



The Reality of Geographic Information Systems (GIS) Used in the Marketing of Tourist Attractions, The Case of the Directorate of Tourism and Handicrafts - Chlef

Djalal AZAYEZ*

Hassiba Ben Bouali University

Chlef, Algeria

d.azaiz@univ-chlef.dz

Received: 12/10/2025

Accepted: 12/11/2025

Published: 04/12/2025

Abstract:

This study aims to evaluate the use of Geographic Information Systems (GIS) within the Directorate of Tourism and Traditional Industry in Chlef Province. Data were collected from 40 employees using a structured questionnaire and analyzed with SPSS, considering two main variables and their associated dimensions. The results indicate that all dimensions of GIS usage recorded mean values above 3, with high t-values and statistical significance ($p < 0.05$), supporting the alternative hypothesis (H_1) and rejecting the null hypothesis (H_0). The findings reveal that the Directorate possesses the necessary technical equipment, utilizes GIS-based software and applications, and incorporates various geographic data in its projects. However, GIS usage for marketing tourist landmarks remains limited and ineffective, primarily restricted to statistical reporting and investment planning rather than serving as a strategic promotional tool. The study emphasizes the need to enhance GIS integration to improve tourism management and marketing practices, enabling more effective promotion of tourist landmarks and strategic decision-making.

Key Words: System, Information, Geography, GIS, Marketing, Attraction, Tourism.

JEL Classification Codes: L83, M31

*Corresponding author: Azayez Djalal (*d.azaiz@univ-chlef.dz*)

Introduction:

In the era of rapid scientific and technological progress, the marketing of tourist attractions is no longer confined to traditional approaches. Advances in information and communication technologies have reshaped the ways in which destinations are promoted and perceived, making room for more innovative and data-driven strategies. Within this context, Geographic Information Systems (GIS) have emerged as a powerful tool that goes beyond mere cartography, offering analytical and spatial capabilities that can enhance tourism planning, management, and marketing. It operates as a scientific and technological framework for investigating and analyzing sites and geographical areas that constitute the natural foundations of tourism. At a time when global competition and the international orientation toward tourism have expanded, tourism has increasingly been regarded as a smooth



economic refuge. This reality necessitates keeping pace with technological innovations and integrating them as essential mechanisms in tourism marketing.

Algeria is considered one of the countries with significant tourism potential, offering diverse attractions that could position it as a competitive destination. Nevertheless, the absence of strong marketing competition has limited the visibility of its landmarks. Consequently, Algeria has sought to implement structured mechanisms and strategies within its tourism development plans. Does the authority responsible for tourism employ a technological marketing system, such as Geographic Information Systems (GIS), in promoting its tourist attractions? To address this question, the study focuses on one of the national provinces of chlef.

Main Research Question: In light of the above introduction, the following main research question can be posed: **To what extent does the Directorate of Tourism and Handicrafts of Chlef Province utilize Geographic Information Systems (GIS) in the marketing of its tourist attractions?**

Research Hypotheses

Null Hypothesis (H₀): There is no actual use of Geographic Information Systems (GIS) in marketing tourist landmarks at the Directorate of Tourism in Chlef.

Alternative Hypothesis (H₁): There is actual use of Geographic Information Systems (GIS) in marketing tourist landmarks at the Directorate of Tourism in Chlef.

Research Objectives

- Examine and highlight the reality of how the Directorate of Tourism and Handicrafts of Chlef Province utilize Geographic Information Systems (GIS)
- Determination and analyze the mechanisms through which the Directorate of Tourism and Handicrafts of Chlef Province markets its tourist attractions.
- Conduct an analytical examination of the use of Geographic Information Systems (GIS) in marketing tourist attractions within the Directorate of Tourism and Handicrafts of Chlef Province.

Scope of the study: This study focused on the reality and role of Geographic Information Systems in enhancing the marketing of tourist attractions at the Directorate of Tourism and Handicrafts in Chlef Province, Algeria. Forty (40) questionnaires were distributed to all directorate employees, with a 100% response rate, during the first half of 2025, excluding other directorates in Algeria.

Research Methodology: In conducting this research, the descriptive-analytical methodology was adopted, as it provides an appropriate framework for both describing the phenomenon under study and analyzing it in order to derive meaningful conclusions. To achieve the objectives of the study, a questionnaire was distributed to a sample of employees from the Directorate of Tourism and Handicrafts of Chlef Province. The collected data were then processed and analyzed using the Statistical Package for the Social Sciences (SPSS), which allowed for testing the research hypotheses and interpreting the Relationship between the identified variables and explanatory dimensions.

