Quality risk assessment model for airline services concerning Taiwanese airlines

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A B S T R A C T

Whereas most studies have focused on elevating the service quality of airlines, few have explored quality risks from the viewpoint of customer dissatisfaction caused by poor service. For this study, we designed a quality risk assessment model that measures quality risk for airline services by integrating the Kano model, degrees of importance and satisfaction, and the failure mode and effects analysis. Data were collected for Taiwanese airlines through a questionnaire. The application of the proposed quality risk assessment model revealed several high-risk services, such as employee service attitudes, the ability of employees to manage customer complaints, the comfort of airplane seats, in-flight snack services, and flight punctuality. Finally, this study presents a discussion on the managerial implications and recommends directions for future research.

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1. Introduction

While managing numerous challenges, airlines face strong competition from competing carriers (Dolnicar et al., 2011). Various antecedents may influence passengers' choice in the airline, including flight schedules, convenience, the frequency of flights, fares, punctuality, frequent flyer programs, perceived image, and service quality (Nako, 1992; Singh, 2015). The service process for airline services has always been considered a primary influence on service quality and customer satisfaction (Goodwin and Ross, 1992). However, in a service process that begins with the ticket booking process and involves onboard services, various factors may result in service failure (Bejou and Palmer, 1998). When the service quality does not meet the expectations of passengers, they become dissatisfied (Kau and Loh, 2006). This generates losses for the airline, and is regarded as a negative influence, which is the reason it is crucial to discuss the service quality of airline services.

Most studies on service quality have applied a positive-influence perspective to investigate the methods of improving service quality (Chen and Chang, 2005; Curry and Gao, 2012; Park et al., 2006; Robledo, 2001; Saha and Theingi, 2009). When the

service quality does not meet customer expectations, passengers become dissatisfied, and may choose another airline in the future (Pérez et al., 2007). This negative assessment is based on a negative-influence perspective that can be used when discussing the service quality of airlines. Because of the relevance of the negative-influence perspective, the Airline Quality Rating (AQR) index was developed in 1991 (Bowen and Headley, 2015). The index is a weighted average of the elements that are relevant to consumers when assessing the quality of airline services. The weight of an element reflects its priority in consumer decision-making, and its sign reflects the direction of impact that the element should have when a consumer rates the airline service quality (Bowen and Headley, 2015). Although the AQR index has included several indices concerning the occurring rate of negative service attributes (e.g., on-time percentage, number of lost baggage reports as well as instances of denied boarding), the concept of quality risk has not been considered in its entirety. Airlines should consider the influence of service quality attributes as well as the requirement of failure prevention for all service attributes (Chang and Sun, 2009). This study regarded service quality management as an implement for controlling quality risks.

Risk is defined as uncertainty caused by a potential loss or injury, and may be avoided through preemptive action. Therefore, risk management aims to minimize losses associated with an event (Cleary and Malleret, 2007; Fragnière and Sullivan, 2006; Rejda,

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2011; Skipper, 2008). Recent applications of risk management have expanded to include the concept of quality; this topic is called quality risk management (QRM) (Claycamp, 2007). QRM is applied to ensure the quality of a product or service through systematic planning. This planning involves the four procedures of risk assessment, risk control, risk communication, and risk review (Mire-Sluis et al., 2010). Risk assessment is the first critical task in QRM. Failure mode and effects analysis (FMEA) is commonly applied for this purpose because it is related to risk assessment. Because FMEA focuses on exploring all types of potential mistakes in an operation system, it evaluates the degree of risk by analyzing error types, the probability of failure, the severity of faults, and the degree of hazards. This methodology is also commonly used for preventing service failures (Chang and Sun, 2009). When applied to service quality, FMEA can identify various service failures by measuring risk factors, and then assessing the probability of service failure (Shahin, 2004). Establishing an improvement method by using FMEA for a service process may help eliminate potential errors (Greenall et al., 2007; McDermott et al., 2008; Ookalkar et al., 2009). However, research applying FMEA to assess the service quality risk of airlines remains scant.

Previous studies have identified a positive, linear relationship between quality and satisfaction; that is, customer satisfaction increases with quality. Kano et al. (1984) developed a "two-dimensional quality" model, and asserted that the relationship between customer satisfaction and the performance of quality attributes is not entirely linear. The attributes then can be divided into five types of quality elements: attractive quality, 1D quality, must-be quality, indifference quality, and reverse quality. Hu and Lee (2011) then designed the improvement effort index (IEI) by combining the Kano model and degrees of importance and satisfaction to create a 2D matrix that provides information for a quality improvement strategy. Shahin (2004) combined the Kano model and FMEA into one index and applied it to a case study of travel agents. However, studies that apply the Kano model to explore QRM for airline services are scant. In addition, the literature lacks a specific methodology for applying FMEA and the Kano model to an assessment of quality risks associated with airline services. These shortcomings provided the motivation to develop a relatively more comprehensive model.

