

## Perception Mapping of Travelers: Case of Six Indian Domestic Airlines

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**Abstract: Problem statement:** A comparison of customer satisfaction based on service quality as perceived by air travelers was done among six domestic airlines. Literature review suggested that flying experience has three stages: Pre-flight, in-flight and post-flight and a set of six variables can be used to measure satisfaction. These variables are: Ease of bookings through the website/call center; Hassle free check in/efficient ticketing staff/regular announcements during flight delays at airport; on time performance of flights; in flight experience; baggage handling and value for money. **Approach:** A questionnaire was designed with above set of variables and responses of 150 fliers of six domestic airlines viz., GoAir, Kingfisher, Jet Airways, Indigo, SpiceJet and Air India (Domestic) was recorded on a five point Likert scale. About 150 respondents were interviewed from different places in NCR: Delhi, Gurgaon, Noida, Greater Noida and Faridabad. A convenient sampling method was followed. Perceptions of only those travelers were captured who had actually undergone the experience of travelling by an airline. The range for the number of respondents was between 103 (for GoAir) and 133 (for Jet Air). **Results:** Using one way ANOVA, it was checked whether travelers perceive any significant difference between six airlines for each of the above six identified variables. With Tukey-Kramer test the airlines which are significantly different from the rest were identified. Perceptual maps with combination of up to two variables (attributes) were drawn to infer about the positioning of six different airlines. **Conclusion:** This study will help marketers of domestic airlines and designers of flight service offerings to enhance the satisfaction level of air travelers.

**Key words:** Perception mapping, air travelers' perception, service quality, Indian domestic airlines, customer satisfaction

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### INTRODUCTION

India is one of the fastest growing aviation markets in the world. With the liberalization of the Indian aviation sector, the industry has witnessed a transformation with the entry of the privately owned full service airlines and low cost carriers. As of March 2009, private carriers accounted for around 82% share of the domestic aviation market. The players in the current Indian domestic market include low cost carriers like SpiceJet, GoAir, Indigo along with Premium airlines like Jet Airways, Kingfisher and Air India (domestic). The sector has also seen a significant increase in number of domestic air travel passengers. Some of the factors that have resulted in higher demand for air transport in India include the growing middle class and its purchasing power, low airfares offered by low cost carriers, the growth of

the tourism industry in India, increasing outbound travel from India and the overall economic growth of India.

In this research a comparative study has been done on six major airlines using perceptual mapping. Responses were recorded from frequent fliers across six variables which are most important for any airline customer. For the purpose of the study the flying experience was divided into three stages- namely, pre-flight, in-flight and post-flight experience. A questionnaire was designed in such a way that the same sets of variables were measured among the customers of the six airlines under study. The objective of this study was to understand the satisfaction levels of the airline customers. The study measured the expected level of service quality using a Likert type scale. The six attributes considered for the study are: Ease of booking through website/call center; Hassle free check

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in; Baggage handling; in flight experience; on time performance of the flights and Overall value for money.

#### **Literature review:**

**Perceptual mapping** has been used as a strategic management tool for about thirty years (Green and Wind, 1975). It offers a unique ability to communicate market structure analysis-i.e., the complex relationships among marketplace competitors and the criteria used by buyers in making purchase decisions and recommendations. Its powerful graphic simplicity appeals to senior management and can stimulate discussion and strategic thinking at all levels of all types of organizations.

Perceptual mapping has been used to satisfy marketing and advertising information needs related to product positioning (DeSarbo and Rao, 1984; Wind, 1982), competitive market structure (Srivastava *et al.*, 1984), consumer preferences and brand perceptions (Cooper, 1983; Pegels and Sekar, 1989; Dowling, 1988; Day *et al.*, 1979). Perceptual maps satisfy these types of information needs by analyzing and then translating consumers' numeric ratings, brand similarity data and brand preference data into a visual representation of how those consumers view the set of brands and products. The most common use of perceptual mapping in advertising and marketing research relates to brand perceptions. However, perceptual mapping is appropriate for exploring perceptions of any set of objects, for example, types of television programs or political candidates. Perceptual maps can also be used to determine similarities and differences across groups of consumers.