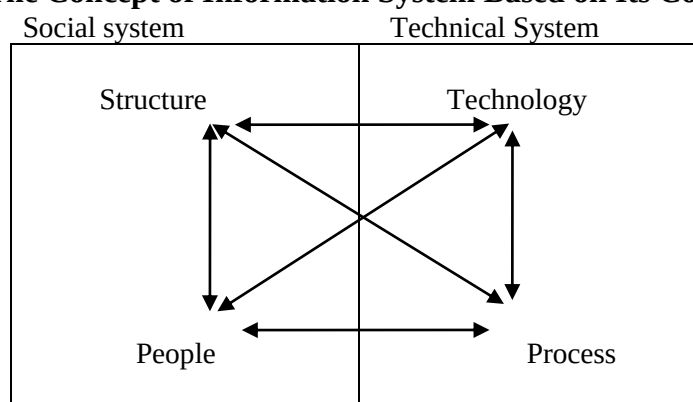


I. Conceptual Framework of the Study Variables

1. Information System:

An information system is defined as a socio-technical system comprised of two sub-systems: a technical sub-system and a social sub-system. The technical sub-system encompasses the technology and process components, while the social sub-system encompasses the people and structure components. The critical insight from the examples introduced earlier is that for an information system to perform and achieve its objectives, all four components have to be present and working together. We now define and describe the four components of a modern information system (Watson, 2007, pp. 19-20)

Fig 1: The Concept of Information System Based on Its Components



Source : Richard T. Watson, Information Systems, University press of florida, by the Global Text Project, 2007,p21

Figure 1 illustrates the concept of an information system based on its components, highlighting the interaction between the social subsystem (structures and individuals) and the socio-technical subsystem, through which geographical information is generated and applied in various fields.

2. geographic information system (GIS):

is a computer system for capturing, storing, querying, analyzing, and displaying geospatial data. One of many applications of GIS is disaster management (Chang, 2019, p. 1)

Geographic Information Systems (GIS) is defined as a system of computer hardware, software, and Procedures designed to support the compiling, storing, retrieving, analyzing, and display of spatially referenced data for addressing planning and management problems. In addition to these technical components, a complete GIS must also include a focus on people, organizations, and standards (Chandrakar, 2016, p. 2).

3. GIS Component (Chang, 2019, pp. 10-12):

3.1. Hardware: The core component is the computer, which plays a central role in storing information and processing data. Other essential hardware includes printers, scanners, and various peripheral devices that support the functioning of Geographic Information Systems.



3.2. Software: Programs and applications executed by the computer to manage, analyze, and display data, as well as perform other tasks.

3.3. People: Refers to the specialists in Geographic Information Systems (GIS) who play a crucial role in interpreting data outputs and effectively presenting the results.

3.4. Organization: GIS functions within the framework of the organization, which oversees decision-making processes, data collection, and presentation. It also integrates the individuals and hardware components that form the core of the system.

4. Tourist Attractions:

A tourist attraction is a system composed of three interrelated elements: the tourist, the nucleus (the central feature that attracts), and the marker (the informational sign that provides knowledge about the nucleus).” (Leiper, 1990, p. 370)

Tourist attractions are “features or places that draw visitors due to their natural, cultural, or man-made characteristics.” (Goeldner, 2012, p. 12)

It can be said, based on the two definitions above, that tourist attractions rely on natural, human, and other tourism resources, and on their utilization in the process of attracting tourists.

5. Tourist Routes in Chlef Province

Chlef Province is rich in numerous tourist sites and attractions, which qualify it to become a significant tourist destination at the national level. To valorize these resources and utilize them in an organized and sustainable manner, the Directorate of Tourism and Handicrafts of Chlef Province has established a set of tourist routes that leverage the province’s diverse natural and cultural assets.

These routes include several main types, such as: (Tourist Routes, 2025)

- **The Green Tourist Route**, focusing on environmental and nature-based tourism,
- **The Exploratory Tourist Route**, which allows visitors to discover mountainous and forested landscapes,
- **The Cultural Tourist Route**, highlighting the local historical and architectural heritage, in addition to other routes showcasing various tourist potentials of the province.

The map below illustrates the distribution of these routes and tourist sites, prepared using Geographic Information Systems (GIS) tools, demonstrating the use of modern technology in tourism planning and development in Chlef Province.

