

Tourism in the Digital Era: Transformation, Opportunities, and Challenges

OPEN ACCESS

Volume: 13

Special Issue: 1

Month: February

Year: 2026

P-ISSN: 2321-4643

E-ISSN: 2581-9402

Citation:
Shanthi, M., and
Ganapathi. R. "Tourism
in the Digital Era:
Transformation,
Opportunities, and
Challenges." *Shanlax
International Journal of
Management*, vol. 13,
no. S1, 2026, pp. 247–56.

DOI:
[https://doi.org/10.34293/
management.v13iS1-i1-
Feb.10356](https://doi.org/10.34293/management.v13iS1-i1-Feb.10356)

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Abstract

In the age of digital technology, tourism is undergoing a significant transformation fueled by AI, big data, IoT, and mobile technology. This evolution is opening doors to personalized experiences, innovative business models, and improved management practices. However, it also encounters hurdles such as digital literacy, infrastructure issues, data privacy concerns, and cultural resistance. These factors are collectively redefining the processes of planning, booking, and in-destination experiences, aiming for enhanced efficiency and sustainability. Digital transformation can significantly change rural tourism by utilizing technology to improve visitor experiences, boost operational efficiency, and encourage sustainable tourism practices. Nevertheless, various challenges must be overcome to guarantee successful execution. A number of rural inhabitants might not be acquainted with digital technologies or may lack the essential skills to use them effectively. It is fundamental to contrivance digital literacy sequencers and exercise enterprises to instruct and authorise rural societies, a"– dealing business operations. In addition to prominence the need for premeditated forecasting, capacity building, and sympathetic policies to augment the advantages of digital technology, this study provides main perceptions into the current state of digital conversion within the tourism business. The results are expected to help academics, policymakers, and tourism groups understand how digitization will change the tourism industry going forward.

Keywords: Tourism, Digital Transformation, Digital Payments, Information Technology, Customer Experience, Sustainability

Introduction

People all around the world have been captivated by Indian religion and culture. Beaches, holy places, historical attractions, highland resorts, and much more draw tourists. Each region is distinguished by its people, customs, music, festivals, and handicrafts. Travel both domestically and abroad is encouraged by the Department of Tourism. The Tourism Advisory Board suggests actions to improve the travel and tourism industry in India. Sincere efforts could contribute to the growth of the travel and tourism sector in India. One

of the industries with the quickest rate of growth worldwide is tourism. It is essential to the growth of our country's economy. One of Asia's most popular travel destinations is India. New business models are required due to the challenges and changing times, and the tourism industry's growing rivalry necessitates a careful examination of existing tactics. In this shift, digital technology is crucial. The tourism industry's future success will be greatly influenced by the digital transition and the opportunities it presents. Global development has taken on new patterns as a result of scientific and technological breakthroughs and new discoveries.

Digitalization and digital transformation have an impact on the economy and society at large. Digitalization has caused the entrepreneurship ecosystem to change the way enterprises compete in the market and how individuals perceive, use, and access tourism services (Chamboko-Mpotaringa & Tichaawa 2021). Furthermore, the ease and flexibility of online booking, tour booking, and payment processes improve the consumer experience. Customers can simply compare and reserve the travel services they require from the comfort of their own homes thanks to a variety of websites and online applications, avoiding the drawn-out and difficult consultation process that comes with the conventional method. Businesses in the industry can save a significant amount of time and money by utilizing modern technologies. Big Data, IoT, will be a powerful right hand to assist tourism businesses in confidently managing data, optimizing operations, and improving service quality.

Review of Literature

Rendering to Subash (2015) impact on job generation and global GDP has increased tremendously including the national and state governments, the commercial sector, and the general public, must work together to ensure the sustainable growth and upkeep of the country's travel and tourist industry. According to Sujith and Jisha (2017), it produces foreign exchange earnings. It encourages cultural pursuits. India's information technology advancements by Butler (2018) it also provides insights based on professional examination of the existing state of affairs.

The tourist sector has been one of the first to embrace ICT and digital innovations, which has changed the value chain and the relationships between companies and customers, according to Sciarelli et al. (2018). Ironically, the growing amount of information available has created what is known as the "informative syndrome," which occasionally makes these connections more difficult. The difficulties of looking at this problem via the prism of a single case study are highlighted in this paper. It functions as a preliminary stage of more extensive research that will require further investigation concerning the number of case studies and demand.

