

The role of tourism marketing in the development of tourist regions

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Abstract---The objective of this study is to analyze the importance of the dimensions of the tourism product in the development of the tourist regions. The statistical analysis of the main compounds (ACP) and the hierarchical cluster analysis were used. The researcher aims to use the method of analysis in the main vehicles, which aims to study all the available variables represented by tourist elements that are rich in Algeria, which affect the development potential. Four tourist attractions were summarized as follows: Tourism infrastructure, Natural and ecological factors) as the use of multi linear regression analysis to identify and evaluate the model between tourist attractions and tourist nights. It was found that the first factor and the second most influential factor. The study also uses the cluster analysis method to collect the country's mandates in regional development groups, namely, tourism division, tourism sector adaptation, and the consolidation of states in four regions with homogeneity and tourist variation.

Keywords---tourism supply, tourism demand, tourism product, tourism regions, factors tourism attractions, factor analysis.

Introduction

Tourism is one of the world's fastest-growing industries. It has become a major sector in international trade, contributing significantly to global GDP by 9.8%, providing millions of direct jobs (representing 9.5% of the total workforce), and accounting for 4.3% of global investment. Furthermore, tourism has become an export industry, representing 6.1% of global exports, and is considered a key driver of economic development. Many countries have focused on opening new markets alongside traditional ones to ensure year-round tourism, offering high-quality tourism programs and suitable distribution channels to extend tourist stays, and employing advanced methods for tourism and hospitality promotion.

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Effective tourism marketing is a powerful tool with a clear role in directing tourist flows towards a particular destination. The development of tourism in most, if not all, developed countries is primarily due to the reliance of various decision-making bodies and tourism institutions in those countries on marketing theories and principles in their operations. This is achieved by discovering the needs, desires, and motivations of tourists through academic studies, such as market research, and by using various marketing tools, techniques, and strategies to meet these needs. This has enabled these countries to become leaders in the tourism sector.

Algeria is among the countries rich in significant and valuable tourism resources. These resources range from natural attractions such as sites, landscapes, mountains, beaches, and forests, to cultural, civilizational, and religious resources, as well as its diverse climate. The Mediterranean climate prevails along the coastal strip, while the high plateaus have a humid climate, and the south has a desert climate. This diversity helps maintain a year-round tourist season and makes Algeria a tourist destination. Despite this, tourism has not achieved its rightful place in the national economy, and Algeria has not fully capitalized on its potential in the tourism sector. Despite its resources, the sector's performance remains very weak, almost nonexistent. According to the Tourism Competitiveness Index, Algeria ranks 123rd out of 141 countries. It is also worth noting that the tourism sector's contribution to the GDP is only 3.5%, and it employs 3% of the total workforce. Overall, these figures indicate the significant lag in Algeria's tourism industry compared to other leading tourist destinations, particularly its neighboring countries. The weak performance of the tourism sector has pushed the country into a state of decline. Striving to develop and modernize its tourism sector, the country aims to provide the best opportunities and possibilities to enhance its competitiveness as much as possible. This will be achieved by seeking the most effective and rapid ways to correct shortcomings, solve problems, remove various obstacles, and establish mechanisms to upgrade and improve its quality, increase investment, and make tourism a national priority and a strategic goal to be achieved in order to reduce the dominance of the hydrocarbons sector, which constitutes 98% of the national economy. To this end, the Tourism Development Master Plan 2030 was developed to prepare the tourism sector, which boasts highly competitive inherent advantages in its offerings. This will be accomplished by adapting its components, in terms of quality and presentation, to the characteristics of the regions, enabling them to effectively position themselves in the Maghreb and global tourism markets and thus improve their market share.

First: The Problem of the Study

In light of the foregoing, the study revolves around a fundamental problem, which can be formulated as follows:

How can tourism marketing contribute to the development of tourist regions? To address and analyze the problem under study, we can pose a set of sub-questions:

- What is the current state and future prospects of the tourism sector, and what are the unique characteristics of each region?
- What is the importance and role of tourism products in the development of tourist regions?
- What are the most important dimensions of tourism products that can enhance the attractiveness of regions?
- How can tourist regions be divided and formed, and what is the current potential of these proposed regions?

Second: Study Hypotheses

To answer these questions, we present the following hypotheses:

Our research is based on a main hypothesis: approaching the tourism product as one element of tourism marketing approaches to determine the extent to which the dimensions of the tourism product contribute to the development of tourist regions.

This hypothesis branches into sub-hypotheses that we will work to prove or disprove through our study. These sub-hypotheses are as follows:

- General infrastructure is an influential factor in developing the attractiveness of tourist regions.

- Natural resources are an influential factor in developing the attractiveness of tourist regions.
- Tourism infrastructure is an influential factor in developing the attractiveness of tourist regions.
- Ecological resources are an influential factor in developing the attractiveness of tourist regions.
- The diversity and homogeneity of tourism potential contribute to the formation of tourist regions.

Third: Study Objectives

- To study and diagnose the current state of the tourism sector in an attempt to uncover and highlight its most significant challenges and problems.
- To contribute a new dimension to tourism research in the Algerian tourism sector by identifying the factors that contribute to regional development.
- To analyze and assess the relationship between tourist attractions and tourist nights to determine which factors have the greatest impact on regional tourism appeal.
- To analyze the homogeneity of tourism potential across different provinces in order to adapt the tourism sector and develop regional tourism zones.
- To highlight and clarify the trends and segments of tourism demand and the performance indicators of the tourism sector in Algeria.
- To identify the nature of the marketing efforts undertaken by Algeria within its new development strategy aimed at elevating its tourism sector to its desired level. - The personal motivation stems from the researcher's desire to research the Algerian tourism sector and understand the reasons for its underdevelopment, given the researcher's conviction that this sector can be a source of diversification for the national economy.

Sixth: Scope of the Study:

The scope of our study can be divided as follows:

Spatial Scope: The study has a spatial scope encompassing a case study of Algeria at both the macro and regional levels, due to its regional, geographical, and natural diversity.

Timeframe: The study period received significant attention from the authorities, as the state demonstrated its sincere intention to promote tourism and establish it as an economic alternative. This was facilitated by the favorable climate and the prevailing political and economic stability. Therefore, we chose to study and analyze this period, specifically the timeframe from 2000 to 2015.

