



Factor Determinants of Customer Satisfaction with Airline Services Using Big Data Approaches

Yuliani Dwi Lestari¹, Eko Agus Murjito²

¹ Sekolah Bisnis dan Manajemen, Institut Teknologi Bandung, Indonesia

² Sekolah Teknik Elektro dan Informatika, Institut Teknologi Bandung, Indonesia

Article Info

Article history:

Received: 20 December 2019;

Accepted: 27 February 2020

Published: 05 March 2020

Keywords:

Airlines; Big-data, Customer satisfaction; Factor determinant; Skytrax.

Abstract

In the commercial airline's industry, customer satisfaction is critical. Due to increasingly fierce competition, customer satisfaction can affect airlines' customer decisions in providing recommendations for prospective customers. For this reason, this study aims to explore the determinant factors that influence customer satisfaction and recommendations for the top 10 airlines listed on the Skytrax list. Using the big data approach, this study collected data from 10.189 customer reviews from 2012 to 2019. Based on the results of statistical analysis using binary logistic regression techniques, it was found that out of 7 factors, only 5 significantly influenced customer recommendations, namely airline rate, seat comfort, cabin staff service, food and beverages, and value for money. In-flight entertainment and ground services were not significant. The findings of this study contribute to strengthening the literature related to customer satisfaction in the airline sector, as well as managerial contributions to be used as a reference for airlines in improving service quality, particularly for long international flights.

Abstrak

Dalam industri penerbangan komersial, kepuasan pelanggan sangat penting. Karena semakin ketatnya persaingan, kepuasan pelanggan dapat mempengaruhi keputusan pelanggan maskapai dalam memberikan rekomendasi bagi calon pelanggan. Untuk alasan ini, penelitian ini bertujuan untuk mengeksplorasi faktor-faktor penentu yang mempengaruhi kepuasan pelanggan dan rekomendasi untuk 10 maskapai teratas yang terdaftar di daftar Skytrax. Menggunakan pendekatan big data, penelitian ini mengumpulkan data 10.189 ulasan pelanggan dari 2012 hingga 2019. Berdasarkan hasil analisis statistik menggunakan teknik regresi logistik biner, ditemukan bahwa dari 7 faktor, hanya 5 yang secara signifikan mempengaruhi rekomendasi pelanggan, yaitu maskapai harga, kenyamanan kursi, layanan staf kabin, makanan dan minuman, dan nilai uang. Hiburan dan layanan darat dalam penerbangan tidak signifikan. Temuan penelitian ini berkontribusi pada penguatan literatur yang terkait dengan kepuasan pelanggan di sektor maskapai penerbangan, serta kontribusi manajerial untuk digunakan sebagai referensi bagi maskapai penerbangan dalam meningkatkan kualitas layanan, khususnya untuk penerbangan internasional jangka panjang.

How to Cite:

Lestari, Y. D., Murjito, E. A. (2020). Factor Determinants of Customer Satisfaction with Airline Services Using Big Data Approaches. *Jurnal Pendidikan Ekonomi & Bisnis*, 8(1), 34-42. <https://doi.org/10.21009/JPEB.008.1.4>

* Corresponding Author.

yuliani.dwi@sbm-itb.ac.id, Yuliani Dwi Lestari

INTRODUCTION

Competition in the airline industry is increasingly fierce and complex. Competition occurs not only between full-service airlines but also between full-service airlines and budget airlines. This condition causes demands that airline providers continue to innovate and improve services, to compete. This increasingly fierce competition has caused the margins to shrink, resulting in some airlines recording losses of millions (Cento and Alessandro 2009; Lordan 2014). Thus, retaining customers is a critical step in ensuring the airline's success. Among the solutions, improving customer satisfaction has emerged as the key (Park et al. 2019).

The attractiveness of airlines is a topic of great interest to researchers and professionals wishing to understand the ability of airlines to attract and satisfy air passengers (Medina-Muñoz, Medina-Muñoz, and Suárez-Cabrera 2018). Furthermore, studies on measuring customer satisfaction with service airlines have indeed been done with a variety of scopes and methods, particularly exploring the relation between customer satisfaction and motivations for customers' intentions to reuse the current airline service, making them one of the most popular research topics in the airline industry (Hsu et al. 2016; Park et al. 2019).

