hospitality management*, 20(1), 61-70.
- [5] Della Corte, V., D'Andrea, C., Savastano, I., & Zamparelli, P. (2017). Smart cities and destination management: Impacts and opportunities for tourism competitiveness. *European Journal of Tourism Research*, 17, 7-27.

- [6] Dijana, Đ., & Jovana, T. M. (2023). Eco Tourism Development Based on Natural and Artificial Surroundings in Semberija and Majevisa Area. *Archives for Technical Sciences*, 1(28), 69-76.
- [7] Estêvão, J. V., Carneiro, M. J., & Teixeira, L. (2014). Destination management systems: creation of value for visitors of tourism destinations. *International Journal of Technology Management*, 64(1), 64-88.
- [8] Ivars-Baidal, J. A., Celdrán-Bernabeu, M. A., Mazón, J. N., & Perles-Ivars, Á. F. (2019). Smart destinations and the evolution of ICTs: a new scenario for destination management? *Current Issues in Tourism*, 22(13), 1581-1600.
- [9] Karya, S. G. N., Suyana, U. M., Urmila, D. H., & Nyoman, Y. N. (2019). Smart Tourism Destination Management In Karangasem Regency Of Indonesia. *Russian Journal of Agricultural and Socio-Economic Sciences*, 93(9), 256-273.
- [10] Llopiz-Guerra, K., Daline, U. R., Ronald, M. H., Valia, L. V. M., Jadira, D. R. J. N., Karla, R. S. (2024). Importance of Environmental Education in the Context of Natural Sustainability. *Natural and Engineering Sciences*, 9(1), 57-71.
- [11] Louillet, M. C., Bédard, F., & Dongmo Temgoua, B. (2021). Approach to Evaluating the Effect of an Inter-organizational Information System on Performance: The Case of a Destination Management Organization. In *Information and Communication Technologies in Tourism 2021: Proceedings of the ENTER 2021 eTourism Conference*, 337-351. Cham: Springer International Publishing.
- [12] Navío-Marco, J., Ruiz-Gómez, L. M., & Sevilla-Sevilla, C. (2018). Progress in information technology and tourism management: 30 years on and 20 years after the internet-Revisiting Buhalis & Law's landmark study about eTourism. *Tourism management*, 69, 460-470.
- [13] Önder, I., Wöber, K., & Zekan, B. (2017). Towards a sustainable urban tourism development in Europe: the role of benchmarking and tourism management information systems—A partial model of destination competitiveness. *Tourism Economics*, 23(2), 243-259.
- [14] Pöhn, D., & Hommel, W. (2021). Universal Identity and Access Management Framework for Future Ecosystems. *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, 12(1), 64-84.
- [15] Purnomo, S., Rahayu, E. S., & Riani, A. L. (2019). Tourism village management based on information technology with destination management system. In *Proceeding of International Conference on Science, Health, And Technology*, 229-233.
- [16] Safari, S., & Tourisme-IREGE, I. M. U. S. (2009). Developing the destination management system of Iran: opportunities and challenges for destination management organisations. *Transport and Tourism*, 279-304.
- [17] Sánchez-Ancajima, R. A., Jiménez-Carrión, M., Gutierrez, F., Hermenegildo-Alfaro, A. O., Saavedra-López, M. A., Hernández, R. M., & Exebio Moya, L. R. (2023). Applications of Intelligent Systems in Tourism: Relevant Methods. *Journal of Internet Services and Information Security*, 13(1), 54-63.
- [18] Sigala, M. (2009). Destination Management Systems (DMS): A reality check in the Greek tourism industry. In *Information and communication technologies in tourism 2009*, 481-491. Springer, Vienna.
- [19] Sigala, M. (2013). Examining the adoption of destination management systems: An inter-organizational information systems approach. *Management Decision*, 51(5), 1011-1036.
- [20] Surayyo, K., Yulduz, K., Munajat, T., Dilshod, M., Gulkhayo, M., Oygul, T., & Nodir, K. (2024). The Vital Role of Libraries in Enriching Tourism Experiences. *Indian Journal of Information Sources and Services*, 14(2), 11–16. <https://doi.org/10.51983/ijiss-2024.14.2.02>
- [21] Tavitiyaman, P., Qu, H., Tsang, W. S. L., & Lam, C. W. R. (2021). The influence of smart tourism applications on perceived destination image and behavioral intention: The moderating role of information search behavior. *Journal of Hospitality and Tourism Management*, 46, 476-487.