Seventh: Methodology and Tools

To achieve the study's objectives and answer the research questions, we adopted a descriptive-analytical approach to diagnose the current state and future prospects of the tourism sector. This approach aimed to provide a clear picture through the use of analytical presentations, including various tables and figures, to aid in analyzing and interpreting the results. Regarding the tools and methods employed in the study, and to analyze the specific problems and test the study's hypotheses, we utilized several statistical analysis tools, including economic measurement tools such as principal component analysis, cluster analysis, and multiple linear regression.

These tools and methods were used to analyze the specific problems and test the study's hypotheses. A set of automated data processing and analysis programs were used, including SPSS 22, XLSTAT, and EViews 10.

First: The Descriptive Framework of the Study

1- 1-Presentation and Measurement of Study Variables

In our objective study, the following variables emerge:

Independent Variables: These are the elements of the tourism product, represented by the tourism assets that Algeria possesses.

Dependent Variable: This is represented by tourist arrivals and tourist nights. The study variables can be presented as follows:

First - Study Variables:

Based on previous studies, the nature of the topic, and the study objectives, we selected a set of variables that represent the tourism offerings, resources, and potential of Algeria. We collected the variables available from government agencies.

-Areas of Tourist Expansion:

Law No. 03/03 dated [date missing] defines [areas missing]. The 16th of Dhu al-Hijjah 1423 AH, corresponding to 17 February 2003, concerning tourist expansion zones and tourist sites, defines tourist expansion zones in Article 2 as follows: Any area or extension of a territory characterized by natural, cultural, human, and creative features suitable for tourism, eligible for the establishment or development of a tourist facility, and which can be exploited for the development of one or more profitable types of tourism, taking into account geographical data. (Law No. 03/03, page 2)

-Hotels:

Decree No. 92-101, dated 3 March 1992, defines a hotel as follows: All structures that are primarily intended for accommodation and provide related services are considered accommodation establishments. These structures are rented to transient guests whose stay is limited to a day, week, or month, without the intention of permanent residence.

-Travel and Tourism Agencies:

Travel and tourism agencies constitute an economic operator with an important role in the tourism sector, given their effective role in improving the quality of tourism services, attracting foreign tourists, acquiring foreign expertise, and developing a spirit of tourism. According to Article 3 of Law No. 99-06 dated 18 Dhu al-Hijjah 1419 AH, corresponding to April 4, 1999, a travel and tourism agency is defined as any commercial establishment that permanently engages in tourism activity, which consists of selling, directly or indirectly, individual or group trips and accommodations and all types of related services as stipulated (Law No. 99.06, page 14)^o

-Nature Reserves:

These are areas characterized by the permanent or temporary presence of fresh or highly saline water on the surface or at shallow depths, whether stagnant or flowing naturally or artificially, at a boundary or transitional point between terrestrial and aquatic environments. These areas harbor plant and animal species permanently or temporarily. Nature reserves are areas designated by the state to protect natural heritage in its various forms, preserving all the natural and cultural components found within them. Algeria includes numerous and diverse national reserves and parks, given the vast area of the country. These sites have been classified based on their fulfillment of a set of conditions, such as the presence of a distinct ecosystem compared to neighboring areas, the presence of a certain number of rare organisms, and the diversity of vegetation or geological structures in desert regions, among others.

-Thermal Stations:

According to Executive Decree 94-41 dated January 29, 1994, which defines mineral bath waters and regulates their protection, use, and exploitation, mineral baths are defined as waters Attracted from a natural spring or drilled well, and which may possess medicinal properties due to its specific elements and the stability of its natural characteristics and chemical composition, the protection of mineral bath waters is a matter of public interest, the responsibility of the relevant state authorities. Mineral bath waters must be subject to continuous monitoring by state agencies. Drilling or underground work may not be carried out within the protected zones of a well source declared to be of public interest except with authorization from the relevant authorities (Executive Decree 94-41a, page 5)

-Traditional Industry and Crafts:

Traditional industry and crafts were defined by Order No. 96-01 dated 10/01/1996, which established the rules governing traditional industry and crafts and their implementing regulations. Article 5 of this order stipulates that traditional industry and crafts are all activities of production, creation, transformation, artistic restoration, maintenance, repair, or service provision that are predominantly manual and practiced primarily and permanently, in a fixed, mobile, or exhibition-based manner, individually or within a traditional industry and crafts cooperative, or enterprise. Traditional Industry and Crafts (Order No. 96-01, page 4): Traditional industry and crafts are considered small industries in

which Algeria possesses enormous potential as an industry that contributes to activating economic mechanisms. These industries boast a very diverse range of branches. According to Executive Decree No. 07-339 dated 10/31/2007, the list of activities in traditional industry and crafts, categorized into three fields, includes 24 sectors of activity.

-Archaeological Sites:

An archaeological site is defined as a site containing archaeological evidence, including material traces of past activities. It is a place where remains are found that indicate human activities during ancient times. These sites are buried underground or submerged in water. In this sense, archaeological sites are classified into two categories: terrestrial and marine. In Algerian legislation, these are built-up and unbuilt spaces without an active function, bearing witness to human activity or interaction with nature, including the subsurface connected to them, and possessing historical, archaeological, religious, artistic, scientific, or anthropological value, including archaeological reserves and cultural parks.

-National Museums:

These are places where valuable objects are displayed on a variety of subjects, such as antiquities, art, traditional crafts, natural history, and more. They reflect the richness of Algeria's history and civilization, showcasing the diverse archaeological remains preserved in archaeological and historical museums.

-Restaurants:

These are places where food and drinks are served to customers. Restaurants were initially established along travel routes to allow travelers to stop, rest, and refresh themselves. Today, restaurants are almost ubiquitous, found on quiet streets and busy roads, in hotels, airports, bus and train stations, as well as in parks, office buildings, and shopping malls. Restaurants constitute the largest segment of the food service industry. Establishments that provide food to people outside their homes are also part of this industry, including schools, hospitals, and factories. Public parks:

A park is a well-managed, wooded, and renewable geographical area that possesses natural beauty and ecological diversity. It is considered an important natural resource and consists of fenced green spaces managed by a public or private entity. - Theater:

It is a branch of the performing arts and acting that embodies or translates stories or literary texts before an audience using a combination of speech, gestures, music, and voice on a stage, which has specific design requirements.

