

Unveiling Key Differentiated Service Dimensions of the Airlines Performances in the COVID-19 Aftermath: An Empirical Investigation on Operational and Service Outcomes on Market Share and Load Factor

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ABSTRACT

The study examines service dimensions provided by each operating flight to explore their impact on airline operational performance. The results suggested that after COVID-19, better quality of responding to requests, service efficiency, check-in processes, and arrival service are crucial operational factors contributing to increased market share. Regression analysis reveals a crucial link between service quality and operational outcomes. Moreover, networks or number of operating countries have positive impacts on load factor. The study reveals the interconnected nature of service quality and operational outcomes, shedding light on how factors such as passenger interactions, efficient airport services, and in-flight service execution collectively impact both market share and load factors in the post-COVID-19 context. This study provides valuable insights into the intricacies of missing gaps in the service of the industry that have a pivotal role in customer experience and shaping operational achievements.

KEYWORDS

Airlines, COVID-19, Marketing-Operations Interface, Service Operations, Service Quality

INTRODUCTION

In the aftermath of the COVID-19 pandemic, the aviation industry has undergone unprecedented challenges, prompting a re-evaluation of service dimensions crucial to airline performances. This study aims to unveil the key differentiated service dimensions that have emerged as pivotal factors in shaping passenger experiences during and after the pandemic. As travelers' expectations and preferences continue to evolve, understanding the distinctive aspects of airline services becomes imperative for industry stakeholders seeking to adapt and thrive in the post-COVID era. Prior to COVID-19, when making purchasing decisions, passengers evaluated the quality of airline products

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or services through personal experiences, physical attributes, and awards or certificates, seeing them as indicators of designed quality from the airlines. The pandemic has induced a significant shift in airline perception, fundamentally altering how passengers and industry stakeholders perceive and prioritize various aspects of air travel such as space for hygiene and comfort and flexibility in travelling plans. Airlines that have demonstrated agility in adapting to these changing expectations and that have effectively communicated their commitment to passenger safety have gained a competitive edge in the post-COVID landscape.

Encompassing service quality dimensions such as reliability, responsiveness, assurance, empathy, and tangibles plays a pivotal role in influencing passengers' choices when selecting an airline (Chou et al., 2011; Kavus et al., 2022; Pakdil & Aydin, 2007). In the competitive aviation industry, passengers evaluate airlines based on their perceived service quality to make informed decisions. Reliability, ensuring consistent and dependable services, is crucial for flight punctuality and baggage handling. Responsiveness involves the airline's ability to address passengers' needs promptly and effectively. Assurance relates to the competence, courtesy, and credibility of airline staff, instilling confidence in travelers. Empathy involves understanding and caring for passengers, creating a positive emotional connection. Tangibles encompass the physical elements of service, from aircraft condition to cabin comfort. Airlines that excel in these dimensions are more likely to attract and retain customers, as passengers increasingly prioritize service quality and overall experience in their decision-making process, recognizing the value of a comprehensive and satisfying travel encounter. One approach to enhancing quality perception is through awards, which serve to assure passengers of performance and capture customer attention. Award-winning services create positive perceptions even without direct customer experience. In wine tourism, for instance, the aesthetic appeal of a cellar gate and numerical rankings or awards reinforce wine quality (Lockshin & Spawton, 2001), bridging the gap between tangible appearances and intangible value. Similarly, Zagat ratings drive restaurant choices based on the belief that top-ranked establishments offer superior food and services. Higher rankings generally indicate better overall quality, yet variations in specific service aspects exist. A 5-star restaurant signifies excellent food taste and premium decor, while a 4-star one may excel in food with moderate decor or vice versa. Awards and certificates emphasize certain facets of product or service performance, potentially overlooking other dimensions. Nevertheless, some characteristics have a greater impact on the overall perception of a product, particularly in service sectors that handle several subtle distinctions.

Following the COVID-19 pandemic, the delivery of business class services has been restructured to promote safety and well-being. Airlines have enforced rigorous health regulations – such as intensified sanitation processes – minimized points of contact, and enforced strict compliance with social distancing measures in order to guarantee a secure and pleasant atmosphere for business class travelers. Several carriers have used altered seating configurations to provide enough spacing, in addition to enhancing ventilation systems to enhance air quality. Furthermore, the inclusion of customized amenities such as hygiene kits, contactless services, and pre-packaged meals has become essential in the business class experience. These modifications demonstrate a deliberate endeavor by airlines to synchronize high-quality services with the current health-conscious travel environment, with the goal of reinstating customer trust and providing a smooth and safe experience for business travelers. Comprehending these crucial characteristics helps service providers concentrate their efforts on the most influential factors, assuring improved compatibility with consumer expectations.

In the context of the challenges posed by the COVID-19 pandemic, this study aims to evaluate the correlation between service dimensions and airline operational performance. As the airline industry undergoes substantial shifts and adaptations, understanding the relevance of accolades in capturing service quality amid evolving circumstances becomes paramount. Furthermore, the research endeavors to discern the pivotal attributes influencing overall airline rankings during this unprecedented period and recognizing that the significance of certain service dimensions may have changed due to the pandemic's impact on travel experience and regulations. By analyzing these relationships,

the study seeks to provide insights into the interplay between awards, service quality, and dynamic factors shaping airline rankings in the COVID-19 era. The airline industry offers both tangible (e.g., seating comfort, meals, magazines) and intangible services, including flight attendant efficiency, responsiveness, and staff attitude. In this highly competitive sector, passengers have numerous choices, and airlines often engage in assessment programs to secure awards from third-party reviewers like Skytrax. These awards, categorized by star ratings, symbolize top-notch passenger experiences.

In 2022, several airlines achieved 5-star distinctions, while others received 3-star ratings. Airlines actively promote these accolades through various channels. Skytrax's annual ranking report not only assigns overall stars but also provides detailed service scores, segmented by first, business, and economy class, covering over 100 distinct service aspects annually for each airline. However, disparities exist between overall star ratings and specific item scores, with some items diverging in scoring from the overall ranking. The prevailing trend in airline seat design focuses on enhancing passenger comfort, flexibility, and technology integration. Airlines are introducing seats with adjustable features, such as customizable recline angles and adjustable headrests, to cater to individual preferences. Spacious seating arrangements, advanced entertainment systems, and sustainability are key features. The post-COVID airline seat design landscape prioritizes passenger-centric innovations that emphasize comfort, technology, and sustainability. Airlines offer various ticket classes with distinct service levels, ranging from first or business class to standard economy class. Premium products not only attract high-end markets but also contribute to improved customer recognition, satisfaction, attachment, and loyalty. This study explores whether individual attributes of service dimensions from premium and lower-quality products impact overall airline performance differently, given the strategic decisions made by airlines in response to the disruptions caused by COVID-19.

