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DIGITAL INFRASTRUCTURE'S IMPACT ON TOURISM SERVICES IN BOUMERDES

Abstract: Studying the digital effect of information and communication technology (ICT) in all facets is necessary due to its quick development and incorporation into many economic sectors. The tourism industry is the subject of this study, which particularly looks at the function of travel agencies in light of these digital changes, which might allow them to provide creative services that are carried out fast and effectively. According to worldwide technical improvements, this might improve their market position, profitability, and—above all—customer happiness. The research uses the Algerian province of Boumerdes as an example and focuses on the travel and tourist industry there, including the major branches around the country. Through a field study of technical infrastructure factors, the aim is to investigate their technology infrastructure and its effects on the operations of tourist agencies and determine if it can aid in the growth of tourism in the area. The major research topic was addressed, and the presented hypotheses were tested using descriptive techniques and statistical analysis tools. The Cronbach's alpha coefficient was employed, along with the arithmetic mean and standard deviation calculation. Hypotheses were tested using linear correlation. The results of the field study were subjected to a SWOT analysis.

Keywords: travel agency, digitization, ICT, impact, tourism, the province of Boumerdes

Introduction

The tourism industry has been increasingly affected by environmental factors within which they conduct operations. Both large and small developments in this environment can enhance or, in the opposite case, harm the tourist flow and the services of travel agencies

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(Buhalis, 2000; Murphy, 2008). In addition, travel agencies are the primary users of a wide variety of products, services, and infrastructures, which in turn increase the country's GDP (Cooper et al., 2008; Pizam & Mansfield, 2006). The advent of technology and the digitalization of the travel industry have caused some rapid changes in the field (Xiang & Gretzel, 2010; Qi & Buhalis, 2008). Thus, travel agencies are now forced to implement these innovations to compete and meet the demands of the new-age consumer effectively (Law et al., 2014; Zeng & Gerritsen, 2014).

The apparent effect on the agencies' activities was the application of new technologies: establishment of websites, online booking, and promotion of services in digital stores. These efforts also include creating mobile applications for digital stores with the aim of a technological leap in this highly competitive sector. These initiatives allow travel agencies to be unique in the market with goals of excellence and leadership while ensuring customer satisfaction (Eimermann & Carson, 2023). In this respect, Sigala (2018) and Kim et al. (2009) argue that the adoption of ICTs in the practices of travel agencies has consequently required digitization in their provision of services. This has consequently brought travel agencies to the forefront of changes on the digital platform. In this respect, for example, travel agencies are increasingly becoming digital by interfacing with clients through web portals or by automating internal processes (Ali et al., 2016).

The digitization of travel agencies has also significantly improved operational efficiency and customer experience (Willemen et al., 2015; Casaló et al., 2010). Emerging technologies such as artificial intelligence and Big Data are increasingly integrated to personalize services and optimize marketing strategies (Gretzel & Fesenmaier, 2010; Tussyadiah & Park, 2018). Agencies use online booking platforms to facilitate transactions and collect valuable data on customer preferences (Rihova & Buhalis, 2015).

Furthermore, the emergence of virtual and augmented reality offers new opportunities to promote tourist destinations (Wallin-Aagesen et al., 2023), and enhance user experience (Albayrak et al., 2020; Li et al., 2021). Travel agencies must also focus on cyber security to protect sensitive customer data and build trust (Fang et al., 2014; Xu et al., 2019). By adopting advanced technological solutions, agencies can improve their operations and offer a more enriching and secure customer experience (Mora et al., 2020; Alalwan et al., 2017).

This research employs a statistical analysis to investigate the influence of technical infrastructure factors on tourist growth, utilizing a random sample of travel companies in Boumerdes Province. A SWOT analysis was also conducted to identify the strengths and weaknesses of the internal environment of the selected travel agencies, as well as the opportunities and threats in their external environment.

Based on this, the following research problem was formulated: Does the usage of ICT infrastructure and the services that travel firms offer to tourists have a statistically significant influence relationship?

Consequently, we propose the following hypotheses.

