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A multiple criteria approach for airline passenger satisfaction measurement and service quality improvement

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ABSTRACT

Measuring customer satisfaction is a key element for modern businesses as it can significantly contribute to a continuing effort of service quality improvement. In order to meet customer expectations and achieve higher quality levels, airlines need to develop a specific mechanism of passenger satisfaction measurement. In this paper we show how MUSA, a multicriteria satisfaction analysis method, can be utilized in order to measure passengers' satisfaction from a large set of services dimensions, as well as to indicate those dimensions that need to be improved. The effectiveness of the method as a passenger satisfaction measurement and analysis tool is illustrated through an application to Aegean Airlines. The results reveal useful findings with regard to the satisfaction criteria and subcriteria that passengers of a full service airline value most, while interesting patterns emerge in different segmentation schemes.

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1. Introduction

In a competitive industry such as the airline industry, it is important for firms not only to correctly perceive what their customers want and expect, but also to manage their own resources in meeting their customer expectations appropriately (Chow, 2015). There is no doubt that nowadays, global financial environment demands targeted and well estimated management of resources. Park et al. (2004) suggest that carriers which provide services meeting customer expectations enjoy a higher level of passenger satisfaction and value perception. Service quality and passenger satisfaction is increasingly recognized as a critical determinant of business performance and as a strategic tool for gaining competitive advantage (Li et al., 2017).

Measuring customer satisfaction in the airline industry is becoming ever more frequent and relevant due to the fact that the delivery of high-quality service is essential for airlines' survival and crucial to the competitiveness of the airline industry (Park et al., 2005). Recently, competition between airlines has become more intense and service quality of airlines is receiving more attention than ever before. High-quality service has become a requirement in the market among air carriers, and helps companies to gain and maintain customer loyalty. It also leads to creating competitive pressure among air carriers (Chen et al., 2011). To achieve a high level of customer satisfaction, a high standard of service quality should be delivered by the service provider, since service quality is considered the basis for customer satisfaction (Clemes et al., 2008).

As Liou et al. (2011) state, there is no universal and exact definition of service quality. Instead, service quality may imply different things to different industries, suggesting that the concept of service quality is context-dependent and its measurements should reflect the operational environment being considered. Passenger satisfaction measurement is a key factor for improving service quality in airline companies, due to the intangible nature of the product, and the fact that customers perceive only two elements: the general outcome and the supplementary services. The general outcome is the transition from one location to another one, and this transition to the desired destination is combined with some essential or complimentary services. Whereas the traditional approach implies that the higher the perceived service quality, the higher the customer's satisfaction, recent studies indicate that the relationship between the dimensions of service quality and customer satisfaction may show a nonlinear pattern (Basfirinci and Mitra, 2015). Thus, determining the relative importance of service quality dimensions is also required.

In this paper we employ MUSA (MUlticriteria Satisfaction Analysis), an approach that combines MCDM analysis for assessing customer satisfaction and IPA for suggesting the critical service

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dimensions that need to be improved. The applicability of the method to airline passenger satisfaction is illustrated through the case of Aegean airlines, a Star Alliance member, which has received seven Skytrax awards within a period of eight years (2009–2016) as the Best Regional Airline in Europe.

2. Literature review

Different approaches have been applied in measuring the airline service quality and passenger satisfaction. One research stream concerns studies that use statistical techniques such as regression (logistic or ordinal) to test hypothesis related to the topic (Oyewole et al., 2007; Eboli and Mazzulla, 2009; Josephat and Ismail, 2012; Ali et al., 2016). Vink et al. (2005) studied service quality from the comfort perspective, dividing the comfort during flight experience into seven phases. Vink et al. (2012) found six descriptors strongly associated with comfort based on 10,032 passengers' trip reports. Nicolini and Salini (2006) used decision trees and the Rasch model, while other studies employ SERVQUAL (Chen and Chang, 2005; Pakdil and Aydin, 2007; Degirmenci et al., 2012). Another research stream is based on the application of Multiple Criteria Decision Making (MCDM) methods and tools in order to evaluate an airline's integrated service level and make suggestions for improvement. Most of them employ fuzzy multicriteria approaches (Tsaur et al., 2002; Chang and Yeh, 2002; Liou and Tzeng, 2007), while Liou et al. (2011) utilize SERVQUAL and Importance Performance Analysis (IPA).

