

CHAPTER - VIII

**ANALYSIS OF
DIFFICULTY FACTOR**

8.1 FACTOR ANALYSIS

8.2 CONCLUSION

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ANALYSIS OF DIFFICULTY FACTOR

Difficulty Factor is the function of various factors like distance, time of the day, road type, size of the bus, seating, driver's driving skill, AC bus, and emergency handling capacity of the driver.

Mathematically Difficulty Factor (DF) can be represented as below

$$DF = f \left\{ \begin{array}{l} \text{distance; time of travel; road type; size of bus; seating; driving; AC;} \\ \text{emergency handling} \end{array} \right\}$$

$$DF = f \left\{ \begin{array}{l} a \times \text{time of travel} + b \times \text{distance} + c \times \text{road type} + d \times \text{seating} + e \times \\ \text{driving} + f \times \text{air-condition} + g \times \text{emergency handling} \end{array} \right\}$$

By manipulating the difficulty factors in terms of cost, transport operators can implement differential pricing strategy to improve revenue generation by having ideal passenger mix. Some customers do not mind facing more difficulty if only the price is low. Some other customer do not mind paying more to reduce difficulty during travel. Therefore Transport Companies can adopt differential pricing as a tool to shift customer density from highly congested route to lower congested route. This can lead to better capacity utilization and results in better profitability.

Difficulty factor could be a combination of some of the variables listed above.

Difficulty factor explains the comfort level, which can be related in rupee value, higher the comfort level (i.e. low difficulty factor) higher is the rupee value and vice versa.

To understand the level of difficulty a passenger is willing to undergo, while traveling and the price he is ready to pay for that level of difficulty, a survey was conducted using a structured questionnaire. The sample size was two hundred respondents. Analysis of data relating to difficulty level and differential pricing resulted in following findings

- 17.5 percent, that is 34 respondents have strongly agreed to travel 5 kilometers more at 3 rupees less than the normal charges.
- 53 respondents, about 27.13 percent have agreed to travel 5 kilometers more at 3 rupees less than the normal charges.
- 87 respondents, about 44.87 percent show favorable response to travel longer distance at lesser price against the normal price.
- Only 25 respondents strongly agreed to travel by longer distance in case they are forced to travel by longer route
- 48 respondents agreed to travel by the longer route in case they are forced to travel by the longer route.
- Thus we can say about 73 respondents, 37.6 percent would definitely like to travel by the longer route by paying 3 rupees less than the normal charges.
- 87.6 percent of the respondents are ready to pay extra to travel by good roads
- 12.4 percent of the respondents feel bad roads are fine if it means paying less.
- 81.95 percent of the respondents are ready travel between 7 am to 9.30 am (before peak hour) if it means paying bit less than the normal charges.

- Amongst the respondents willing to travel between 7 am and 9.30am, 40.25 percent of them would like to travel by 9.00 am
- 11.85 percent of the respondents said they are ready to travel during peak hours even if it means paying slightly more than the normal charges.
- About 51.54 percent of the respondents would like to have good drivers even if it means paying more than the normal charges.
- 39.6 percent of the respondents are ready to pay more if the bus personnel are capable of handling emergency.
- Only 17 percent of the respondents said they are ready to pay more to get a seat in the middle portion of the bus.

A factor analysis was done on the data to understand, which factors combine to form the difficulty factor equation.

8.1 FACTOR ANALYSIS:

Table – 8.1
Total Variance Explained – Total Sample

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.573	32.164	32.164	2.573	32.164	32.164	2.163	27.041	27.041
2	1.440	17.995	50.158	1.440	17.995	50.158	1.849	23.117	50.158
3	.918	11.481	61.639						
4	.881	11.012	72.651						
5	.723	9.036	81.688						
6	.591	7.389	89.076						
7	.460	5.753	94.830						
8	.414	5.170	100.000						

Source: SPSS Output

Table – 8.2**Component Matrix (A) –Total Sample**

	Component	
	1	2
Lowest dist	.530	-.107
Travel time	.659	-6.055E-02
Good Roads	.497	-.298
BUS_SIZE	.518	.575
Seat locn	.507	.451
Safe driving	.658	-.494
AC_BUS	.537	.591
Emergency handling	.602	-.455

*Source: SPSS Output***Table – 8.3****Rotated Component Matrix (A) - Total Sample**

	Component	
	1	2
Lowest dist (LD)	.488	.233
Travel time (TT)	.563	.348
Good roads (GR)	.576	6.106E-02
BUS_size (BS)	6.796E-02	.771
Seat location (SI)	.134	.665
Safe driving (SD)	.823	7.062E-04
AC_bus (AB)	7.388E-02	.795
Emergency handling (EH)	.755	-1.397E-03

Source: SPSS Output

$$DF1 = 0.823SD + 0.755EH + 0.576GR + 0.563TT + 0.488LD \text{-----} \rightarrow$$

ORDINARY TRAVELLERS

$$DF2 = 0.795AB + 0.771BS + 0.665SI \text{-----} \rightarrow \text{LUXURY TRAVELLERS}$$

8.2 CONCLUSIONS:

1. Respondents are ready to travel by alternate routes hence they need to be given choice of the routes.
2. Respondents travel early because less traffic, less congestions etc, passengers can be motivated to travel early by charging less compared to the charges during the peak hours.
3. Various factors like travel distance, time of travel, good roads, size of the bus, seat location in the bus, bus driver's ability, air-conditioned bus and emergency handling capacity can be used to calculate the difficulty factor equations.
4. Using the difficulty factor equation we can calculate differential pricing for various combination of factor that the passenger would like to choose.