In summary, when service quality fails to meet a customer's expectations or needs, it is had a negative influence on future purchase decisions. The possibility of this negative influence is referred to as quality risk. Improving service quality can then be viewed as a managerial method for controlling quality risks. Previous studies on airline service quality have primarily focused on the attributes of service quality or have evaluated it, whereas few have explored quality risk assessment. For this study, we thus developed an integrated quality risk assessment model for use by airline services, and then applied it to Taiwanese airlines. Data collected using a questionnaire and subsequent analysis can facilitate evaluating quality risk. An evaluation of quality risk can be quantified and used to prioritize improvements to airline service quality.

2. Literature review

2.1. Airline service quality

Many scholars have treated service quality as a subjective customer perception (Levitt, 1984; Wakefield, 2001). Parasuraman et al. (1985) defined service quality as the gap between customer expectations and perceptions of the service received. Many researchers have examined various dimensions of service quality (Dabholkar et al., 1996; Juran, 1974; Lehtinet and Lehtinen, 1982; Sasser et al., 1978). The five dimensions of the SERVQUAL model are tangible, assurance, reliability, responsiveness, and responsiveness (Parasuraman et al., 1988). This model is widely used for measuring service quality in different service industries (Landrum et al., 2008; Quader, 2009; Tate and Evermann, 2010; Turner et al., 2010; Zaimrr et al., 2010). Brady and Cronin (2001) identified a multidimensional, hierarchical model with three primary dimensions of service quality (interaction, environment, and outcome) and nine subdimensions based on studies by Parasuraman et al. (1988), Rust and Oliver (1994), and Dabholka et al. (1994). Their model conflated multiple service quality conceptualizations into a single comprehensive multidimensional framework with a strong theoretical grounding.

Certain studies that have addressed service quality topics in the airline industry have explored and measured service attributes, including studies by Robledo (2001), Park et al. (2004, 2006), Chen and Chang (2005), and An and Noh (2009). Rhoades and Waguespack Jr. (2008) reviewed the conceptual foundations for service quality as it applied to the airline industry, and used data from the Air Travel Consumer Report to investigate airline quality performance regarding such key indicators as on-time arrivals, customer complaints, denials of boarding, and occurrences of mishandled baggage to characterize trends in airline service performance over the last two decades. Saha and Theingi (2009) indicated that, regarding order of priority, the dimensions of service quality, in descending order, are flight schedules, flight attendants, tangibles, and ground staff. Curry and Gao (2012) examined relationships among service quality, service satisfaction, and customer loyalty in a budget airline. Tsaur et al. (2002), Nejati et al. (2009), and Torlak et al. (2011) have used the fuzzy or TOPSIS approach to assess airline performance. Although many studies have investigated airline services, few have examined quality risk in relation to airline services.

2.2. Kano model and improvement effort index

In the past, customer satisfaction has been perceived as a 1D construct: customer satisfaction increases with the fulfillment of desired attributes (Yang, 2005). In other words, if the attribute quality is sufficient, customers can be satisfied; otherwise, they cannot. However, certain studies have shown that not every fulfillment of an attribute results in a high level of customer satisfaction (Matzler and Hinterhuber, 1998). Moreover, certain attributes may only result in nonsatisfaction or a neutral feeling for a customer, rather than increase or reduce satisfaction (Chen and Lee, 2006). Based on the results obtained by Herzberg (1959), Kano and Takahashi (1979) developed the concept of a 2D quality. Kano et al. (1984) applied two dimensions of any quality attribute: the fulfillment of quality and customer-perceived satisfaction. Each of these dimensions have five categories of quality attributes, each of which has different impacts on customer satisfaction and customer dissatisfaction (Kano et al., 1984; Löfgren and Witell, 2005; Yang, 2005). Many previous studies have applied the Kano model to measure customer satisfaction (Chen and Chuang, 2008; Chen and Lee, 2006; Matzler et al., 1996, 2004; Matzler and Hinterhuber, 1998; Rivière et al., 2006; Tan et al., 2004; Wassenaar et al., 2005).

Based on Kano's definitions, service quality was divided into attractive quality elements (A), one-dimension quality elements (O), must-be quality elements (M), indifferent quality elements (I), and reverse quality elements (R). For the attractive (A) attribute, customer satisfaction increases superlinearly with attribute performance; for the one-dimensional (O) attribute, customer satisfaction is a linear function of the performance of a criterion; for the must-be (M) attribute, customers become dissatisfied when the performance of this criterion is low or the product attribute is