

Consumer Perception of Budget Hotels: A Multi-Dimensional Scaling Approach

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Abstract

The Indian hospitality landscape has witnessed the emergence of budget hotels in the last decade. This segment has attracted major investments and advent of new brands is evident. This study aims at finding the consumer perception towards budget hotels using multi-dimensional scaling and also makes an attempt to find out the underlying factors that leads to such perception levels with the help of exploratory factor analysis. The ensuing research work relies on primary data and four popular brands compared. Study outcome suggests differential perception for these brands, with two brands appearing similar. It also appears that the factors named 'Basics' and 'Comfort' are very important in shaping the consumer perception.

Keywords: Budget Hotels, Perception, Multi-Dimensional Scaling, Exploratory Factor Analysis.

Introduction

Until the opening up of the economy in the early 90s, the Indian hotel industry had primarily been dominated by the unorganized players. Alongside these unorganized hoteliers remained the hi-end luxury hotels. The market continued to be polarized with service offerings on two extremes of the price spectrum, the low or entry level on one end and premium segment at the other end. The economic reforms saw investments in many sectors in India, including the hospitality segment. Traveling in India started growing many folds on account of enhanced business activities and the need for accommodation was a natural consequence. The disposable income in the hands of Indian consumers witnessed a striking growth; ease of communication started changing the mind set of Indian consumers and the concept of holidaying and travel for leisure also saw a radical transformation. All these fuelled the need for accommodation, however, the demand was primarily from the middle class Indians and budget accommodation was a concern.

The last decade observed the rise of a large number of budget and economy hotels in India. While the luxury hotels were concentrated in the metro cities and exotic locations, the budget hotels started concentrating in metro cities and tier II towns in the country. In fact the budget hotels entered all possible markets and opened facilities in locations which had been untapped till then. These included pilgrim destinations, industrial towns, corporate hubs, leisure destinations to name a few. Within a short span of time the emergence of new brands was a reality. Fab Hotels from Casa2 Stays Private Limited, with their aggressive strategies took to dethrone the projects of the international brands. The entry of OYO Rooms, Fab hotels, Treebo and Lemon Tree has been a game-changer, giving birth to a whole new industry, and organizing properties within this segment. Never before has the country's hospitality industry witnessed such a surge in the growth of these 'budget brands'.

It is the sudden influx of these 'budget brands' that has ignited the growth of this sector, fuelled by the drastic, almost unrealistic pricing that they have introduced. Domestic tourism has especially benefitted from this and has been growing steadily. To take their business to the next level, these brands, apart from offering highly attractive pricing, have also implemented stringent quality standards including booking facility, complimentary breakfast, hygienic food, pick up and drop facility with broader focus on the guest experience. The consumer experience in the new age budget hotels has beheld a mix of encouraging rebuffing reactions. It is quite natural that the consumer perception towards budget hotels would not be the same and there appears to be a dearth of such evaluation in the Indian context. This motivated the researcher to



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objectively analyze the consumer perception towards four budget hotel brands who have presence in Kolkata city. Multi-dimensional scaling is used in this study for measurement of consumer perception and fifteen key performance indicators defining the budget hotel services have been considered. The rest of the paper is organized as follows. Literature review is dealt in the next section, followed by Research Framework. The third section deals with the analysis and discussion of the outcomes while in the final section conclusions have been drawn.

Review of Literature

Literature review was done with the objective to have an understanding of the research works already done in similar and related field and to find out the gap where further research is needed. Systematic review of literature was done and it has been seen that Ravald and Grönroos (1996) stating that any physical product can be turned into a service to a customer if the one person selling the service provided the service is made into a solution to meet the demand of a customer. Quality of service and customer satisfaction is critical factors for success of any business (Ravald and Grönroos, 1996; Parasuraman, Zeithaml, and Berry, 1988). As Valdani (2009) points out those enterprises exist because they have a customer to serve. The key to achieve sustainable advantage lies in delivering high quality service has also been highlighted (Shemwell, Yavas, and Wuhrer, 1998). Service quality and customer satisfaction are key factors in the battle to obtain competitive advantage and customer retention. Customer satisfaction is the outcome of customer's perception of the value received in a transaction or relationship, where value equals perceived service quality, compared to the value expected from transactions or relationships with competing vendors (Blanchard & Galloway, 1994; Heskett et al, 1990; Parasuraman et al., 1990). In order to achieve customer satisfaction, it is important to recognize and to anticipate customers' needs and to be able to satisfy them.