There are two approaches to perceptual mapping: attribute based and non-attribute based. Attribute based approaches, used in this study, require a respondent to evaluate a set of brands on a large number of specific attributes, typically those attributes felt to influence how consumers perceive, evaluate and distinguish among brands and products.

All mapping techniques attempt to show the comparative differences in how products or services are rated on a given set of attributes. The validity of a map depends on both the overall set of attributes and brands in the study as well as the subset of attributes and brands evaluated by each respondent.

**Measuring service quality:** Extensive research has been conducted in the field of service quality (Fisk *et al.*, 1993; Cunningham *et al.*, 2004). Review of literature suggests that initial publications on airline service quality appeared in 1988 (Gourdin, 1988). Fick and Ritchie (1991) and Gourdin and Kloppenborg (1991)

were the first to apply the service quality gap model to the airline industry in 1991. Fick and Ritchie (1991) used the SERVQUAL scale to measure perceived service quality within several service industries including the airline industry.

Measurement and management of service quality is the fundamental issue for the survival and growth of airline companies. Cunningham *et al.* (2002) have measured service quality based on SERVPERF which is a set of multi-dimensional measures of customer evaluations of service quality.

Wen Li and Chen (1998) studied the quality evaluation of domestic airline industry using modified Taguchi loss function with different weights and target values. They proposed three quality categories with ten identified variables and service quality of domestic airline is quantified accordingly.

According to Zeithaml *et al.* (2008), the concept of satisfaction is influenced by five variables viz., (1) service quality, (2) product quality, (3) price, (4) situation and (5) personality. Natalia and Subroto (2003) combined the variables of product quality and service quality and studied the customers' perception of service quality in the domestic airline services of Indonesia.

So far service quality of airlines has been studied based on industry measures, SERVQUAL, SERVPERF, Taguchi loss function and Zeithaml and Bitner Model. This study attempts to examine the satisfaction level of service quality of domestic airline travelers in India for six airlines viz., GoAir, Kingfisher, Jet Airways, Indigo, SpiceJet and Air India (Domestic) across six airline travel process variables viz., Ease of bookings through the website/ Call Center; Hassle free check in/Efficient ticketing staff/Regular announcements during flight delays at airport; On Time Performance of flights; In flight Experience; Baggage handling and Value for money.

**Research objectives and focus issues:** The main objective of this case study is to compare the service quality of the airlines under study by drawing Perceptual Maps for the six major airlines in the Indian domestic market.

This case attempts to seek answers to following questions:

- How travelers rate the services offered by an airline?
- Which factors should be considered for evaluating the experience of domestic air travel?
- Do travelers perceive any significant difference between services rendered by different airlines?

Table 1: Airline wise composition of sample

Company	Number of samples obtained
GoAir	103
Kingfisher	126
Jet Airways	133
Indigo	121
SpiceJet	130
Air India	121

- Which airlines are able to deliver higher values for factors that travelers consider as important for creating memorable flight experience?
- How to carry out comparison between competing airline brands?

### MATERIALS AND METHODS

**Questionnaire design and pre-testing:** The respondents were asked to evaluate the quality of the service provided by the airline, they have travelled. Perceived service quality of each variable was measured through questions designed on a 5 point Likert-type scale ranging from Strongly Agree to Strongly Disagree. For example, the on-time services of the airline was measured through the question, “The flights are on time” with Strongly Agree as the best positive response and Strongly Disagree as the worst negative response, any other response can be recorded between “Strongly Agree” and “Strongly Disagree” on the scale. Similarly, other good ground service-in-flight service and post-flight service were measured on the same scale. The questionnaire also had a question to check the response to the loyalty programs provided by the airlines to frequent fliers which was measured through, “the airline offers Overall value for money” on the five point Likert-type scale. After designing the questionnaire it was pre-tested with 20 respondents. The required changes were incorporated and the survey was conducted.