Fig 2: Tourist Routes in Chlef Province

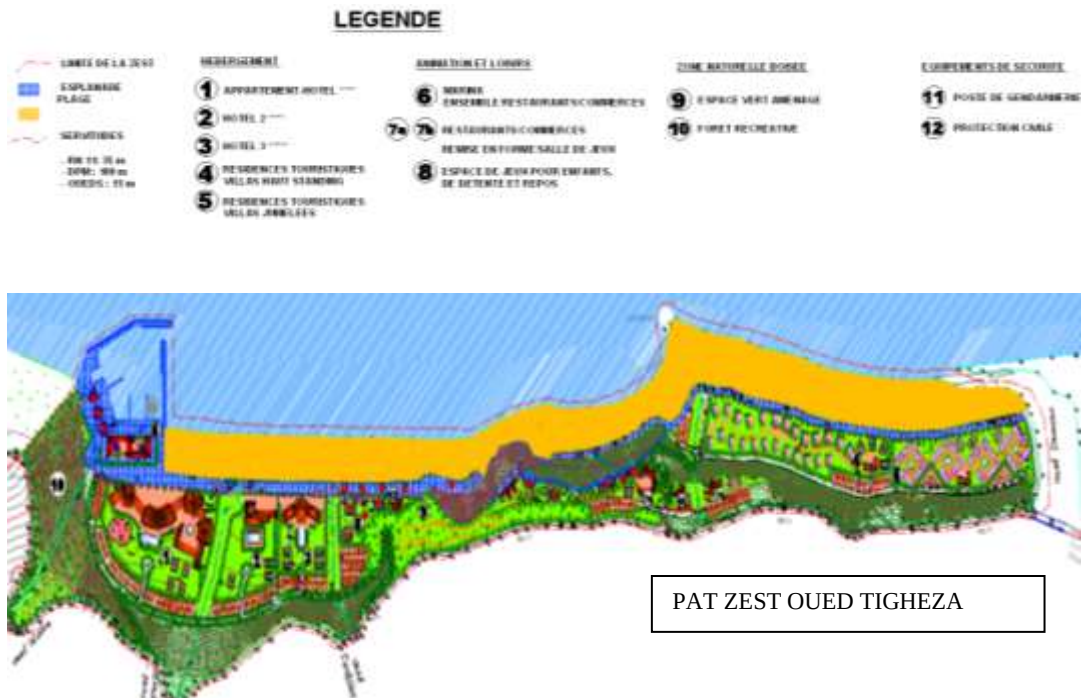
Source: Directorate of Tourism and Handicrafts in Chlef, 2025:<https://chlef.mta.gov.dz>

6-Tourism Planning Map of Chlef Province Using Geographic Information Systems (GIS)

The Directorate of Tourism and Traditional Industries of Chlef Province employed Geographic Information System (GIS) techniques to develop a static map illustrating the tourism development plan for the Oued Tighza site, classified among the tourism expansion zones along the province's tourism corridor, as presented in Figure (3) below.

This process also included the preparation of tourism development plans for other sites, such as the Aïn Hamadi area and the Mâinis area, as illustrated in Figure (4). This comprehensive approach aims to utilize spatial analysis tools to support tourism planning and to enhance the spatial vision for the distribution of tourism projects across the region.

Fig 3: Tourist development Plan (ZEST OUED TIGHEZA)



Source: Directorate of Tourism and Handicrafts in Chlef, 2014

Fig 4 : Map Showing the location of the (zet) in the wilaya of Chlef

(ZET : Tourism Expansion Areas)



Source: Ibid, 2014

(PAT : Tourist development Plan,
ZEST : Tourism Expansion Areas And Sites)



II. Applied aspect of the study

1. Population and Sample Of Study

The study population comprised all employees of the Directorate of Tourism and Handicrafts of Chlef Province. A total of 40 questionnaires were distributed to the entire staff using a census sampling method. All 40 questionnaires were returned and found valid for statistical analysis, yielding a 100% response rate. Data were entered and analyzed using SPSS v22, with all responses deemed reliable and suitable for analysis.

2. Characteristics of the Study Sample

To identify the characteristics of the study sample, it was necessary to classify its members according to the following variables: educational qualification, professional experience, and job position.

2.1. Distribution of the Sample Individuals According to Educational Qualification:

The following table illustrates this distribution:

Table1: «Distribution of the Sample Individuals According to Educational Qualification»

Educational Qualification	Frequency	Percentage
Baccalaureate or Below	6	15%
Senior Technician	4	10%
University Degree	30	75%
Total	40	100%

Source: Author's compilation based on SPSS output.

Table (1) shows that more than half of the sample consists of university graduates, representing 75%, which is a positive indicator for the study as it demonstrates the employees' ability to easily understand the content of the questionnaire. This is followed by the educational level "Baccalaureate or below" with a rate of 15%, representing the remaining staff members of the Directorate. Finally, the category "Senior Technician" accounts for 10%. This indicates that the study sample is diverse in terms of educational levels, which may have implications for the analysis of the results.

2.2. Distribution of the Sample Individuals According to Professional Experience:

The following table illustrates this distribution:

Table2: «Distribution of the Sample Individuals According to Professional Experience»

Professional Experience	Frequency	Percentage
Less than 5 years	6	15%
From 5 to 10 years	19	47.5%
From 10 to 15 years	11	27.5%
More than 15 years	4	10%
Total	40	100%

Source: Author's compilation based on SPSS output.



Table (2) shows that the most common range of work experience among the study sample is from 5 to 10 years, representing 47.5% of the total respondents. This is followed by the category from 10 to 15 years with 27.5%, then less than 5 years with 15%, and finally more than 15 years with 10%.

These varying percentages indicate that the Directorate works to retain its senior employees due to their experience and competence, which is an aspect that contributes positively to our study.

2.3.Distribution of the Sample Individuals According to Job Position: The following table illustrates this distribution:

Table3:«Distribution of the Sample Individuals According to Job Position»

Job Position	Frequency	Percentage
Director	1	2.5%
Head of Office	6	15%
Head of Department	5	12.5%
Engineer	4	10%
Inspector	3	7.5%
Chief Inspector	7	17.5%
Other	14	35%
Total	40	100%

Source: Author's compilation based on SPSS output.