For instance, (Park et al. 2019) investigated the potential determinants of customers' perceived satisfaction with airline services through a close examination of their feedback on these services, using a dataset comprising feedback from more than 133,000 customers. The authors explored both general and concrete components of customer satisfaction of airline services and investigated the determinate role of satisfaction on customers' intention to reuse the services. Other studies also have contributed to understanding the factor determinants to customer satisfaction (Chen and Hu 2013; Forgas et al. 2010; Mikulić and Prebežac 2011). However, the majorities of studies include airlines of various classes, or only focus on low-cost carriers, while the top airlines that specifically provide international flight services, full services, and long-flights are still limited. Competition conditions are very severe in the upper segment. For this reason, this study differs in its focus from previous studies, by observing the determinant factors of customer satisfaction for the top 10 airlines listed on Skytrax, with a focus on international and long-flight services using the big data approach.

Customer satisfaction is defined as “an emotional response that results from a cognitive process of evaluating the service received against the costs of obtaining the service.” The majority of service sector studies focused on the concept of customer satisfaction as a key determinant of success (Park 2019; Tam 2004). In another word, to be profitable and sustain, the company needs to put customer satisfaction in the first place. The service sector, clearly customer satisfaction is a post-decision experience (Jiang and Zhang 2016). It is expected that by having high customer satisfaction, the company will receive fewer complaints, thus specifically reducing operational and quality costs. Customer satisfaction is also a critical aspect in marketing, representing the needs and wants of customers, leads to favorable word-of-mouth publicity, could gaining higher market share, serves as an exit barrier, and affecting customer retention rates (Clemes et al. 2008; Han and Ryu 2009; Hapsari, Clemes, and Dean 2016; Jin, Lee, and Huffman 2012).

The study of determinant factors for customer satisfaction generally underlines two factors, namely service quality, and perceived value. Service quality has been widely acknowledged as an important issue in many industries, as it helps a company enhance its profits and also satisfy and retain customers (Hapsari et al. 2016). By providing excellent service quality, a business can create a competitive advantage to distinguish it from other organizations (Hapsari et al. 2016). 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). It is defined as the gap between customers' expectations about the service that they have perceived and received (Parasuraman, Zeithaml, and Berry 1985). The service quality instrument encompasses five dimensions of service quality, comprising tangibles, reliability, responsiveness, assurance, and empathy aspects (Ijadi Maghsoodi, Saghaei, and Hafezalkotob 2019; Pena et al. 2013). Tangible is defined as the physical appearance of facilities, equipment, tools, and personnel of the service provider. Reliability is defined as the ability to provide consistent, assured service, and reliable to the customer. Responsiveness is defined as the quick response, willingness

to guide customers along with delivering prompt service. Assurance is the acquaintance and courtesy of employees and their ability to inspire trust and confidence, while empathy is defined as the delivery of individualized and adjusted care and attention to customers (Ijadi Maghsoodi et al. 2019). Further, service quality drives customers' perceived value that is a global judgment or attitude, relating to the superiority of the service (Clemes et al. 2008), which is also believed to be a trigger of customer satisfaction. When a customer receives a high value of service, it will result in high satisfaction (Ijadi Maghsoodi et al. 2019).

