Journal of Air Transport Management 53 (2016) 131–139

Contents lists available at ScienceDirect

Journal of Air Transport Management

journal homepage: www.elsevier.com/locate/jairtraman

Using TRIZ to enhance passengers' perceptions of an airline's image through service quality and safety

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ARTICLE INFO

Article history:
Received 29 April 2015
Received in revised form
11 February 2016
Accepted 13 February 2016
Available online 5 March 2016

Keywords:
Airline image
Airline services
Airline safety
Service quality measurement (SQM)
SERVQUAL
The Kano model
TRIZ

ABSTRACT

To improve the impacts of airline image, service quality and safety on passenger perceptions, this paper examined and presented three case studies to identify the factors that influenced service quality in the airline business, and passenger perceptions of airline image. A literature review on service quality measurement (SQM) and airline safety analysed case studies. The quality management framework SERVQUAL with five service quality dimensions including reliability, assurance, tangibility, empathy and responsiveness was used to assess passenger requirements. Selected criteria from airline services and the Kano model measured customer satisfaction. Airline safety criteria were studied and TRIZ techniques were employed to integrate improved service quality without compromising safety regulations, to best enhance airline image.

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1. Introduction

In 1987 an open sky policy was implemented in the airline industry (Chang and Chiu, 2009) and this business freedom for flight operations resulted in increased competition among airlines. Consequently, in most parts of the world, the deregulation of the airline business has affected industry competition. During the past decade, two major airline business models were classified according to their strategic plans. The traditional model covered the comprehensive service package and the other concerned low cost airlines offering reduced prices with minimum extras (Tiernan et al., 2008a, b). Full service airline criteria include seats with space to recline, leg room, in-flight entertainment, baggage processing, meal service, in-flight amenities, a choice of first, business or economy class travel and partners such as Star Alliance, Sky Team and Oneworld. Air carriers identified the major strengths and weaknesses of their services related to their brand positioning (Wen and Chen, 2010). Competition in the airline business caused airlines to resort to different strategies such as intensive marketing, advertising and promotions combined with price and ticketing sales. In the airline business regulatory safety requirements are the top priority; air safety records reflect airline image, while high quality service is associated with passenger expectation (Liou et al., 2008). Airline businesses have consolidated their images, using integrated methods to manage the improvement of passenger satisfaction.

This paper examined the effect of airline image on passenger perception of service quality and safety operations. Part two reviewed the literature on service quality management, airline service criteria and SERVQUAL measurement, the Kano model and customer satisfaction coefficient analyses, airline safety criteria and rankings and TRIZ application tools. Part three examined three airline service quality case studies and Part four presented and discussed the conclusions.

2. Literature review

The term ‘service quality’ has been used in evaluating service quality through customer satisfaction. The competitive advantages in offering superior service quality include increasing an airline's market share. Efforts to increase adherence to aviation safety should be prioritised (GASP ICAO, 2014) to improve airline image.

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http://dx.doi.org/10.1016/j.jairtraman.2016.02.011
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Given the large variety of service quality definitions, formulations from customer perspectives and perceptions are important dimensions (Lewis, 1993). One definition of service quality is the level required to meet customer expectations (Gronross, 1982).

Improvements in service quality can increase both profits and client base through new and repeat purchases from loyal customers (Gilbert and Wong, 2002). Service characteristics cannot be produced in advance, therefore they must always exceed customer expectations and outcomes. Customer satisfaction influences loyalty, which then stimulates growth to maximise profitability (Heskett et al., 1994).

2.1. Airline service quality management using the SERVQUAL method

Previous airline service studies used the SERVQUAL method to evaluate service quality (Park et al., 2005). SERVQUAL is a framework to measure service quality using the gap theory model. This has five service quality dimensions included reliability, assurance, tangibility, empathy and responsiveness, with 22 attributes that define service quality as the degree of discrepancy between customer expectation and customer perception of the service performance they received (Gronross, 1982; Parasuraman et al., 1988; Wongrukmita and Thawesaengskulthai, 2014). Service quality in the airline industry is complex and differs from other industries (Feng and Jeng, 2005). Airline service quality includes safety procedures, in-flight comfort, hospitality and service accuracy. The airline industry service items are defined by IATA (International Air Transportation Association) and include reservation seating capacity, ticketing, check-in processes, in-flight services, baggage handling and post-flight service (Feng and Jeng, 2005).