Customer requirements for quality products and service in the tourism industry have become increasingly evident to professionals (Lam & Zhang, 1999). Guest relationships are a strategic asset of the organization (Gruen, Summers and Acito, 2000) and customer satisfaction is the starting point to define business objectives. Hotels with good service quality will ultimately improve their profitability (Oh & Parks, 1997). In a competitive hospitality industry which offers homogeneous services, individual hoteliers must be able to satisfy customers better than their counterparts (Choi & Chou, 2001). Hotels often utilize technology as a value-added amenity to help promote differentiation and enhance guest satisfaction. The adoption of technology by the hospitality industry started in early 1970s and has been rapidly evolving ever since (Cobanoglu, Berezina, Kasavana and Erdem, 2011). Many hospitality industry experts emphasize the importance of in-room technologies as the traveling public continues to become more technologically savvy (Higley, 2007; Squires, 2008). Preferred criteria in winning budget hotel

interior design projects in China was studied by Huang, Chen and Tsaih (2019). Budget and midrange hotel managers' perceptions of and responses to Airbnb was analysed in the context of Istanbul (Alrawadieh, Guttentag, Aydogan Cifci and Cetin, 2020).

It follows from literature review that not much of research work related to the study on perception of Indian budget hotels have been conducted so far. The present study makes an attempt to address two objectives as described below.

Objective of the Study

1. To find the perceptual gap between four popular budget hotel brands which includes OYO Rooms, Fab hotels, Treebo and Lemon Tree to be precise.
2. To find the latent factors that results in the observed consumer perception

In the study fifteen key performance attributes defining the perception of budget hotels have been considered that includes Room Rates, Promptness in Service, Basic stay amenities, Cleanliness, Complimentary Breakfast, Convenient location, Online and App based booking facilities, Hygienic food, Pick up and Drop facility, Easy check in and check out facilities, 24 hour check in and check out facility, Car parking facility and arrangement for driver's stay, Disturbance free rooms (noise free), Cancellation and reservation policy and Aesthetics (interior and exterior) appeals me in hotel selection. Inclusion of these attributes is based on feedback from the hotels considered in the study.

Research Methodology

The present study uses cross-sectional study design as it helps in getting consumer feedback on a near real time basis which also helps in generalizing the output. Primary Data forms the basis of the study and data captured using a questionnaire which consists of a mix of both open and close ended questions. There was emphasis on ascertaining the dissimilarity among 4 different hotels followed by a set of questions that was aimed at performing exploratory factor analysis. For the purpose of data collection, undisguised personal interview method was employed. The sample size required was estimated using the following formula: $N = [\{ t^2 \times p (1 - p) \} / m^2]$ where N: Required Sample Size, t: confidence level at 95% (standard value of 1.96), m: margin of error at 5% (standard value of 0.05) and p: estimated prevalence of consumer knowledge about hotel (10%). N was calculated to be 138 and in the full-scale survey, 300 respondents were approached of which 168 filled in questionnaire were received at a rate of 56%. Many of them were in hurry; hence did not co-operate in the survey. The filled in questionnaires were then scrutinized and the incomplete ones rejected. Responses of 149 questionnaires were finally considered for analysis owing to their completeness. Information thus collected was used for further analysis. Internal consistency estimates of reliability of primary data were found out and Cronbach's α (Taber, 2018) was found to be in acceptable range. In accordance to the research objectives, judgmental or purposive

sampling, a non-probabilistic sampling method is chosen to arrive at optimal results. The present study uses two methods of multivariate statistical analysis; more precisely inter dependency techniques; namely (i) multi-dimensional scaling and (ii) exploratory factor analysis. While the former technique is used to understand the consumer perception towards the four budget hotels and the latter is used to understand the underlying structure arising out of the relationships amongst variables that form perception. The researcher has used R programming language for conducting MDS, PCA and EFA in this study.