Table3 shows that the highest proportion of employees falls within the category labeled Other, representing ordinary staff members and workers, with a percentage of 35%. This is followed by the positions of Chief Inspector and Head of Office, each representing 15%. Next comes the Head of Department position with 12.5%, followed by Engineer with 10%, and Inspector with 7.5% of the total sample. The Director position recorded the lowest percentage at 2.5%. These results indicate a diverse functional structure within the Directorate, reflecting opportunities for self-development and career advancement.

3.Study Instruments and Reliability

3.1. Main Study Instruments

The data collection process relied on a direct survey of the study sample, which consisted of 40 employees from the Directorate. The study utilized a questionnaire as the primary data collection instrument, given that it is one of the most widely used tools in field research. Accordingly, particular attention was devoted to its design, both in terms of form and content, to ensure the accuracy and reliability of the collected data.

3.2.Reliability Instrument

Regarding the reliability instrument, this measure indicates the degree of consistency of the tool used (the questionnaire) in assessing the variables included in the study. A questionnaire consisting of 23 statements was developed and administered to 40 employees of the Directorate. The reliability coefficient is



considered statistically acceptable when the value of Cronbach's Alpha (α) exceeds 0.60. Moreover, the closer the coefficient approaches 1, the higher the level of reliability of the study instrument.

Table4: «Reliability Results of the Applied Scale (Cronbach's Alpha) »

Axes	Number of Items	Reliability Coefficient (Cronbach's Alpha)
The Actual Use of Geographic Information Systems (GIS) in the Directorate of Tourism and Handicrafts of Chlef Province	11	0.927
The Marketing of Tourist Landmarks within the Directorate of Tourism and Handicrafts of Chlef Province	12	0.865
The General Trend	23	0.941

Source: Author's compilation based on SPSS output

The results shown in the table indicate that the values of Cronbach's Alpha for all study dimensions are higher than the acceptable threshold of 0.70, which confirms a high level of internal consistency and reliability of the instrument used.

Specifically, the "Actual Use of Geographic Information Systems (GIS)" dimension recorded a Cronbach's Alpha of 0.941, which reflects an excellent degree of reliability. The "Marketing of Tourist Landmarks" dimension obtained a Cronbach's Alpha of 0.865, indicating a very good internal consistency. Finally, the overall "General Trend" recorded a Cronbach's Alpha of 0.927, also signifying a high level of reliability.

Accordingly, these results demonstrate that the questionnaire is a highly reliable measurement tool, suitable for accurately assessing the variables included in this study.

4.Statistical Processing Methods in the Study:

The data were statistically processed through a series of systematic steps consistent with the nature and objectives of the study, using the Statistical Package for the Social Sciences (SPSS).

In the first stage, descriptive statistical methods were applied, including the preparation of simple frequency and percentage tables, to summarize and describe the responses of the study sample and to identify the general trends regarding the use of Geographic Information Systems (GIS) and their role in marketing tourist landmarks within the Directorate of Tourism and Handicrafts of Chlef Province.

Subsequently, the questionnaire items were classified into main dimensions that reflect the key aspects of the study, namely:

- ✓ The questionnaire included questions related to the participants' personal data — namely, educational qualification, professional experience, and job position — measured using the nominal scale to differentiate among the respondents.
- ✓ The questionnaire included 11 statements aimed at measuring the dimensions of GIS use, employing a five-point Likert scale ranging from (1) "very low" to (5) "very high." The items covered three dimensions: cognitive, resources and



equipment, and current use. The value (3) represented the neutral or theoretical mean level.

- ✓ The questionnaire included 12 statements aimed at measuring the dimensions of tourist landmark marketing within the Directorate of Tourism and Handicrafts, in order to determine the relationship between the study variables. The same five-point Likert scale used in the previous section was applied to these items.

Table5: « Statements Specified for the Study Variables »

Variables		Dimensions	Item Number s
First Variable	The Actual Use of Geographic Information Systems (GIS) in the Directorate of Tourism and Handicrafts of Chlef Province	Cognitive Dimension	1-3
		Resources and Equipment Dimension	4-7
		Current Use Dimension	8-11
Second Variable	The Marketing of Tourist Landmarks within the Directorate of Tourism and Handicrafts of Chlef Province	Marketing Planning for Tourist Landmarks	12-15
		Marketing Decision-Making	16-19
		Programming the Marketing of Tourist Landmarks	20-23

Source:Prepared by the Researcher

In the final stage, the Pearson Correlation Coefficient was employed as one of the inferential statistical methods to examine the strength and direction of the relationship between the study variables, and to determine whether a statistically significant relationship exists between the use of Geographic Information Systems and the level of marketing of tourist landmarks.

These analytical procedures collectively demonstrate that the statistical processing of the study was conducted with accuracy, objectivity, and methodological rigor, ensuring that the research objectives and hypotheses were addressed in a scientifically sound manner.

The results of the Pearson correlation analysis revealed a strong positive and statistically significant relationship between the two main study variables: the use of Geographic Information Systems (GIS) and the marketing of tourist landmarks within the Directorate of Tourism and Handicrafts of Chlef Province.

This finding indicates that the greater the use of GIS technologies within the Directorate, the higher the efficiency and effectiveness of tourist landmark marketing.