Regarding customer satisfaction in the airline industry, (Clemes et al. 2008) explores the dimensionality of perceived service quality in international air travel, revealing seven dimensions namely timeliness, assurance, convenience, helpfulness, comfort, meals, and safety and security. Also, the findings indicate that passengers' perception of international air travel service quality will differ according to passengers' age, gender, income, occupation, and marital status. (Jiang and Zhang 2016) investigated the service quality of four major airlines in China's domestic market and explored the links between their service quality and customer satisfaction, as well as the conditions under which airlines can retain existing passengers. Specifically, there are 3 groups of factors, namely In-flight entertainment, Frequent Flight Program (FFP) and airline response to flight delay and passenger complaints; Departure and arrival experiences, in-flight comfort and cabin crew professionalism; and Flight selection and ticket purchase experience. It was also revealed that service quality variables are significant factors influencing customer satisfaction levels. (Tsantoulis and Palmer 2008) conducted a study focusing on long-flight airlines and found that the primary service quality dimensions are airline schedule and price, with secondary dimensions being safety, comfort, in-flight amenities, the attitude of the ground and flight crew, financial stability, on-time performance, and luggage delivery. (Kim and Lee 2011) examine the relative importance of perceived service quality and the relationship between perceived service quality, customer satisfaction, and behavioral intention, using multi-dimensional methods. The results of this study indicate that the significant dimensions of customer satisfaction are tangibles and responsiveness. Consistent with existing literature, this study uses determinant factors that are reflected in the service quality framework. In the airline sector, the quality encompasses pre-flight services, in-flight, and post-flight which have a significant positive effect on customer satisfaction and loyalty (Jiang and Zhang 2016). Thus, following similar logic, the factors used in this study, namely airline rate, seat comfort, cabin staff service, food and beverages, value for money, in-flight entertainment and ground services are derived from the Skytrax website.

In the Skytrax web, airline rating describes the overall rating by consumers of airline service and performance. The scale used to measure this rating is 1-10 where the higher the score, the better the consumers' perception of the airline. The other six factors are measured on a scale of 1-5, where 5 show a very good perception of the factor being measured. In long-haul flights, seat comfort is defined as the availability of comfortable seating facilities, including footrest, seat cushion, reclining seat, handy tray, etc. Cabin staff service is defined as excellent customer service to passengers, ensuring their comfort and safety throughout the flight, including dealing with security and emergencies which may arise and administering first aid to passengers if needed. Food and beverages encompass meals, snacks, and complimentary drinks during the flight. Value for money is defined as the consumer's perception of the overall airline service compared to the price. In-flight entertainment is the availability of entertainment to aircraft passengers during a flight. Ground services refer to service while the aircraft is on the ground or parked at a terminal gate of an airport, which generally covers handling check-in processes, baggage, and loss claims.

Furthermore, in contrast to previous studies, the novelty of this study is to raise the issue of how customers' perceptions of service from airlines using big data analysis, especially for long-haul flights from the top 10 airlines listed on Skytrax. Thus the study is expected to complement the existing literature, and as a basis for airline management in making continuous improvements related to service quality.

METHOD

This study applies a big data approach. Big Data refers to vast and voluminous data sets that may be structured or unstructured that can be processed and analyzed to reveal patterns and trends (Hazen et al. 2014). Big Data technologies and initiatives are increasing to analyze data for gaining insights that can help in making strategic decisions. Big Data is identified to have three defining characteristics, in which called 3Vs of Big Data namely: (i) volume (terabytes, petabytes of data and beyond), (ii) variety (heterogeneous formats like text, sensors, audio, video, graphs and more), (iii) velocity (continuous streams of data) (Bilal et al. 2019; Laney 2001).

In today business, different sources of data such as the social media, internet of things, and search engines have created significant opportunities for the company to conduct an analytical view in understanding the voice of the customer, their perception towards to company's service quality in which important as the basis to develop business strategy. These types of online data sources have precipitated a significant shift away from traditional data collection approaches for business operations (Jabbar, Akhtar, and Dani 2019; Kitchens et al. 2018), creating a scenario where the companies need to evaluate the usefulness of multiple data sources as part of their decision-making process (Abbasi, Sarker, and Chiang 2016). In this study, four steps are taken to execute the big data approach as shown in the following figure.

First is the identification of data and information. In this study, data from the Skytrax website was utilized, emphasizing the review particularly of airline rate, seat comfort, cabin staff service, food and beverages, value for money, in-flight entertainment, ground service aspects, and recommendation. Secondly, the data were collected from 2012 to 2019 particularly for the top ten airlines. The data are collected by creating a computer program with the python language program. As described in the previous part, the data extracted from the Skytrax website are as follow:

Dependent Variable

1. Recommend/ not recommend, describes the overall customer's voice in providing recommendations to prospective customers to use the airline.

