E-ISSN: 2676-6167 | P-ISSN: 2538-5100

Journal of Applied Research on Industrial Engineering

www.journal-aprie.com

J. Appl. Res. Ind. Eng. Vol. 9, No. 1 (2022) 95–107.

Paper Type: Research Paper

Developed Reverse Logistic Airline Service Quality (RL AIRQUAL) Model for Reverse Support Service Quality Gaps Analysis in Air Industry

Nazila Adabavazaeh [1], Mehrdad Nikbakht [1,*]

[1] Department of Industrial Engineering, Najafabad Branch, Islamic Azad University, Najafabad, Iran; nazilaadabavazeh@yahoo.com, nikbakht2020@yahoo.com.

Citation:

Adabavazaeh, N., & Nikbakht, M. (2022). Developed reverse logistic airline service quality (RL AIRQUAL) model for reverse support service quality gaps analysis in air industry. *Journal of applied research on industrial engineering, 9*(1), 95-107.

Received: 21/06/2021 Reviewed: 04/08/2021 Revised: 14/08/2021 Accepted: 06/09/2021

Abstract

The airline industry plays a fundamental role in the economic and social development of societies and it also has an important impact on improving foreign trade. The airline industry is one of the main infrastructures for sustainable development of the country. The quality of the reverse engineering service of the airline industry will be effective in increasing the safety and health of structures, reducing the impact of disasters and reducing costs. The airline industry needs its own defined models to measure the quality of service which has the ability to assess the quality of the services of this industry. Purpose of this research is to present a developed SERVQUAL model to assess the quality of services in the air industry. The Developed Reverse Logistic Airline Service Quality (RL AIRQUAL) model was a descriptive and cross-sectional analysis of reverse-customer support services of six organizational units of the air industry company using a 35-item questionnaire with standard 5-point Likert scale and adjusted SERVQUAL in eight dimensions of tangibility, reliability, assurance, empathy, responsiveness, safety and security, customer satisfaction and customer loyalty dimensions. Data were analyzed by paired t-test using SPSS software. Based on the determination of reverse service support quality, the responsiveness had the highest gap and safety and security had the lowest gap. The results can be used to assess the competitive position of the organization and identifying opportunities for improving the airline industry. With the help of the results of the modified model evaluation, applicable and suitable solutions can be developed to improve customer satisfaction.

Keywords: SERVQUAL, Service quality gap analysis, Reverse support, Airline industry.

1 | Introduction

The airline industry needs long-term decision-making. Because aircraft and its equipment are too expensive and the cost of capital in airline operations is a very important long-term factor. Operating revenue from air transportations has been steadily growing. The employment rate of this sector is also worth paying attention to. Competition in air transportations is increasing rapidly and the environment is too sensitive and alert to changes. These changes have resulted that assurance of a quality level, is very important to reduce accidents, increase safety, reduce costs and customer satisfaction. An essential element in quality assurance, pathology and the assessment of the existing level of quality is to develop a suitable strategy for upgrading to the desired level. In this regard, the quality gaps models have appropriate capabilities.

Corresponding Author: nikbakht2020@yahoo.com

http://dx.doi.org/10.22105/jarie.2021.291483.1344

The SERVQUAL model has been able to consolidate its footprint in studies on customer satisfaction to service providing organizations. So today, this tool is widely used to evaluate the quality of different services. Some studies on quality of air services are as follows.

Chonsalasin et al. [1] presented a model for measuring the quality of service from the airport. This model identified the expectations of passengers including 1037 samples by analyzing the confirmatory factor. The model has seven dimensions: security, arrival, route finding, airport environment, access, arrival services, and airport facilities.

Shah et al. [2] investigated the effect of airline service quality on passenger behavior. This study measured the perception of the quality of passenger services of Pakistan International Airlines using SERVQUAL. Data are analyzed using correlation analysis and hierarchical regression analysis. The systematic random sampling method was used.

Adabavazaeh and Nikbakht [3] analyzed the structural interpretive modeling of the main factors in the success of the reverse supply chain of the aviation industry. By studying the research literature, 159 factors were identified and finally, 24 main factors of success were identified by the Lawshe technique and the main factors of success of the aviation industry were categorized with the structural interpretive modeling method and by using the opinions of experts, the results show that the most influential factors related to inventory management, transportation, materials, and information integration, communications, information technology, mutual trust of supply chain partners, supply chain performance, supply chain flexibility, awareness of reverse support, knowledge management, standardization, supply chain reliability, returned good collections, return monitoring systems, supply chain component cooperations, return policies, support and commitment of the stakeholder are the interface factors that any minor change on these factors will cause fundamental changes in the system.

