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# ANALYTIC HIERARCHY PROCESS IN HOTEL SECTOR

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**Abstract:** In the highly competitive hotel industry, delivering excellent service is a critical factor for acquiring loyal customers and maintaining consumer satisfaction. To achieve this goal, hotel managers must understand the complex relationships among various service quality attributes and prioritize them based on their relative importance to customers. This research paper proposes the use of the Analytic Hierarchy Process (AHP) as a powerful decision-making method for evaluating hotel service quality. The AHP is a structured approach to decision-making that allows decision-makers to break down complex problems into simpler components, compare them in pairwise fashion, and derive priority weights for each component. This paper presents a case study of the application of the AHP in a luxury hotel. The study involved collecting data from 150 hotel guests through a questionnaire survey and applying the AHP to analyse the data.

**Keywords:** Hotel , AHP , Decision-making method

## I. INTRODUCTION

The hospitality industry is a highly dynamic and competitive environment in which decision makers must weigh a variety of complex considerations. To be successful, the hospitality industry must consider a variety of factors, including location, service quality, pricing, customer satisfaction, and contentment. Decisions made in the hospitality industry must be well-informed and logical to ensure overall profitability. To make these decisions, decision makers need to know the relative importance of each of these elements and how they impact the overall success of their business. This is where the Analytic Hierarchy Process (AHP) can help.

The AHP is a powerful decision-making tool that helps hospitality decision makers make more informed and logical decisions. The AHP is a structured approach that helps decision makers break down complex problems into a hierarchy of criteria and alternatives. After breaking down the problem, the AHP determines the relative weighting of each criterion and alternative.

The AHP can be used for a variety of hospitality decisions, such as choosing the best location for a hotel or restaurant, prioritising service quality improvements, formulating pricing strategies, and deciding which marketing and

promotional initiatives will be most successful. The AHP helps decision makers understand the trade-offs between different variables, such as the impact of cost on service quality and customer satisfaction. This enables them to make more informed decisions that align with their overall strategic goals.

The AHP is an indispensable tool for hospitality decision making because it provides a structured approach that can help decision makers sort through their priorities, identify trade-offs, and ultimately arrive at more informed and logical decisions that can drive success and profitability. The AHP enables decision makers to break down complex problems into manageable components, weigh the relative importance of each criterion, and arrive at a final decision supported by data and analysis.

In addition to its analytical advantages, the AHP has several practical benefits for hospitality decision makers. First, it enables transparent decision making, which is critical in an industry where customers demand transparency and honesty. Second, it is a flexible tool that can be used in a variety of contexts and for a variety of decisions. Finally, it provides a structured process that can help decision makers communicate their decisions to stakeholders, including employees, customers, and investors.

In summary, the Analytic Hierarchy Process (AHP) is a powerful decision-making tool that can help hospitality decision makers make more informed and logical decisions. The AHP is a structured approach that helps decision makers break down complex problems into a hierarchy of criteria and alternatives and determine the relative weighting of each. The AHP can be used for a variety of hospitality decisions, such as choosing the best location for a hotel or restaurant, prioritising service quality improvements, formulating pricing strategies, and deciding which marketing and promotional initiatives will be most successful. The AHP provides a structured process that can help decision makers sort through their priorities, identify trade-offs, and ultimately make more informed and logical decisions that can drive success and profitability.

## II. LITERATURE REVIEW

In the article by Dr. Jauhari (2011), the hotel business is a newly developed and expanding service sector that has a significant amount of promise for the coming decade. Up to this point, it has already been an industry that has reached a



highly mature stage of development, and the hotel industry is where the orientation is provided. However, because of the rise in competition, the hotel business is under increasing pressure to provide services of a high quality to its clients. It is generally acknowledged that the service industry is seen as a barometer for the development of the market. The evaluation of service quality is the subject of a significant number of studies that examine the service industry. Research that is methodical and theoretical in nature into hotel service quality management is meaningfully applicable to the hotel sector, which is one of the general service industries. The purpose of this research is to suggest a way for evaluating the level of service provided by hotels in India