LITERATURE REVIEW

According to the US Department of Transportation, conformance quality based on the accessibility of previous airline data utilization was commonly used to assess the quality of airline services. These quality measures include the quantity of on-time arrivals, refused boardings, mishandled baggage, and customer complaints (Baker, 2014; Salamoura & Voxaki, 2019; Scotti et al., 2016; Sim et al., 2006). These measures are then calculated, and airlines are ranked based on the sum of the scores (Bowen et al., 2013). Instead of prioritizing the tangible aspects of service quality, such as physical features, reliability, promptness, confidence, and understanding, the output metrics primarily consider passengers' impressions of the quality of the services they have received. According to Gronroos (1984), the definition of service quality is the subjective perception of the caliber of the service. Parasuraman et al. (1991) created the metric for measuring service quality (SERVQUAL). According to price, safety, timeliness, food and beverage, seat comfort, or check-in process, the literature has studied airline services using the SERVQUAL measure using the airline industry as a sample (Kavus et al., 2022; Thongkruer & Wanarat, 2021; Setiawan et al., 2020; Shah et al., 2020; Shen & Yahya, 2021). The relationship between airline image and passenger experience has been the subject of empirical study (Hassan & Salem, 2021; Kusumawardani & Aruan, 2019; Song et al., 2019). According to the study, customer satisfaction and loyalty result in a favorable perception of the airline and a preference for it over competitors (Agarwal & Gowda, 2021; Li & Liu, 2019; Radiah et al., 2021); however, these methods used in the survey were arbitrary. According to a study by Grönroos (1984), individual satisfaction is determined by the discrepancies between perception and expectation. However, this type of survey method is unable to capture variations in expectations because different people may have different comparative standards and expect various results. Consequently, this research reveals that studies using data with similar criteria for ranking are limited. However, this research provides a comparison of service outcomes that has been endorsed by a direct customer-based perception web data passenger review.

Endorsed by a substantial customer base and assessed through objective metrics, another dimension of evaluating service quality in airline offerings is how airlines diversify their product range. Research literature underscores that the equity between premium products, word-of-mouth and advertising, customer loyalty and drives referrals (Boubker & Naoui, 2022; Fatmawati & Fauzan, 2021; Hudson et al., 2015; Kim et al., 2016; Malarvizhi et al., 2022). This exposure to varied products and services stimulates broader customer engagement within the market. Previous investigations into airline service quality have not only overlooked the tangible interaction between airlines and passengers – along with the multifaceted dimensions of service delivery, which encompasses intangible aspects – but have also disregarded differentiating service quality based on airline classes such as premium and low-fare economy class. Hence, this research aims to assess the impact of each quality attribute across high-quality and low-quality services on the overall airline perception, employing an objective metric in terms of perception on airline image, satisfaction, and other operational performance measures of the airline industry.

Conceptual Framework

The notion of a favorable airline reputation may not fully include the success of a company's service performance. The airline's image is linked to both tangible and intangible characteristics of goods or services (Choi et al., 2021; Law et al., 2022; Yu et al., 2019). Improved service in specific aspects, such as check-in, transfer, seat comfort, quality of meals, cleanliness, staff attitude, and flight attendants' efficiency, can positively influence the overall image of an airline. Skytrax provides separate rankings for individual classes of airline service (economy class and business class) alongside the overall image or star award. These rankings indicate dependencies within each class, revealing that an airline might excel in one class while underperforming in another. Therefore, class ranks offer insights into the performance of each service class. The following hypotheses address the unique impact of class rank on detailed service performance. Business and economy class dimensions differ; thus, business class rank reflects the management of premium services, while economy class rank indicates the preparation of tangible services and staff training for the economy cabin. Both ranks should align with the airline's regulations.

Market share, in the context of the airline industry, reflects the proportion of the total passenger demand that an airline captures. This metric provides a direct insight into an airline's competitiveness within its market. Previous literature highlights that higher market shares are indicative of an airline's strong customer base, effective service delivery, and favorable image among travelers (Dixit & Srinivasan, 2023; Dresner et al., 2018; Gualini et al., 2023; Zou et al., 2023). A significant market share suggests that an airline has managed to secure a larger slice of the customer base, potentially by offering competitive fares, efficient operations, and superior customer experiences. Moreover, market share reflects the airline's ability to effectively manage and allocate resources, optimize routes, and maintain a reliable flight schedule, all of which are crucial components of operational efficiency (Borenstein, 2019). Load factors, on the other hand, represent the proportion of available seats that are filled with passengers on a given flight. This metric underscores an airline's capacity utilization and revenue optimization strategies. A high load factor indicates that an airline is effectively managing its seat inventory, ensuring that a substantial portion of its flights operate at or near full capacity. Load factors reflect not only demand but also the airline's pricing strategies, marketing efforts, and route planning. Academic literature suggests that high load factors correlate with sound financial performance, as they reflect efficient resource allocation and revenue maximization (Cento et al., 2018; Gillen & Morrison, 2018). Market share and load factors serve as robust indicators of an airline's operational performance. These performance metrics encompass diverse elements of an airline's strategy, efficiency, customer satisfaction, and financial viability. Their significance lies in their ability to succinctly capture a wide range of operational dynamics, making the output of service design a valuable tool for both academic analysis and industry decision-making. The second goal of

this study is to investigate how service attributes had an impact on the operational performance of airlines during and after COVID-19.