Woo [4] has examined the customer behavior of the aviation industry in terms of quality and value of services. This research has identified four types of customers. Customer behavior, support, feedback, and patience are examined. The results indicate that the quality of services (intangible and tangible resources of airline services) that indirectly affect customer behavior through the perceived value of internal travels is higher than that of international travels.

Stamolampros and Korfiatis [5] examine the quality of aviation services and economic factors in US airlines. This study examines the impact of interest rates, fuel prices, and market focus on airline performance. To evaluate the performance, four criteria of airline service are considered: "Timely performance, canceled flights, improper cargo handling, passenger complaints".

Gupta [6] has evaluated the quality of aircraft services using BWM and Vikor. The quality-of-service criteria derived from the research literature is ranked using the Vikor method. The criteria of tangibility, reliability, security, and safety, and ticket price have been identified as important features of service quality.

Farooq et al. [7] have examined the quality of Malaysia Airlines' services on customer satisfaction with the PLS-SEM approach. This study used the sampling method from 460 respondents in five dimensions of the Airqual scale using PLS-SEM. Findings showed that all five dimensions of Airqual: airplane tangibles, terminal tangibles, personnel services, empathy, and image have a positive and significant effect on customer satisfaction.

Yimga [8] has examined the impact of airline up-to-date performance on customer behavior. This study has estimated the customer response to flight delay at the origin-destination with a discrete estimation model. The results showed that increasing the delay hurts the probability of re-select, even if the welfare costs of the delay are significant for the customer.

Table 1 summarizes the achievements of some research records. A review of the existing literature on the quality of reverse supply chain services showed that despite numerous studies, it seems that "the field of quality of reverse supply chain services" has not been considered by researchers. Most research pays special attention to other services, which require study in this field. Since the aviation industry is one of the main infrastructures for the sustainable development of the country. To create the necessary conditions for the development and dynamism of this industry and to compensate for the lack of research in this field, identifying the main factors for the success of the reverse supply chain of the aviation industry can help the above goal. One solution is to use the RlAirqual model. The present study aims to help aviation industries to improve their strategic plan development by providing a service quality assessment model.

Table 1. Research background.

Researcher(s) (year)	Research Tools	Research Results		Research Achievements	
		Model/ Pattern Presentation	Introduction Dimensions/ Factors	Quality of Service	Supply Chain Service Quality
Chonsalasin et al. [1]	CFA		✓	✓	
Shah et al. [2]				✓	
Adabavazaeh and Nikbakht [3]	ISM		✓		✓
Woo [4]			✓	✓	
Stamolampros and Korfiatis [5]			✓	✓	
Gupta [6]	BWM & Vikor		✓	✓	
Farooq et al. [7]	PLS-SEM	✓		✓	
Yimga [8]				✓	

2 | Research Methodology

The study is implicational in objective and in terms of data collection method is descriptive and survey research. Statistical population of this research is airline industry. In this research, the views of the customers of this industry have been used. This descriptive and cross-sectional study is done on customers of an airline industry using a 35-item questionnaire with 5-point Likert scale standard and adjusted SERVQUAL model in eight dimensions and thirty-five subscales. SPSS software was used to analyze the data. The proposed RL AIRQUAL model can be used as one of the service quality measurement techniques to challenge existing support services for the reverse engineering industry. The ISM approach has been used to classify and identify the relationships between service quality dimensions. The Structural Self-Interaction matrix data was compiled by distributing the questionnaire among experts with a return rate of 90%. According to the available population volume, 20 questionnaires were distributed, of which 18 questionnaires were received with a return rate of 90% and used as a basis for statistical analysis. The initial acquisition matrix was computed using Matlab software version 2007 and expert data entry was done in Microsoft Excel 2007 software and Microsoft Excel 2007 software was used to draw the basic model that developed by ISM and the final analysis.

3 | Suggested Model: the Quality Gap Analysis Model of Airline Industry Reverse Support Services

Measuring the quality of services can play a very important role in identifying problems and planning improvements in service delivery. A tool that can measure customer expectations and perceptions can help managers identify opportunities and weaknesses. Identifying service gaps and covering them will increase customer satisfaction. One of the developed models for measuring the quality of services is the SERVQUAL model [9]. According to Carman [23], in order to apply SERVQUAL to industries, criteria must be added to the tool that can capture the concept of service quality sufficiently and adequately. At the same time, criteria must be removed from the primary tool.