Konstantinova (2019) investigates the impact of digital technology on the growth of tourism. Artificial intelligence, Blockchain technology, sharing economy platforms, the internet of things, virtual reality, augmented reality, voice search, improving customer experience, leisure travel, and more are some of the ways that tourism is undergoing digital transformation. Establishing new major projects, honing digital skills and competencies, encouraging creativity and innovation, forging new connections between producers and consumers, implementing best practices, developing new value chains, customizing visitor experiences, obtaining funding, changing destination configurations, enhancing infrastructure, and winning political support are just a few of the opportunities and challenges brought about by d,--

According to Barykin et al. (2021), COVID-19 caused major effects all over the world. Numerous industries across the globe can attest to the magnitude of the disruption's effects on their respective fields, especially with relation to operational flow, human resources, and income creation.

According to Bilgili and Koc (2021), many industries, like tourism, which is an important element of the global economy, are being profoundly impacted by digital technology. According

to Bănescu et al. (2021), economic growth, education, Internet skills, and ICT infrastructure safety and security all have an impact on the proportion of people who plan their vacations online. The fixed-effects model proved to be the most effective. Furthermore, the study discovered that the use of online travel booking services was heavily influenced by country.

Thus according to Kumar (2022), the tourism industry has a huge impact on a country's growth, and historic sites play an important role in Indian tourism. However, this industry faces a number of challenges, including inadequate infrastructure facilities, international concerns about visitor health and safety, disparate state-by-state tax legislation for road and highway services, and a skilled labor shortage. This essay will address the factors that have an impact on the tourism industry.

According to Cave et al. (2022), this paper offers useful information into the opportunities and challenges faced by destination marketers advocating for recuperative tourism. Specialists emphasize the importance of having practical tools, innovative viewpoints, and relevant examples in order to effectively communicate the concept of regenerative tourism.

According to Phuong (2022), one of the most important components of the tourism of the industry's digital transformation is the development of platforms and solutions for operational efficiencies. Swajan Shriyon (2024) Machine has created numerous prospects for development, ensuring that this progress is permanent; however, certain issues must be addressed, such as improving internet security and social media activity. Technology economy, but rather fostering inclusive

Santarsiero et al. (2024) the paper also makes recommendations for further research and strategic planning to help the tourist industry reform itself. Yang (2025) explores the benefits and drawbacks of incorporating new technologies into tourist instruction. However, further research is needed to eliminate institutional hurdles and promote equal access to digital education. Zhang and colleagues (2025) study advances the field of digital tourism by integrating several theoretical ideas and providing practical strategies for using technology responsibly and sustainably in a range of sectors.

A study by Bekele and Raj (2025) examines the patterns in publications and citations in the field of tourism-related digitalization and digital transformation research. This report offers some suggestions for further research on the digitalization and digital transformation of the tourism industry in order to improve its implementation.

Objectives of the Study

1. To study the type of tourism organization and the digital payments in tourism industry.
2. To evaluate the major barrier to digital transformation in Tourism sector.
3. To determine the Opportunities and Challenges for Tourism in the Digital Era.

Research Methodology

The approach taken in this research highlights the techniques employed to achieve the study's goals, which encompass research design, sampling strategy, data sources, data collection, data processing, coverage period, and analytical framework.

Research Design

The large amount of data has been gathered from main sources. So, to show, explain, and analyze this big data in the current research report, it's important to choose the right research design. The research design chosen for this study is descriptive.

Source of Data

The study is mainly focused on primary data which were collected through well-designed questionnaires to suit the points of this research. The principal data have been supplemented by secondary sources. The necessary secondary data relating to the study have been gathered from books, journals, websites, reports and journals, magazines, and newspapers.

Sample Design

Simple random sampling was the method employed to pick the sample respondents.

Framework of Analysis

Statistical techniques for analysis include (i) percentage analysis, (ii) ANOVA, and (iii) correlations.

Research Analysis

Table 1 Type of Tourism Organization

Type of Tourism Organization	Frequency	Percent
Hotel	70	23.3
Travel Agency	91	30.3
Tour Operator	82	27.3
Transport Service	57	19.0
Total	300	100.0

The geographic distribution shows that different kinds of tourism groups are well represented. Nonetheless, the predominance of tour companies and travel agents underscores the importance they play in tourism-related activities. Although it represents a variety of viewpoints within the tourism industry, this varied participation improves the trustworthiness of the study's conclusions.