Multi-Dimensional Scaling (MDS)

MDS is a set of mathematical techniques that enables to uncover the hidden structure of database. The term MDS is used in two essentially different ways in statistics (de Leeuw&Heiser, 1980a& 1980b). MDS in wide sense refers to any technique that produces a multidimensional geometric representation of data, where quantitative or

$$\Delta = \begin{bmatrix} \delta_{11} & \delta_{12} & \delta_{13} & \dots & \delta_{1I} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ \delta_{J1} & \delta_{J2} & \delta_{J3} & \dots & \delta_{JI} \end{bmatrix}$$

Each object is represented by a point x_i which corresponds to the i^{th} object. X is used to indicate the entire configuration of points $x_1, x_2, x_3, \dots, x_i$. In many situations there is no effective difference in the meaning between δ_{ij} & δ_{ji} and using a coordinate

$$\begin{aligned} x_1 &= (x_{11}, x_{12}, \dots, x_{1R}) \\ x_i &= (x_{i1}, x_{i2}, \dots, x_{iR}) \\ x_j &= (x_{j1}, x_{j2}, \dots, x_{jR}) \end{aligned}$$

Strictly speaking, a point is a geometrical object and is distinct from the sequence of coordinates which represents it. The distance between the points of X plays a central role in MDS.

$$d_{ij} = \left[\sum_{r=1}^R (x_{ir} - x_{jr})^p \right]^{\frac{1}{p}}$$

Where p is the specified power

Unless, otherwise indicated distance always mean ordinary Euclidean distance that may be calculated by Pythagorean formula (where p=2)

$$d_{ij} = \sqrt{(x_{i1} - x_{j1})^2 + \dots + (x_{iR} - x_{jR})^2}$$

$$d_{ij} = \sqrt{\sum_{r=1}^R (x_{ir} - x_{jr})^2}$$

Where $d_{ii} = 0$ for all i and $d_{ij} = d_{ji}$ for all i & j

The central motivating concept of MDS is that the distance, d_{ij} , between the points should correspond to the proximities δ_{ij} . Goodness of fit is a very important consideration in deciding how many dimensions are appropriate. A measure of fit widely used in MDS is "stress" which is a square root of a

$$Stress (S) = \sqrt{\frac{\sum_{i < j} (d_{ij} - \hat{d}_{ij})^2}{\sum_{i < j} d_{ij}^2}}$$

where $\hat{d}_{ij} = \|x_i - x_j\| \dots \dots \dots (1)$

$$Stress (S) = \sqrt{\frac{\sum (f(x) - d_{ij})^2}{\sum d_{ij}^2}}$$

where f(x) is the monotonic transformation of x (2)

It is to be noted that stress always decreases as the dimensionality increases. Also, the points usually form a convex pattern i.e. the line connecting between any two points on the plot is above the

qualitative relationships in the data are made to correspond with relationships in the representation. MDS in another sense starts with information about some form of dissimilarity between the elements of a set of objects and it constructs its geometric representation from this information. The data on dissimilarities are distance like quantities while data on similarities are inversely related to distances. MDS is an important class of multivariate data analysis which is a descriptive in nature and represents one of the most important interdependency techniques.

MDS calculations are highly complex. Even the simplest versions are never performed without the aid of a computer. In MDS, data pertaining to some collection of objects are represented in terms of proximity, represented by δ_{ij} (data value connecting object i with another object j) by the below matrix notation, Δ .

system each point can be represented by coordinates. For 2 dimensional space the coordinates of x_i are written as (x_{i1}, x_{i2}) . For R-Dimensional space the coordinates of x_i may be written as

The distance between the two point's x_i & x_j ; $d(x_i, x_j)$ is denoted by d_{ij} .

The general formula for calculating distances is:

normalized residual sum of squares. Stress varies between 0 and 1 with values near 0 indicating better fit. Each stress results from an iterative computational procedure. Stress (S) for metric and non-metric multi-dimensional scaling is calculated using formula 1 and 2 respectively.

intermediate points. Violation of either of these conditions may suggest incomplete convergence or local minima. Iterations terminate when the maximum absolute difference between any coordinate in the

solution at iteration 'i' vs iteration 'i-1' is less than the specified convergence criteria. Because the configuration is standardized to unit variance on every iteration, iteration stops when no coordinate moves more than the specified convergence criteria (0.005 by default) from its value on the previous iteration.