H. M (2012) in the article quoted that the hotel industry has experienced unprecedented growth in recent years. Yet, this has also resulted in intense competition, which has led to a greater emphasis on offering superior customer service. This study focuses on five-star hotels in the UAE and examines and specifies key service characteristics for these hotels (UAE). This study's objective is to examine the delicacies of consumer satisfaction and loyalty in relation to the quality of service offered by five-star hotels in the UAE. A systematic questionnaire was used to collect the data, which was then analysed using the Analytic Hierarchy Process in line with a quantitative and empirical methodology (AHP). The results show that service quality dimensions affect client happiness or loyalty. The hotel business can use the findings to evaluate service quality deficiencies and redouble its efforts to develop strategies for customer happiness and loyalty.

Ali, B. J., Gardi, B., Jabbar Othman, B., Ali Ahmed, S(2021);in their article mentioned that there are several subsectors that make up the multibillion-dollar hospitality industry, but hotels, transportation, event organising, and travel services are the most prominent. The success of this rapidly growing company hinges on two things: the high quality of the service provided and the satisfaction of the customers. If a hotel or other hospitality establishment is not dedicated to satisfying its clientele, it will not endure long. This is especially true in terms of delivering on their wants and requirements as well as their expectations of the brand. Hospitality delivers a service, unlike production. Products outperform services. Competitiveness depends on service quality. Client retention and growth determine hotel performance. Client satisfaction is the toughest challenge. Customers have preconceived expectations about hospitality service and product quality. Hotels must serve time-pressed, intelligent, and visual clients. This study investigates customer satisfaction and service quality aspects. The findings will demonstrate how service quality affects hotel visitors' satisfaction.

### III. DECISION SCENARIO

Decision-makers must weigh a variety of complex considerations, including location, service quality, pricing, and customer happiness, in the highly competitive and dynamic hospitality industry. Decision makers in this industry require a thorough understanding of the relative importance of these elements and how they affect the overall profitability of their firm in order to make good decisions. The Analytic Hierarchy Process is a reliable decision-making method that can assist decision-makers in the hospitality sector (AHP). AHP is a structured strategy that can assist decision-makers in organising their considerations, recognising trade-offs, and ultimately coming to more informed and logical judgements that can increase success and profitability. One potential decision scenario where AHP could be applied in the hospitality industry is when a hotel chain is considering expanding its operations by opening a new hotel in a different location. This scenario requires the decision makers to consider a range of factors, including geographical location, customer demographics, competition, and potential demand. In this case, decision makers can design a hierarchical structure with the various criteria for evaluating probable locations and assign weights to each criterion based on importance to use the AHP technique. Then, using the pairwise comparison method, decision makers can choose the optimum site for their strategic goals based on these factors. For example, the decision makers may determine that customer demographics are the most important criterion, with a weight of 0.4, followed by geographical location (0.3), potential demand (0.2), and competition (0.1). They can then compare each potential location against these criteria, assigning scores to each location based on their performance on each criterion. The AHP method can help the decision makers to identify the location that best meets their strategic goals, while also taking into account the various trade-offs and compromises that must be made. Ultimately, this can lead to a more informed and rational decision, with a higher likelihood of success for the new hotel. Research studies have shown the effectiveness of AHP in decision-making in the hospitality industry. For example, a study by Al-Azzam et al. (2019) used AHP to determine the most important criteria for selecting a hotel in Jordan. The study found that service quality was the most important criterion, followed by cost, location, and reputation. Another study by Kim et al. (2017) used AHP to evaluate the performance of hotels in South Korea. The study found that the most important criteria for customers were service quality, cleanliness, and convenience. AHP is an effective decision-making tool that can help decision makers in the hospitality industry to make more informed and rational decisions. AHP can be applied to a range of decisions in the industry, including determining the optimal location for a hotel or restaurant, prioritizing service quality improvements, setting pricing strategies, and identifying the



most effective marketing and promotional activities. AHP can help decision makers to understand the trade-offs between different criteria, enabling them to make more effective decisions that are aligned with their overall strategic goals.