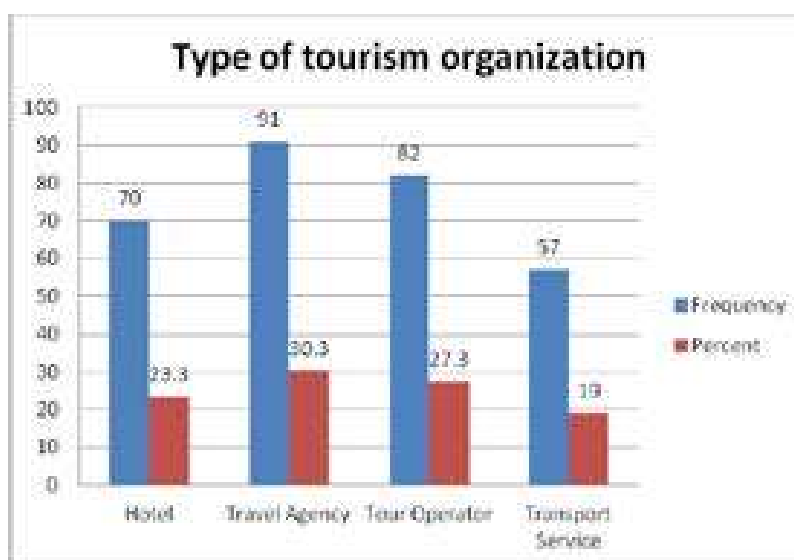


Figure 1 Type of Tourism Organization

Table 2 Digital Technology in Tourism

Digital Technology In Tourism	Frequency	Percent
Artificial Intelligence (AI)	64	21.3
Big Data & Analytics	70	23.3
Virtual Reality (VR) & Augmented Reality (AR)	35	11.7
Internet of Things (IoT)	45	15.0
Cloud Computing	86	28.7
Total	300	100.0

The outcomes show that while new innovations like AI and IoT are starting to gain traction, tourist firms mostly concentrate on cloud-based solutions and data analytics. The comparatively poor uptake of VR and AR implies that more funding, education, and awareness are required in order to fully realize the opportunities they offer for enhancing marketing tactics and visitor engagement.

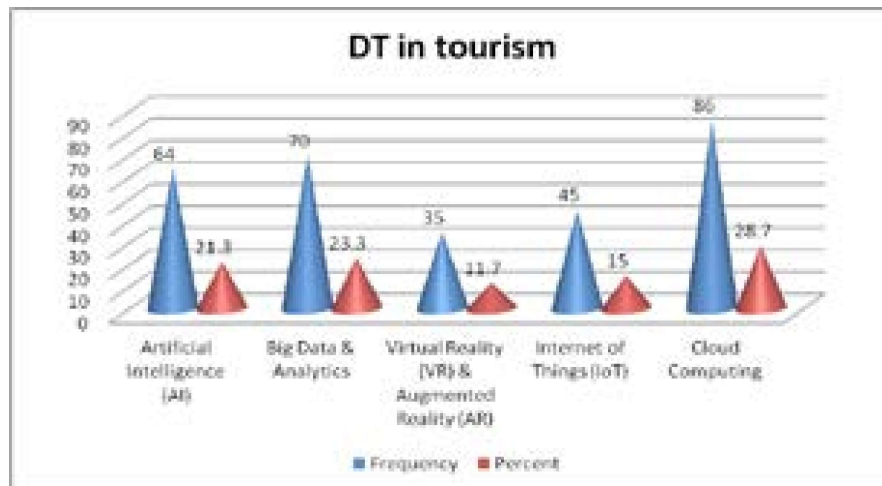


Figure 2 Digital Technology in Tourism

Table 3 Level of Digital Technology Usage

Level of Digital Technology Usage	Frequency	Percent
Low	83	27.7
Moderate	142	47.3
High	75	25.0
Total	300	100.0

Technology is advancing quickly in the tourism sector, and data-driven solutions are being used more and more. In conclusion, these results encourage tourism experts to adopt new technology in order to progress their industry and enhance the customer experience.