Such a positive correlation highlights the crucial role of GIS technologies in supporting tourism planning and promotion activities by enhancing access to spatial information and utilizing it to showcase the region's tourism potential.



Table6: « Pearson Correlation between GIS Use and Tourist Landmark Marketing »

Variable 1	Variable 2	Pearson's r	Sig. (2-tailed)	N
GIS Use	Tourist Marketing	0.81	0.000	40

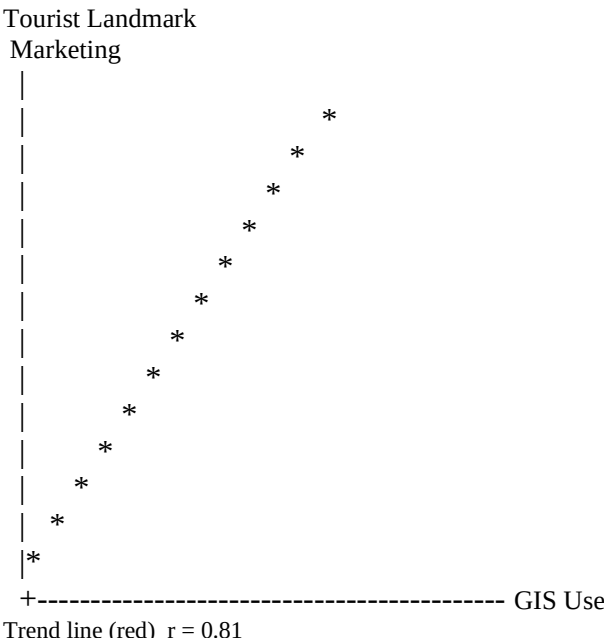
Source: Author's compilation based on SPSS output $\alpha \leq 0.05^*$

The table shows a strong positive and statistically significant correlation between the study variables, namely the use of Geographic Information Systems (GIS) and the marketing of tourist landmarks ($r = 0.81$, $p < 0.05$).

This indicates that higher GIS utilization within the Directorate is associated with increased efficiency and effectiveness in marketing tourist landmarks. The correlation highlights the important role of GIS technologies in supporting tourism planning and promotion.

Tourist Marketing

Fig 5: Relationship between GIS Use and Tourist Marketing based on Pearson's Correlation



Source: Author's own data (N = 40)

The figure shows a very strong positive correlation ($r = 0.81$) that is statistically significant (Sig. = 0.000) between GIS use and tourist marketing, indicating that increased use of GIS is clearly associated with improved tourist marketing.



5. Study Analysis, Hypotheses Testing, and Discussion of Results:

5.1. Study Analysis:

a. Measuring the Relative Importance of Study Variables:

Before testing the study hypotheses, the relative importance of the study variables and dimensions from the perspective of the sample participants is presented as follows:

a1. Measuring the Relative Importance of the Items on the Actual Use of Geographic Information Systems (GIS) in the Directorate of Tourism and Handicrafts of Chlef Province:

To measure and rank the relative importance of the items related to the actual use of GIS, the arithmetic mean and standard deviation were used to identify the most important items. The item with the highest mean score is considered the most important from the perspective of the study sample. The items can thus be ranked and analyzed as shown in the following table:

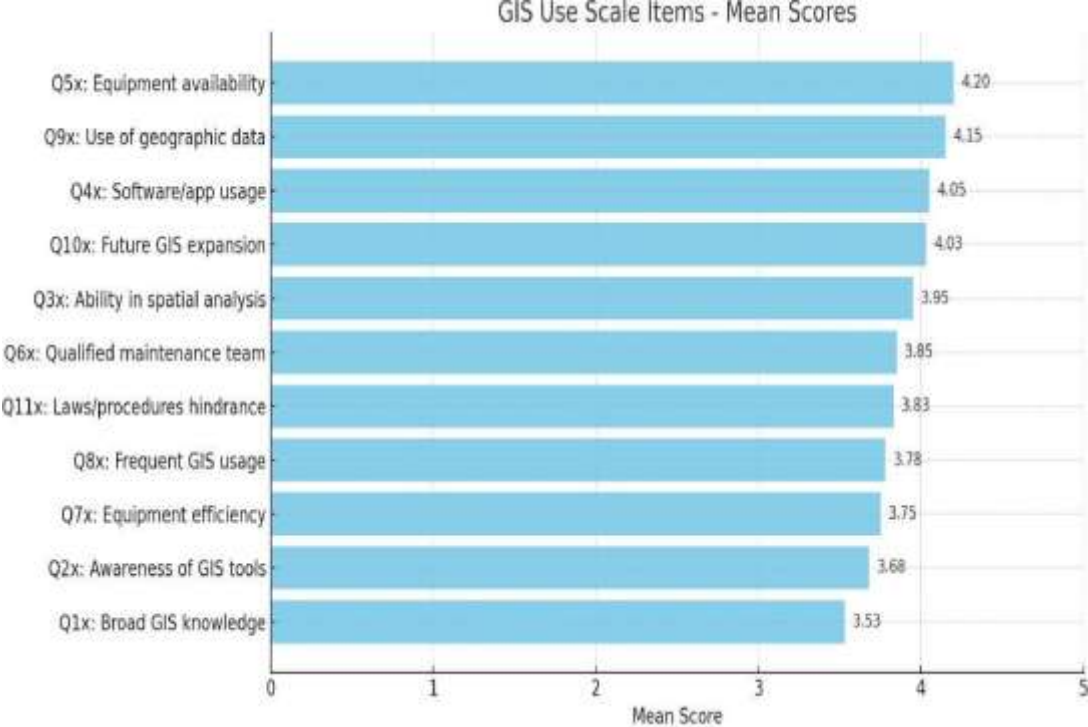
Table7: « Measuring and Ranking the Importance of GIS Usage Items »