-Café:

Or coffee shop, it is a public place where people sit to drink coffee or tea. It is considered a gathering place for young people, where they meet and exchange conversations.

-Dependent Variable:

This is represented by tourist nights, which is the number of nights spent by non-resident tourists in hotels and similar establishments in all types of tourist accommodation. It is calculated between the arrival date and the departure date (Rojet De Métadonnée De L'OMT Glossaire Commun, Org, p. 4.)
Secondly: Methods of Measuring Study Variables

The study variables are processed and measured through three methods: principal component analysis, hierarchical cluster analysis, and multiple linear regression analysis. This comes within the following steps:

-Selecting a set of variables that, in their entirety, can express the tourism potential and resources of the states.

-Conducting factor analysis on a set of variables to determine the dimensions of the governing factors. This involves identifying the set of variables with the greatest relative importance and weight in causing the variance and determining the type and nature of these factors. This is done using the principal components method, which is characterized by its ability to reduce the number of original variables to the smallest number of new variables that include the original variables in varying proportions. These proportions differ in their impact according to the correlation value between the variables. If it is

possible to identify three factors, ideally, that can explain the largest proportion of the variance between the states, then these can be relied upon instead of the original factors.

Second: Discussion of the Study Results

The results of the automated processing obtained will be presented. We will attempt to analyze, interpret, and discuss them. This will be done by dividing this section into three parts. In the first part, we will present and analyze the outputs of the principal component factor analysis using SPSS 22. In the second part, we will analyze the results of the cluster analysis using Excelstat. In the third part, we will analyze the results of the multiple linear regression using EViews 10.

1-2 Interpretation of Principal Component Analysis Results:

Tourism is considered a regular economic activity. It appears that some regions, destinations, and locations are more successful than others. In presenting tourist activities and attracting tourists, analyzing the components and resources of tourism are crucial steps in the ability to assess and attract tourists to a particular region (Sandro Formica and Muzaffer Uysal, 2006, p. 14). This is achieved by using and applying principal component analysis, which aims to reduce the variables explaining the phenomenon to the fewest possible factors. This is done by analyzing the correlations between these variables. After obtaining the correlation matrix between these variables, this correlation matrix is factor-analyzed to reach the fewest possible factors or axes, allowing us to express the greatest degree of variance between these variables. This is done by calculating the arithmetic means and standard deviations, as well as the correlation matrix, in addition to identifying the principal components that best represent these variables (Erika Kulcsár, 2010, p. 12). Algeria abounds in these resources, which represent its comparative advantage, with the aim of extracting the factors Tourist attractions that influence the attraction of tourists to tourist destinations. Our study relied on tangible attractions, as there are also intangible tourist attractions. Attractions within the framework of market pull are the reasons that make tourists choose and prefer one destination over another in terms of the characteristics of the vendors working there, the appeal derived from the diversity of service content and local food, affordable consumption, and vendor service characteristics including performance, empathy, responsiveness, and courtesy. Unique performance. It can be said that there are tangible and intangible tourist attractions (Yi-Fei Chuang, Shih-Nan Hwang, Jehn-Yih Wong, and others, 2014, p. 10.)

-1 2-1Standard Statistics:

Standard statistics for the analysis outputs and the most important conditions for achieving factor analysis will be presented.

-1.1Descriptive Statistics:

The table shows the descriptive statistics (arithmetic mean and standard deviation) for the study variables, as shown in the following table:

Table No. (01): Means and Standard Deviations For variables

Variable	Moyenne	Ecart type	Analyse N
Hotels	47,574	59,7443	48
Restaurants	246,468	367,5415	48
Cultural Sites	10,511	14,8542	48
Cafes	490,915	412,3264	48
Tea Rooms	17,043	33,1183	48
Travel Agency	43,426	105,1177	48
Crafts	1708,191	1095,0833	48
Beaches	12,021	20,0765	48

Variable	Moyenne	Ecart type	Analyse N
Wetlands	38,915	48,0081	48
Public Gardens	37,979	41,0919	48
Thermal Springs	5,553	7,3597	48
ZET (Zone d'Extension Touristique - Tourist Expansion Zone)	4,255	5,5618	48
Museums	,489	,7766	48
Theaters	,383	,4914	48

Source: SPSS program output. 22

From the table, we observe that the arithmetic means are all considered relative to their deviations, so we cannot compare them with each other because their nature differs, according to their contribution to the study. The variables of traditional industries and crafts (1708,191) witnessed a mean of (490,915), followed by cafes (246,468), followed by tourism and travel agencies with an arithmetic mean of (43,426).

As for the standard deviations, they are as follows:

The variables of theaters, museums, tourist expansion areas, and mineral baths witnessed the smallest standard deviations with values of: (0.49), (0.77), (5.56), and (7.35).

While the following variables, traditional industries and crafts, tourism and travel agencies, cafes, and restaurants, had the largest standard deviations with values of (1095,0833), (105,1177), (412,3264), (367,5415)

2.1 Correlation Matrix:

The correlation matrix provides us with values that illustrate the relationships between variables.

From the correlation matrix, we conclude the following: All variables are strongly positively correlated, with the correlation ranging between hotels, cafes, and restaurants with family-oriented services, respectively. This indicates that all variables are strongly positively correlated with each other, as evidenced by the large coefficients and positive sign.

The table shows that we obtained the correlation coefficient matrix, which is the initial solution to the relationships between the variables included in the factor analysis. We note that the value of Determinant (1,16E-005) is significant. As long as this value is greater than 0.0001, we do not eliminate any of the variables. The correlation matrix summarizes the relationship between the study variables, showing the correlation value between a variable and all other variables. The correlation of the variable itself is always equal to 1, and the units appear on the positive diagonal of the matrix, which is the diagonal connecting the upper left end of the matrix to its lower right end. The table above shows the correlation coefficient matrix and its significance. We note (Hamza Muhammad Doudin, 2010, page 120) that most of the correlation coefficients are significant at 0.01, and some at... 0.05. By examining the correlation matrix, we can deduce the pattern of correlation coefficients. These patterns are later summarized as factors that express the correlation coefficients between these variables. The main diagonal of this matrix equals one, and the remaining elements represent the simple linear correlation coefficient between two variables. This square matrix is known as the square correlation matrix. Note that the diagonal divides the matrix into two identical halves because the correlation relationship is commutative. The value 1 is the correlation coefficient of the variable with itself.