METHODOLOGY

The data has been released by Skytrax and is accessible to the general public at <http://www.airlinequality.com>. The overall dataset is derived using review information and reviews scores. Skytrax converted individual reviews into overall stars on a scale of 1 to 5 stars. 2018-2022 scores were recorded for a total of 112 international airlines flying in economy class and 98 flying in business class. Individual rank scores are also compiled on a scale of 5 stars, separated by class. All cabin types must adhere to the airline’s airport and onboard product and service requirements, which are disclosed in the specific quality items. The study was able to gather scores on 15 service items (both business and economy) that relate to staff activities (staff responding to customer requests, staff service efficiency, staff attitude, staff ability on language skills, cabin presence through flight, and staff assisting children), physical service items (seat comfort, meals, newspapers and magazines, blankets and pillows, inflight entertainment system), and airport facilities such as check-in and transit. Scores for lounge service and lounge workers are listed for business class. Financial performance data for the period 2018-2022 were extracted from airlines’ annual reports. Non-financial performance data were sourced from multiple platforms including Transtat (US Department of Transport, T100), seatguru.com, and Skytrax. The T100 database offers comprehensive monthly operational statistics such as passenger counts, seat availability, aircraft specifics, and route distances.

The literature cited in Table 1 mainly focused on traditional airline performance metrics, such as load factor, revenue passenger miles, and tonnage, instead of focusing on perception of image and

Table 1. A summary of literature review on variables used in the airline industry investigation on operational and financial performance

Studies	Sample/Data Range/(Tools)	Inputs	Outputs
Schefczyk (1993)	15 global airlines 1990 (DEA)	Available seat miles, operating costs, non-flight assets	Revenue passenger miles, revenue ton miles
Oum and Yu (1995)	23 global airlines 1986-1993 (TFP)	Labor, fuel, materials, flight equipment, and ground property and equipment (GPE)	Revenue passenger miles, revenue ton miles (including sales, commissions, and services)
Fethi et al. (2001)	17 European airlines 1991-1995 (DEA)	Available seat miles, operating costs, non-flight assets	Revenue passenger miles, revenue ton miles
Scheraga (2004)	38 global airlines 1995, 2000, 2001 (regression analysis)	Available seat miles, operating costs, non-flight assets	Revenue passenger miles, revenue ton miles
Fare et al. (2007)	13 US airlines 1979-1992 (TFP)	Labor, energy, types of aircraft, materials, load factor	Revenue passenger miles, revenue ton miles
Barbot (2008)	51 global airlines (DEA)	Labor, fleet, fuel	Available seat miles, revenue passenger miles, revenue ton miles
Jenatabadi and Ismaili (2014)	214 global airlines (SEM Model)	Labor, energy, types of aircraft, materials, load factor	Revenue passenger miles, revenue ton miles
Yu and Zhang (2019)	13 India and China- based airlines 2008-2015 (DEA)	Low cost vs. full service carrier, market concentration	Number of aircrafts, number of destinations, revenue passenger miles, revenue ton miles
Korfiatis et al. (2019)	557,208 global airline reviews (regression analysis)	Business vs. economy class, service dimensions from airline reviews	Satisfaction
Lucini et al. (2020)	419 global airlines (sentimental analysis, regression analysis)	Service dimensions from airline reviews	Satisfaction
Dresner et al. (2021)	11 US airlines 2019-2021 (regression analysis)	Market concentration, connection, number of COVID-19 cases	Market share, yield

satisfaction, which could reveal a perception towards service operational effectiveness. While load factor has long been considered a crucial indicator of operational efficiency, previous studies contend that it offers a limited perspective on passenger experience. Later studies highlight the multifaceted nature of customer satisfaction (Korfiatis et al., 2019; Lucini et al., 2020), emphasizing the need for a more comprehensive approach that considers factors beyond seat occupancy. These studies argue that aspects such as in-flight amenities, service quality, on-time performance, and overall passenger experience contribute significantly to customer satisfaction. The literature underscores the importance of adopting a holistic measurement framework that captures the nuanced elements influencing travelers' perceptions and preferences, thereby providing a more accurate reflection of an airline's performance in meeting passenger expectations.

Examining the many aspects of airline service is essential for gaining a full knowledge of how service operations affect airline performance. Service dimensions consist of several aspects, such as reliability, responsiveness, assurance, empathy, and tangibles, which together influence the overall passenger experience. By exploring these characteristics, airlines may assess the efficiency of their service operations in satisfying customer expectations and improving overall satisfaction. For example, while evaluating reliability, aspects such as punctuality and luggage handling are considered, which directly impact how customers perceive the service. Responsiveness refers to the extent to which airlines effectively and promptly answer the wants and concerns of passengers in real-time. The level of assurance is a direct reflection of the staff's expertise and politeness, which in turn fosters a feeling of safety and confidence. By taking into account these dimensions, airlines may pinpoint particular areas for improvement, customize service plans, and eventually enhance their overall performance by aligning operational practices with consumer preferences and industry standards. This research examined many dimensions of airline-related service quality dimensions to explore different components of airline decision-making and their impact on operational and financial performance.

RESULTS

The dataset includes global airline performance for both domestic and foreign airlines operating in the US or its territories. Skytrax provided quality rankings such as recommendations and value for money for each airline, classed by first, business, and economy, and assigned numerical ratings. Reputable airline service benchmarking authority Skytrax uses expert auditors to assess the quality of service in airport terminals as well as on board (Source: Skytrax website, <http://www.skytraxresearch.com>). Furthermore, Seatguru offered comprehensive details on the aircraft, including seat arrangements, dimensions (width, length, and legroom), and the quantity of seats available in different classes (first, business, premium, and economy) (Source: Seatguru website, <http://www.seatguru.com>). The dataset focuses on a sample of domestic U.S. airlines and spans the years 2018–2022. This information was obtained from Transtats (Form 41 Financial Data), a database maintained by the U.S. Department of Transportation's (DOT) Bureau of Transportation Statistics (BTS). Semi-annual profit and loss statements for low-cost and full-service carriers with yearly operating sales above \$20 million are included in Transtats Schedule P-1.2. Important financial information such as market share and load factor are included in this dataset. Table 1 summarizes the determinants of airline performance found in earlier research. The list of airlines utilized in the dataset is shown in Table 2 and presents statistical data comparing the economy class and first/business class in terms of the number of different layout designs, the average percentage of recommendations, the average scores for value of money (out of 5), and the average percentage of recommendations to others. On average, there are approximately 77.43 different layout designs for both classes. In the economy class, the average percentage of recommendations is 0.5317, the average value of money score is 3.1327, and the average percentage of recommendations to others is 0.6265. Standard deviation values reveal some variability in these metrics, with a minimum of 1 layout design, 0.1649 for the economy class recommendation percentage, 0.6610 for the economy class value of money score, and 0.1322 for the