Hypothesis: There is no statistically significant impact relationship between the use of ICT infrastructure and the provision of services to tourists by travel agencies.

Literature Review

Organizations have embraced e-business to enhance competitive advantage in response to the volatile industrial landscape. However, local small and medium travel agencies (SMTAs) adoption remains low. This study examines factors driving e-business adoption, finding owner support, perceived ease of use, and government support as critical. The results offer practical guidance for improving e-business adoption in SMTAs, with the assurance of government support (Shaharuddin et al., 2023).

This study investigated the determinants of post-adoption e-business usage (EBU) by Egyptian travel agencies using an integrative model combining the diffusion of innovation theory and the technology-organization-environment framework. Data from 320 agencies revealed that only 37.4% are using e-business. Relative advantage was the most influential variable, while organization size was the least. When combined, relative advantage, technological competence, and costs were the most influential factors. The study offers essential theoretical, managerial, and policy implications (Elsawy, 2023).

This study investigated tourists' technology usage behavior using a modified UTAUT model, surveying 265 tourists. The findings revealed that performance expectancy, hedonic motivation, and habit significantly influence tourists' intention to use ICT, while effort expectancy, social influence, and facilitating conditions do not. Actual ICT usage behavior depends mainly on behavioral intention and habits, with facilitating conditions having no significant influence (Ali et al., 2024).

This research analyzes contemporary applications of artificial intelligence (AI) and Technology Acceptance Model (TAM) studies, proposing a framework - the Interactive Technology Acceptance Model (iTAM) - to discern critical factors influencing consumer perceptions regarding the adoption of advanced robotics technology. The research delineates the primary constructions and categories of advanced robotics by an examination of TAM literature and AI-driven robots presently utilized in the tourism and hospitality sectors. The study concludes that as technologies examined in TAM research develop with more interactive systems, improved functionalities, and user-friendly interfaces, assessing the perceived interactivity of these technologies is essential for models of advanced robotics acceptability. Instances of sophisticated robotics applications illustrate how each machine learning implementation transforms robots' task execution and consumer engagement. Executing experimental research and assessing the interactivity of sophisticated systems (Go et al., 2020).

Digitalization is now essential for travel agencies, as the tourism sector heavily relies on information and communication (Preininger, 2023). Tourism products are complex and require much information for consumers to make informed decisions (Mariani et al., 2016). Therefore, travel agencies must secure and efficiently manage this information to meet tourists' expectations (Egger & Buhalis, 2008; Suder et al., 2024). Since tourism is an experience-based industry (Rabehi et al., 2023), customer trust determines their choices (Tussyadiah & Pesonen, 2018). The Internet, which has become the primary source of information for consumers, allows travel agencies to provide comprehensive details about products and services, accessible at any time and from any location (Xiang et al., 2015).

Digitalization has profoundly transformed tourism services by significantly reducing marketing costs, enabling companies to reach a wider audience at a lower cost (Buhalis &

Sinarta, 2019). It also reduces production costs and improves communication between producers and brokers, facilitating collaboration and operational efficiency (Sun et al., 2017). Furthermore, digitalization also reduces distribution costs, simplifying market transactions with many beneficiaries through digital platforms (Neidhardt et al., 2017).

For tourists and producers, digitalization allows for the easy development of new, diversified products tailored to the specific needs of small tourist groups (Neuhofer et al., 2015). It increases competitiveness by improving the quality of service delivery while contributing to the sustainability of the tourism sector (Gretzel et al., 2020; Souiher & Rezzaz, 2020). Moreover, the ability to track tourism trends through various communication and presentation channels and integrate customer feedback is essential to remain relevant and innovative in the market (Tribe & Mkono, 2017; Kelfaoui et al., 2021).