This matrix is useful in verifying the hypothesis of the adequacy of the sample for each of the study variables. If we follow the numbers on the main diagonal of the pseudo-correlation matrix, we find that more than 62% of the variables (a) indicated by the letter have a pseudo-correlation coefficient not less than 0.40, indicating that this percentage of variables meets the hypothesis of sample adequacy for each

variable. Therefore, factor analysis is suitable and does not exclude any variable, allowing us to continue the analysis, as shown in the following tables, which reflect the initial solution, the percentage of variance explained for the study variables, their grouping, the underlying root, the factor, and the frequency for each variable.

4.1 Data Suitability Measure:

Table No. (4) Bartlett's Test and KMO Index
Indice KMO et test de Bartlett

Indice de Kaiser-Meyer-Olkin pour la mesure de la qualité d'échantillonnage.		,754
Test de sphéricité de Bartlett	Khi-deux approx.	460,232
	ddl	91
	Signification	,000

Source: SPSS outputs.22

We know that ACP can be applied if at least two of the conditions are met. Therefore, ACP can be applied in this study, as the scale for the suitability of data for factor analysis indicates that the higher the KMO value, the better. It is observed from the results in the table above that its value is 0.7540, which is greater than 0.60. Thus, the study data is suitable for conducting factor analysis. Partial correlation between variables is calculated to ensure that strong correlations exist between all or most of the variables and not just between a few of them. Therefore, no variable is removed from the included variables, given that Bartlett's test for circularity had a significance level of 0.000. This is, of course, less than the significance level of 0.05, indicating that this matrix represents the unity matrix. This indicator shows the difference between the correlation matrix and the unity matrix, meaning that there is a shared variance among the study variables that constitutes a set of hidden factors, which is what we seek to uncover. The fit scale for each variable ranges from 460, 232, and 91.

5.1- Community Coefficients

Table No. (5): Subscription Values
Qualités de représentation

	Initiales	Extraction
Hotels	1,000	,811
Restaurants	1,000	,898
Cultural sites	1,000	,692
Cafés	1,000	,685
Tea rooms	1,000	,712
Travel agency	1,000	,879
Crafts	1,000	,452
Beaches	1,000	,914
Wetlands	1,000	,745
Public gardens	1,000	,578
Thermal springs	1,000	,773
ZET (Zone d'Extension Touristique - Tourist Expansion Zone)	1,000	,886
Museums	1,000	,488
Theaters	1,000	,640

Méthode d'extraction : Analyse en composantes principales.

Source: SPSS 22 output

The table above shows the subscription values estimated using the principal components method for factor analysis, the most accurate method of factor analysis. It expresses the proportion of variance in a variable explained by the common factors derived from factor analysis. The initial subscription values are taken as equal to one in the principal components method when using a correlation matrix. This represents the extracted subscription values for all variables, ranging from zero to one. For example, for the hotels variable, the extracted subscription value is 0.811%, indicating that this percentage of variance in the variable's values is explained by common factors. Therefore, the preliminary analysis results show that the number of factors involved ranges from one to 14 (the number of variables), and the commonality of all variables is one.

- 6.1 Explained Total Variance:

This table shows the principal components and their respective variances. It also shows the amount of information explained for each component. The number of principal components is chosen to minimize data loss. The Kaiser's criterion is used, which considers each principal variable to have a variance of one. The explained variance ratio provides a detailed explanation of the total variance in three successive stages. The method for factor extraction (analyse en composantes principales) is included, as shown in the table below.

Table No. (6): Explained Total Variance
Variance totale expliquée

Component	Initial eigenvalues			Sums extracted from the loading square			Rotation sums of the square of the loads		
	Total	Percentage of variance	Cumulative percentage	Total	Percentage of variance	Cumulative percentage	Total	Percentage of variance	Cumulative percentage
1	6,049	43,208	43,208	6,049	43,208	43,208	4,841	34,582	34,582
2	1,779	12,705	55,913	1,779	12,705	55,913	2,169	15,492	50,074
3	1,202	8,585	64,498	1,202	8,585	64,498	1,774	12,674	62,749
4	1,123	8,019	72,517	1,123	8,019	72,517	1,368	9,769	72,517
5	,839	5,990	78,507						
6	,754	5,384	83,892						
7	,600	4,284	88,176						
8	,564	4,026	92,202						
9	,436	3,115	95,316						
10	,308	2,197	97,513						
11	,154	1,101	98,615						
12	,095	,682	99,297						
13	,072	,516	99,813						
14	,026	,187	100,000						

Méthode d'extraction : Analyse en composantes principales.

Source: SPSS 22 output

The table provides estimates of the statistical measures related to the extracted principal components. The first section of this table is titled "Primary Latent Roots".

This section represents the variance of each factor and determines which of the component factors in the table will remain in the analysis. All factors with latent roots less than one will be excluded in the factorial solution. The first factor explains most of the variance and corresponds to the largest latent root, the second factor explains the second-largest amount of variance, and so on. In the table above,

there are four factors, each with a latent root greater than one, contributing 72,517.0% of the total variance, as shown in the column titled "Cumulative Percentage".

The second section of the table relates to the extracted sum of squares for the saturation values and consists of three columns:

1-Latent root of each of the four extracted factors

2-Percentage contribution of each of the four factors to the total variance

3 -Cumulative percentage contribution of each of the four factors to the total variance

The first component (first axis) includes eight variances The first component (Axis 2) contains two inequalities and explains 43.208% of the total information. The second component (Axis 2) contains two inequalities and explains 12.705% of the total information. The third component (Axis 3) contains three inequalities and explains 8.585% of the total information. The fourth component (Axis 4) contains one inequality and explains 8.019%. If a table of 14 variables is reduced to four axes, with an information volume of 72.517%, then 17.495% of the information is omitted to simplify the study.