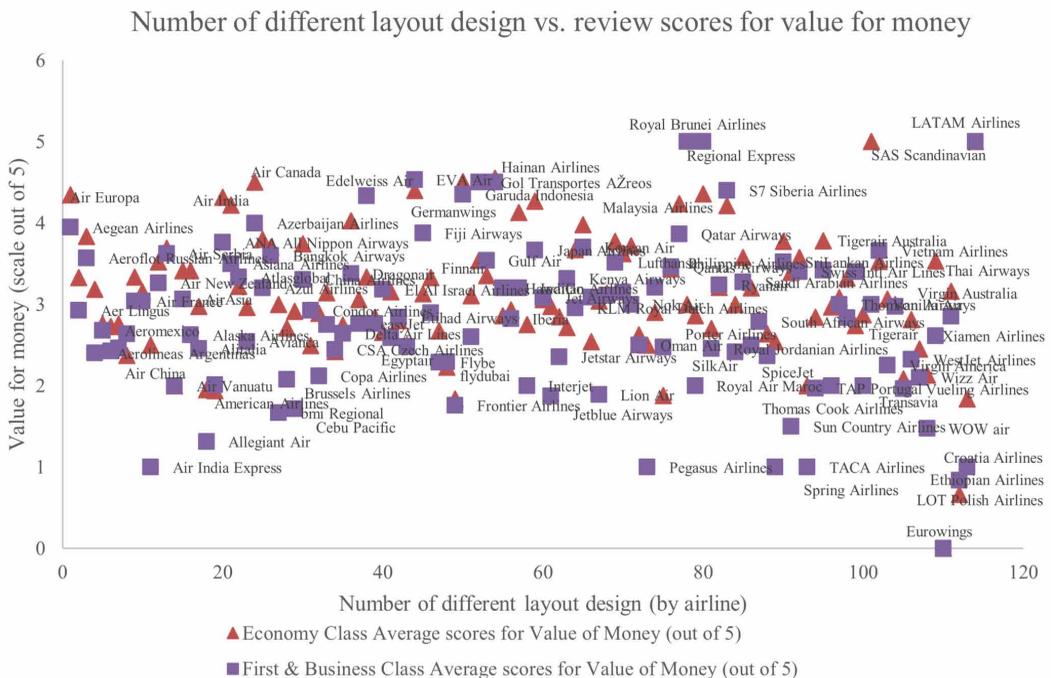
economy class recommendation percentage. The maximum values are 482 for the number of layout designs, 1 for both classes in the recommendation percentage, 5 for the value of money score, and 1 for the recommendation percentage in both classes.

Figure 1 represents a scatter plot including the number of different layout designs, average percentages for average scores for the value of money (out of 5), and corresponding average percentages for the value of money from 112 airlines in the dataset. The table encompasses a diverse range of airlines, each characterized by distinct layout designs and corresponding customer satisfaction metrics, providing a comprehensive overview of their performance in terms of value for money and likelihood of recommendation. The figure statistical information on the number of different layout designs, average percentages for the value of money in the economy class, and average percentages for the value of money in the first and business classes across various airlines used in this dataset. On average, airlines have approximately 80.59 different layout designs, with an average percentage

Table 2. Comparative analysis of economy and first/business class airline services: Layout designs, recommendation metrics, and value of money scores

	Economy Class		First and Business Class	
	Number of Different Layout Design	Average % for Recommended to Others	Average Scores for Value of Money (Out of 5)	Average % for Recommended to Others
Average	77.43354537	0.531673	3.132671	0.626534
Std. dev.	95.11905582	0.209809	0.728465	0.145693
Min	1	0.164948	0.660973	0.132195
Max	482	1	5	1

Figure 1. Relationship between number of different layout design on perception in value for money between premium vs. economy classes from 2018-2022 dataset

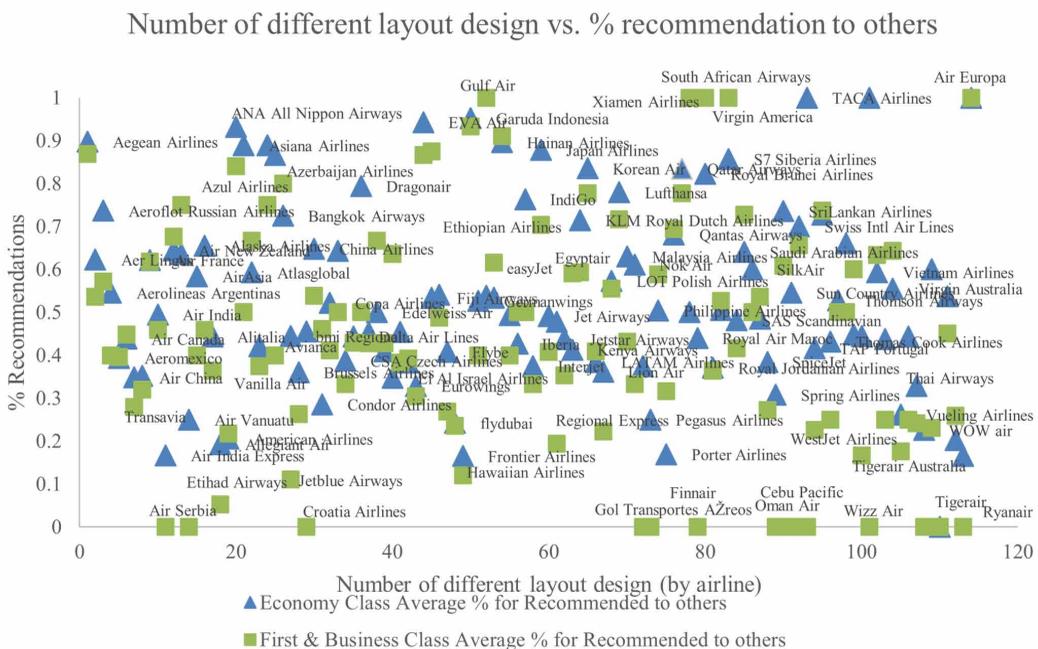


for the value of money in the economy class at 0.5438 and in the first and business class at 3.1217. The standard deviation values indicate a considerable variability in the number of layout designs and the value of money percentages. The minimum number of layout designs is 1, while the minimum percentage for the value of money in the economy class is 0.1649, and the minimum for the first and business class is 0.6579. In contrast, the maximum values are 482 for the number of layout designs, 1 for the economy class value of money percentage, and 5 for the first and business class value of money.