**Sample characteristics:** The six domestic airlines considered for the study are GoAir, Kingfisher, Jet Airways, Indigo, SpiceJet and Air India (Domestic). The major reason to consider these airlines is that they represent the majority of people travelling by air in India. These airlines consist from full fare to low priced airlines. The targeted sample size was around 110 per airline and the achieved was as in Table 1.

### RESULTS

The statistical analyses used are t-test (reliability test), single factor ANOVA, Tukey-Kramer Test and Multi-Dimensional Scaling technique. Where ever applicable,  $\alpha = 0.05$  was used as the level of significance for the analysis.

Table 2: t-test for significant difference

t-test for ease of booking attribute	Calculated value of p	Is calculated value of p<0.025?	Inference
GoAir booking	6.56296E-20	Yes	Question accepted
Kingfisher booking	5.5578E-23	Yes	Question accepted
Jet Air booking	2.67713E-17	Yes	Question accepted
Indigo booking	1.85078E-34	Yes	Question accepted
SpiceJet booking	2.76285E-20	Yes	Question accepted
Air India booking	8.57249E-22	Yes	Question accepted

**Reliability test: t-test:** This test helps in determining whether a question is well understood by respondents and it is able to distinguish between two classes of respondents: one who wish to ‘Strongly agree’ and the other who wish to ‘Strongly disagree’. For such questions the null hypothesis of a two tailed t-test should get rejected when applied to test if there is any significant difference between the mean responses of top quartile and the bottom quartile of respondents in an ordered list.

Similar to ease of bookings, t-test was applied for other five attributes (for six airlines). In case of each of the question the null hypothesis of t-test was rejected and hence all the six questions have been retained for further analysis (Table 2).

**Single factor ANOVA:** At this stage it is important to test if there is significant difference in service quality as determined by the perception of travelers towards six variables between six airlines. To establish the presence or absence of significant difference following six null hypotheses are framed:

- H01: There is no significant difference between six airlines as far as ‘Ease of Booking through website/call centre’ is concerned
- H02: There is no significant difference between six airlines as far as ‘Hassle free Check in/regular announcements at the airport during flight delays’ are concerned
- H03: There is no significant difference between six airlines as far as ‘Baggage Handling’ is concerned
- H04: There is no significant difference between six airlines as far ‘In Flight Experience’ is concerned
- H05: There is no significant difference between six airlines as far as ‘On Time Performance of the flights’ is concerned
- H06: There is no significant difference between six airlines as far as ‘Overall Value for Money’ is concerned

For each of the above six null hypotheses, the alternate Hypotheses ( $H_a$ ) will state that ‘At least one of the airlines is different from the rest’.

Table 3: ANOVA table for ease of booking tickets through website/call center

Summary						
Groups	Count	Sum	Average	Variance		
GoAir booking	103	245	2.378641	0.531696		
Kingfisher booking	126	196	1.555556	0.376889		
Jet Air booking	133	222	1.669173	0.495785		
Indigo booking	121	241	1.991736	0.574931		
SpiceJet booking	130	242	1.861538	0.476804		
Air India booking	121	298	2.462810	0.884022		
ANOVA						
Source of variation	SS	df	MS	F	p-value	F crit
Between groups	81.84546	5	16.369090	29.54286	2.32E-27	2.226407
Within groups	403.36980	728	0.554079			
Total	485.21530	733				

Table 4: Ease of booking attribute

	GoAir booking	Kingfisher booking	Jet Airways booking	Indigo booking	SpiceJet booking	Air India booking
GoAir booking	-	0.28250	0.27920	0.2851	0.2806	0.2851
Kingfisher booking	0.82310*	-	0.26440	0.2707	0.2659	0.2707
Jet Airways booking	0.70950*	0.11362	-	0.2672	0.2623	0.2672
Indigo booking	0.38690*	0.43620*	0.32260*	-	0.2687	0.2734
SpiceJet booking	0.51710*	0.30598*	0.19237	0.1302	-	0.2687
Air India booking	0.08417	0.90730*	0.7936*	0.4711*	0.6013*	-

\*: Mark denotes significant differences

ANOVA table for ease of booking tickets through website/call center is displayed in Table 3.