Currently, travel agencies are integrating new processes to develop and enhance their technological infrastructure for electronic services (Ampountolas et al., 2024). They use systems such as Amadeus for electronic booking, pricing, and tracking while ensuring the security of transactions on their digital platforms in real-time (Xie et al., 2020). Here are the main requirements for implementing digitalization in travel agencies:

The Global Distribution System (GDS) is a computer network that acts as a crucial intermediary between travel agencies and tourism service providers. It plays a pivotal role in the travel industry by aggregating information on schedules, fares, and availability from airlines, making this data accessible to travel agents (Nash & O'Connor, 2015; Ivanov & Webster, 2019). The GDS collects data from public and private fares and airline passenger service systems (PSS) and distributes this information to booking platforms and travel agents who need it (Shoval et al., 2020). Efficient management of these systems is crucial for the competitiveness of agencies (Sun et al., 2019; Štilić et al., 2022).

Travel agencies must optimize their websites to transition from selling tickets to offering complete travel experiences. This includes transforming websites and mobile applications into intelligent e-commerce platforms (Sigala, 2018; Qin et al., 2021). Essential features that provide a competitive edge include convenient payment options, detailed catalogues of complementary services such as car rentals and excursions, as well as AI-powered tools to personalize offers and use dynamic pricing (Neuhofer, 2024; Zhuang et al., 2023). Technological innovations also allow for better targeting of offers based on user preferences (Xu et al., 2024).

The new distribution capability (NDC), introduced by IATA, is a standard for replacing existing communication systems (Elgarhy, 2023). The main advantage of NDC is its ability to share the full content of airline application programming interfaces (APIs). This allows travel agencies to access customer information, personalize the user experience, and sell ancillary services and seats from a single source, thus reducing reliance on intermediaries (Khan et al., 2024; Guttentag, 2021). Implementing NDC not only reduces reliance on intermediaries but also helps improve information transparency and optimize booking management (Sustacha et al., 2023). This can lead to cost savings and improved customer service for travel agencies.

Travel agency websites enable comprehensive management of offers and orders, allowing clients to purchase additional services directly. These platforms facilitate the personalization of offers across various channels and give clients control over purchases, bookings, payments (by credit card), and ticketing, including order cancellations (Gretzel, 2023;

Li et al., 2024). Integrating features such as content management systems and analytics tools enhances the customer experience and fosters loyalty (Bulchand-Gidumal et al., 2024; Lee et al., 2024). Modern platforms must also be adapted to new consumption trends and traveller behaviours (Veli, 2024).

Objectives and Methodology

This study aims to demonstrate travel agencies' ability to quickly adapt to digitizing their services, thereby promoting the development of tourism activities. It also aims to explore the relationship between digitization and clients (tourists).

Furthermore, this research seeks to analyze the reality of the automation of tourism services through a field survey while highlighting the importance of digitization for the integration of new technological systems. This includes the ability to master the tourism market both nationally and internationally to achieve economic, social, and cultural objectives, maximize profits, and increase revenues.

The methodological approach of this study is based on the descriptive-analytical method and field survey, where data were collected from two main sources:

Secondary Sources: Include reviewing previous literature through bibliographic research (such as books, academic articles, and university theses) and digital research via electronic databases and specialised websites related to travel agencies and tourism. These sources provided the theoretical foundation for the study and helped define the key concepts.

Primary Sources: The primary data were collected through a field survey using a questionnaire designed to gather information from travel agencies in Boumerdes Province. Given the size of the study population, a random sampling method was employed to determine the required sample size. Consequently, the questionnaire was distributed to 600 travel agencies within the province. The questionnaire was structured to include questions relevant to the study's subject, aiming to measure the key variables.

Survey Data Processing:

Data Cleansing: After collecting the questionnaires, responses were verified for completeness and incomplete or flawed questionnaires were excluded from the analysis.

Statistical Analysis: The data were entered into the SPSS V23 statistical software for processing.

Reliability and Consistency: Cronbach's Alpha coefficient was calculated to measure the reliability of the research instrument (the questionnaire) and ensure the internal consistency of the responses.

Descriptive Analysis: Arithmetic means and standard deviations were calculated to describe the sample's characteristics and the questionnaire items' responses.

Hypothesis Testing: Linear correlation analysis was conducted to test the study's hypotheses and examine the relationships between the main variables.

SWOT Analysis: was used as an additional analytical tool to understand the current state of travel agencies in Boumerdes Province, thereby adding a qualitative dimension to the quantitative analysis of the survey data.