Independent Variable

1. Airline Rate describes the consumer's perception of overall airline service and performance. The scale used to measure this airline rate is 1-10 where the higher the score, the better the consumers' perception of the airline.
2. Seat comfort is defined as the availability of comfortable seating facilities, including footrest, seat cushion, reclining seat, handy tray, etc. It is measured on a scale of 1-5, where 5 shows a very good or better perception of the factor being measured.
3. Cabin staff service is defined as excellent customer service to passengers, ensuring their comfort and safety throughout the flight, including dealing with security and emergencies which may arise and administering first aid to passengers if needed. It is measured on a scale of 1-5, where 5 shows a very good or better perception of the factor being measured.
4. Food and beverages encompass meals, snacks, and complimentary drinks during the flight. It is measured on a scale of 1-5, where 5 shows a very good or better perception of the factor being measured.
5. Value for money is defined as the consumer's perception of the overall airline service compared to the price. It is measured on a scale of 1-5, where 5 shows a very good or better perception of the factor being measured.
6. In-flight entertainment is the availability of entertainment to aircraft passengers during a flight. It is measured on a scale of 1-5, where 5 shows a very good or better perception of the factor being measured.
7. Ground services refer to service while the aircraft is on the ground or parked at a terminal gate of an airport, which generally covers handling check-in processes, baggage, and loss claims. It is measured on a scale of 1-5, where 5 shows a very good or better perception of the factor being measured.

Thirdly is data consolidation by classifying the review data. The classification is conducted to identify customer's review with positive recommendation (recommend) versus negative

recommendation (not recommend), along with the customer's score on each of the satisfaction determinant factors. Furthermore, this study will only analyze data with a positive recommendation by using statistical analysis with binary logistic regression techniques is conducted. The binary logistic regression technique is an extension of simple linear regression. When dealing with a dichotomous dependent variable or binary in nature, the usage of simple linear regression is inappropriate. Logistic regression is defined as the statistical technique used to predict the relationship between the independent variables and the dependent variable. In this study, the dependent variable is the positive recommendation from the customer, while the independent variables are airline rate, seat comfort, cabin staff service, food and beverages, and value for money, in-flight entertainment and ground services. Fourthly is the insight and conclusion.

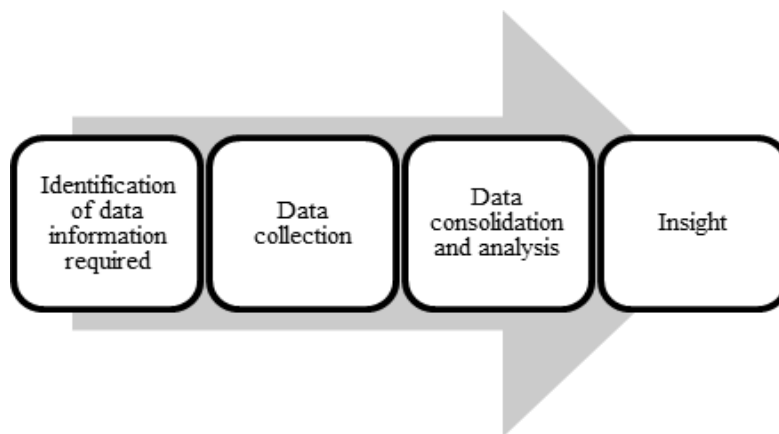


Figure 1. Research Methodology

RESULTS AND DISCUSSION

This study aims to observe the determinant factors that influence customer satisfaction and recommendations for the top 10 airlines listed on the Skytrax list, with most of the flight is classified as long-haul flight as well as domestic and international services. Passenger backgrounds that fill the review are diverse and from various countries around the world. Further, in the analysis, this study did not distinguish whether the passengers who filled the review were frequent flyers or not, as well as ignoring the customer's demographic background. Using the big data approach, this study collected data of 10.189 reviews from customers from 2012 to 2019. Based on the results of statistical analysis using binary logistic regression techniques, it is revealed that out of 7 factors, only 5 significantly influenced customer recommendations, namely airline rate, seat comfort, cabin staff service, food and beverages, and value for money. In-flight entertainment and ground services were not found to be significant. The following tables describe the statistical analysis results.