Exploratory Factor Analysis (EFA)

EFA is a popular interdependent technique used for the purpose of grouping together correlated variables (Cooper, Schindler and Sharma, 2012). It tries to explore, if possible, the covariance relationship among many variables in terms of few underlying, but unobservable, random quantities called factors. If all variables within a particular group are highly correlated among themselves but have relatively small or low correlation with variables in a different group, then it is conceivable that each group of variables represent a single underlying construct, or factor, that is responsible for the observed correlations. The application of EFA is based on the concept of the Factor Models, the Orthogonal Factor Model to be precise.

In EFA an attempt is made to find out some pattern of relationships in which a factor would be heavily loaded on some variables while other factors would heavily load on to some other variables. Such a condition would suggest rather 'pure' constructs underlying each factor. One attempt to secure this near 'pure' condition or less ambiguous condition between factors and variables and the same is achieved by "Rotation". The process of rotation allows 2 choices:

Orthogonal rotations

When the factors are intentionally rotated to result in no correlation between the factors in the final solution

Oblique rotations

When the factors are not manipulated to be zero correlation but may reveal the degree of correlation that exists naturally.

If the factors may theoretically allow interdependence, the latter should be considered. The former includes the varimax rotation, which is most common and simple to maximize squared column variance). The latter includes promax and oblimin

rotations. The present study uses varimax rotation. In order to get results those are interpretable, it most important to check the adequacy of factor analysis. The same is done using:

1. Criteria of sample size adequacy - sample size 50 is very poor, 100 is poor, 200 is fair, 300 is good, 500 is very good, and more than 1,000 is excellent (Comfrey and Lee, 1992).
2. Kaiser-Meyer-Olkin's sampling adequacy criteria (KMO) with MSA (individual measures of sampling adequacy for each item) -It tests whether there are a significant number of factors in the dataset. Kaiser and Michael (1975) suggested that KMO > 0.9 were marvellous, in the 0.80s - meritorious, in the 0.70s - middling, in the 0.60s - mediocre, in the 0.50s - miserable, and less than 0.5 - unacceptable.
3. Bartlett's sphericity test – It is a test statistic that tests the hypothesis that the variables are uncorrelated (H_0) in the population (Dziuban and Shirkey, 1974).

The number of factors to be extracted is based on certain criteria (mentioned below) but no full proof statistical tests exist.

1. Eigen value Criteria – The criteria says eigen values to be > 1.
2. Scree Plot - A graphical plot of the eigen values (amount of variance explained by an extracted factor) against the number of factors in order of extraction. The adequate number of factors is before the sudden downward inflexion of the plot.

Analysis & Discussion

Before proceeding with the analysis on multi-dimensional scaling, the reliability of data was checked (Table 1). Alpha value was found to be in the acceptable range and hence data set is considered reliable. Table 2 shows the dis-similarity data and the distance between the points Convergence of data is observed after 5 iterations and the co-ordinates of points in a 2-dimensional space is indicated and the same is shown in Table 3. Calculated Stress value (1.092221e-14) has been found to be very low and close to zero, thereby indicating a good fit. Finally the MDS plot or the perceptual map obtained is shown in Fig. 1.