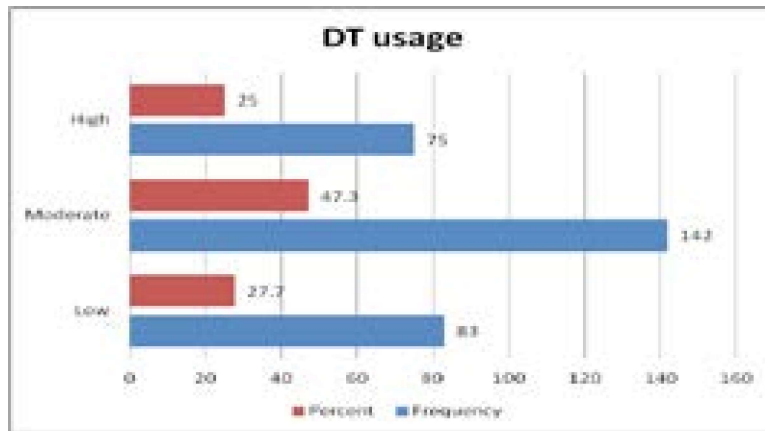


Figure 3 Level of Digital Technology Usage

Table 4 Types of Digital Payment

Types of Digital Payment Used	Frequency	Percent
UPI	87	29.0
Debit/Credit Card	83	27.7
Mobile Wallet	53	17.7
Internet Banking	77	25.7
Total	300	100.0

Indicate that respondents favour quick, safe, and convenient methods of digital payment, with UPI being made the most popular payment method in the travel sector.

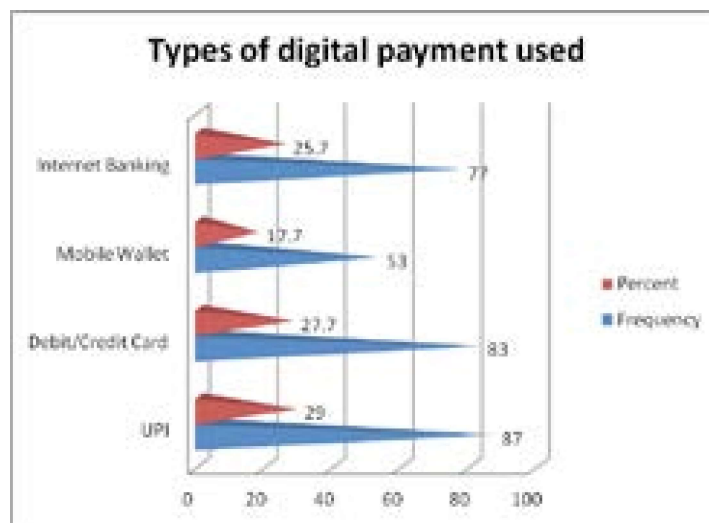


Figure 4 Types of Digital Payment Used

Table 5 Major Barrier to Digital Transformation

Major Barrier to Digital Transformation	Frequency	Percent
High cost	83	27.7
Lack of skills	97	32.3
Poor infrastructure	60	20.0
Data security concerns	60	20.0
Total	300	100.0

A significant percentage of respondents (32.3%) believe that the primary obstacle to digital transformation is a lack of competence. Second, 27.7% of participants said that the significant costs are necessary. Additionally, 20.0% of respondents think that concerns about data security and insufficient infrastructure are related issues.