1 -Component Matrix After Rotating the Axes:

The purpose of deriving components is to derive new variables that represent groups of the existing variables. Each variable theoretically represents a group (component) described by the set of variables, such as loading onto the component. Or, to put it another way, the hidden (latent) structure described by that set of variables is not described until the set is identified and brought into existence. This process is similar to calculating the average of a data set. Each component is extracted concurrently with the first component as the line that is as close as possible to all the lines representing all the variables at the same time, using the midpoint method. Considering our correlation matrix (Larry Dwyer, 2012, p. 189),

Table 7 shows the factor matrix after rotation of the axes.

Rotation of the component matrix

	Component			
	1	2	3	4
Travel agency	,914	,110	,175	
Restaurants	,849	,146	,342	,196
Tea rooms	,801	,202	,161	
Cultural site	,775	,256	,158	
Public gardens	,744		,106	-,107
Hotels	,678	,343	,482	
Museums	,572	,357	-,174	
Crafts	,447	-,270	,158	,392
ZET (Zone d'Extension Touristique - Tourist Expansion Zone)	,191	,918		
Beaches	,299	,882	,190	-,102
Theaters	,188		,774	
Cafés	,518		,622	,148
Hot springs	-,155	,232	,434	-,712
Wetlands	-,218	,146	,244	,785

Source: SPSS 22 output

The table above shows the matrix of components or factors resulting from factor extraction after rotation. It details the analysis factors for each variable on each of the four factors according to the Varimax with Kisers normalization method. The table shows that four factors were chosen, each principal component being a linear combination of the scores of the original variables, as follows:

$$Pym = bm1x1 + bm2x2 + \dots + bmmxm = xbm$$

The table shows the matrix of coefficients after rotation, which includes the saturations of the extracted factors. We observe that the variables with the strongest correlations to the first factor are: travel agencies, restaurants, tea rooms, cultural landmarks, public parks, hotels, museums, and traditional industries. The variables with the strongest correlations to the second factor are: tourist expansion areas and beaches. The variables with the strongest correlations to the third factor are: theaters, cafes, and thermal areas. The variable with the strongest correlations to the fourth factor is: wetlands.

Each column B contains coefficients related to PC.

The PC coefficients were chosen to have the largest possible variance based on the condition... The scores on PC and PC2 should have the greatest possible variance, provided that the scores on PC1 and PC2 are not correlated. Generally, the PCI coefficients are chosen to have the greatest possible variance, provided that it is not correlated with the scores on PC1. The data for the fourteen variables can be summarized into only four components:

equation for the first factor is: (Mahfouz Joudah, 2008, p. 178)

$$PC1 = 0.914 \text{ travel agencies} + 0.849 \text{ restaurants} + 0.80 \text{ tea rooms} + 0.775 \text{ cultural sites} + 0.744 \text{ public gardens} + 0.678 \text{ hotels} + 0.572 \text{ museums} + 0.447 \text{ handicrafts}$$

The equation for the second factor is:

$$PC2 = 0.918 \text{ ZET} + \text{PLAGES}$$

The equation for the third factor is:

$$PC3 = 0.774 \text{ theaters} + 0.622 \text{ cafes} + 0.734 \text{ sources Thermals}$$

As for the equation of the fourth factor:

$$PC4 = 0.785 \text{ ZONES HUMIDE}$$

-9.1 Naming and Interpreting the Extracted Factors:

Based on the factor matrix after rotating the axes, the four factors and their associated variables can be summarized to provide an initial description of the four factors explaining the importance of tourist attractions and their role in developing tourist regions.

-The first factor: We note that it explains, in order, the variables:

The relative importance of this factor is 43.20% of the total cumulative variance. Therefore, it is considered the primary factor for interpreting the correlation matrix between the variables. We observe that the results of this first factor explain the variables: hotels and restaurants. Travel agencies, tea houses, historical sites, public gardens, museums, and traditional crafts. Therefore, this factor can be called: Tourism Infrastructure.

-The second factor:

This factor comes second in importance in explaining the relationship between the variables, as it explains 64.49% of the total cumulative variance. Upon examining the results of this factor, we find high loading values for each of the variables, amounting to 0.918 and 0.882 respectively, explained by: tourist expansion areas and beaches. Therefore, we can call this the third factor: Natural Resources. -

Third Factor:

This factor ranks third in importance in explaining the relationship between variables, as it explains 55.91% of the total cumulative variance. Upon examining the results of this factor, we find high loading values for each variable, amounting to 0.77, 0.62, and 0.43, respectively, explained by: cafes, theaters, and thermal baths. Therefore, this factor can be called: Public Infrastructure.

-Fourth Factor:

This factor ranks fourth in importance in explaining the relationship between variables, as it explains 72.51% of the total cumulative variance. Upon examining the results of this factor, we find high loading

values for each variable, amounting to 0.78, respectively, explained by: wetlands. Therefore, this factor can be called: Ecological Components.

-02 Interpretation of Hierarchical Cluster Analysis Results

To highlight the economic importance of hierarchy in the tourism industry and demonstrate the relationship between supply indicators in the tourism sector, which is more appropriate for clarifying and evaluating regional attractiveness, we established a hierarchical model that considers four indicators: natural assets, cultural assets, tourism infrastructure, and public infrastructure. It also includes two indicators for measuring tourist demand: arrivals and tourist nights (M. Bulai, Alexandra Cehan, 2015, p. 18)

The attractiveness of a tourist region is based on non-market regional resources, environmental public goods (nature, landscapes, flora, fauna), free services, accessibility, cleanliness, safety, culture, and even commercial regional resources. Commercial regional resources, either in the sense of general tourism offerings (museums, public services for a fee) or as products offered by companies, often rely on regional resources (nature, culture, etc.). Thus, regional resources, as a whole, create regional differentiation, a competitive advantage based on non-reproducible regional characteristics unlikely to exist elsewhere; they are at the heart of destination attractiveness. Tourism (YzatbekBerenaliev, p. 180).