Figure 2 provides a scatter plot on the number of layout designs and the average scores for the value of money (out of 5) for various airlines in the first and business class category. Aegean Airlines leads with an 86.8% recommendation rate and a 3.95 value of money score. Garuda Indonesia follows closely with a 93.3% recommendation rate and a 4.35 value of money score. Other notable performers include EVA Air, Hainan Airlines, and Qatar Airways, each achieving high scores in both recommendation and value of money. Conversely, airlines like Allegiant Air, Frontier Airlines, and Vanilla Air receive lower recommendation rates and value of money scores. The data highlights significant variations in passenger satisfaction and perceived value across different airlines in the first and business class segment.

This study is focusing on utilization of regression analysis to examine the impact of various service items on the overall image perception of airlines. Employing the methodology of multiple regression, the results prior to COVID and after COVID during periods of operations for both economy and business classes are summarized in Table 3 and Table 4. The primary objective is to comprehend the manner in which distinct service dimensions contribute to the comprehensive perception of airlines among passengers. The factors mentioned in the summary include several aspects that jointly influence an airline's overall reputation and effectiveness. Proficiency in language and attentive customer care contribute to customers' comfort and happiness, promoting a favorable impression of the airline. Services that cater to the needs of families, particularly in terms of supporting children, contribute to the establishment of a hospitable and inviting reputation. Factors such as the presence of the

Figure 2. Relationship between number of different layout design on recommendation to others between premium vs. economy classes from 2018-2022 dataset



cabin, the efficiency of the service, the comfort of the seats, and the quality of the in-flight meals have a vital role in shaping the whole flying experience and impacting passengers' assessment of the airline's service quality. The image of an airline is indirectly influenced by its financial stability, worldwide presence, operational history, and staffing levels, which are reflected by its assets, the number of countries it operates in, the number of years it has been in business, and the number of workers it has, respectively.

Ultimately, these characteristics together lead to the creation of a favorable overall impression, which is essential for an airline's competitiveness. Market share and load factor are crucial industry metrics that provide measurable indicators of an airline's success and efficiency within the competitive aviation sector. The investigation clarifies the degree to which these service issues impact passengers' assessments of airlines' reputations, providing insights into the potential differences that may have arisen during the worldwide epidemic. This study attempts to provide a detailed understanding of the factors that influence consumers' impressions of airlines' overall images in different situations using a thorough statistical method. This regression table presents the results of dual analyses done before and after the start of the COVID-19 epidemic. The studies concentrate on evaluating the impact of several service parameters on the overall image of airlines in both economy and premium classes. The values included in parentheses next to the coefficients are the standard errors, which show the accuracy of the estimates. The table displays the results of an Ordinary Least Squares (OLS) regression analysis. This analytical method investigates how different service aspects affect both the overall and individual perceptions of airline images in various contextual settings. This analytical undertaking is conducted individually for discrete travel classes, namely economy and business classes, and for different time periods, namely pre- and post-COVID-19. The variables are described in detail in Table 3.

Table 3 presents a descriptive summary of various variables related to airline performance, with each variable measured across a sample size of 80,132. The provided data presents the mean, standard deviation, and sample size (80,132) for various service quality dimensions assessed on a scale of 5.

Table 3. Descriptive summary of variables

Variables	Mean	Standard Dev.	N
Language Skills (scale of 5)	2.167	0.471	80132
Responding Request (scale of 5)	3.167	0.425	80132
Cabin Presence (scale of 5)	2.792	0.519	80132
Service Efficiency (scale of 5)	3.208	0.38	80132
Seat Comfort (scale of 5)	3.208	0.32	80132
Meals (scale of 5)	2.792	0.644	80132
Inflight Entertainment (scale of 5)	2.667	1.328	80132
Cabin Safety Standard (scale of 5)	2.875	0.361	80132
Check-In (scale of 5)	3.125	0.298	80132
Transfer (scale of 5)	2.635	0.587	80132
Arrival (scale of 5)	2.604	0.673	80132
Total assets (\$ mil.)	6.769	0.917	80132
Number of Operated Countries (per 10)	3.153	2.636	80132
Number of Employees (per 10,000)	1.549	1.806	80132
Years of Operations (per 10)	6.262	2.539	80132
Load Factor (%)	0.827	0.033	80132
Market Share (%)	0.127	0.058	80132

The descriptive summary includes passengers' relatively lower perceptions of language skills (2.167) and cabin presence (2.792), suggesting potential areas for improvement. On the other hand, responding to requests (3.167), service efficiency (3.208), and seat comfort (3.208) received higher mean scores, indicating positive passenger perceptions in these dimensions. Meals (2.792), inflight entertainment (2.667), cabin safety standards (2.875), check-in processes (3.125), and transfer experiences (2.635) fall within the mid-range, showcasing a mixed but generally satisfactory assessment. The lowest mean score is attributed to the arrival experience (2.604), suggesting room for enhancement in this aspect of service quality. The standard deviations provide insights into the variability of responses across these dimensions, emphasizing the need for nuanced improvements tailored to diverse passenger preferences and expectations. The provided data offers a summary of key financial and operational metrics for airlines, with mean values, standard deviations, and a sample size of 80,132. Total assets, representing financial strength, have a mean value of \$6.769 million with a low standard deviation of 0.917. The number of operated countries per 10 years (3.153) reflects the global reach of airlines, showing considerable variability with a standard deviation of 2.636. Employee count per 10,000 persons (1.549) signifies workforce scale, with a moderate standard deviation of 1.806. Years of operations per decade (6.262) indicate industry experience, displaying variability with a standard deviation of 2.539. Load factor, a key operational metric, has a mean of 0.827 with a low standard deviation of 0.033. Market share, representing competitive positioning, has a mean of 0.127 with a standard deviation of 0.058. These metrics provide a comprehensive overview of financial, operational, and competitive dimensions, enabling a nuanced understanding of the industry's diverse landscape.