**Result:** Since the F (Observed) value is greater than the F critical value the Null hypothesis is rejected. This implies that at least one of the airlines is significantly different from the rest as far as 'Ease of Booking through website/call centre' is concerned (Table 3). Similarly the ANOVA test was applied for other five variables also. In each of the five cases the null hypothesis was rejected. It is concluded that in case of each of the variables, at least one of the airlines is perceived by the customers to be significantly different from the rest of the lot.

**Tukey-Kramer minimum significant difference:** Tukey-Kramer minimum significant difference test identifies the airlines that are significantly different from the rest of the lot. As in the preceding section the null hypotheses got rejected, it is necessary to find out as to which of the airline(s) is/are significantly different from the rest. For 'Ease of booking' attribute in Table 4 captures the result of Tukey-Kramer test.

**Result:** As far as booking is concerned (Table 4):

- GoAir is significantly different from Kingfisher, Jet Airways SpiceJet and Indigo
- Air India is significantly different from Indigo, SpiceJet, Kingfisher and Jet Airways
- This implies that GoAir and Air India are significantly different from the rest

- Comparison of mean values establishes that GoAir and Air India are both perceived to be inferior; where as Kingfisher and Jet Air are perceived to be superior. While Indigo and Spice Jet are somewhere in between

In a similar manner Tukey-Kramer test was applied for other five variables also and conclusions drawn.

**Multi-dimensional scaling:** In this part of analysis Multi-dimensional Scaling was used to create perceptual maps. Six airlines were mapped based on the following meaningful combinations of variables (attributes):

- Booking Vs value for money
- Baggage handling Vs value for money
- Hassle free check in Vs baggage handling
- Hassle free check in Vs value for money
- In flight experience Vs value for money
- On time performance Vs value for money

**Result:** In Fig. 1 it is very clear that Indigo and SpiceJet are perceived almost similar by the customers. Jet Air and Kingfisher are perceived similar on the higher side whereas GoAir and Air India (domestic) are on the lower side as perceived by the customers. It is also clear that if GoAir and Air India (domestic) improve their ticket booking procedures they can position themselves on the higher side and nearer to other airlines.

Table 5: Mean values, degrees of freedom, ANOVA and Tukey-Kramer Tests

Variable (attributes) Column No.	GoAir mean 2	King fisher mean 3	Jet Air mean 4	Indigo mean 5	SpiceJet mean 6	Air India mean 7	df 8	One-way ANOVA			Reject H <sub>0</sub> ? 11	Conclusions of Tukey- Kramer test 12
								F Cal value 9	F critical 10	P Cal value 11		
Ease of booking tickets through the website/call center	2.37	1.55	1.66	1.99	1.86	2.46	5	29.54	2.22	2.32E-27	Yes	GoAir and Air India are significantly different from the rest
Hassle free check in/ Regular announcements during flight delays at airport	2.91	1.58	1.61	2.45	2.44	2.79	5	57.57	2.22	1.704E-50	Yes	Indigo was found to be significantly different from Go Air, Jet Airways and Kingfisher but similar to SpiceJet.
Good IN-flight experience	2.84	1.35	1.53	2.49	2.43	2.75	5	68.35	2.22	1.366E-58	Yes	Jet and Kingfisher were found to be significantly different from the rest.
Good-baggage handling	2.61	1.72	1.77	2.33	2.27	2.55	5	24.71	2.22	4.834E-23	Yes	Indigo was found to be similar to SpiceJet and Air India.
On time performance	3.29	2.01	2.09	2.67	2.83	3.02	5	29.55	2.22	2.287E-27	Yes	Kingfisher was found to be significantly different from Indigo, SpiceJet, GoAir and Air India, but similar to Jet Airways.
Value for money	2.59	1.98	2.27	2.38	2.31	2.99	5	13.78	2.22	7.041E-13	Yes	Indigo was found to be similar to SpiceJet.