Table 1: Cronbach's Alpha

Sample Size	No. of Items	Alpha
149	15	0.86

Source: Author's Computation

Table 2: MDS Distance

1	2	3
90.37360		
94.01899	73.20461	
84.90521	84.64615	87.66628

Source: Author's Computation

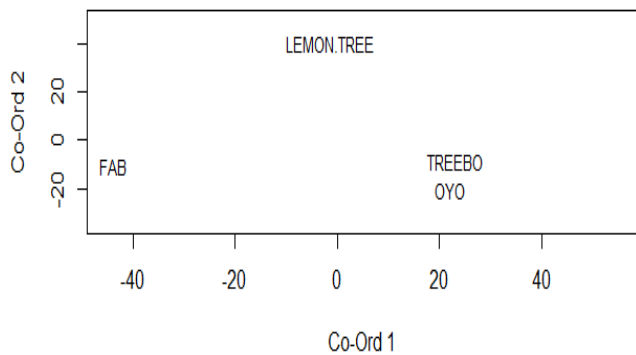
Table 3: MDS Fit and Coordinates

Dim.[1]	Dim.[2]
8.62	-30.09
-31.31	-6.25
-38.84	-9.58
21.53	45.93

Source: Author's Computation

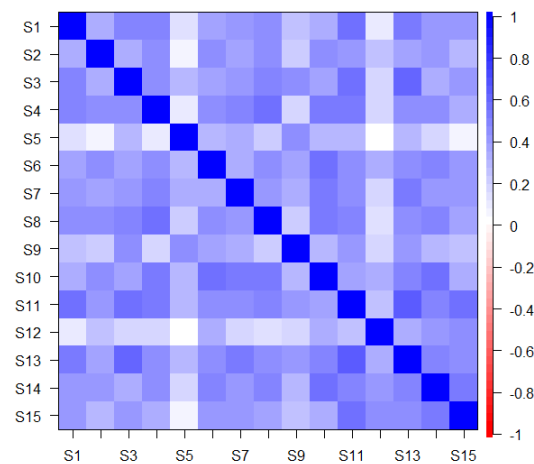
In order to find out the latent factors that resulted in the perception of budget hotels (Fig. 1) PCA and EFA was conducted. The dataset was first examined and tested if it is fit to be put to these two tests. Corplot (correlation plot) was first extracted to explore the type of relationship that exists amongst

Fig. 1: Perceptual Map



the attributes. Corplot of attributes is shown in Fig. 2. The below correlation matrix displays the correlation of each variable with every other variable. Also test of multi collinearity; was done. The Variance Inflation Factor (VIF) value (< 10 for all variables) indicates absence of multicollinearity.

Fig. 2: Correlation Plot



Source: Author's Computation

Table 4: VIF

S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15
1.80	1.54	1.98	2.07	1.53	1.92	1.92	1.88	1.54	2.21	2.45	1.44	2.29	2.02	1.98

Source: Author's Computation

PCA was done to find out the relative importance of the attributes or components (Table 5). Those having standard deviation values > 1 were

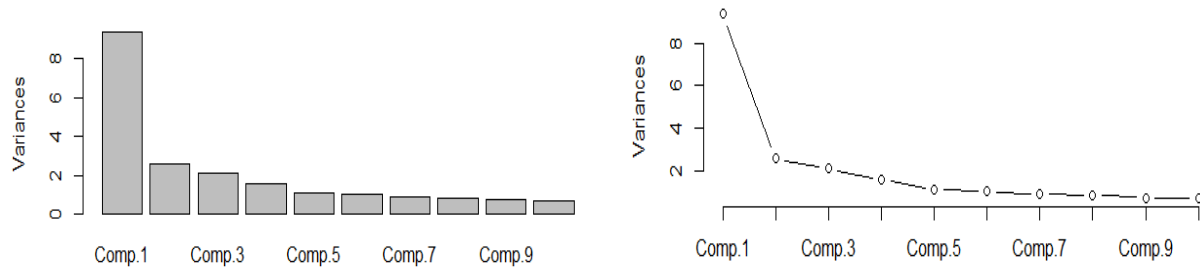
considered important but how many components to be retained for conducting EFA was checked from Scree Plot (Fig. 3).

Table 5: PCA Summary – Importance of Components

	C1	C2	C3	C4	C5	C6	C7	
Standard deviation	3.0586	1.6010	1.4455	1.2517	1.0617	1.0103	0.9600	
Proportion of Variance	0.4015	0.1100	0.0897	0.0672	0.0484	0.0438	0.0396	
Cumulative Proportion	0.4015	0.5115	0.6012	0.6684	0.7168	0.7606	0.8002	
	C8	C9	C10	C11	C12	C13	C14	C15
Standard deviation	0.9201	0.8533	0.8247	0.7895	0.7437	0.6759	0.6350	0.6043
Proportion of Variance	0.0363	0.0312	0.0292	0.0268	0.0237	0.0196	0.0173	0.0157
Cumulative Proportion	0.8365	0.8677	0.8969	0.9237	0.9474	0.9670	0.9843	1.0000

Source: Author's Computation (C1 to C15: Components)

Fig. 3: Scree Plots



Source: Author's Computation

Before EFA was done, KMO test was done to check if there are a significant number of factors in the dataset. R-Output of KMO yields overall MSA (measure of sampling adequacy) of 0.88. The MSA

for each attribute is shown in Table 6. Overall MSA value of 0.88 in the present study suggests it is meritorious. Also, MSA value for each item > 0.5 i.e. they are in the acceptable range.