GIS Use Scale Items	Mean	Standard Deviation	Rank
Q5x "The directorate has the necessary technical equipment (computers, internet access, GPS, etc.)."	4.20	1.181	1
Q9x "Various geographic data are used in the directorate's tourism projects."	4.15	1.027	2
Q4x "The directorate uses software and applications based on information systems."	4.05	1.085	3
Q10x "The directorate aims to expand the use of Geographic Information Systems in the future with greater efficiency."	4.03	1.143	4
Q3x "I have the ability to use spatial analysis tools in tourism. "	3.95	1.108	5
Q6x "We have a qualified team for the continuous maintenance and updating of Geographic Information Systems."	3.85	1.189	6
Q11x "Current laws and administrative procedures do not meet the requirements for integrating Geographic Information Systems into tourism work."	3.83	1.152	7
Q8x "GIS tools are used frequently in the directorate's daily operations."	3.78	1.230	8
Q7x "The available equipment allows us to use GIS efficiently. "	3.75	1.171	9
Q2x "I am aware of the various means that use GIS, including applications and websites. "	3.68	1.071	10
Q1x "I have a broad knowledge background in GIS. "	3.53	1.198	11
Total	3.89	0.907	

Source: Author's compilation based on SPSS output



Fig 6: GIS Use Scale Items-Mean Scores



Source: Results of the Table7

The table7 and Fig2 presents the evaluation of 11 items related to the use of Geographic Information Systems (GIS) by employees of the Directorate of Tourism and Handicrafts. The means ranged from 3.53 to 4.20, indicating an overall positive perception of GIS availability and utilization, with the highest mean (4.20) reflecting the adequacy of technical equipment, and the lowest mean (3.53) indicating limited general knowledge of GIS. The standard deviations varied between 1.027 and 1.230, suggesting moderate variability in employees' responses, with the greatest dispersion observed in daily GIS usage (SD = 1.230). The overall mean of 3.89 and total standard deviation of 0.907 demonstrate that employees' evaluations were generally consistent, with minor individual differences. Ranking analysis highlights strengths in equipment and geographic data usage, while areas requiring improvement include employee knowledge and skills. These results provide a precise statistical overview of the effectiveness and variability of GIS usage within the directorate.



a2. Measuring and Ranking the Importance of Tourist Landmark Marketing Scale Statements in the Directorate: As shown in the following table:

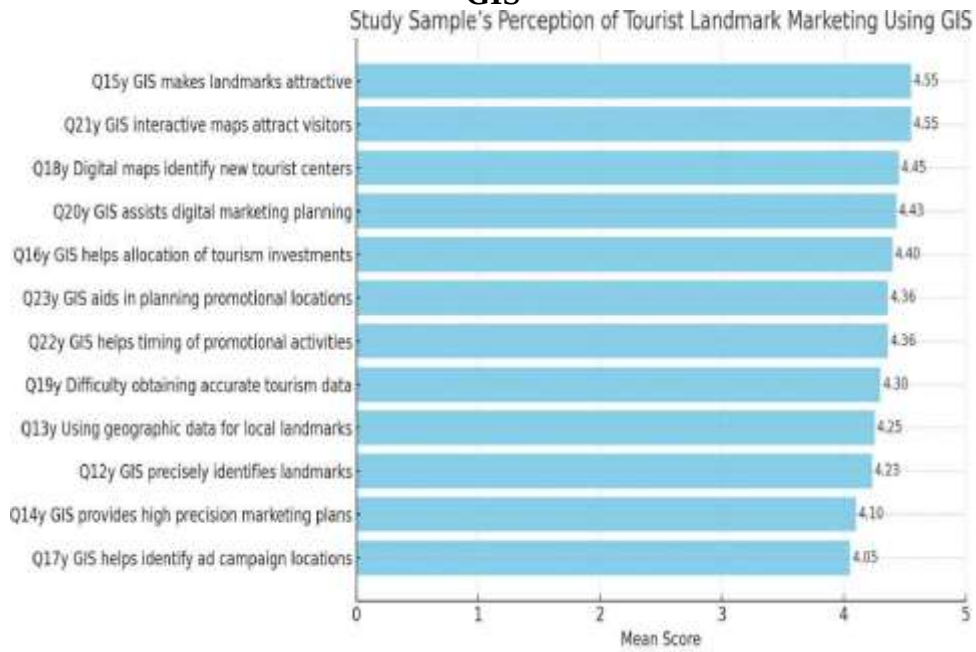
Table8: « Measuring and Ranking the Importance of Tourist Landmark Marketing Scale Statements in the Directorate »