In Table 4, regression analysis was used to examine the influence of service dimensions on the perception of airline image. In order to differentiate services between economy and business class, specific service dimensions on customers' evaluations of airlines' images and operational performance. In the pre-COVID-19 context, the coefficient for Language Skills stands at 0.036 in the context of economy class, suggesting that improvements in language-related services yield an increase of 0.036 in overall image perception. Similarly, a coefficient of 0.215 associated with business class indicates that enhancements in language proficiency yield a stronger positive effect in this elevated class. Within this scenario, Language Skills demonstrate coefficients of 0.114 for economy class and 0.012 for business class, signifying a favorable impact on overall image perception, albeit without establishing statistical significance. In the post-COVID-19 scenario, a coefficient of 0.131 within the domain of economy class, coupled with a notably significant coefficient of 0.347 within the business class, underscores the positive impact of responsiveness to passenger requests on image perception. Furthermore, the service attribute Assisting Children displays a coefficient of 0.120 for economy class, indicating that services catering to the needs of younger passengers positively influence the overall image perception. However, in the context of business class, the coefficient takes on a contrasting value of -0.057, thereby suggesting a divergent effect within this specific context.

In the next regression model, significant variables from Table 6 were selected to test for the impact of these service dimensions on operational performance factors. The operational performance variables included in the model are assets, number of operating countries, years of operations, and number of employees. The total value of a company's assets, the number of countries in which it operates, the duration of its operations, and the total number of personnel are all important factors that determine the success of an airline. An airline's operating capabilities, fleet quality, and overall competitiveness are strongly influenced by the size and makeup of its assets. The carrier's worldwide reach and market presence, as shown by the number of operational nations, contribute to revenue diversification and resilience in different economic situations. The number of years an airline has been in business reflects its level of industry expertise and operational maturity, which in turn affects its capacity to effectively handle obstacles and maintain long-term success. Moreover, the quantity of staff plays a crucial role in assessing operational efficiency, customer service excellence, and overall organizational performance. These elements together provide a complex framework that influences an airline's strategic position, ability to withstand challenges, and potential for long-term development

Table 4. Regression analysis of the impact of service dimension on airline image

	(1a)	(1b)	(2a)	(2b)
	Pre-COVID-19		Post-COVID-19	
	Overall Image (Economy)	Overall Image (Business)	Overall Image (Economy)	Overall Image (Business)
Language	0.036	0.215	-0.016	-0.166
Skills	(0.0845)	(0.105)	(0.0705)	(0.0741)
Responding	0.114	0.012	0.131	0.347**
Request	(0.0918)	(0.119)	(0.0802)	(0.0739)
Assisting	0.108	0.129	0.120	-0.057
Children	(0.0757)	(0.102)	(0.0701)	(0.0790)
Cabin	0.242*	0.028	0.058	0.051
Presence	(0.0944)	(0.128)	(0.0715)	(0.120)
Service	-0.179**	0.241	0.007	0.128
Efficiency	(0.0653)	(0.110)	(0.0518)	(0.0886)
Seat Comfort	-0.035	-0.085	0.154	0.127
	(0.114)	(0.123)	(0.113)	(0.0919)
Meals	0.045	-0.025	0.160	0.099
	(0.0881)	(0.132)	(0.0763)	(0.121)
Inflight	0.067	0.106	0.053	0.092
Entertainment	(0.0403)	(0.0662)	(0.0413)	(0.0530)
Cabin Safety	-0.142*	-0.032	0.050	0.209
Standards	(0.0704)	(0.123)	(0.0547)	(0.106)
Check In	0.306**	-0.021	0.284*	-0.088
	(0.0895)	(0.0923)	(0.0784)	(0.0726)
Transfer	0.029	0.020	0.079	0.108
	(0.0746)	(0.0714)	(0.0588)	(0.0548)
Arrival	0.035	-0.137	-0.147*	-0.120
	(0.0656)	(0.0673)	(0.0540)	(0.0401)
<i>N</i>	80132	80132	80132	80132
<i>R</i> ²	0.794	0.666	0.748	0.738
adj. <i>R</i> ²	0.758	0.592	0.705	0.680
<i>F</i>	20.23	11.19	19.79	23.40

Note. Standardized beta coefficients; Standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.

and success in the ever-changing and competitive aviation sector. The second regression model includes the service dimensions and operational variables to analyze their influence on market share and load factor. The results are shown in Table 5.

In Table 5, a comparative analysis is conducted before and after the COVID-19 pandemic (Model 3a and 3b), examining the influence of various factors on both market share and load factor within the airline industry. In the pre-COVID-19 scenario, several significant determinants are identified. Notably, a decline in the quality of Responding to Request (coefficient = -0.535) is strongly associated

Table 5. Regression model of the impact of service dimensions on airline operational performances of the airlines

	(3a)	(3b)	(4a)	(4b)
	Pre-COVID-19		Post-COVID-19	
	Market Share	Load Factor	Market Share	Load Factor
Responding to Request	-0.535*** (0.0320)	0.0132** (0.00648)	0.00116 (0.0257)	0.0820*** (0.00484)
Check-In	0.523*** (0.0340)	-0.0202*** (0.00654)	0.374*** (0.0242)	-0.0936*** (0.00451)
Arrival	-0.408*** (0.0324)	0.00447 (0.00761)	0.181*** (0.0288)	0.0713*** (0.00698)
Ln (Assets)	0.212*** (0.0286)	0.0107 (0.00651)	-0.717*** (0.0262)	-0.0216*** (0.00571)
Ln (Number of Operated Countries)	0.0205*** (0.00448)	0.515*** (0.00615)	0.0662*** (0.00495)	0.520*** (0.00605)
Years of Operations	0.0361*** (0.00461)	-0.520*** (0.00616)	-0.0114** (0.00508)	-0.525*** (0.00605)
Ln (Number of Employees)	0.00263*** (0.000989)	0.000837*** (0.000188)	0.00189* (0.00108)	0.0000952 (0.000180)
<i>N</i>	80132	80132	80132	80132
<i>R</i> ²	0.307	0.880	0.102	0.877
adj. <i>R</i> ²	0.307	0.880	0.102	0.877
F	969.6	1414.4	1232.8	2648.6

Note. Standardized beta coefficients; Standard errors in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001.

with a decrease in market share, whereas a more efficient Check-In process (coefficient = 0.523), a positive Arrival experience (coefficient = -0.408), a larger Number of Operating Countries (coefficient = 0.0205), and extended Operational Years (coefficient = 0.0361) contribute positively to market share. The model collectively explains 30.7% of the variance in market share ($R^2 = 0.307$) with a significant fit ($F = 969.6$). Similarly, for load factor, the pre-COVID-19 analysis indicates that attributes to Responding to Request (coefficient = 0.0132), Check-In process (coefficient = -0.0202), and Arrival experience (coefficient = 0.00447) significantly influence load factor. Moreover, the Number of Employees (coefficient = 0.000837) positively affects load factor. The model provides an explanation for 88% of the variability in load factor ($R^2 = 0.880$), reflecting a highly significant fit ($F = 1414.4$).