Another MCDM method for customer satisfaction evaluation and service quality assessment is MUSA. The main advantage of MUSA is that it respects the qualitative form of customers' judgments and preferences as they are expressed in a customer satisfaction survey. The method avoids the arbitrary quantification of the collected information, since the coding of the qualitative scale is a result, not an input to the proposed methodology, as is the case with other statistical methods such as regression analysis. This capability of qualitatively representing the customer's judgments and preferences makes MUSA an appropriate tool for assessing customer satisfaction and service quality in a wide range of sectors such as banking (Mihelis et al., 2001; Grigoroudis et al., 2002), coastal shipping (Grigoroudis et al., 1999), publishing (Alexopoulos et al., 2006), and ecommerce (Kyriazopoulos et al., 2006; Grigoroudis et al., 2007a,b) among others.

MUSA constitutes an appropriate tool for assessing customer satisfaction and service quality in the civil aviation industry, as the latter exhibits all the typical characteristics of service industries: the intangibility and perishability of the product and the high importance of personal contact to the customer (Wittmer and Bieger, 2011). Furthermore, MUSA is based on the principles of ordinal regression, and thus can effectively handle qualitative assessment structures such as ordinal scales based on star ratings that are typical in customer review systems for service industries (e.g. Tripadvisor for hotels). Skytrax for example, the leading international Airline Rating system classifying airlines by the quality of front-line product and staff service standards, allows passengers to evaluate airlines on seven criteria using a 5-point ordinal scale based on star rating.

3. Customer satisfaction

Satisfaction has been defined as the feeling of pleasure or disappointment when a customer compares a product's perceived performance with his or her prior expectations (Oliver, 1981). In recent times, organizations of all types and sizes have increasingly come to understand the importance of customer satisfaction. It is widely understood that it is far less costly to keep existing customers than it is to win new ones, and it is becoming accepted that there is a strong link between customer satisfaction, customer retention and profitability. (Hill and Alexander, 2006). O'Sullivan and McCallig (2012) showed that customer satisfaction has a positive impact on firm value. Critically, the authors found that this impact is over and above the impact that earnings has on firm value, and that customer satisfaction positively and significantly moderates the earnings-firm value relationship. According to Daub and Ergenzinger (2005) customer satisfaction must be seen in a more holistic, multidimensional perspective in future. Companies succeeding in taking this step towards sustainable management will raise their profile among customers, and differentiate themselves from the competition. Service quality and customer satisfaction are closely related but not interchangeable, although both concepts involve a comparison of expectations of quality and the actual service received (Jiang and Zhang, 2016). Szwarc (2005) notes that service quality increases customer satisfaction, which enforces customer loyalty and in turn leads to increased corporate profits.

The most frequently used customer satisfaction and service quality measurement approaches are (Grigoroudis and Siskos, 2010):

- Quantitative methods and data analysis techniques: descriptive statistics, multiple regression analysis, factor analysis, probit–logit analysis, discriminant analysis, conjoint analysis, and other statistical quantitative methods (DEA, cluster analysis, probability-plotting methods).
- Quality approaches: Malcolm Baldridge award, European quality model, ideal point approach, SERVQUAL.
- Consumer behavioral analysis: expectancy disconfirmation model, motivation theories, equity theory, regret theory.
- Other methodological approaches: customer loyalty, Kano's model, Fornell's model.

4. The MUSA method

Most of the aforementioned models do not consider the qualitative form of customers' judgments, although this information is the basic satisfaction input data. Furthermore, in several cases, the measurements are not sufficient enough to analyze in detail customer satisfaction because models' results are mainly focused on a simple descriptive analysis. The MUSA method (Grigoroudis and Siskos, 2002) fully considers the qualitative form of customers' satisfaction data in order to overcome the above limitations. The results of the model are not only focused on descriptive analysis of customer satisfaction data, but they are also able to assess an integrated benchmarking system. The model does not require strong assumptions regarding customer satisfaction or consumer behavior generally. Furthermore, input data can be easily collected using a very simple, comprehensive, and short questionnaire. The MUSA system is a survey-based software, which is able to provide complete and effective results to the user, through the evaluation of concrete and understandable indices of customer satisfaction.

MUSA is based on the principles of multicriteria analysis, and particularly on the aggregation–disaggregation approach and linear programming modeling. The preference disaggregation methodology is an ordinal regression based approach in the field of multicriteria analysis used for the assessment of a set of marginal satisfaction functions in such a way that the global satisfaction criterion becomes as consistent as possible with customer's judgments. The main objective of the MUSA model is the aggregation of individual judgments into a collective value function assuming that

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