Table 1. The binary logistic regression output

Source	DF	Adj Dev	Adj Mean	Chi-Square	P-Value
Regression	7	9893.3	1413.32	9893.27	0.000
Airline Rate	1	1692.9	1692.87	1692.87	0.000
Seat Comfort	1	8.5	8.49	8.49	0.004
Cabin Staff Service	1	21.6	21.59	21.59	0.000
Food Beverages	1	5.4	5.43	5.43	0.020
Entertainment	1	0.0	0.02	0.02	0.894
Ground Service	1	3.2	3.16	3.16	0.076
Value For Money	1	152.3	152.28	152.28	0.000
Error	10206	3029.5	0.30		
Total	10213	12922.7			

Table 1 shows the output of binary logistic regression analysis. It shows that in-flight

entertainment and ground service are not significant, with the p-value of 0.894 and 0.076, while the other five factors namely airline rate, seat comfort, cabin staff service, and food beverages are significant with p-value <0.05. Thus the second analysis is conducted by eliminating the factors that are not significant, as shown in Table 2 and Table 3 below.

Table 2. The final binary logistic regression output

Source	DF	Adj Dev	Adj Mean	Chi-Square	P-Value
Regression	5	9890.1	1978.02	9890.09	0.000
Airline Rate	1	1731.0	1730.99	1730.99	0.000
Seat Comfort	1	10.7	10.65	10.65	0.001
Cabin Staff Service	1	22.8	22.83	22.83	0.000
Food Beverages	1	5,4	5.39	5.39	0.020
Value For Money	1	150.2	150.17	150.17	0.000
Error	10208	3032.6	0.30		
Total	10213	12922.7			

Table 3. Model summary

Deviance	Deviance	
R-Sq	R-Sq(adj)	AIC
76.53%	76.49%	3044.65

Regression Equation

$Y = -9.034 + 1.0430 \text{ Airline Rate} + 0.1348 \text{ Seat Comfort} + 0.1975 \text{ Cabin Staff Service} + 0.1001 \text{ Food Beverages} + 0.6774 \text{ Value for Money}$

Firstly, tables 2 and 3 show the final results of the regression analysis and it yields R-Sq value of 76.53% in which indicating the data are 76.53% close to the fitted regression line. The coefficient value on each independent factor is positive, ranging from 0.1001 to 1.0430. The coefficient from 5 significant factors tends to be small when compared to the constant value which is equal to -9.034. To guarantee that customers will provide positive recommendations to airlines, a fairly high rating is needed from customers with an average score of at least 4. Thus it can be concluded that the higher performance of 5 factors of the airline will increase the customer's recommendation to reuse and recommend the airline's services.

Secondly, as the airline industry operates in a highly competitive market, in which achieving and maintaining a high level of passenger satisfaction is seen as a key competitive advantage (Lucini et al. 2020). (Wang et al. 2011) underlined that the accuracy of operations, provision of committed services and professional training of personnel are the important factors that influence the service quality of airline companies. Specifically, this study yields that five factors are significant, which are classified as service quality factors; these findings are consistent with previous studies by (Jiang and Zhang 2016), (Kos Koklic, Kukar-Kinney, and Vegelj 2017) and (Tsantoulis and Palmer 2008), which found that factors related to service quality impact customer satisfaction and loyalty. Furthermore, although the studies were capturing different scope, in which (Jiang and Zhang 2016) investigated the service quality of four major airlines in China's domestic market, while (Tsantoulis and Palmer 2008) focused on long-flight, both studies underlined the critical factors of value for money, in-flight services, facilities, and cabin crew professionalism. Moreover, tangibles and personnel quality positively affect satisfaction, and satisfaction positively influences intentions to repurchase and recommend (Kos Koklic et al. 2017), while (Hussain, Al Nasser, and Hussain 2015) suggested that service quality, perceived value, and brand image have a positive significant impact on customer satisfaction, which can, in turn, lead to brand loyalty. This study also has consistent findings with the study from (Lucini et al. 2020) which underlined the cabin staff, onboard service and value for money as the top three dimensions of satisfaction to predict the recommendation of airlines. Designing services that excel in