Scale Items Assessing the Study Sample's Perception of Tourist Landmark Marketing in the Directorate of Chlef	Mean	Standard Deviation	Rank
Q15y Adopting Geographic Information Systems (GIS) in presenting tourist landmarks makes them more attractive and professional.	4.55	0.504	1
Q21y Displaying tourist landmarks on interactive maps using GIS helps attract visitors.	4.55	0.504	2
Q18y Digital maps contribute to identifying suitable locations for establishing new tourist centers in Chlef Province	4.45	0.639	3
Q20y GIS results assist in planning digital marketing campaigns for tourist landmarks in Chlef Province.	4.43	0.636	4
Q16y GIS helps in making decisions regarding the allocation of tourism investments in Chlef Province.	4.40	0.744	5
Q23y GIS aids in determining the locations for implementing tourism promotional activities based on spatial analysis tools.	4.36	0.622	6
Q22y GIS helps determine the timing for executing promotional activities based on temporal analysis tools.	4.36	0.736	7
Q19y The difficulty of obtaining accurate and up-to-date tourism data makes it challenging to make decisions regarding the improvement of infrastructure serving tourist routes.	4.30	0.911	8
Q13y We use geographic data to develop the tourism promotion process for local landmarks in Chlef Province.	4.25	0.899	9
Q12y Geographic Information Systems (GIS) precisely identify tourist landmarks	4.23	0.577	10
Q14y Using GIS provides high precision for tourism marketing plans.	4.10	0.871	11
Q17y The geographic analysis tool helps us identify various locations for tourism advertising campaigns.	4.05	0.904	12
Total	4.33	0.461	

Source: Author's compilation based on SPSS output



Fig 7: study sample's perception of tourist landmark marketing using GIS



Source: Results of the Table8

According Table8 and Figure3, The study results indicate a generally high positive perception of GIS use in marketing tourist landmarks in the Directorate of Chlef, with an overall mean of 4.33 and a standard deviation of 0.461. Employees strongly agreed that GIS enhances the attractiveness and professionalism of landmarks and supports interactive map displays (mean = 4.55). Some variability was noted regarding challenges in obtaining accurate tourism data and determining locations for advertising campaigns (SD = 0.911 and 0.904). Overall, GIS is viewed as an effective tool for planning, decision-making, and tourism promotion.

5.2. Hypotheses Testing:

The one-sample t-test was used to examine the two main hypotheses regarding the actual use of Geographic Information Systems (GIS) in marketing tourist landmarks. Results showed high means and low standard deviations, indicating statistically significant differences (Sig < 0.05) and providing insight into the current use of GIS in presenting tourist landmarks.

a. Null Hypothesis (H₀):

There is no actual use of Geographic Information Systems (GIS) in marketing tourist landmarks at the Directorate of Tourism in Chlef.

**Table9: One-Sample t-Test Results for the First Hypothesis on the Use of GIS**

Dimension	t-value	p-value	Conclusion
Cognitive dimension	4.04	0.00012	Mean greater than 3, H0 rejected → There is cognitive use of Geographic Information Systems
Equipment and facilities	5.25	0.000003	Mean greater than 3, H0 rejected → There are effective equipment and facilities
Current use	5.28	0.000003	Mean greater than 3, H0 rejected → There is actual use of Geographic Information Systems

Source: Calculated by the researcher based on survey data.

The one-sample t-test results indicate that the mean values for all dimensions of Geographic Information Systems (GIS) are significantly higher than the neutral value of 3 ($p < 0.05$). Consequently, the null hypothesis (H_0) is rejected. These findings suggest that the study participants possess a sufficient cognitive dimension of GIS, that the necessary technical equipment is available and effective, and that GIS is actively used in marketing tourist landmarks.

a2. Alternative Hypothesis (H_1):

There is actual use of Geographic Information Systems (GIS) in marketing tourist landmarks at the Directorate of Tourism in Chlef.

Table10: One-Sample t-Test Results for the Alternative Hypothesis

Dimension	t-value	p-value	Conclusion
Tourist Landmark Marketing Planning	11.35	3.11×10^{-14}	Mean $> 3 \rightarrow H_2$ **accepted**; GIS is meaningfully used in marketing planning
Marketing Decision-Making	10.28	5.86×10^{-13}	Mean $> 3 \rightarrow H_2$ **accepted**; GIS affects marketing decision-making
Tourist Landmark Marketing Programming	14.47	≈ 0	Mean $> 3 \rightarrow H_2$ **accepted**; GIS is effectively used in marketing programming

Source: Calculated by the researcher based on survey data.

The results of the one-sample t-test indicate that the alternative hypothesis (H_1) is supported across all dimensions, with high t-values and p-values below 0.05, leading to the rejection of the null hypothesis (H_0). These findings demonstrate that GIS is meaningfully utilized in tourist landmark marketing planning, significantly influences marketing decision-making, and is effectively employed in the programming of marketing campaigns, highlighting its critical role as a strategic tool in enhancing the effectiveness of tourism marketing.