In the post-COVID-19 context (Model 4a and 4b), the analysis demonstrates shifts in the impact of determinants on market share and load factor. Notably, the significance of Responding to Request on market share diminishes (coefficient = 0.00116), while Check-In process (coefficient = 0.374) and a positive Arrival experience (coefficient = 0.181) remain important. Interestingly, a higher Number of Operating Countries (coefficient = 0.0662) and lounges (coefficient = 0.520) now exerts a positive influence on market share. Conversely, the number of seats (coefficient = -0.0114) slightly negatively affects market share. The model explains 10.2% of the variance in market share ($R^2 = 0.102$) with a significant fit ($F = 1232.8$). For load factor, the post-COVID-19 analysis reveals a stronger positive impact of Responding to Request (coefficient = 0.0820) and a more pronounced negative influence of the Check-In process (coefficient = -0.0936). The model clarifies 87.7% of

the variability in load factor ($R^2 = 0.877$) with a highly significant fit ($F = 2648.6$). These findings highlight the changing dynamics of influential factors on market share and load factor in the airline industry as a result of the pandemic.

The regression results confirmed that there is a relationship between operational outcome and service quality. In order to examine their effects on airline operational performance, the research includes control factors (amount of business assets, number of operated countries, years of operations, and number of personnel) alongside significant variables (responding to request, check-in, and arrival) that were previously established. Because market share and load factors are essential for illustrating the competitiveness and efficiency of an industry, they are closely examined as reliable indicators of operational success. These indicators are critical to both industry practices and investigative procedures because they capture essential aspects of consumer appeal and operational efficiency. Overall, the data support the notion that enhanced airline market share may be attained by improved request response times, more effective check-in procedures, pleasant arrival experiences, and expanded service offerings. Furthermore, beneficial effects are derived from elements such as the number of operational countries and the number of personnel covered. Similarly, in terms of load factor, significant relationships are shown between critical service elements and passengers' evaluations of airlines' operational effectiveness. In summary, this study shows how customers' perceptions of airline images, both during and after the pandemic, relate to service dimensions across a range of travel classes and the integration of operational performance evaluation with service quality assessment, underscoring the necessity of enhancing airline service quality for long-term viability and adaptability in the wake of the COVID-19 pandemic.

CONCLUSION

This research investigates the influence of an airline's service operational performance on its overall corporate image, utilizing a sample of airlines. This study examines how an airline's service dimensions effectively impact overall performance, utilizing a selection of airlines as a sample. The research delves into various aspects of interactions between airlines and passengers, encompassing elements such as the behavior and competence of flight attendants, the quality of physical amenities offered during flights, and the efficiency of airport services. By investigating these dimensions, the study aims to uncover the extent to which positive service delivery impacts the airline's overall reputation and image among customers and stakeholders. This analysis provides insights into the crucial role that effective service operations play in shaping an airline's perception in the eyes of its target audience. Airlines engage with passengers across multiple dimensions, including interactions with flight attendants (attitudes, language skills, appearances), physical offerings (seating, meals, in-flight entertainment), and airport services (check-in, transfer, arrival service counters). Airlines design seats in business and economy class with distinct considerations to cater to the varying needs of passengers in each category. Business class seats are often designed to offer enhanced comfort and privacy, featuring larger seat sizes, increased legroom, and the possibility of lie-flat or fully reclining positions. In contrast, economy class seats prioritize efficient space utilization to accommodate a larger number of passengers. While still aiming for comfort, these seats typically have more compact dimensions, with a focus on optimizing the available space. While both classes seek to provide comfort, the differentiation in seat design reflects the varying preferences and expectations of passengers in business and economy class. Airlines engage with passengers across a diverse range of dimensions, encompassing interactions with flight attendants, physical offerings, and airport services. This comprehensive approach acknowledges that passenger experiences are shaped by various factors, necessitating attention to elements such as flight attendants' attitudes, language skills, and appearances to ensure positive interactions. Additionally, the quality of physical amenities such as seating, meals, and in-flight entertainment significantly contributes to overall passenger satisfaction. Equally important are efficient and seamless airport services such as check-in, transfer, and arrival

processes, along with the provision of comfortable lounges. Engaging with passengers across these multifaceted dimensions reflects airlines' commitment to delivering a holistic and superior travel experience that encompasses both in-flight and ground services.

Airlines must give priority to certain elements due to the changing demands and preferences of customers as well as the shift in travel norms and expectations. The study's findings demonstrate that, especially in the aftermath of the COVID-19 pandemic, skillful handling of customer demands, enhancements in cabin atmosphere, top-notch in-flight amenities, and seamless check-in processes play a crucial role in influencing a favorable overall image. Responding to customer queries, enhancing the cabin mood, offering high-quality in-flight amenities, and implementing speedy check-in processes all help to cultivate a positive overall image. These features improve passenger experiences by providing individualized attention, establishing comfortable surroundings, providing exceptional amenities, and optimizing procedures, fostering a feeling of satisfaction and trust among customers. This optimistic perspective not only affects immediate customer contentment but also greatly affects the overall standing and perception of the airline. In order to effectively cope with the consequences of COVID-19, airlines need to excel in all aspects of service offering, strategically enhancing the quality of their services to get a greater portion of the market.

