



An SEM–artificial-neural-network analysis of the relationships between SERVPERF, customer satisfaction and loyalty among low-cost and full-service airline



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ABSTRACT

There is a dearth of studies pertaining to the influence of SERVPERF on customer satisfaction and customer loyalty among low cost and full service airlines. Prior studies have measured service quality using the GAP-5 model with SERVQUAL; however this study offers a new perspective by using the SERVPERF with an SEM–artificial-neural-networks predictive analytic approach. This is different from the previous studies as it contributes to application of expert systems and intelligent algorithms in the context of low cost and full service airline. The findings revealed significant influences of SERVPERF dimensions on customer satisfaction towards customer loyalty with 63.1% and 55.6% variance explained. The implications from this research may help CEOs and managers of the air travel and tourism industry players to make better decisions in their resource planning stage, at the same time improving customer satisfaction and loyalty.

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1. Introduction

In the new era of the borderless world and modern society together with the emergence of low cost airlines, air travelling has been a kind of necessity rather than a luxury activity. Due to the keen competition among global airliners, various marketing strategies and approaches have been employed to increase passenger and cargo traffic volume. Nevertheless, global airline business has experienced a roller-coaster phenomenon during the last few years. According to the CEO of Air Asia, the global airline industry has picked up its pace again in 2010 while the forecast for 2011 is encouraging though with element of caution (Air Asia, 2010 Annual Report). The International Air Transport Association (IATA, 2014) has forecasted the industry's net profit level from USD12.9 billion in 2013 to USD18.7 billion for 2014. IATA further estimates a 5.3% in passenger growth (RPK) for 2013 and 5.8% for 2014 from 3.129 billions passengers to 3.304 billions in 2014. In terms of the international revenue passenger kilometers (RPK), IATA has estimated a 6.1% growth while for the international

freight ton kilometers (FTK), a 5.9% growth in 2013. In the Malaysia airlines industry context, for the year 2010, it experienced a 12.4% growth of passenger traffic followed by a growth rate of 10.7% for 2011 and only 5% for 2012 (Maybank IB Research, 2013). It surged to a 21-year record high of 18.4% in 2013 (Maybank IB Research, 2014).

The airline industry in Malaysia is dominated by full service Malaysia Airlines (MAS) as the national airline with 100 destinations worldwide and Air Asia as the first low cost carrier serving 75 destinations in 21 nations via its Air Asia X, Indonesia Air Asia and Thai Air Asia wings (Wong & Musa, 2011). Air Asia has received the “Best Low-Cost Airline” category at Business Traveller Asia-Pacific's 2012 annual Travel Awards ceremony in Hong Kong (The Star, 2012), the first ASEAN Commercial Aviation Award 2013 in Langkawi (The Star, 2013a) as well as the World's Best Low Cost Airlines award for 2009 and 2010 from Skytrax and was voted as the top three Best Regional airlines in the low cost carrier category by Skytrax World Airline Award in 2006. Lately, it has also won the award for World's and Asia's “Best Low-Cost Airlines” in the Paris 2013 World Airlines Award (The Star, 2013b) and the World Travel Awards Asia and Australasia in Dubai (The Star, 2013c) whereby MAS was also named as “Asia's Leading Airline”. The competition between the two airlines has been enormous especially with Air Asia promoting aggressively its tagline “Now Everyone Can Fly”.

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In fact, the airline sector has been ascertained to be an intangible service industry by [Clemes, Gan, Kao, and Choong \(2008\)](#). A good service quality (SQ) will lead to increase in profits ([Buzzell & Gale, 1989](#)) while maintaining an organization's competitive advantage ([Park, Robertson, & Wu, 2004](#)). Therefore, the impact of SQ on airline customers' satisfaction and loyalty is worth studying as the findings would be beneficial to not only the two airlines but also other airlines worldwide in increasing their passenger traffic as well as improving the profitability. Majority of the previous studies ([Table 1](#)) have focused on measuring airlines SQ using the SERVQUAL's GAP-5 model. Perhaps this research is among the

first to ascertain the direct impact of the SERVPERF dimensions towards full service and low cost airlines' (LCC) customer satisfaction (CS) and customer loyalty (CL) using a Structural Equation Modeling (SEM)–artificial neural network predictive analytic approach. “Predictive analytics are useful for generating new theory, developing new measures, comparing competing theories, improving existing theories, assessing the relevance of theories, and assessing the predictability of empirical phenomena” ([Shmueli & Koppius, 2011, p. 554](#)). Finally, there are hardly any previous studies that examine whether differences exist in the SERVPERF provided between full service and low cost airline.

Table 1

Studies on service quality, customer satisfaction, loyalty and/or behavioral intention of airline industry.

Researcher(s)	Country	Sample size	Unit of analysis	Measurement model of service quality	Method of analysis	Findings
Abdullah et al. (2007)	Malaysia	391	Passenger at the Kuala Lumpur International Airport (KLIA)	SERVQUAL	Factor analysis, Chi-square test and regression analysis	SERVQUAL dimensions influence CS, intention to re-patron and likelihood to recommend to others
Ariffin et al. (2010)	Malaysia	100	Passenger of low cost carriers terminal (LCCT) at KLIA	SERVQUAL	Factor analysis and stepwise multiple regression analysis	Caring and tangible was the most important dimension of service quality followed by reliability, responsiveness, affordability and visual attractiveness. Only caring and tangible significantly predict customers' satisfaction on service quality
Atilgan, Akinci, and Aksoy (2008)	Turkey	235	Passenger at the Antalya International Airport	SERVQUAL	Paired <i>t</i> -tests and correspondence analysis	Gaps exist for the dimensions of food and beverage, cabin, aesthetics, convenience, dependability, in-flight activities and personnel
Chau and Kao (2009)	Taiwan	263	Passenger at Taoyuan International Airport and London Heathrow International Airport	SERVQUAL	Paired-sample <i>t</i> -tests and linear regression	The gap-5 sizes quality dimensions have significant impact on CS and service value
Clemes et al. (2008)	New Zealand	428	International air traveler	SERVQUAL	Multiple regression analysis, ANOVA, <i>t</i> -tests	Assurance, comfort, convenience, timeliness, helpfulness, meals, security and safety are positively associated to PSQ. PSQ is affected by travelers' gender, age, occupation, marital status and income. PSQ and price influence CS. CS has a strong influence on future BI
Cunningham et al. (2002)	U.S. and Korea	105 (U.S.) 145 (Korea)	Student of an evening MBA program using air transportation	SERVPERF	Regression analysis	US: reliability, connections and in-flight comfort influence CS. Intention to re-patronize is affected by reliability and empathy Korea: reliability, risk factors and assurance affect CS. Intention to re-patronize is affected by overall risk and reliability
Huang (2009)	Taiwan	602	Passenger at Taoyuan International Airport	SERVQUAL	SEM	Service quality has direct effects on passengers' behavioral intention
Ling and Lin (2005)	Taiwan and China	262 (Taiwan) 142 (China)	Traveler between Taiwan and Mainland China	SERVPEX	SEM, ANOVA	CS is influenced by tangibles, reliability, responsiveness and assurance but not empathy. Customer's preference is affected by tangibles and reliability
Nadiri et al. (2008)	Cyprus	583	North Cyprus national airline passenger	SERVQUAL	SEM	SERVQUAL dimensions positively influence CS and repurchase intention. CS

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