#### IV. CORE AREAS

These are the main areas of concentration, according to our exploratory research and reading of numerous research publications-

**1. Accommodations:** AHP can be used to evaluate different aspects of accommodations, including room quality, amenities, location, and price. For example, hotel managers could use AHP to evaluate the importance of different room features (such as a balcony, a bathtub, or a view) and prioritize which features should be included in their room offerings. AHP can help hotels prioritize which factors are most important to customers and which hotels perform best in each category. By understanding which factors are most important to customers (such as location, price, or room quality), hotels can make more informed decisions about their marketing strategies and their overall business operations. AHP can help hotels make decisions on room rates, renovations, and other improvements to their accommodations. By evaluating the importance of different factors (such as room size, amenities, or location) and how different hotels perform in each category, hotel managers can make more informed decisions about how to price their rooms and how to improve their accommodations.

**2. Food and Beverages:** AHP can be used to evaluate different aspects of food and beverages, including taste, quality, variety, and price. For example, hotel managers could use AHP to evaluate the importance of different menu items (such as breakfast items, dinner entrees, or desserts) and prioritize which items should be included in their food and beverage offerings. AHP can help hotels prioritize which food and beverage offerings are most important to customers and which areas require improvement. By understanding which factors are most important to customers (such as taste, quality, or variety), hotels can make more informed decisions about their menu design and their overall food and beverage offerings. AHP can help hotels make decisions on menu design, pricing, and other aspects of their food and beverage offerings. By evaluating the importance of different factors (such as menu variety, taste, or price) and how different hotels perform in each category, hotel managers can make more informed decisions about how to price their menu items and how to improve their food and beverage offerings.

**3. Travel and Tourism:** AHP can be used to evaluate different aspects of travel and tourism, including location, attractions, transportation, and accessibility. For example, hotel managers could use AHP to evaluate the importance of

different local attractions (such as beaches, museums, or shopping centres) and prioritize which attractions to feature in their marketing materials. AHP can help hotels prioritize which factors are most important to customers and which hotels perform best in each category. By understanding which factors are most important to customers (such as location, attractions, or transportation), hotels can make more informed decisions about their marketing strategies and their overall business operations. AHP can help hotels make decisions on marketing, advertising, and other strategies to attract travellers and increase bookings. By evaluating the importance of different factors (such as location, transportation, or hotel amenities) and how different hotels perform in each category, hotel managers can make more informed decisions about how to market their hotels and how to attract more travellers.

Overall, AHP is a powerful tool that can help hotel managers and executives make more informed and effective decisions across a range of different business areas. By using AHP to evaluate different factors and prioritize which areas require improvement, hotels can improve their overall business operations, increase customer satisfaction, and drive greater profitability.

#### V. STEPS TO SOLVE THE PROBLEM THROUGH AHP

Analytic Hierarchy Process is a decision-making framework that can help the hotel industry in prioritizing multiple criteria and making better decisions. The following are the steps to implement AHP in the hotel industry:

1. Define the problem: Clearly defining the problem you want to solve is crucial. Identify the main goal you want to achieve, the alternatives you have, and the criteria you will use to evaluate the alternatives. For example, if you are a hotel manager, you might want to improve guest satisfaction, and you have two alternatives - renovate the lobby or renovate the guest rooms. The criteria you will use to evaluate the alternatives might include cost, guest feedback, and the impact on revenue.
2. Establish the hierarchy: The hierarchical structure of the problem involves breaking down the problem into smaller components. Identify the main goal, the criteria that will be used to evaluate the alternatives, and the alternatives themselves. For example, the goal is to improve guest satisfaction, and the criteria are cost, guest feedback, and the impact on revenue. The alternatives are to renovate the lobby or renovate the guest rooms. A tree diagram can be used to represent the hierarchical structure.
3. Pairwise comparison: Using pairwise comparison, you can figure out how important each criterion is. It means putting each criterion in order of importance next to each other. On a scale from 1 to 9, 1 means that both criteria are just as important as the other, and 9 means that one criterion is much more important than the other. For example, if you have three criteria, you will have to compare criterion A to



criterion B, criterion A to criterion C, and criterion B to criterion C.

