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Quantification Satisfaction Airline Passengers

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Abstract *In the last period we are witnessing numerous limited activities of the flights of various air transport companies or even resounding bankruptcies. This is due mainly to the fall in the number of passengers, caused by a combination of factors, including lack of confidence in certain air transport companies and poor quality of services provided. In order to cope with the competition resulting from the air transport market, companies in this field should retain and multiply the price of capital and particularly their customer (the passenger).To this end, the air transportation company must be aware at all times of their expectations and also how satisfied are the passengers of the primates.*

Key words Quality, satisfaction of passengers, air transport, measurement, mathematical model

JEL Codes: M31

1. Introduction

In order for an organization in general, and air transport, in particular, to have success in this globalized market, it should always understand the customers' expectations, both current and prospective, and meet their requests and even try to exceed their expectations. Thus, the Organization must identify the various methods and tools for assessing the degree of customer satisfaction (Păunescu, 2006).

In a broad sense, the term "customer satisfaction" means the extent to which particular products or services provided by various organizations achieve or exceed the expectations of their customers (Farris *et al.*, 2010). We can say that "satisfaction" means a person, feeling the result by comparing perceived performance (results) of a product with the expectations of the people (Pascu, 2011). From the point of view of Quality Management, customer satisfaction is the extent to which its requirements have been met (Avram, 2005). We cannot speak of customer satisfaction in the absence of their expectations from that product or service (Pascu, 2011).

2. Literature review

About services in general and air transport services in particular, we cannot speak of quality without passengers, this being due to particularities of these services. Thus, when we speak of the satisfaction of passengers, air transport must take into account the expectations of that service, as well as previously planned experiences; this is generally due to the fact that passengers not having sufficient tangible parts within this service compare the service received to prior experiences and to their expectations with respect to that service.

Passenger satisfaction depends on the spread between reality and expectations of the service received and is evaluated by the level and quality of services offered. Thus, we can affirm that the degree of customer satisfaction is measured almost every time individually for each passenger, but it always should be reported at aggregate level.

3. Methodology of research

The evaluation of the degree of satisfaction of passengers of an air transport company may be made on the basis of information in a marketing research by means of a mathematical model. In what follows below, I propose a mathematical model of measuring the satisfaction of passengers. In this mathematical model will be given a number of absolute and relative indicators that allow the econometric analysis and processing of the phenomena observed. The qualitative aspects of complexity on passenger satisfaction make necessary a numerical measurement to be able to generate statistics indicators (Dragut, 2013).

Thus, I propose a mathematical model by which I measure the passengers' degree of satisfaction, taking into account those characteristics that highlight its determination, the absolute and relative indicators being present in matrix form. Using statistical methods and techniques of training, I have developed the following set of indicators that allow me to measure the degree of satisfaction concerning the professionalism of company personnel on the staff and on the types of features.

Table 1. Measuring the passengers' satisfaction degree on the professionalism of company personnel on the staff and on the types of features (Dragut, 2013)

Staff	Feature	Indicators			
		Feature of satisfaction level	Average level of satisfaction	Amplitude of satisfaction	Degree of fulfilling satisfaction on i/j
Shipping personnel	1	p_1^{na}	$\mu_1^{pna} = \frac{\sum_{i=1}^{k} p_1^{na} n_i}{\sum_{i=1}^{k} n_i}$	$A_{p1}^{na} = p_{1\max}^{na} - p_{1\min}^{na}$	$g_1^{na} = \frac{\mu_1^{na}}{5} \cdot 100$
	...	...	...	...	...
	i	p_i^{na}	$\mu_i^{pna} = \frac{\sum_{i=1}^{k} p_i^{na} n_i}{\sum_{i=1}^{k} n_i}$	$A_{pi}^{na} = p_{i\max}^{na} - p_{i\min}^{na}$	$g_i^{na} = \frac{\mu_i^{na}}{5} \cdot 100$
	...	...	...	...	...
	k	p_k^{na}	$\mu_k^{pna} = \frac{\sum_{i=1}^{k} p_k^{na} n_i}{\sum_{i=1}^{k} n_i}$	$A_{pk}^{na} = p_{k\max}^{na} - p_{k\min}^{na}$	$g_k^{na} = \frac{\mu_k^{na}}{5} \cdot 100$
	Total	$\overline{p}^{na}$	$\overline{\mu}^{pna} = \frac{\sum_{i=1}^{k} p_k^{na} n_i}{\sum_{i=1}^{k} n_i}$	$A_{pk}^{na} = p_{k\max}^{na} - p_{k\min}^{na}$	$G^{pna} = \frac{\sum_{i=1}^{k} g_i^{na}}{k}$
Unskilled staff	1	p_1^{ne}	$\mu_1^{pne} = \frac{\sum_{j=1}^{m} p_1^{ne} n_j}{\sum_{j=1}^{m} n_j}$	$A_{p1}^{ne} = p_{1\max}^{ne} - p_{1\min}^{ne}$	$g_1^{ne} = \frac{\mu_1^{ne}}{5} \cdot 100$
	...				
	j	p_j^{ne}	$\mu_j^{pne} = \frac{\sum_{j=1}^{m} p_j^{ne} n_j}{\sum_{j=1}^{m} n_j}$	$A_{pj}^{ne} = p_{j\max}^{ne} - p_{j\min}^{ne}$	$g_j^{ne} = \frac{\mu_j^{ne}}{5} \cdot 100$
	...				
	m	p_m^{ne}	$\mu_m^{pne} = \frac{\sum_{j=1}^{m} p_m^{ne} n_j}{\sum_{j=1}^{m} n_j}$	$A_{pm}^{ne} = p_{m\max}^{ne} - p_{m\min}^{ne}$	$g_m^{ne} = \frac{\mu_m^{ne}}{5} \cdot 100$
	Total	$\overline{p}^{ne}$	$\overline{\mu}^{pne} = \frac{\sum_{i=1}^{k} p_k^{ne} n_i}{\sum_{i=1}^{k} n_i}$	$A_{pk}^{ne} = p_{k\max}^{ne} - p_{k\min}^{ne}$	$G^{pne} = \frac{\sum_{i=1}^{k} g_i^{ne}}{k}$