Table 6: Individual MSA

S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15
0.92	0.91	0.9	0.89	0.69	0.89	0.87	0.93	0.87	0.89	0.91	0.79	0.93	0.91	0.82

Source: Author's Computation

Adequacy of Factor Analysis was further confirmed by conducting Bartlett's Test of Sphericity. The chisquare value was found to be 602.29 with p-value of 8.011523e-71, thus indicating H_0 to be rejected and H_1 accepted i.e. variables are correlated in the population. Also, Criteria of sample size adequacy with a sample size of 149 is relatively weak. EFA with 5 factors and varimax rotation were conducted and the results obtained are shown in Table 7. The total variance explained is indicated in Table 8. Test of the hypothesis that 5 factors are sufficient was done and the chi square statistic found

is 40.31 with the p-value of 0.456, thereby suggesting one to accept H_0 i.e. 5 factors are sufficient. The 5 factors and the attributes included in each factor are: Factor 1 [F1]: S1, S3, S11, S13; Factor 2 [F2]: S2, S4, S6, S8, S10; Factor 3 [F3]: S12, S15; Factor 4 [F4]: S5, S9; Factor 5 [F5]: S7.

The attribute/ variable loading in each factor and their names, as given by the author is shown in Table 9. The 5 factors have been named as Basics (Factor 1); Comfort (Factor 2); Convenience (Factor 3); Add-ons (Factor 4); Online (Factor 5).

Table 7: Factor Loadings

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
S1	0.63	0.269			0.124
S2	0.274	0.499	0.165		0.114
S3	0.577	0.237	0.11	0.343	
S4	0.477	0.597			0.197
S5				0.717	0.119
S6	0.232	0.517	0.327	0.298	
S7	0.281	0.315	0.136	0.246	0.859
S8	0.442	0.533			
S9	0.253		0.168	0.584	
S10		0.718	0.247	0.269	0.197
S11	0.722	0.206	0.271	0.231	0.103
S12		0.178	0.621		
S13	0.523	0.313	0.265	0.322	0.169
S14	0.269	0.478	0.469	0.129	
S15	0.421	0.107	0.647		0.192

Source: Author's Computation

Table 8: Cumulative Variance Explained

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
SS loadings	2.480	2.329	1.442	1.389	0.959
Proportion Variance	0.165	0.155	0.096	0.093	0.064
Cumulative Variance	0.165	0.321	0.417	0.509	0.573

Source: Author's Computation**Table 9: Factors Names and Variables Loading in Factors**

Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
BASICS	COMFORT	CONVENIENCE	ADD-ONS	ONLINE
Room Rates	Prompt Service	Car Parking	Complimentary Breakfast	App Booking
Basic Stay Amenities	Cleanliness of Hotel	Aesthetics	Pick up/ Drop	
24 Hour Check in/ out	Convenient location			
Disturbance free room	Hygienic Food			
	Easy Check in/ out			

Source: Author's Computation**Conclusion**

This study is aimed at finding out the consumer perception towards budget hotels and also attempts made at understanding the underlying latent factors that leads to such perception levels. From the study it may be concluded that there is the gap between the brands in term of consumer perception and in term of service provided by the hotel. The perceptual map in two dimensions clearly shows that Lemon tree is way ahead of the other three brands along one co-ordinate (dimension). Also, Oyo and Treebo have close proximity to each other along the other co-ordinate (dimension). The spatial representation thus helps to identify the similarity and dissimilarity between the budget hotel brands. It is also understood that the factors named 'Basics' and 'Comfort' are very strong in shaping the consumer perception while the other two factors, 'Convenience' and 'Add-Ons' having nearly equal influence in consumer perception, though to a much lesser extent as compared with the first two factors. The factor named 'Online' appears to have the least impact among all the five factors. The study being primary data based and with 149 samples that could be collected during the present time from Kolkata city, it may be understood that the output cannot be generalized for the entire country. Owing to feasibility constraints four budget hotel brands, Fab, OYO, Treebo and Lemon Tree was considered as the reference case. Future researches may consider more brands from the budget hotel category and comparison of consumer perception made between different cities or towns.

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