Therefore, in this standard study, we will attempt to apply cluster analysis to statistical data describing tourism supply indicators in the various Algerian provinces, which number forty-eight. The aim is to group provinces characterized by homogeneity and similarity, thus regionalizing the tourism sector based on their available tourism potential and resources. This allows for the development of a regional tourism specialization that assists decision-makers in determining tourism investment directions through development programs and future plans. It also aims to build competitive tourism clusters, destinations, and hubs, helping to identify tourist destinations for both foreign and domestic tourists. The mean correlation method was used to find the relationship between the provinces, relying on the proximity scale and the Euclidean distance square. Through this division, the provinces were categorized and measured with values that indicate the proximity of each province to the others, or the proximity of groups to each other. We can deduce several observations and interpretations that reveal the importance of each state and its relationship to other states, as well as the characteristics of clusters. Clusters can be defined according to their characteristics and tourism potential, including archaeological sites, scenic attractions, and infrastructure level.

2-1 Clusters' Proximity: Ward's Distance Method

In 1963, Ward proposed a method that allows for clustering in a way that minimizes information loss from each clustering. This method relies on analysis of variance, where the sum of squares is reduced by the amount of information lost from each clustering stage. The separation index is equal to the amount of information lost from the clustering. This method is considered by some statisticians to be the best clustering method because it allows for the identification of fragmented and separate clusters.

Table No. (8): Distances between cluster centers

	1	2	3	4
1	0	489,793	397,270	3278,362
2	489,793	0	407,863	3696,599
3	397,270	407,863	0	3529,612
4	3278,362	3696,599	3529,612	0

Source: XLSTAT program output

The table above gives the Euclidean distance, the center of gravity between clusters. The clusters linked together in each step of the analysis can be identified by the distance between any other pair. The

distance is shown in the column titled "Coefficients." The actual value of the coefficients depends on the distance scale and the method of average linking. This follows traditional cluster analysis methods, from which stepwise methods and then clustering methods branch out. In this method, the distance between each pair of clusters is defined. We observe that the center of gravity between the first cluster is closest to the third and second clusters and furthest to the fourth cluster. As for the second cluster, the table shows the distances between the centers of the four clusters. The average of the second cluster is 489.79, the average of the third cluster is 397.270, and the average of the fourth cluster is 3278.362. We observe that the second and third clusters are closest to the first cluster, while the second cluster is closer to the first and third clusters. The third cluster is closer to the first and second clusters, and the fourth cluster is closest to the first cluster with an average of 3278.362 and the third cluster with an average of 3529.612.

2-2 Results by Cluster

Descriptive statistics for the categories are displayed (number of objects, total weights, variance within a class, minimum distance to, maximum distance to, and average distance.)

Table 9: Results by Cluster (Groups)

Class	1	2	3	4
Objects	15	25	7	1
Sum of weights	15	25	7	1
Intra-class variance	1207353,133	1481023,322	599583,238	0,000
Minimum distance from centroid	86,649	86,867	131,498	0,000
Average distance from centroid	955,143	964,848	609,712	0,000
Maximum distance from centroid	1829,082	2693,809	1364,159	0,000

Source: XLSTAT program outputs

The table shows the results by cluster, where four groups were defined to group members. Clustering methods branching from stepwise methods were used, starting with a series of successive merges of n units that transform into groups. These methods merge the closest or most similar items or groups of items.

We observe that the first cluster consists of fifteen states, the second cluster includes twenty-five states, the third cluster includes seven states, and the fourth cluster includes one state. Analysis of variance within each of the four clusters yields the average of the four clusters, estimated at 1,207,353,133 for the first cluster, 1,481,023,322 for the second cluster, and 599,583,238 for the third cluster. Regarding the index of maximum distance between cluster centers, we observe that the average t -value for the first cluster is 86.649, and for the second cluster, it is 86.867. Similarly, the average distance between clusters is 955.143 for the first cluster, 964.848 for the second cluster, and 609.712 for the third cluster. The maximum distance between clusters is estimated at 1,829.082 for the first cluster, 2,693.809 for the second cluster, and 1,364.15 for the third cluster. The distance between individual regional clusters in these cities should not be considered. It necessarily indicates a distance, or difference, in terms of socio-economic development characteristics for such regional entities, despite being located in the coastal region (Ivana Rašić-Bakarić, 2005, p. 180). Through this division, we can deduce many observations and interpretations that reveal the importance of each state and its relationship to other states according to the characteristics of the clusters. Cluster groups can be defined according to characteristics and tourism potential, including archaeological sites, scenic attractions, and the level of infrastructure. The groups can be described as follows: a group with high tourism potential, a group with medium tourism potential, groups with below-average potential, and a group with slightly below-average potential (Petr Chalupa, Martin Prokop, Jaromír Rux, 2013, p. 65). The tree diagram, which uses the linking method, illustrates the different stages of integrating cluster elements using various hierarchical clustering techniques. This allows us to identify the elements or groups that have been linked together at each step

of the analysis. The distances at the top of this diagram... The diagram was divided and measured with values ranging to indicate the proximity of each state to the others or the proximity of groups to each other. The tree diagram illustrates how groups are formed and provides a scale for linking distances for the purpose of grouping. Based on this, the research concluded that the states can be divided into four tourism development regions as follows:

-The first tourism development region:

The overall reading of the tree diagram indicates that this region includes a large number of states from the High Plateaus region, specifically the central states of Guelma, Annaba, Souk Ahras, and Oum El Bouaghi. Considering the precise statistical division, this region is divided into five independent sub-regions with varying development potentials. The first sub-region comprises the states of TiziOuzou, Constantine, and Setif. The second sub-region includes Blida, Tiaret, and Mascara. The third sub-region includes Saida, Laghouat, and Oum El Bouaghi. The final sub-region includes Souk Ahras, Annaba, Batna, and Guelma. Independent and homogeneous. Mila and Adrar also form an independent sub-region in successive stages, as they are characterized by considerable tourism potential and resources.

-The second tourism development region:

This region includes the provinces in green, which have varying and homogeneous development potentials. This region comprises three sub-regions: coastal provinces of El Tarf, M'Sila, Chlef, Ain Temouchent, and Boumerdès, due to the homogeneity of development potential within this region. The second sub-region includes the western provinces of Béchar and Tindouf. This region includes desert provinces such as Ghardaïa, Ouargla, Biskra, and the oases, as they are characterized by geographical and natural proximity. Khenchela, Djelfa, and Tébessa are also included. The overall tree structure indicates that this region includes a large number of provinces.