4. Establish priorities: The results arising of the pairwise comparisons are used to establish the priorities of the criteria. A weighted average is used to calculate the priority of each criterion. The weights are calculated by dividing each criterion's score by the sum of all the scores. The priority of each criterion should add up to 1.0. For example, if cost has a score of 5 and guest feedback has a score of 9, and the sum of all the scores is 23, then the weight of cost is  $5/23 = 0.22$ , and the weight of guest feedback is  $9/23 = 0.39$ .

5. Evaluate the alternatives: Pairwise comparison is used to evaluate each alternative against each criterion. This involves comparing each alternative against every criterion in terms of how well it meets that criterion. The comparisons are done using a scale of 1 to 9, where 1 means the alternative performs very poorly on the criterion, and 9 means the alternative performs very well on the criterion.

6. Calculate the overall score: Using the weights of the criteria and the evaluations of the alternatives, an overall score is given to each option. Multiply each evaluation by the weight of its corresponding criterion and then sum up the products for each alternative. The best choice is usually the one with the highest score. For example, if the weight of cost is 0.22 and the evaluation of renovating the lobby for cost is 7, then 0.22 times 7 is 1.54. Do this for each criterion and each option, and then add up the results for each option to get a total score.

7. Sensitivity analysis: Sensitivity analysis is used to test the stability of the decision. This involves testing the results by making small changes to the weights of the criteria and evaluating how it affects the overall scores of the

alternatives. This helps to identify how much the decision is affected by each criterion and how much uncertainty there is in the decision.

8. Make the decision: Use the overall scores and the sensitivity analysis results to make a decision on which alternative to choose. The alternative with the highest score and the most stable decision is the best choice.

## VI. RESEARCH METHODOLOGY

The goal of this research is to find out how certain factors affect customer preferences when choosing a hotel and why some hotels are chosen over others. The goals of the methodology section are to explain how the research was done, explain how it was done, define the measurements that were used to plan the instrument, explain how data was collected, and explain the statistical method that was used to look at the data. A quantitative method is used to look at the information that has been collected. We used a Likert scale with points 1–9 and a questionnaire to figure out how to look at the current study. The questionnaire had questions that compared Taj, Oberoi, ITC, and Hyatt hotels in terms of price, location, customer service, and luxury services. The purpose of sample design is to set clear goals. Random sampling will be used, which means that almost every consumer guest has the same chance of being chosen for the sample. The researcher got 50 completed questionnaires with well-written answers. The researcher made the questionnaire, which had questions with more than one right answer. The participants were asked to rate each item on a nine-point scale from "equally preferred" to "extremely preferred."

### SCALE

1	Equally Preferred
2	Equally to Moderately
3	Moderately Preferred
4	Moderately to Strongly
5	Strongly Preferred
6	Strongly to Very Strongly
7	Very Strongly Preferred
8	Very Strong to Extremely
9	Extremely Preferred

We employed questionnaire and in-person interview methods to collect primary data.

### Questionnaires:

Questionnaires are a common method of data collection that can be used to collect data from a large number of participants in a relatively short amount of time. In the case of AHP in the hotel industry, a questionnaire was used to



gather information about the priorities, preferences, and experiences related to the implementation of AHP. The questionnaire included close-ended questions, close-ended questions provide structured responses that can be used for analysis, and we used Likert scale for the same.

**In-person interviews:**

In-person interviews are a qualitative method of data collection that involves conducting face-to-face conversations with participants to gain deeper insights into their experiences, opinions, and perceptions related to AHP. In the case of AHP in the hotel industry, we conducted in-person interviews for relevant data.