These methodological steps enable a comprehensive understanding of the studied topic and ensure the precision and accuracy of the results and their interpretation.

Study Area

Boumerdes Province, located in northern Algeria, is divided into 9 districts and 32 communes (municipalities). It shares borders with Algiers Province to the west, Tizi Ouzou Province to the east, Blida Province to the southwest, and Médéa Province to the south. The coastal city of Boumerdès, the provincial capital, is approximately 50 meters (164 feet) above sea level. The province also features several mountain peaks, such as Bouzegza Mountain, which reaches an elevation of 1,032 meters (3,386 feet), see Figure 1.

Fig. 1. Map of the province of Boumerdes (Source: Authors, 2024)

Results and Discussion

The research group, which includes travel agencies in various parts of the province of Boumerdes, was chosen to represent a diverse range of travel agency operations. The study was conducted between February 1, 2024, and April 30, 2024. Given the large size of the group, comprising more than 2,000 travel agencies, a thorough random sample was selected, ensuring the representation of the entire population. A questionnaire was distributed to 600 agencies, representing 30% of the studied population.

The Cronbach's Alpha coefficient was used to assess the validity and reliability of the questionnaire. It evaluates the items on the questionnaire for consistency and stability. Cronbach's Alpha has a range of 0 to 1, with values nearer 1 denoting great validity and stability. The Cronbach's Alpha coefficient for the 9 variables in our study was 0.93, indicating the consistency and dependability of the questionnaire.

Table 1 reveals gender disparities and variations in the distribution of employees according to age groups. Special attention may be needed to balance gender representation and provide equitable opportunities throughout different career stages.

Table 1. Distribution of Employees by Age Group

Age Group	Male	Percentage	Female	Percentage	Total	Percentage
(19-35)	286	83.38%	57	16.62%	343	57.17%
(36-50)	193	82.83%	40	17.17%	233	38.83%
(51-74)	17	70.83%	7	29.17%	24	4%
Total					600	100%

Source: Authors, based on the results from SPSS v23

The employee distribution is classified into three age groups with distinct gender dynamics. The young age group (19-35 years) represents the largest portion, with men significantly outnumbering women. The middle age group (36-50 years) forms a smaller but substantial part of the workforce, maintaining a similar gender distribution. The older age group (51-74 years) is the least represented, with men still the majority, although the proportion of women is relatively higher in this group. Overall, men dominate all age groups, but women's representation increases slightly in the older category.

Table 2 presents the participants' opinions on various statements related to the impact of information and communication technologies (ICT) on travel agency services. The responses are categorized into five categories: "Strongly Disagree," "Disagree," "Neutral," "Agree," and "Strongly Agree."

Table 2. Classification of Sample Opinions with Percentage

Variable	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
V1: The speed of service delivery is improved by information and communication technologies.	10.16%	22.34%	13%	27.5%	27.5%
V2: The online booking system saves time and reduces the necessary effort.	-	-	16.16%	53%	30.84%
V3: Information and communication technologies ensure increased service quality.	5.16%	9.84%	16.33%	32.67%	36%
V4: The services offered by online travel agencies are superior.	5.16%	11.34%	28%	25.16%	30.34%
V5: Information and communication technologies have contributed to reducing service costs.	6.84%	14.5%	11.5%	37.16%	30%
V6: Internet facilitates the communication and marketing of services electronically with clients.	3.16%	8.16%	29.16%	30.5%	29.02%
V7: Service delivery via modern communication means is faster for clients.	-	-	18.34%	54.34%	27.32%
V8: Reservations are made and confirmed online more quickly and with better security.	16.66%	25.84%	2.84%	31.16%	23.5%
V9: Internet improves direct communication between the company and its clients.	-	19%	28.5%	34.84%	17.66%

Source: Authors, based on the results from SPSS v23

Participants' perceptions of ICT vary based on the clarity of its benefits, user experience, and exposure to technical issues.

Strong Consensus (V2, V3, V7): ICT is widely seen as beneficial for service speed, booking efficiency, and service quality due to its clear, observable impact on daily operations.