those dimensions is likely to improve the company's performance with customers (Lucini et al. 2020). (Han et al. 2019) also found that quality factors of in-flight food and beverage (core, external, and delivery), price reasonableness, airline image, satisfaction, may affect re-flying intention empirically. As this study has a more specific focus on top 10 airlines with long-flight, but underlining consistent findings, thus this study has strengthened these existing literature. (Wang et al. 2011) also underlined that direct and excellent interaction based on the trust of passengers, such as actively taking care of them and providing them with the required service, simplifying the designation of seats and sale of tickets. When customers complain, they must actively and rapidly respond to passenger requests. Only when customers receive satisfaction every time, they would continue to enhance their trust and loyalty to the airline companies.

Thirdly, ground service founds to be insignificant with a p-value equal to 0.076. This finding is consistent with (Tsantoulis and Palmer 2008) that concluded speedy check-in and reliable baggage services may be considered more important dimensions of quality for short-haul flights. However, a study from (Sezgen, Mason, and Mayer 2019) underlined different findings where a text mining and categorization technique – is applied to analyses online user-generated airline reviews, it revealed that luggage/flight disruptions are becoming the main reasons for passengers' dissatisfaction. This study suspects that on long flights, passengers tend to have prepared themselves to deal with the flight preparation process from checking in, handling luggage, to boarding. This condition is likely different from short-haul passenger flights, which becoming more demanding on the speed of service before and after the flight. Further, study from (Türeli et al. 2019) underlined that the organizational factors, ground handling job factors including team characteristics and relations, and individual factors such as behaviors of the people who serve as the employees of the airport, airline or ground handling companies serving to the passengers, their baggage and cargo at the airport terminal providing customer satisfaction.

Fourthly, in-flight entertainment also founds to be insignificant. However, this finding is inconsistent with a study from (Curtis, Rhoades, and Waguespack 2012) which suggested that in-flight entertainment will be more important on long-haul flights. (Jiang and Zhang 2016) also suggested different findings with this study, which underlined three significant factors: (i) in-flight entertainment, FFP and airline response to flight delay and passenger complaints, (ii) departure and arrival experiences, in-flight comfort and cabin crew professionalism, (iii) departure airport experience. This study predicts that the demographic differences from the respondents may influence passenger perceptions of the existence of in-flight entertainment. This could be due to differences in passenger age, origin, and destination (whether for business or leisure), flight frequency. Medina et al. (2018) suggesting that air travel frequency and socio-demographic characteristics affected the perceived importance of the categories of satisfaction attributes. For instance, air travel frequency had a positive influence on the importance passengers attach to 'safety and punctuality', 'flight schedule and connections', and 'in-flight space' (Medina et al. 2018).

CONCLUSIONS AND SUGGESTION

In general, through the analysis using big data approach with binary logistic regression techniques, this study finds five significant factors underlining the airline customer's satisfaction and recommendation namely: the airline rate, seat comfort, cabin staff service, food and beverages, and value for money factors are significantly affecting the customer's recommendation on the airlines service. These five factors are consistent with various existing studies in the same scope and field of study, in which mostly highlight factor determinants related to service quality attribute.

On the other hand, this study finds that factor in-flight entertainment and ground services were not significant, where these findings are partly consistent and also conflict with existing references. Moreover, the findings of this study contribute to strengthening the literature related to customer satisfaction in the airline's sector, as well as managerial contributions to be used as a reference for airlines in improving service quality, particularly for long international flights. However, as this study unable to explain what might cause the different finding specifically related to "in-flight entertainment" in which insignificant for long-flight, studies are recommended to observe this differences and improve the quality of data and findings by classifying passenger backgrounds in more detail, based on country of origin, age, gender, type of domestic or international flight, and short-haul

or long-haul flight. This study predicts that the customer's demographic background might affect a customer's behavior towards in-flight entertainment services. Another potential study might be conducted by using text analysis with big data analysis to get deeper insight from customer's qualitative review towards airlines services.