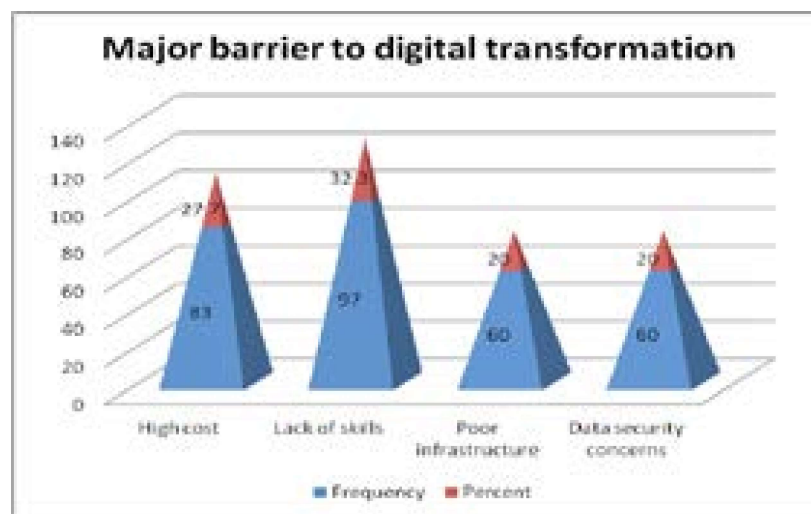


Figure 5 Major Barrier to Digital Transformation

Table 6 Digital Transformation in Tourism and the Gender of the Respondents

ANOVA						
Digital Transformation in Tourism		Sum of Squares	DF	Mean Square	F	Sig.
Tourism digitally transformed	Between Groups	11.202	1	11.202	7.907	.005
	Within Groups	422.194	298	1.417		
	Total	433.397	299			
Tourism-related information	Between Groups	19.220	1	19.220	14.993	.000
	Within Groups	382.017	298	1.282		
	Total	401.237	299			
Travel planning experience	Between Groups	39.902	1	39.902	22.141	.000
	Within Groups	537.044	298	1.802		
	Total	576.947	299			
Tourism service providers	Between Groups	2.494	1	2.494	3.934	.048
	Within Groups	188.903	298	.634		
	Total	191.397	299			

Service quality in tourism	Between Groups	5.227	1	5.227	8.367	.004
	Within Groups	186.169	298	.625		
	Total	191.397	299			

The ANOVA's findings demonstrate that gender has a significant impact on the travel industry's digital transformation. The significance (Sig.) values for each variable under analysis are less than 0.05, indicating statistically significant differences between males and females. Findings show those respondents' experiences with and perceptions of digital transformation in the tourism sector are significantly influenced by their gender.

Table 7 Challenges of Indian Tourism and the Gender of the Respondents

ANOVA						
Challenges of Indian Tourism		Sum of Squares	DF	Mean Square	F	Sig.
Lack of proper infrastructure	Between Groups	6.845	1	6.845	4.500	.035
	Within Groups	453.325	298	1.521		
	Total	460.170	299			
Access and connectivity	Between Groups	11.520	1	11.520	19.330	.000
	Within Groups	177.600	298	.596		
	Total	189.120	299			
Amenities	Between Groups	31.205	1	31.205	16.800	.000
	Within Groups	553.525	298	1.857		
	Total	584.730	299			
Human resource	Between Groups	9.245	1	9.245	6.937	.009
	Within Groups	397.142	298	1.333		
	Total	406.387	299			
Information & communication	Between Groups	4.500	1	4.500	3.927	.048
	Within Groups	341.500	298	1.146		
	Total	346.000	299			
Security & safety	Between Groups	5.780	1	5.780	6.054	.014
	Within Groups	284.500	298	.955		
	Total	290.280	299			
Lack of publicity	Between Groups	8.000	1	8.000	6.618	.011
	Within Groups	360.250	298	1.209		
	Total	368.250	299			

Because all of the significance (Sig.) values are less than 0.05, the ANOVA results show that gender has a significant influence on all of the major difficulties confronting Indian tourism.

Table 8 Correlate - Opportunities for Tourism in the Digital Era and the Digital Transformation in Tourism

Correlations			
		Opportunities for Tourism in the Digital Era	Digital Technology in tourism
Opportunities for Tourism in the Digital Era	Pearson Correlation	1	.142*
	Sig. (2-tailed)		.014
	N	300	300
Digital Technology in tourism	Pearson Correlation	.142*	1
	Sig. (2-tailed)	.014	
	N	300	300

*. Correlation is significant at the 0.05 level (2-tailed).

Opportunities for Tourism in the Digital Era and Digital Technology in Tourism are positively and significantly correlated, according to the analysis. The significance value ($p = 0.014$), which is less than the 0.05 cut-off, indicates that this relationship is statistically significant.

Recommendations and Conclusion

Ensure that all users have access to travel websites, applications, and digital services to foster the development of digital platforms that are inclusive of all genders. Offer specialized digital training initiatives designed to close the gender-related skill gaps in the use of advanced technologies in tourism. The significance of digital transformation stems from the idea that digital technology enables people to find answers to traditional problems and that they are more likely to use digital solutions rather than old ones. The shift implies that, rather than simply improving and sustaining old processes, digital applications often promote new sorts of development, creativity, and innovation in a certain area. The creation of new digital business units can be part of a company's digital transformation, but the creation of new business models can also lead to expansion into new markets or well as for specific enterprises. It may enhance public services, create jobs, increase economic growth, increase competitiveness worldwide, and promote preservation of the environment.

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