Analysis of the quality gap support services dimensions list in airline industry, provided to experts by extracting the original research literature and it was finalized with the aggregation of comments. A comprehensive list of dimensions and subscale (subtests) of the quality of the reverse-provision support services provided by the airline industry is presented in *Table 1*. Given the selected dimensions, the proposed gap analysis model will be as shown in *Fig. 1*.

The proposed model can serve as a service quality measurement technique to challenge existing support services for reverse engineering of the airline industry.

The development model includes 35 items, each of them is related to one of the eight main dimensions of the model and each statement is asked in two ways: Customer perceptions of services provided (perception) and customer expectations of service (Expectation).

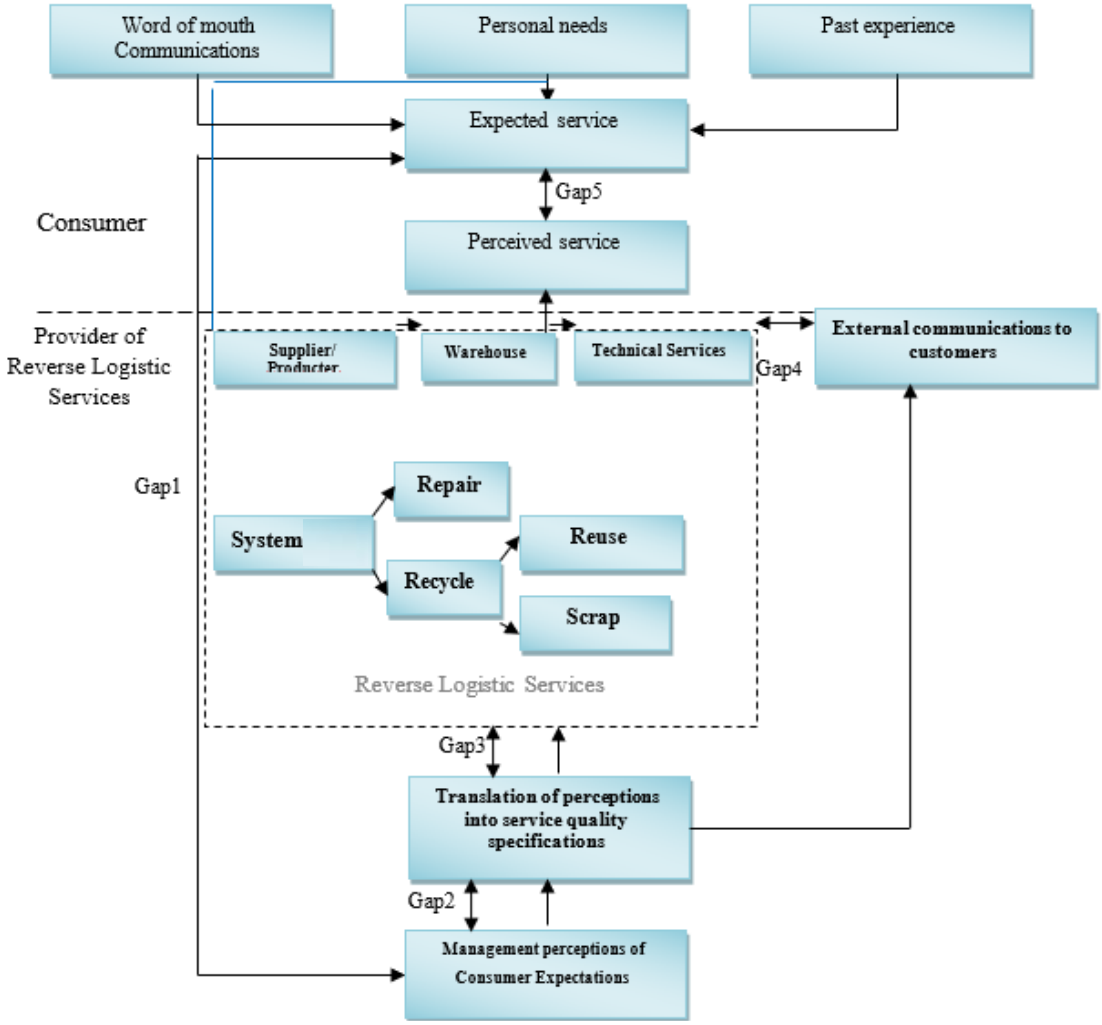

Fig. 1. Extended model of service quality gap analysis ([12]-[14]).