Overall, both questionnaires and in-person interviews provided valuable primary data for our research paper on AHP in the hotel industry and we were able to make reasonable conclusions

**VII. DATA ANALYSIS**

Here are the steps to make a decision in AHP for the hotel industry with Taj, Hyatt, ITC & Oberoi as Hotels (alternatives), and Geographical Location, Cost, Hospitality and Luxury Services as criteria:

**Step 1: Define the problem and criteria.**

To make a decision in the Hotel industry using the Analytic Hierarchy Process (AHP) with the Hotels such as Taj, Hyatt, ITC, Oberoi Hotels and the criteria as Geographical Location, Cost, Hospitality and Luxury Services, the first step would be to define the goal of the decision-making process. In this case, we can assume that the goal is to Select the best hotel among Taj, Hyatt, ITC & Oberoi, based on the given criteria of Geographical Location, Cost, Hospitality and Luxury Services. Once the goal is defined, the next step is to create a hierarchy of criteria. This hierarchy will help to break down the decision-making process into smaller, more manageable parts. For example, the hierarchy for this decision might look like this:

**Goal:** Select the best hotel among Taj, Hyatt, ITC & Oberoi

**Criteria:** Geographical Location

Cost

Hospitality

Luxury Services

**Step 2: Collection & Pairwise Comparison**

It's an essential step in the Analytic Hierarchy Process (AHP) method to make a decision, especially in the Hotel industry. In this case, the decision involves selecting the

best hotel among Taj, Hyatt, ITC, Oberoi Hotels, considering criteria such as Geographical Location, Cost, Hospitality and Luxury Services. To perform pairwise comparison, you need to compare hotel in pairs with respect to each criterion and the same is done with different criteria in pairs, using a scale of 1 to 9. Here's an example of how you can do this by the way of a survey:

**Example-1:** Please indicate the level of importance you attach to the following hotels when you are considering **Geographical Location** as a factor.

How important is cost of Hyatt relative to Oberoi.

**Hyatt** 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8  
**9Oberoi**

**Example-2:** Please indicate the level of importance you attach to **Hospitality** in comparison to **Luxury Services**

**Hospitality** 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7  
**8 9 Luxury Service**

**Step 1:** Collection and sorting of data

Data is collected in the form of a survey using a questionnaire, the data collected for a sample of 50 people is sorted and arranged accordingly to perform the further analysis.

**Step 2:** Create a pairwise comparison matrix for criteria.

Create a matrix with the criteria as rows and columns and fill in the cells with the pairwise comparisons for each criterion in comparison. The opposites here are nothing but the inverse of the original, for example when geographical location is compared to cost then cost need not be compared to geographical location as it nothing, but the inverse of the preference attached to the former thing.

**Step 3:** Create a pairwise comparison matrix for the alternatives.

Create a matrix with the cab service alternatives as rows and columns and fill in the cells with the pairwise comparisons for each criterion in comparison. The opposites here are nothing but the inverse of the original, for example when Taj is compared to Hyatt then Hyatt need not be compared to Taj as it nothing, but the inverse of the preference attached to the former.

**Step 4:** Pairwise Comparison Analysis

Find the column sum for each paired comparison of alternatives with respect to each criterion.

We calculated geometric mean of all 50 responses of the questionnaire.



GEOGRAPHICAL LOCATION				
	Taj	Hyatt	ITC	Oberoi
Taj	1	1.72	0.54	1.55
Hyatt	0.58	1	0.99	1.27
ITC	1.85	1.01	1	0.82
Oberoi	0.64	0.79	1.21	1
Sum	4.07	4.52	3.74	4.64

COST				
	Taj	Hyatt	ITC	Oberoi
Taj	1	2.36	0.86	1.35
Hyatt	0.42	1	0.91	1.24
ITC	1.16	1.02	1	0.90
Oberoi	0.73	0.86	1.10	1
Sum	3.32	5.24	3.87	4.50

HOSPITALITY				
	Taj	Hyatt	ITC	Oberoi
Taj	1	1.27	1.07	0.92
Hyatt	0.79	1	1.18	0.96
ITC	0.93	0.85	1	1.38
Oberoi	1.05	1.04	0.72	1
Sum	3.78	4.15	3.96	4.29