-The third tourism development region:

This cluster is colored red. The coastal provinces of Tlemcen, Oran, Mostaganem, Tipaza, Jijel, Bejaia, and Skikda are characterized by high tourism potential, allowing for the development of specialized regional tourism such as beach tourism, mountain tourism (due to their mountainous terrain), recreational tourism for enjoying natural scenery, and archaeological tourism. - Fourth Tourism Development Region:

This region includes one province, colored blue, which is the province of Algiers. As can be seen from the tree diagram, the province of Algiers, under any level of classification or division, stands in its own separate group from the other provinces due to the enormous potential unique to Algiers. This region includes mission tourism and business tourism, as it houses various governmental and ministerial bodies.

- 3-2: Distribution of Items in Cluster Membership

Table No. (10): Distribution of Items in Cluster Membership

Classe 1	Classe 2	Classe 3	Classe4
ADRAR	CHLEF	BEJAIA	ALGER
LAGHOUAT	BISKRA	TLEMCCEN	
OUM EL BOUAGHI	BECHAR	JIJEL	
BATNA	BOUIRA	SKIKDA	
BLIDA	TAMANRASSET	MOSTAGANEM	

TIARET	TEBESSA	ORAN	
TIZI OUZOU	DJELFA	TIPAZA	
SETIF	SIDI BEL ABBES		
SAIDA	MEDEA		
ANNABA	M'SILA		
GUELMA	OUARGLA		
CONSTANTINE	EL BAYADH		
MASCARA	ILLIZI		
SOUK AHRAS	B. BOU ARRERIDJ		
MILA	BOUMERDES		
	EL TARF		
	TINDOUF		
	TISSEMSILT		
	EL OUED		
	KHENCHELA		
	AIN DEFLA		
	NAAMA		
	AIN TEMOUCHENT		
	GHARDAIA		
	RELIZANE		

Source: XLSTAT Program Outputs

3 Interpreting Multiple Linear Regression Results:

3-1 Describing the Standard Model:

The standard study aims to develop a standard model in multiple linear regression to measure the impact of tourism factors, extracted from the four principal component factor analysis, on the economic development of regions, in order to determine which components have the greatest influence.

This will determine the impact of the aforementioned variables and whether they have a positive role in tourist demand, represented by tourist nights. It will also identify which variables take precedence by constructing a standard model using multiple linear regression, with tourist nights as the dependent variable and tourist attractions as independent variables. This relationship is expressed as follows:

PC1 = Infrastructure Tourist

PC2 = Natural Potential

PC3 = General Infrastructure

PC4 = Ecological Potential. This standard model, considered a measure of this, can be used in tourism planning, especially as Algeria seeks to develop its tourism sector and adopt it as an alternative investment policy to boost its economy. This underscores the importance of identifying the most influential tourist attractions in attracting tourists through tourist nights, which reflect the demand for hotel services in Algeria. Since demand is the driving force behind the tourism supply process, this study utilized annual time series data using the quadratic method. The least squares method is used to estimate the relationship between tourist attractions and tourist nights, as it is the most suitable method due to the sample size and the type of variables.

2-3 Results of estimating the model between tourist attractions and tourist nights.:

The regression model was estimated using EViews 10 software to clarify the relationship between the independent and dependent variables through the ordinary least squares method, the results of which

are shown in the following table. We will analyze and interpret the results obtained from an economic and statistical perspective.

3-3-Statistical Tests for the Estimated Model

In statistical studies, it is not enough to estimate a statistical model; rather, its statistical power must be assessed through a set of tests that assist us in this study. These tests are as follows:

- Testing the quality of documentation
- Testing the statistical significance of the estimated coefficients, in addition to testing the overall significance of the estimated model
- Testing autocorrelation of errors

We observe from the table above, which shows the correlation coefficients between the variables involved in the regression, that we first note the correlation between the dependent variable (number of overnight stays) and each of the independent variables: infrastructure, tourism infrastructure, natural resources, and ecological resources. We find that these values are (55447.48), (160213.8), (21713.84), and (33083.96), respectively. These values indicate a strong correlation between each independent variable and the dependent variable. Naturally, the stronger this correlation, the more accurate the prediction. However, the correlation between the independent variables should ideally be weak. The standard error for these variables is calculated using the t-test. Obtaining the value by dividing the coefficient by the standard error, we find the value of the t-test. The absolute calculated t-test value is greater than or equal to the tabulated value of 2. This indicates a statistically significant relationship between the independent variables: tourism infrastructure, natural resources, and environmental resources. We find the following values: (4.819532), (13.92589), (1.887381), and (2.875680), where the value of the dependent variable is (13.11082). The probability is less than the significance level: If the significance level (sig) is less than 0.05, this ratio is statistically acceptable. However, if its value is greater than 0.05, the independent variables explain a small percentage of the variance of the dependent variable. We note that the variables have acceptable statistical significance for both the dependent variable (tourist nights) and the independent variables (tourism infrastructure and general infrastructure). The two variables that represent Natural and environmental factors are all highly significant, with a value of 0.000 except for those deemed statistically insignificant.

Table 2 summarizes the linear correlation (R) between the dependent variable and the independent variables. This value is called multiple correlation and is calculated by finding the correlation coefficient between the observed and predicted values of the dependent variable. The independent variables explain a significant portion of the coefficient of determination (R^2), which is a descriptive measure used to explain the usefulness of the regression equation in estimating values. It represents the percentage reduction in errors when using the regression equation and is thus the result of dividing the total squares of the regression by the total square of the deviations. A value of 0.845 for the independent variables can explain 84% of the variance of the dependent variable (tourist nights). The adjusted coefficient of determination (R^2) is 0.830, which is the adjusted value of R^2 . Similarly, the variance of the random term is 0.780, and the least squares are 2.56. The maximum plausibility was 5.72 and the descriptive statistics were as follows, where the arithmetic mean was 149223.3 and the standard deviation of the dependent variable was 189388.5. It is possible to know from it the explanatory power of the model as a whole through the F statistic. As we see from the analysis of variance table, it is characterized by high significance for the F test ($P < 0.0000$). This confirms the high explanatory power of the multiple linear regression model from a statistical standpoint.