REFERENCES

- Abbasi, A., Suprateek, S., and Roger, H.L.C. (2016). Big Data Research in Information Systems: Toward an Inclusive Research Agenda. *Journal of the Association for Information Systems*, 17(2),1–32.
- Bilal, M., Lukumon, O.O., Habeeb, O.K., Hakeem, A.O., Lukman, A.A., Anuoluwapo, O.A., Olugbenga, O.A., and Juan, M.D.D. (2019). Investigating Profitability Performance of Construction Projects Using Big Data: A Project Analytics Approach. *Journal of Building Engineering*, 26 (100850). <https://doi.org/10.1016/j.job.2019.100850>.
- Cento, A. (2009). *The Airline Industry Challenges in the 21st Century*. Heidelberg, Germany: Springer Science & Business Media.
- Chen, P.T., and Hsin-Hui, S.H. (2013). The Mediating Role of Relational Benefit between Service Quality and Customer Loyalty in Airline Industry. *Total Quality Management and Business Excellence*, 24(9–10),1084–1095.
- Clemes, M.D., Christopher, G., Tzu-Hui, K., and Michelle, C. (2008). An Empirical Analysis of Customer Satisfaction in International Air Travel. *Innovative Marketing*, 4(2), 49–62.
- Curtis, T., Dawna L. R., and Blaise P. W. (2012). Satisfaction with Airline Service Quality: Familiarity Breeds Contempt. *International Journal of Aviation Management*, 1(4), 242–256.
- Forgas, S., Miguel A. M., Javier, S., and Ramon, P. (2010). Antecedents of Airline Passenger Loyalty: Low-Cost versus Traditional Airlines. *Journal of Air Transport Management*, 16(4), 229–233.
- Han, H., Kai-Sean, L., Bee-Lia, C., Sanghyeop, L., and Wansoo, K. (2019). Role of Airline Food Quality, Price Reasonableness, Image, Satisfaction, and Attachment in Building Re-Flying Intention. *International Journal of Hospitality Management*, 80, 91–100.
- Han, H., and Kisang, R. (2009). The Roles of the Physical Environment, Price Perception, and Customer Satisfaction in Determining Customer Loyalty in the Restaurant Industry. *Journal of Hospitality & Tourism Research*, 33(4), 487–510.
- Hapsari, R., Michael D.C., and David, L.D. (2016). The Mediating Role of Perceived Value on the Relationship between Service Quality and Customer Satisfaction: Evidence from Indonesian Airline Passengers. *Procedia Economics and Finance*, 35, 388–395.
- Hazen, B.T., Christopher A. B., Jeremy D. E., and Jones-Farmer, L.A. (2014). Data Quality for Data Science, Predictive Analytics, and Big Data in Supply Chain Management: An Introduction to the Problem and Suggestions for Research and Applications. *International Journal of Production Economics*, 154, 72–80.
- Hsu, C.J., Jin-Ru, Y., Yu-Chun, C., and Hui, K.W. (2016). How Do the Services of Low Cost Carriers Affect Passengers' Behavioral Intentions to Revisit a Destination? *Journal of Air Transport Management*, 52, 111–116.
- Hussain, R., Amjad, N., and Yomna, K.H. (2015). Service Quality and Customer Satisfaction of a UAE-Based Airline: An Empirical Investigation. *Journal of Air Transport Management*, 42, 167–175.
- Ijadi, M.A., Abbas, S., and Ashkan, H. (2019). Service Quality Measurement Model Integrating an Extended SERVQUAL Model and a Hybrid Decision Support System. *European Research on Management and Business Economics*, 25(3),151–164.
- Jabbar, A., Pervaiz, A., and Samir, D. (2019). Real-Time Big Data Processing for Instantaneous Marketing Decisions: A Problematization Approach. *Industrial Marketing Management*. <https://doi.org/10.1016/j.indmarman>.
- Jiang, H., and Yahua, Z. (2016). An Investigation of Service Quality, Customer Satisfaction and