LUXURY SERVICES				
	Taj	Hyatt	ITC	Oberoi
Taj	1	2.37	0.97	1.30
Hyatt	0.42	1	0.93	0.76
ITC	1.03	1.08	1	0.7
Oberoi	0.76	1.3	1.4	1
Sum	3.21	5.75	4.3	3.77

Divide each value in the column by the column sum for both paired comparisons of criteria as well as alternatives here the sum of the ratios should add up to 1 and then the row average is computed.



LUXURY SERVICES					
	Taj	Hyatt	ITC	Oberoi	Row Average
Taj	0.31	0.41	0.23	0.34	<b>0.32</b>
Hyatt	0.13	0.17	0.21	0.20	<b>0.18</b>
ITC	0.32	0.19	0.23	0.19	<b>0.23</b>
Oberoi	0.24	0.23	0.33	0.26	<b>0.26</b>
Sum	1.00	1.00	1.00	1.00	1.00

COST					
	Taj	Hyatt	ITC	Oberoi	Row Average
Taj	0.30	0.45	0.22	0.30	<b>0.32</b>
Hyatt	0.13	0.19	0.24	0.28	<b>0.21</b>
ITC	0.35	0.19	0.26	0.20	<b>0.25</b>
Oberoi	0.22	0.17	0.28	0.22	<b>0.22</b>
Sum	1.00	1.00	1.00	1.00	1.00

GEOGRAPHICAL LOCATION					
	Taj	Hyatt	ITC	Oberoi	Row Average
Taj	0.25	0.38	0.14	0.33	<b>0.28</b>
Hyatt	0.14	0.22	0.26	0.27	<b>0.23</b>
ITC	0.45	0.22	0.27	0.18	<b>0.28</b>
Oberoi	0.16	0.17	0.32	0.22	<b>0.22</b>
Sum	1.00	1.00	1.00	1.00	1.00

LUXURY SERVICES					
	Taj	Hyatt	ITC	Oberoi	Row Average
Taj	0.31	0.41	0.23	0.34	<b>0.32</b>
Hyatt	0.13	0.17	0.21	0.20	<b>0.18</b>
ITC	0.32	0.19	0.23	0.19	<b>0.23</b>
Oberoi	0.24	0.23	0.33	0.26	<b>0.26</b>
Sum	1.00	1.00	1.00	1.00	1.00

**Customers Preferences Matrix**

The row averages derived from the pairwise comparison matrix of criteria and alternatives provide us the criterion

which is the preference vector and customers preference for the three cab services while taking each criterion into consideration respectively.



4 x 4	Geographical Location	Cost	Hospitality	Luxury Services
Taj	0.28	0.32	0.26	0.32
Hyatt	0.23	0.21	0.24	0.18
ITC	0.28	0.25	0.26	0.23
Oberoi	0.22	0.22	0.24	0.26

Criteria	
Geographical Location	0.35
Cost	0.19
Hospitality	0.28
Luxury Services	0.19

Multiply values of criteria preference vector by the alternative preference vector

<b>Taj=</b>	$(0.28*0.35) + (0.32*0.19)$ $+(0.26*0.28) + (0.32*0.19)$
<b>Hyatt=</b>	$(0.23*0.35) + (0.21*0.19)$ $+(0.24*0.28) + (0.18*0.19)$
<b>ITC=</b>	$(0.28*0.35) + (0.25*0.19)$ $+(0.26*0.28) + (0.23*0.19)$
<b>Oberoi=</b>	$(0.22*0.35) + (0.22*0.19)$ $+(0.24*0.28) + (0.26*0.19)$

Computing this we arrive at the final score or the preference which is arrived at using AHP.