**Note:** Column No. 7 shows degrees of freedom; Column No. 8 shows the calculated values of F which can be compared with the critical (table) value of F given in the next column number 9; Column No. 10 shows the calculated p value (calculated rejection area). Null Hypothesis gets rejected if this calculated area is less than significance level of 0.05. In this study, for each of the six variables the null hypothesis is rejected; Column No. 12 summarizes the result of application of Tukey Kramer test

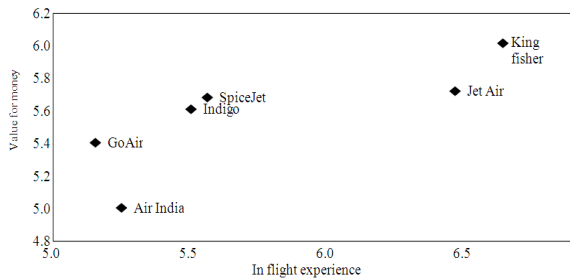


Fig. 1: In flight experience Vs value for money

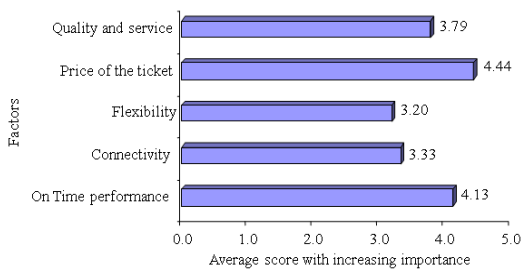


Fig. 2: Importance of various factors

Similarly, results for the other five combinations were also found out. In each of the five cases Kingfisher and Jet Air are perceived to be superior, Spice Jet and Indigo fall in the middle and GoAir and Air India (domestic) are clubbed at an inferior level.

**Service quality scores for various airlines:** For quick reference the Table 5 displays mean values, degrees of

freedoms, F calculated and critical values, inference about rejecting (or failing to reject) null hypothesis and conclusions drawn from the Tukey-Kramer test.

Based on average scores, for any airline customer, the most important factor is 'Price of the ticket' and the least important factor is found to be 'Flexibility' (Fig. 2).

**Limitations and caveats:** The findings of this study are limited to the airline industry in India. This study has not considered industry practice of measuring service quality. In this project only the customer perception of service quality (as determined by six variables) has been measured.

**DISCUSSION**

This study brings out that the six domestic airlines are perceived to be significantly different for the six factors selected to measure flight experience.

Perceptual maps of value for money versus ease of booking, baggage handling, hassle-free check-in, in flight experience and on-time performance for six airlines reveal that passengers perceive Indigo and Spice Jet to be similar; Jet Air and Kingfisher are perceived similar but on the superior side whereas GoAir and Air India (domestic) are on the inferior side.

**CONCLUSION**

One thing that clearly came out in the study was that the difference in the perception of customers

among the low cost and the full service carriers. Differentiation can occur only by adding new service elements along with providing better quality in delivering the current service.