Note: Quantifying the degree of satisfaction of passengers is carried out on a numeric scale of 1-5 where: 1– total dissatisfaction and 5- total satisfaction.

Thus, overall, the average level of satisfaction regarding the professionalism of the company personnel on the staff and on the types of features is determined according to the relationship

$$\overline{\mu}^{p*} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} \mu_i n_j}{\sum_{i=1}^{n}\sum_{j=1}^{n} n_{ij}} \quad (1)$$

and Amplitude satisfaction per total:

$$A_{\bar{p}}^{*} = \bar{p}_{i\max}^{*} - \bar{p}_{i\min}^{*} \quad (2)$$

In which:

p_i^{na} - scalar level valued by the passenger on professionalism flight crew on the "i" (preparation, courtesy, experience etc.)

p_j^{ne} - scalar level valued by the customer on professionalism non-flight staff on "j" (punctuality; empathy; kindness; experience etc.)

n_i - number of customers who have appreciated the professionalism satisfaction concerning crew-number

n_j -- number of customers who have appreciated the professionalism satisfaction concerning non-flight staff

On the basis of quantities described above we can present a number of other indicators such as:

relative Amplitude of variations for level of satisfaction:

generated by the flight crew

$$A_p^{\%} = \frac{A_{pi}^{na}}{\mu_i^{na}} \cdot 100 \quad (3)$$

generated by the non-flight staff

$$A_p^{\%} = \frac{A_{pj}^{ne}}{\mu_j^{ne}} \cdot 100 \quad (4)$$

generated by the total staff company

$$A_p^{\%} = \frac{A_p^{*}}{\bar{\mu}^{p*}} \cdot 100 \quad (5)$$

Individual variation of absolute deviations for level of satisfaction

generated by the flight crew

$$d_i = p_i^{na} - \mu^{pna} \quad (6)$$

generated by non-flight staff

$$d_j = p_j^{ne} - \mu^{pne} \quad (7)$$

Individual variation of relative deviations for level of satisfaction

Generated by the flight crew

$$d_{i\%} = \frac{p_i^{na} - \mu^{pna}}{\mu^{pna}} \cdot 100 \quad (8)$$

Generated by non-flight staff

$$d_{j\%} = \frac{p_j^{ne} - \mu^{pne}}{\mu^{pne}} \cdot 100 \quad (9)$$

Deepening analysis may determine: dispersion, square average deviation.

Mathematical model of variation

This mathematical model can be extrapolated to all the characteristics that highlight the formation of company's image among the passengers, which results in obtaining information on the degree of satisfaction of the passengers, thus calculating the overall passenger satisfaction, as follows:

General average

$$\overline{\overline{\mu}}^{p*} = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}\overline{\mu}_{ij}n_{ij}}{\sum_{i=1}^{n}\sum_{j=1}^{n}n_{ij}} \quad (10)$$

The mathematical model of measuring passenger satisfaction can be extrapolated across all characteristics that highlight the formation of the image of the service, such as identifying the degree of satisfaction of the passengers; the results may be based on quality growth of air transport services by the airline, leading finally to the improvement of the passengers' degree of satisfaction. Only horizontal lines should be used within a table, to distinguish the column headings from the body of the table. Tables must be embedded into the text and not supplied separately. All tables should be numbered with Arabic numerals. Headings should be placed above tables, underlined and centred. Leave one line space between the heading and the table. Only horizontal lines should be used within a table, to distinguish the column headings from the body of the table. Tables must be embedded into the text and not supplied separately.