5.3. Discussion of Results

The study results indicate that all dimensions of Geographic Information Systems (GIS) usage in the Directorate of Tourism and Traditional Industry in Chlef Province recorded means above 3, with high t-values and statistical significance ($p < 0.05$), demonstrating support for the alternative hypothesis (H_1) and rejection of the null hypothesis (H_0). In detail:



- ✓ Technical equipment and facilities: data shows that the directorate possesses adequate technical equipment (computers, internet access, GPS devices, specialized software), facilitating the effective use of GIS in marketing planning.
- ✓ Use of geographic data: The results indicated that the directorate employs diverse geographic data in tourism projects, enhancing the accuracy of planning and the precision of audience targeting.
- ✓ Software and applications: It was observed that the directorate uses GIS-based software and applications, contributing to the presentation of tourist landmarks in an attractive and professional manner and supporting marketing decisions based on accurate information.
- ✓ Impact on tourist landmark marketing: The findings showed that GIS makes tourist landmarks more appealing and professional, and enables their display on interactive maps to attract visitors, highlighting its significant role in improving the tourism experience and increasing engagement with tourist sites.
- ✓ Support for marketing decision-making and campaigns: The data indicate that GIS clearly contributes to better marketing decisions and is effectively used in programming and executing marketing campaigns, enhancing the efficiency of marketing strategies and improving audience targeting.

Conclusion:

The study confirms that GIS is a vital strategic tool for enhancing tourism effectiveness, integrating data collection, spatial analysis, and decision support, while presenting tourist landmarks in a more attractive and professional way. GIS can thus be considered a key element in improving marketing planning and increasing the tourism appeal of the province.

Recommendations

- Enhance the utilization of Geographic Information Systems (GIS): The directorate should fully leverage available equipment, software, and geographic data to improve marketing planning for tourism projects.
- Increase the use of GIS in marketing tourist landmarks: Implement interactive maps and professional presentations of tourist sites to enhance attractiveness and visitor engagement, based on the demonstrated positive impact of GIS on marketing.
- Support data-driven decision-making: Encourage the use of spatial analyses and geographic information to make more accurate and effective marketing decisions, in line with the study's findings on GIS's role in decision support.
- Improve planning and execution of marketing campaigns: Utilize GIS capabilities to design and implement marketing campaigns more efficiently, directing resources optimally to achieve tangible outcomes, as indicated by the data.
- Monitor and evaluate marketing performance continuously: Conduct regular assessments of GIS's impact on tourist landmark marketing to identify areas



for improvement and enhance marketing effectiveness based on empirical results.

6.2. Research Perspectives

Based on the results of this study, several future research directions can be proposed to deepen the analysis and expand the scope:

- Expanding the research scope geographically and thematically: Apply the study to other provinces or regions to assess the impact of Geographic Information Systems (GIS) on tourism marketing in different contexts.
- Integrating advanced technologies: Explore the potential of combining GIS with technologies such as Artificial Intelligence (AI) or Augmented Reality (AR) to enhance marketing data analysis and provide innovative tourism experiences.
- Evaluating economic and operational impact: Analyze how the use of GIS affects tourism revenue and optimizes resource allocation in marketing campaigns.
- Enhancing human capacity: Develop advanced training programs for staff in GIS usage to support strategic marketing decision-making.
- Expanding qualitative research: Investigate tourists' and stakeholders' perceptions of GIS applications in improving the visitor experience, complementing quantitative analyses with field insights.

Future Research Suggestions

Future research could include a comparative study of the Directorates of Tourism and Handicrafts across Algeria regarding the use of Geographic Information Systems (GIS), an analytical study on the impact of GIS on tourism marketing, an investigation of the current implementation of GIS in Algerian tourism institutions, and highlighting the experiences of leading countries in tourism marketing using GIS to benefit from international best practices.

Bibliographie References

- Al-Abbasi, A. (2017). *Introduction to tourism [In Arabic]*. amman, jordan: Dar Al-Massira for Publishing and Distribution.
- Chandrakar, A. S. (2016, March 17–18). Application of GIS. *Proceedings of the 2nd International Seminar on Non-Conventional Energy Sources for Sustainable Development of Rural Areas*.
https://www.researchgate.net/publication/318001118_Application_of_GIS?utm_source=chatgpt.com.
- Chang, K. T. (2019). *Introduction to geographic information systems* (9th ed ed.). McGraw-Hill Education.
- Goeldner, C. R. (2012). *Tourism: Principles, Practices, Philosophies* (12th ed ed.). Hoboken: NJ: John Wiley & Sons.
- Leiper, N. (1990). *Tourist attraction systems* (Vol. 3). Annals of Tourism Research.
- *Tourist Routes*. (2025). Retrieved 11 07, 2025, from <https://chlef.mta.gov.dz>
- Watson, R. T. (2007). *Information Systems*. University press of florida: A Global Text. Global Text Project.