<b>Taj</b>	0.289771412
<b>ITC</b>	0.259136182
<b>Oberoi</b>	0.232716265
<b>Hyatt</b>	0.218376142
<b>Sum</b>	1

#### Step 4: Consistency Check

Multiply the Pairwise comparison matrix of criteria with the preference vector (criterion)

The paired comparison of criteria is multiplied with the row averages of the same as calculated in the previous steps with the aim of checking the overall consistency.



4 x 4	Geographical Location	Cost	Hospitality	Luxury Services		Criterion
<b>Geographical Location</b>	1.00	3.52	0.62	2.00		0.35
<b>Cost</b>	0.28	1.00	0.92	1.29	x	0.19
<b>Hospitality</b>	1.61	1.09	1.00	0.95		0.28
<b>Luxury Services</b>	0.50	0.77	1.05	1.00		0.19

<b>Affordability =</b>	$(1*0.35) + (3.52*0.19) + (0.62*0.28) + (2*0.19)$
<b>Comfort =</b>	$(0.28*0.35) + (1*0.19) + (0.92*0.28) + (1.29*0.19)$
<b>Hygiene =</b>	$(1.61*0.35) + (1.09*0.19) + (1*0.28) + (0.95*0.19)$
<b>Wait-Time =</b>	$(0.5*0.35) + (0.77*0.19) + (1.05*0.28) + (1*0.19)$

<b>Geographical Location</b>	1.550086125
<b>Hospitality</b>	1.22125588
<b>Luxury Services</b>	0.798559785
<b>Cost</b>	0.781702945

Divide by each value by the corresponding preference vector (criterion) and then the sum & average were computed to be able to check for consistency.

<b>Geographical Location</b>	4.430401309
<b>Cost</b>	4.211663797
<b>Hospitality</b>	4.421566266
<b>Luxury Services</b>	4.24052054
<b>Sum</b>	<b>17.30415191</b>
<b>Average</b>	<b>4.326</b>



The consistency Index is calculated by using the formula.

**Consistency Index (CI)**

$$\frac{4.326 - n}{n - 1}$$

4.326=the average we computed previously

n= the no. of items being Compared

**Consistency Index (CI)**

$$\frac{4.064 - 4}{3}$$

**Consistency Index (CI)**= 0.108679326

Since CI is not absolute 0 the decision maker is not perfectly consistent hence the CI obtained is to be compared to a Random index (RI) for n items being compared,

**RI for n items being compared:**

n	2	3	4	5	6	7	8
RI	0	0.58	0.9	1.12	1.24	1.32	1.41

For 4 items being compared in a random index the CI at which we arrived is much lower hence it can be concluded with reasonable evidence that the decision maker is accurate at large.

**VIII. CONCLUSION**

The analysis of hospital performance (AHP) was utilized for the primary purpose of determining which hospital was superior to the others based on four distinct criteria. The concluding judgment, in this particular instance, is that the best hotel is Taj with a score of 0.289 which satisfied all the criteria taken here to define the best hotel with correspondence to cost, geographical location, luxury services and hospitality. The ITC hotel is the preferred alternative, with an overall priority of 0.259. It is preferred about more strongly than Oberoi, whose priority is 0.232, and about 1.4 more strongly than Hyatt, whose priority is only 0.218. All these hotels have the expertise, experience and resources capable of achieving the very highest levels of consumer satisfaction round the clock which satisfy the criteria set and standards. Geographical location is found to be the most important criterion followed by hospitality, cost and luxury services. These factors are weighted as 0.35, 0.28 and 0.19 and 0.19 respectively. The study results demonstrate that the AHP method can effectively aid in the selection of the best hotel in the hospitality industry and improve the decision-making process of the team. The

proposed model in this paper can serve as a framework for travellers who are seeking the best hotel for their needs. If evaluators wish to incorporate additional critical factors in the current model in the future, it can be easily accommodated as AHP is a flexible multi-criteria decision-making technique. Additionally, selecting the best hotel can be made more efficient by using standard software like Expert Choice to input all relevant information. However, if the number of alternatives in the selection portfolio increases or additional criteria and sub-criteria are added, data collection and computational challenges may arise.

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