4. Data analysis

Following the results of a survey carried out among the passengers of an air transport company in our country on a sample of 385 respondents and the theoretical mathematical model elaborated the results obtained using the mathematical model, replacing the values resulted in the following:

Table 2. Measuring the passengers' satisfaction degree on the professionalism of company personnel on the staff and on the types of features (Dragut, 2013)

Staff	Feature	Indicators			
		Feature of satisfaction level	Average level of satisfaction	Amplitude of satisfaction	Degree of fulfilling satisfaction on i/j
Shipping personnel	1. Level of training of seafarers	3-5	***4,49***	2	$g_1^{na} = \frac{4,49}{5} \cdot 100 = 89,79\%$
	2.. Ease of pilots navigation	2-5	**4.62**	3	$g_2^{na} = \frac{4,62}{5} \cdot 100 = 92,4\%$
	3. Pilot experience	2-5	**4.62**	3	$g_3^{na} = \frac{4,62}{5} \cdot 100 = 92,4\%$
	4. The flight attendants	2-5	**4,3**	3	$g_4^{na} = \frac{4,3}{5} \cdot 100 = 86\%$
	5. Stewardess professionalism	1-5	**4,19**	4	$g_5^{na} = \frac{4,19}{5} \cdot 100 = 83,8\%$
	6. The courtesy of stewardess	2-5	**4.25**	3	$g_6^{na} = \frac{4,25}{5} \cdot 100 = 85\%$
	Total shipping personnel	1+5	**4,41**	4	$G = \frac{5,2939}{6} \cdot 100 = 88,23\%$
Unskilled staff	1. Ground staff in general	2-5	**3.88**	3	$g_1^{ne} = \frac{3,88}{5} \cdot 100 = 77,6\%$
	2. The courtesy of the ground staff	2-5	**3.86**	3	$g_2^{ne} = \frac{3,86}{5} \cdot 100 = 77,2\%$
	Total unskilled staff	2-5	**3.87**	3	$G = \frac{1,548}{2} \cdot 100 = 77,4\%$
Total staff		1-5	**4,14**	4	$G = \frac{1,6563}{2} \cdot 100 = 82,82\%$

The above table shows that "The average level of satisfaction with the professionalism of the company's shipping personnel" is determined by the relationship

$$G^{pna} = \frac{4,49}{5} \cdot 100 + \frac{4,62}{5} \cdot 100 + \frac{4,62}{5} \cdot 100 + \frac{4,3}{5} \cdot 100 + \frac{4,19}{5} \cdot 100 + \frac{4,25}{5} = 88,23\%$$

and "The average level of satisfaction with the professionalism of the company's unskilled staff" is determined by the relationship

$$G^{pne} = \frac{3,88}{5} \cdot 100 + \frac{3,86}{5} \cdot 100 = 77,4\%$$

Thus, the overall average satisfaction level for the company's staff is:

$$\overline{\mu}^{p*} = \frac{4,41 + 3,87}{2} = 4,14$$

Also, the average level of passenger satisfaction for the company's staff is:

$$G* = \frac{4,14}{5} \cdot 100 = 82,8\%$$

Based on the dimensions presented above, we can determine a number of other indicators such as:

Relative Amplitude of Satisfaction Variation

generated by seafaring personnel

$$A_p^{\%} = \frac{4}{4,41} \cdot 100 = 90,7$$

generated by unscrupulous staff

$$A_p^{\%} = \frac{3}{3,87} \cdot 100 = 77,52$$

generated by the company's total staff

$$A_p^{\%} = \frac{4}{4,14} \cdot 100 = 96,62$$

5. Conclusions

In order to remain competitive in the globalised market, air transport companies in this field must adopt another approach, namely, orientation to the customer. In so doing, these companies must increase the degree of satisfaction of the passengers; this can only be possible through knowledge of the expectations of passengers from air transport service.

Assessment of the degree of satisfaction of passengers should represent for the air transport company a long-term objective, because only so one can appreciate the behavior of passengers in consumption and at the same time one can identify their needs and expectations. Customer satisfaction results from the positive experiences of it (Kim *et al*., 2008).

Only by knowing the expectations and the degree of satisfaction of the passengers, a company in the field of air transport can survive in this market without knowing borders, globalized and it can obtain benefits.

A dissatisfied passenger, aside from the fact that he will no longer call at the air transport company, he will also drive away other customers through negative recommendations, while a satisfied customer will bring other passengers by positive recommendations.

We can say that in the field of air transport, and not only, the passenger represents the most important capital, thus, the capital shall be kept and multiplied, this being possible by increasing the satisfaction degree of the passengers' expectations , and also by exceeding their expectations.

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