2.2. Kano's attractive quality theory and the customer satisfaction coefficient

In 1984, Dr. Noriaki Kano and his colleagues (Kano et al., 1984) developed a model to identify core customer requirements and areas of product and service improvement by examining the non-linear relationship between service performance and customer satisfaction (Ankur et al., 2010).

According to Matzler and Hiterhuber (1998) (Fig. 1), attractive quality separated Kano's service requirements into Must-be (M), One-dimension (O), Attractive (A), Indifferent (I) and Reverse (R). The customer satisfaction coefficient (CS) measures qualitative values of customer satisfaction and dissatisfaction. The Kano model and the CS formula are applied to indicate the qualitative values of the customer satisfaction index (Berger et al., 1993; Ankur et al., 2010) (Table 1).

2.3. SERVQUAL and Kano's model applied to airline service measurement

Table 2 summarises airline service quality measurements obtained by SERVQUAL and Kano's attractive quality model (Matzler and Hiterhuber, 1998; Berger et al., 1993).

Airline service criteria categorised by the SERVQUAL RATER and the Kano model to identify the Customer Satisfaction Index indicating overall passenger satisfaction are listed in Table 2.

2.4. Airline safety criteria and ranking

Airline safety criteria are determined by IOSA (IATA Operational Safety Audit), ICAO (International Civil Aviation Organisation) and the FAA (Federal Aviation Administration). According to airlineratings.com, airline safety ratings are based on a comprehensive holistic safety analysis of factors that impact safety. Analyses utilise information from the world's aviation governments as well as crash data. Table 3 shows the criteria used for airline safety ratings. Each airline has the potential to earn seven stars (*) credit for safety assessment with the criteria for the best safety ranking.

Airline safety index rankings are based on the JACDEC (Jet Airliner Crash Data Evaluation Centre) annual safety calculations. International safety benchmarks such as IOSA and USOAP (Universal Safety Oversight Audit Programme) country factors are also a time weighting factor that increases the effects of recent accidents and weakens the impact of past accidents (ICAO, 2004., 2006); (ICAO USOAP 2011). Table 4 shows the criteria for calculating the safety index and the resulting safety index ranking, including the Annual Revenue Passengers Kilometres (RPKs) which measure of passenger traffic calculate with number of paying passengers multiply by kilometres flown, IOSA Membership and Country Transparency (JACDEC, 2013).

2.5. TRIZ for service quality in the airline industry

Genrich Altshuller developed TRIZ by analysing more than three million patents and discovering that the patterns predicted breakthrough solutions to problems. TRIZ is now increasingly used in Six Sigma processes, project management, risk management and innovation initiatives. It solves problems by analysing their repeatability, predictability and reliability by relying on the study of the patterns of problems and solutions. A TRIZ perspective in service industries demonstrates that the TRIZ's 40 Inventive Principles in service operations differ from physical product development (Zhang et al., 2009). For example, unique service industry characteristics include customer participation, simultaneity, heterogeneity, intangibility and perishability which can help resolve airline service problems. An empirical study on developing a new service

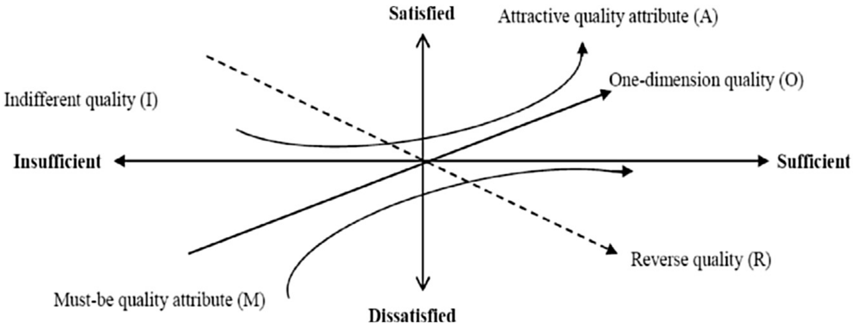
Satisfied
Attractive quality attribute (A)
One-dimension quality (O)
Indifferent quality (I)
Insufficient
Sufficient
Reverse quality (R)
Must-be quality attribute (M)
Dissatisfied

Fig. 1. Kano's excitement and basic quality model adapted from Matzler and Hiterhuber (1998).

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