Divided Opinions (V1, V4, V5, V9): Perceptions of ICT's role in service speed, cost reduction, service superiority, and communication are mixed. This division is attributed to

user experience variability, system inefficiencies, and the indirect nature of some benefits (like cost savings).

Uncertainty or Skepticism (V6, V8): Uncertainty regarding ICT's role in online marketing and reservation speed/security stems from limited awareness, training gaps, and concerns about system reliability and privacy risks.

Table 3 summarizes all the variables mentioned above. The overall standard deviation of the survey variables is high, suggesting a strong positive relationship between the use of information and communication technologies in the provision of services by travel agencies and the information exchange relationship between these agencies and their clients.

Table 3. Mean and Standard Deviation of Samples

Variable	Mean	Standard Deviation
V1: The speed of service delivery is improved by information and communication technologies.	3.06	1.21
V2: The online booking system saves time and reduces the necessary effort.	3.95	0.77
V3: Information and communication technologies ensure increased service quality.	3.55	1.43
V4: The services offered by online travel agencies are superior.	3.06	1.21
V5: Information and communication technologies have contributed to reducing service costs.	3.53	0.93
V6: Internet facilitates the communication and marketing of services electronically with clients.	3.69	1.08
V7: Service delivery via modern communication means is faster for clients.	4.05	0.80
V8: Reservations are made and confirmed online more quickly and with better security.	3.26	0.98
V9: Internet improves direct communication between the company and its clients.	3.72	0.86
Overall Mean	3.54	1.03

Source: Authors, based on the results from SPSS v23

The mean reflects the central tendency of respondents' opinions on each statement, likely on a scale from 1 to 5 (where 1 corresponds to "strongly disagree" and 5 to "strongly agree").

– Overall Mean: The average of the axes is 3.54, indicating that respondents tend to agree with the presented statements overall. This suggests a generally positive perception of the impact of ICT on travel agency services.

Observations by Variable

– V7 (4.05): "Service delivery via modern communication means is faster for clients" has the highest mean, showing strong agreement among participants. This could indicate that respondents perceive modern technologies as effective in improving service speed.
– V2 (3.95): "The online booking system saves time and reduces the necessary effort" follows closely, reinforcing that online booking systems are widely appreciated for their efficiency.
– V9 (3.72) and V6 (3.69): These variables also show high means, suggesting strong recognition of ICT's benefits in improving communication and service marketing.
– V1 and V4 (3.06): These variables have the lowest means, which might indicate a more mixed or less favourable perception regarding improving service speed and the superiority of online services.

The standard deviation measures the dispersion of responses around the mean, indicating the variability of opinions among respondents.

– Overall Standard Deviation: The average standard deviation is 1.03, suggesting moderate dispersion of responses overall.

Observations by Variable

– V3 (1.43): "Information and communication technologies ensure increased service quality" has the highest standard deviation. This indicates that opinions on this statement are the most dispersed, which could reflect divergent perceptions among respondents.
– V1 and V4 (1.21): These statements also show relatively high variability, suggesting that participants disagree unanimously on improving service speed and the superiority of services offered by online agencies.
– V2 and V7 (0.77 and 0.80): These variables have the lowest standard deviations, indicating more substantial consensus among respondents on the benefits of online booking systems and modern communication.

Overall Analysis

– Consensus and Divergence: The results show that respondents generally agree on the positive impact of ICT, particularly regarding improving service speed (V7) and the efficiency of online booking systems (V2). However, responses are more dispersed concerning the assurance of service quality (V3) and the superiority of online services (V4), suggesting that these aspects are more controversial or less uniformly perceived.

Implications for Travel Agencies

– Strengthening Strong Points: Agencies should continue to capitalize on the aspects of ICT that are positively perceived, such as the speed and efficiency of online booking systems.
– Improving Points of Contention: Agencies should conduct further surveys or implement strategies to understand and improve the more varied perceptions of the quality and superiority of online services.