Outstanding service elicits favorable passenger feedback, enhancing satisfaction and promoting customer loyalty. Airlines may enhance customer loyalty and increase their market share by establishing customer retention programs and providing premium services to cater to various consumer categories. Moreover, providing excellent service assists in reducing adverse publicity, safeguarding reputation, and bolstering customer trust. In the end, a dedication to improving airline services creates a beneficial cycle of customer assessments about service attributes and distinctiveness, leading to significant growth in market dominance. This entails the effective management of passenger interactions, including important elements after the COVID-19 pandemic, such as attentive staff and interactions, as well as smooth operations at airport facilities, which includes fast check-ins, convenient transfers, and inviting lounges, thus improving the overall visitor experience. This study aims to give detailed insights into the key factors that distinguish airline services in the present industry by analyzing a range of performance metrics, including language skills, responsiveness, safety standards, and market share. This investigation not only adds to scholarly discussions but also has practical significance for airlines seeking to improve customer happiness and operational resilience in the rapidly changing aviation industry. Key performance indicators that are crucial for both industrial operations and investigative processes include customer satisfaction and operational effectiveness. The study provides evidence to support the claim that improved service offerings, quicker response times to requests, streamlined check-in procedures, and more pleasant arrival experiences can all lead to an increase in market share. The study also found positive connections between key service components and passengers' evaluations of airlines' operational efficiency in relation to load factor.

DISCUSSION

This study presents a comprehensive comparative analysis of the determinants influencing market share and load factor in the airline industry, both before and after the onset of the COVID-19 pandemic. In the pre-COVID-19 scenario, the research identifies critical factors such as the quality of response to customer requests, efficiency in the check-in process, positive arrival experiences, and the airline's global reach, all significantly impacting market share and load factor. The model elucidates a substantial portion of the variability in market share and load factor, providing valuable insights into the operational dynamics of the industry. Transitioning to the post-COVID-19 landscape, the analysis reveals noteworthy shifts in the impact of determinants, reflecting the industry's adaptation to the new normal. While certain factors maintain their significance, such as the check-in process and positive arrival experiences, others experience changes, such as the reduced impact of responding to customer requests on market share. The study underscores the evolving nature of influential factors

in the airline industry post-pandemic, shedding light on the complex interplay between operational performance and service quality.

The consequences of the COVID-19 epidemic have shown a significant change in the airline sector, highlighting important distinct service characteristics that have become crucial drivers in creating passenger experiences. The changing environment has emphasized the crucial significance of service components such as health and safety measures, adaptable reservation choices, and smooth, touch-less procedures. Passengers now give more importance to airlines that exhibit a dedication to stringent cleanliness standards, which instill a feeling of safety and overall welfare. The capacity to overcome the difficulties of the post-pandemic period is intricately linked to elements such as the quality of services provided during flights, the availability of digital resources, and the clear and open communication on safety protocols. These distinct service dimensions go beyond conventional measures, demonstrating a significant influence on the whole passenger experience. To ensure the continued success of airlines in the changing aviation sector, it is crucial to comprehend and incorporate these essential service dimensions into airline operations. This will enable airlines to satisfy the ever-changing expectations of passengers and adapt to the new normal.

IMPLICATIONS AND RECOMMENDATIONS FOR PRACTICE

In contemplating the future trajectory of the airline industry, strategic decision-making is informed by a meticulous examination of operational dynamics. The identified correlation between service quality and operational outcomes underscores the imperative for airlines to prioritize and enhance their service dimensions. Resource allocation towards the refinement of service elements, such as responsiveness, check-in efficiency, and arrival experiences, is anticipated as a proactive response to evolving consumer expectations. The substantial correlations observed between market share, load factors, and superior service quality underscore the enduring significance of customer satisfaction in fortifying an airline's competitive position and overall operational efficiency. Against the backdrop of the enduring impacts of the COVID-19 pandemic, the established correlations between service components and passengers' perceptions accentuate the ongoing necessity for adaptability and resilience. Airlines adept at balancing operational efficiency with an unwavering commitment to delivering exceptional service are strategically positioned for success in the forthcoming decade. By leveraging the sustained importance of an exceptional customer experience, these airlines stand to achieve enduring success and position themselves as industry leaders.

The outcome of this study establishes a clear correlation between operational results and service quality, emphasizing the enduring importance of factors such as response times, check-in procedures, and overall service quality in shaping market share and load factor. The findings contribute valuable insights for industry practitioners and researchers, emphasizing the need for airlines to adapt their strategies to meet the evolving expectations and preferences of consumers, especially in the aftermath of the unprecedented disruptions caused by the COVID-19 pandemic. The presented research intricately explores the multifaceted relationship between an airline service's operational performance and its overall corporate image, emphasizing the dynamic nature of passenger experiences across various dimensions. The study delves into the behaviors of flight attendants, the quality of in-flight amenities, and the efficiency of airport services, shedding light on the interconnected elements that collectively contribute to shaping an airline's perception among customers and stakeholders. The attention to detail, considering factors such as language skills, responsiveness, and safety standards, underscores the complexity of the aviation industry's operational landscape. The distinction in seat design between business and economy class reflects a nuanced understanding of passenger preferences, acknowledging the diverse needs of travelers in different classes. In the context of the post-COVID era, the research provides timely insights into the evolving priorities for airlines. Notably, the effective management of customer requests, improvements in cabin ambiance, high-quality in-flight offerings, and streamlined check-in procedures emerge as pivotal factors in fostering a positive overall perception. The study's

findings offer a roadmap for airlines seeking to navigate the challenging landscape shaped by the pandemic, highlighting the importance of adaptability and excellence across various service domains. Moreover, the research underscores the enduring significance of safety regulations, emphasizing the need for airlines to maintain and communicate stringent safety measures to avoid adverse effects on reputation.

In the context of the COVID-19 challenge, there is a growing recognition of the pivotal role of airline service quality in augmenting load factors. As air travel demand rises and consumer confidence recovers, priorities shift towards an emphasis on enhanced experiences. Airlines attuned to this shift and actively engaged in elevating service quality are better equipped to navigate the crisis effectively. Establishing a sense of dependability and comfort by facilitating smooth and expeditious check-in procedures, offering courteous responses to customer inquiries, and ensuring a pleasant arrival experience becomes crucial. Furthermore, advancements in in-flight entertainment, seating comfort, and onboard amenities have the potential to enrich the overall travel experience, thereby fostering greater customer satisfaction and, consequently, higher passenger occupancy rates. The strategic integration of service quality and operational optimization not only addresses the immediate aftermath of the crisis but also positions airlines to navigate the evolving travel landscape by prioritizing airline service. Implementing a complete plan to achieve service excellence in all areas is crucial for creating a positive and lasting impression on passengers, which will improve the airline's strategic service and design and serve as a key competitive advantage in leading among other competitors in the market.

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