As far comparison of service quality provided by the airlines is concerned:

- GoAir and Air India were found to be significantly different from the rest as far as ease of booking tickets is concerned. These airlines really need to improve the structure of their website and make the procedure of booking easier
- As far as hassle free check in and announcements at the airport during flight delay were concerned, Indigo and SpiceJet were found to be similar to each other and were significantly different from the rest. However customers believe that Kingfisher offers them the best services in this regards
- As per feedback of travelers, baggage loss has been a problem with GoAir. Air India also needs to improve its service in this regard
- Kingfisher and Jet Airways have proved to be the undisputed leaders as far as in flight experience is concerned. Customers are really happy with the kind of entertainment offered inside these carriers. Also it comes out clearly from the study that kingfisher has truly been able to position itself as a five star airlines, providing its passengers the best services
- As far as value for money is concerned, SpiceJet and Indigo have done well. Customers feel that whatever services they are getting for the price paid is satisfactory. GoAir and Air India need to improve in this respect

## REFERENCES

- Cooper, L.G., 1983. A review of multidimensional scaling in marketing research. *Applied Psycholog. Measure.*, 7: 427-450. DOI: 10.1177/014662168300700404
- Cunningham, L.F., C.E. Young and M. Lee, 2002. Cross-cultural perspectives of service quality and risk in air transportation. *J. Air Transport.*, 7: 3-26. DOI: 10.1016/j.jairtraman.2007.08.002
- Cunningham, L.F., C.E. Young and M. Lee, 2004. Perceptions of airline service quality Pre and Post 9/11. *Public Works Manage. Policy*, 9: 10-25. DOI: 10.1177/1087724X04265135
- Day, G.S., A.D. Shocker and R.K. Srivastava, 1979. Customer-oriented approaches to identifying product markets. *J. Market.*, 43: 8-20. <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=5004693&site=ehost-live>
- DeSarbo, W.S. and V.R. Rao, 1984. GENFOLD2: A set of models and algorithms for the general unfolding analysis of preference/dominance data. *J. Classif.*, 1: 147-186. DOI: 10.1007/BF01890122
- Dowling, G.R., 1988. Measuring corporate images: A review of alternative approaches. *J. Bus. Res.*, 17: 27-34. DOI: 10.1016/0148-2963(88)90019-7
- Fick, G.R. and J.R.B. Ritchie, 1991. Measuring service quality in the travel and tourism industry. *J. Travel Res.*, 30: 2-9. DOI: 10.1177/004728759103000201
- Fisk, R.P., S.W. Brown and M.J. Bitner, 1993. Tracking the evolution of the services marketing literature. *J. Retail.*, 69: 61-103. DOI: 10.1016/S0022-4359(05)80004-1
- Gourdin, K., 1988. Bringing quality back to commercial travel. *Transport. J.*, 27: 23-29. <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=8504612&site=ehost-live>
- Gourdin, K.N. and T.J. Kloppenborg, 1991. Identifying service gaps in commercial air travel: The first step toward quality improvement. *Transport. J.*, 31: 22-30. <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=8504612&site=ehost-live>
- Green, P.E. and Y. Wind, 1975. New way to measure consumers' judgments. *Harvard Bus. Rev.*, 53: 107-117. <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=3867280&site=ehost-live>
- Natalia, D. and B. Subroto, 2003. Effects of management commitment on service quality to increase customer satisfaction of domestic airlines in Indonesia. *Singapore Manage. Rev.*, 25: 85-104. <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=9084110&site=ehost-live>
- Pegels, C.C. and C. Sekar, 1989. Determining strategic groups using multidimensional scaling. *Interfaces*, 19: 47-57. DOI: 10.1287/inte.19.3.47
- Srivastava, R.K., M.I. Alpert and A.D. Shocker, 1984. A consumer oriented approach for determining market structures. *J. Market.*, 48: 32-45. <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=5004394&site=ehost-live>
- Wen Li, C. and K.A. Chen, 1998. Quality evaluation of domestic airline industry using modified taguchi loss function with different weights and target values. *Total Qual. Manage.*, 9: 645-653. DOI: 10.1080/0954412988334
- Wind, Y., 1982. *Product Policy: Concepts, Methods and Strategy*. Addison-Wesley Publishing, Reading, MA., ISBN: 10: 0201083434.
- Zeithaml, V., M.J. Bitner and D. Gremler, 2008. *Services Marketing*. McGraw Hill, ISBN: 10: 0073380938.