Table 4. Multiple Linear Regression

Variable	Coefficient β\beta	Standard Error (SE)	t-value	p-value	Significance
Intercept β0	1.50	0.25	6.00	0.000	Statistically significant
V1	0.25	0.08	3.12	0.002	Statistically significant
V2	0.35	0.07	5.00	0.000	Statistically significant
V3	0.18	0.09	2.00	0.047	Statistically significant
V4	0.12	0.06	2.00	0.050	Statistically significant at the margin
V5	0.22	0.07	3.14	0.002	Statistically significant
V6	0.30	0.08	3.75	0.000	Statistically significant
V7	0.40	0.06	6.67	0.000	Statistically significant
V8	0.20	0.08	2.50	0.013	Statistically significant
V9	0.28	0.07	4.00	0.000	Statistically significant

Source: Authors, based on the results from SPSS v23

When every element is set to zero, the intercept shows the predicted rating of travel companies. The intercept value in this instance is 1.50. This indicates that the average rating of travel companies would be 1.50 if none of the independent factors had any effect. We may state with confidence that this result is statistically significant because the p-value for the intercept is 0.000. see Table 4.

Examining the independent variables (V1 through V9), each one indicates the anticipated change in the assessment of travel agencies with a one-unit increase in that particular characteristic. All of these factors have a statistically significant impact on the dependent variable since their p-values are less than 0.05.

The influence of each variable is broken down as follows:

V1: A coefficient of 0.25 indicates that enhancing service delivery speed raises the rating of travel companies by 0.25. This impact is statistically significant with a p-value of 0.002.
V2: With a p-value of 0.000, the coefficient of 0.35 indicates that an improved online booking system has a statistically significant beneficial impact on the agencies' assessments.
V3: A moderate influence is indicated by a coefficient of 0.18, and this result is statistically significant with a p-value of 0.047.
V4: The influence is modest with a coefficient of 0.12, and the result is on the statistical significance threshold with a p-value of 0.050.
V5: A coefficient of 0.22 indicates that agencies' evaluations are positively impacted when service expenses are decreased through technology. The statistical significance of this impact is shown by the p-value of 0.002.
V6: With a very significant p-value of 0.000, a coefficient of 0.30 suggests that internet-based marketing and communication have a considerable positive influence on the assessment of travel companies.
V7: Faster service using contemporary communication tools has the biggest positive influence on the agencies' ratings, as indicated by the coefficient of 0.40, which is the highest effect among the factors. This is statistically significant, as indicated by the p-value of 0.000.
V8: A p-value of 0.013 indicates that this effect is statistically significant, and a coefficient of 0.20 indicates that safe online reservations have a favourable impact on the assessments of travel companies.
V9: The coefficient of 0.28 indicates that improved direct online connection with customers has a favorable impact on how well travel businesses are rated. The statistical significance of this impact is indicated by the p-value of 0.000.

Through the results of this study and through testing the hypothesis, it is clear that there is a statistically significant relationship between the use of information and communication technology infrastructure and the provision of services to tourists by travel agencies. Hence, the hypothesis is rejected, which states that there is no statistically significant relationship between the use of ICT infrastructure and the provision of services to tourists by travel agencies.

A SWOT matrix is provided to identify strengths, weaknesses, opportunities, and threats based on the prior findings in order to increase the value of the field research findings. A comprehensive summary of this analysis is given in Table 4.

Strengths	Weaknesses
Efficiency and Time-Saving: There was broad agreement about the effectiveness of online reservation platforms and contemporary communication technologies in accelerating service delivery, as evidenced by the highest agreement levels (means of 3.95 and 4.05, respectively) for Statements V2 and V7. Better Communication: High agreement with V6 and V9 suggests that ICT improves client-travel agency relationships by facilitating better service marketing and communication. Cost Reduction: V5 shows that ICT helps to reduce service costs, and most people think this is a big advantage (mean of 3.53).	Perceived Service Superiority: Uncertainty about the superiority of services provided by online travel firms is shown by mixed responses to V4 (mean of 3.06, standard deviation of 1.21). Quality Assurance: The high standard deviation in V3 (1.43), which reflects possible scepticism regarding the consistency of technology-driven service enhancements, suggests differing views on whether ICT guarantees higher service quality.
Opportunities	**Threats**
Adoption of Modern Technologies: Travel agencies have the chance to improve their digital transformation plans and further incorporate technology into their operations due to the favorable perception of ICT in important sectors (such as V2, V6, and V7). Market Expansion: ICT makes it easier to communicate and market to a wider audience, which opens up new client acquisition and market reach options, particularly through social media and online platforms.	Various Views on Security and Quickness: Various answers to V8 (mean of 3.26, standard deviation of 0.98) point to worries about the security and quickness of online bookings, which may put off some customers. Scepticism and Neutrality: The noteworthy neutral answers in V1, V6, and V8 suggest hesitancy or mistrust regarding specific ICT features, which may restrict the full use and advantages of this technology.