4 -Conclusion

4 - 1Hypothesis Testing:

Regarding the hypotheses previously formulated, the following results were obtained:

-The first hypothesis is correct. It shows that there is a statistically significant relationship at the significance level between public infrastructure and tourist nights because the calculated t-value is greater than the critical t-value, and the significance level was equal to zero (less than 0.5%). This necessitated rejecting the null hypothesis and accepting the alternative hypothesis: Algeria possesses significant and diverse tourism potential capable of making it a competitive tourist destination.

-The second hypothesis is correct. It shows that there is a statistically significant relationship at the significance level between natural resources and tourist nights because the calculated t-value is greater than the critical t-value, and the significance level was equal to zero (less than 0.5%). This necessitated rejecting the null hypothesis and accepting the alternative hypothesis. - The third hypothesis is correct. It shows that there is a statistically significant relationship at the significance level between tourist infrastructure and tourist nights because the calculated t-value is greater than the critical t-value, and the significance level was zero (less than 0.5%). This necessitated rejecting the null hypothesis and accepting the alternative hypothesis.

-The fourth hypothesis is correct. It shows that there is a statistically significant relationship at the significance level between ecological resources and tourist nights because the calculated t-value is greater than the critical t-value, and the significance level was zero (less than 0.5%). This necessitated rejecting the null hypothesis and accepting the alternative hypothesis.

-The fifth hypothesis is correct. The Algerian provinces were classified into regions according to their tourism potential, based on many variables. The research relied on fourteen tourism variables and identified four tourist regions that reflect the tourism potential and resources in Algeria.

4- 2-Results of the Field Study:

Based on the stages of the applied study, the following key findings can be drawn:

4 . -1 .2 of Principal Component Analysis:

Based on the stages of the applied study, the following key findings can be drawn:

-The principal component analysis revealed four factors that act as tourist attractions and influence the development of tourist regions in Algeria: The first factor, tourism infrastructure, had a characteristic value of (eigenvalue = 6.04), explaining 43.20% of the total variance. The second factor, general infrastructure, had a characteristic value of (eigenvalue = 1.77), explaining 12.70% of the total variance. The third factor, natural resources, had a characteristic value of (eigenvalue = 1.20), explaining 8.58% of the total variance. The fourth factor, ecological resources, had a characteristic value of (eigenvalue = 1.23), explaining 8.01% of the total variance.

The research shows that four derived factors collectively explained 72.51% of the cumulative variance in the original variables: Factor 1 (34.58%), Factor 2 (15.49%), Factor 3 (12.67%), and Factor 4 (9.76%). These high percentages indicate that the vast majority of the information included in the interpretation process was covered by these derived factors. None of the fourteen variables included in the analysis had a frequency coefficient less than 0.5, meaning that a significant portion of the data related to these variables was included in the derived factors. The highest value for the saturations, which indicates the degree of correlation between the variables and the derived factors, was 0.194. The first factor, called the "tourism infrastructure" factor, is considered the most important derived factor, as it was associated with seven variables that collectively explained 43.20% of the variance in the original variables.

-The data is suitable for factor analysis because the KMO value is 0.754, which is greater than 0.5. - There are four main factors, which are factors whose intrinsic values exceed one (1), such that the total explainable variance is 72.517%. - The contribution values ranged between 0.640 and 0.898, which represent the percentage of variance of the variable that can be explained by the extracted factors.

4- .2.2 Results of Hierarchical Cluster Analysis:

Regarding cluster analysis, the Algerian provinces can be classified and divided into tourist regions according to their tourism potential, based on a number of variables estimated at fourteen. Four tourist regions were identified that reflect the tourism potential in Algeria.

- There is a close proximity between the centers of the first, second, and third groups, while the fourth is farther away.
- The first region includes fifteen provinces, the second cluster includes twenty-five provinces, the third cluster includes seven provinces, and the fourth cluster includes one province.
- The province of Algiers constitutes a tourist region in its own right, due to its unique tourist attractions, making it a region with high tourism potential.
- The second cluster includes the northern, central, and high plateau provinces, with sub-clusters including Tebessa, Djelfa, Biskra, Khenchela, Ouargla, and Ghardaia. This indicates that the tourism development potential is largely similar, suggesting that their tourism potential is below average.
- The third region includes the coastal provinces of the northeast and northwest: Oran, Mostaganem, Tipaza, Bejaia, Skikda, and Jijel. These coastal provinces share similar tourist attractions and possess moderate tourism potential.

4 .2.3Results of Linear Regression Analysis Multiple:

Our study has yielded a set of results that can help investors, researchers, and decision-makers in the tourism sector and those responsible for oversight to understand the factors influencing tourist flow. We will begin by analyzing the results obtained by estimating the model using the Eviews 10 statistical software. The economic aspect will be followed by the statistical aspect to deduce the relationships between the dependent variable and the independent variables. The results are drawn and ranked according to the strength of the relationship as follows:

-Regarding the public infrastructure coefficient, we note that its positive sign indicates a positive effect, i.e., a direct relationship between the independent variable (public infrastructure) and the dependent variable (tourist nights). This relationship is statistically significant, and the strongest relationships, at a high significance level, were found in Algeria. This is due to the extent of its impact on tourists and their search for leisure and recreation tourism. This is achieved through the availability of complementary support services, with a statistically significant effect.

-Regarding the tourism infrastructure coefficient, we observe a positive sign, indicating a positive effect, i.e., a direct relationship between the independent variable (tourism infrastructure) and the dependent variable (tourist nights). We note that its sign is positive and it has a high effect strength with a statistically significant effect.

-Regarding the natural resources coefficient, we observe a positive sign, indicating a direct relationship between the independent variable (natural resources) and the dependent variable (tourist nights). We note that its sign is positive and it has a high effect strength with a statistical significance of 0.0063.

-Regarding the ecological resources coefficient, we observe a positive sign, indicating a direct relationship, and the dependent variable (tourist nights) has a positive sign but does not have a high effect strength with a statistical significance of 0.660.

The reviewer

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