- Loyalty in China's Airline Market. *Journal of Air Transport Management*, 57, 80–88.
- Jin, N., Sangmook, L., and Lynn, H. (2012). Impact of Restaurant Experience on Brand Image and Customer Loyalty: Moderating Role of Dining Motivation. *Journal of Travel and Tourism Marketing*, 29(6), 532–551.
- Kim, Y.K., and Lee, H.R. (2011). Customer Satisfaction Using Low Cost Carriers. *Tourism Management*, 32(2), 235–243.
- Kitchens, B., David, D., Jingjing, L., and Ahmed, A. (2018). Advanced Customer Analytics: Strategic Value Through Integration of Relationship-Oriented Big Data. *Journal of Management Information Systems*, 35(2), 540–574.
- Koklic, M.K., Monika, K.K., and Spela, V. (2017). An Investigation of Customer Satisfaction with Low-Cost and Full-Service Airline Companies. *Journal of Business Research*, 80, 188–196.
- Laney, D. (2001, February). 3D Data Management: Controlling Data Volume, Velocity, and Variety. Current Business Conditions and Mediums Are Pushing Traditional Data Management Principles to Their Limits, Giving Rise to Novel, More Formalized Approaches. *Meta Delta*, 949.
- Lordan, O. (2014). Study of the Full-Service and Low-Cost Carriers Network Configuration. *Journal of Industrial Engineering and Management*, 7(5), 1112–1123.
- Lucini, F.R., Leandro M.T., Flavio, S.F., and Michel, J.A. (2020). Text Mining Approach to Explore Dimensions of Airline Customer Satisfaction Using Online Customer Reviews. *Journal of Air Transport Management*, 83, 101760.
- Medina. M., Diego, R., Rita, D., and Miguel, A.S.C. (2018). Determining Important Attributes for Assessing the Attractiveness of Airlines. *Journal of Air Transport Management*, 70, 45–56.
- Mikulić, J., and Darko, P. (2011). What Drives Passenger Loyalty to Traditional and Low-Cost Airlines? A Formative Partial Least Squares Approach. *Journal of Air Transport Management*, 17(4), 237–240.
- Parasuraman, A., Valarie A.Z., and Leonard L.B. (1985). A Conceptual Model Service Its Quality and Implications for Future Research. *Research Paper*, 49(4), 41–50.
- Park, E. (2019). The Role of Satisfaction on Customer Reuse to Airline Services: An Application of Big Data Approaches. *Journal of Retailing and Consumer Services*, 47, 370–374.
- Park, E., Yeonju, J., Jina, K., Nam, K.K., Kunwoo, B., and Angel, P.P. (2019). Determinants of Customer Satisfaction with Airline Services: An Analysis of Customer Feedback Big Data. *Journal of Retailing and Consumer Services*, 51, 186–190.
- Pena, M.M., Edenise, M.S.S., Daisy, M.R.T., and Marta, M.M. (2013). The Use of the Quality Model of Parasuraman, Zeithaml and Berry in Health Services. *Revista Da Escola de Enfermagem*, 47(5), 1227–1232.
- Sezgen, E., Keith, J.M., and Robert, M. (2019). Voice of Airline Passenger: A Text Mining Approach to Understand Customer Satisfaction. *Journal of Air Transport Management*, 77, 65–74.
- Tam, J.L.M. (2004). Customer Satisfaction, Service Quality and Perceived Value: An Integrative Model. *Journal of Marketing Management*, 20(7–8), 897–917.
- Tsantoulis, M., and Adrian, P. (2008). Quality Convergence in Airline Co-Brand Alliances. *Managing Service Quality: An International Journal*, 18(1), 34–64.
- Türeli, N.S., Vildan, D., Yağmur, S.B., and Senem, S.A. (2019). An Analysis of Importance of Innovative Behaviors of Ground Handling Human Resources in Ensuring Customer Satisfaction. *Procedia Computer Science*, 158, 1077–1087.
- Wang, R., Shu-Li., Hsu., Yuan, H.L., and Ming-Lang, T. (2011). Evaluation of Customer Perceptions on Airline Service Quality in Uncertainty. *Procedia - Social and Behavioral Sciences*, 25, 419–437.