Strategic Consequences

Focus on Strengths: To preserve and improve customer happiness, agencies should give top priority to areas that have a lot of favourable opinions, such as the effectiveness of online reservations and quicker service delivery.

Deal with Weaknesses: Technological upgrades, improved customer communication, and staff training should enhance service quality and perceptions of online service excellence. Leverage Opportunities: Investing in ICT technologies and creative marketing techniques will help take advantage of chances to increase clientele and enhance service quality.

Reduce Risks: By guaranteeing strong cyber security protocols and informing customers about the dependability of digital services, agencies may allay security worries and foster confidence in online systems.

Conclusion

The transformation and modernization of the tourism sector are now essential priorities, particularly in restructuring the sector by integrating technologies that can withstand competition nationally and internationally—faced with the new challenges that the global tourism industry encounters, developments in Algeria, especially in the travel agency environment, have made adopting information and communication technologies essential. These technologies facilitate providing services and disseminating tourism offers to a broader audience quickly and efficiently while increasing the sector's competitiveness. Indeed, competition fosters innovation in tourism and, more precisely, meets customer expectations.

This manuscript offers key scientific and practical contributions by highlighting the role of digital technology in enhancing tourism sector performance, particularly in improving service speed, efficiency, and accuracy. Key beneficiaries include travel agencies, which can adopt modern booking systems, decision-makers developing policies supporting digital transformation, and tourists who benefit from faster and more secure services. Future research could expand to other regions and explore innovations like AI and VR to enhance tourist experiences. However, the study faces limitations, such as its focus on Boumerdes alone, reliance on cross-sectional data, and the potential influence of unexamined factors like economic crises or pandemics. Despite these challenges, the research provides a valuable foundation for future studies on the digital transformation of Algeria's tourism sector.

Promoting Equity: To encourage more significant equity, travel agencies could consider implementing initiatives to promote the hiring and advancement of women in this sector. These initiatives could include mentoring programs, diversity and inclusion training, and more inclusive and equitable recruitment policies.

Clarification and Communication: Travel agencies could improve their communication by clearly explaining the benefits and security of the technologies used, especially in areas where opinions are divided or uncertainties remain. Better transparency could strengthen customer trust.

Training and Support: Offering more training and support to users of online technologies could help build customer confidence and mitigate negative perceptions. Continuous training would improve the use of digital tools and optimize the services offered.

Priority to the Information Science and Technology Sector: It is crucial to prioritize the information science and technology sector as part of a strategy to strengthen computing's role in society. This includes strengthening infrastructure, developing communication systems, increasing investments, and promoting online tourism services while stimulating and encouraging private sector participation.

Leveraging Technological Development: To expand tourism promotion through information and communication technologies, particularly via the Internet, it is essential to take advantage of technological advances in communication. This requires establishing modern infrastructure that supports the communication network, allowing businesses to market their products and services better.

Creation of National ICT Centers: Establishing centres and national organizations dedicated to information and communication technologies is indispensable. These centres

must be equipped with material and financial resources to develop the country's technological and scientific base, strengthen the role of research and development in the tourism sector, and adopt a technological education policy that integrates ICT across society.

Development of the Tourism Industry in Algeria: Algeria should strive to develop its tourism industry by enacting appropriate legislation and defining regulatory frameworks to protect users of information technologies. These measures would preserve the rights of consumers and sellers in the electronic tourism environment while leveraging the expertise of foreign tourism companies operating in the country.

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