Pitt et al. [10] argue that the gap 1 is known as the cognition gap, the gap 2 as the design gap, the gap 3 as the service gap, the gap 4 as the communication gap and the gap 5 as the quality gap. The defect in customer perceived service quality (gap 5) is due to four deficiencies in the provision of services (gaps 1-4). Gap 5 is a service quality gap. This gap has been considered for most service organizations. Previous gaps affect on gaps 5. Successful service providers manage all these gaps. Proposed RL AIRQUAL model is a compilation of the Servqual model (Parasuraman et al. [11]) and the reverse-provisioning service model [12]. A comprehensive list of dimensions and sub-scales (sub-test) from Reverse Support Service Quality in Air Industry proposed model of RL AIRQUAL, is presented in *Table 1*.

Table 1. Analysis of the quality gap support services dimensions list for the reverse engineering in airlineindustry (RL AIRQUAL).

No.	Level I-Variabele	Level II-Indicator
1	Tangibles [11] and [15]	Availability of facilities [17]. Cleanliness, ambience [17]. Aisles, display signs [17]. Modern and up to date equipment [18] and [19]. Attractive physical features [18]. Convenient operating hours [18] and [19]. Airline company Insists on Error-free records [18]. Neat and well-dressed staffs [18] and [19]. The appearance of physical fitness according to the type of service [18].
2	Reliability [11] and [15]	Accuracy of transactions [17]. Ability of the logistics system to respond to customer needs in terms of time, reliability, communication and convenience [20]. Speed of service [17] and [19]. Ability or capacity to satisfy the requirements and expectations of customers (logistics, transportation, warehousing, inventory management, information and packaging) [18]. Flexible delivery [21]. Delivery time [18] and [19]. Product availability [21]. Maintaining the level of supplier performance [22]. The process of providing a competitive advantage and creating additional benefi ts through the supply chain in order to maximize the total value for the end customer [14]. Convenience of placing orders [21].
3	Assurance [11] and [15]	Concern for customers [17]. Staff attitude [17]. Technical knowledge (competence of staff [9]). Skill and expertise (competence of staff) [21]. Customer trust [19]. Security for transactions [17] and [19].
4	Empathy [11] and [15]	Ease of communication [17]. Understanding specific needs [18] and [19]. Attention and Patience of the staff [17].
5	Responsiveness [11] and [15]	Concern and desire for assisting [17]. Speed of response to complaints [17].
6	Safety and Security [16]	Safety principles in the technical services [16].
7	Customer Satisfaction [9]	Environmental conditions [9]. Quality of service [9].
8	Customer Loyalty [9]	I will remain loyal to this organzition [9]. I recommend this organization to the public [9]. I told the superiority of this organization to others [9].

4 | Results

The ISM approach has been used to classify and identify the relationship between the quality dimensions of the RL AIRQUAL model. The adapted acquisition matrix is presented in *Table 2*.

Table 2. Adapted acquisition matrix dimensions of RL AIRQUAL service quality model.

	D1	D2	D3	D4	D5	D6	D7	D8
D1	1	1	1	0	1	1	0	0
D2	0	1	0	0	1	1	1	1
D3	0	1	1	0	1	1	1	1
D4	0	1	1	1	1	1	1	1
D5	0	1	1	1	1	1	1	1
D6	0	0	0	0	0	1	1	1
D7	0	0	0	0	0	0	1	1
D8	0	0	0	0	0	0	0	1

With the use of data in *Table 2*, we can determine the access and prefix sets for each dimension. Cone matrix must be formed to determine the level of the main success factors. The level of the obtained factors is also shown in *Table 3*.

Table 3. Levels of RL AIRQUAL quality dimensions based on adapted primary acquisition matrix.

Quality Dimention	Reachability Set	Antecedent Set	Intersection Set	Level
D1	1,2,3,4,6,7	1	1	8
D2	2,6,7,8	1,2,3,4,5	2	4
D3	2,3,6,7,8	1,3,4,5	3	5
D4	2,3,4,6,7,8	1,4,5	4	6
D5	2,3,4,5,6,7,8	1,5	5	7
D6	6,7,8	1,2,3,4,5,6	6	3
D7	7,8	1,2,3,4,5,6,7	7	2
D8	8	2,3,4,5,6,7,8	8	1

Using leveling done in *Table 3* and the relationships in *Table 2*, a diagram is depicted as the ISM Extended Model. Basic model developed with ISM is presented in *Fig. 2*. Developed basic model make better decision-making space for managers.

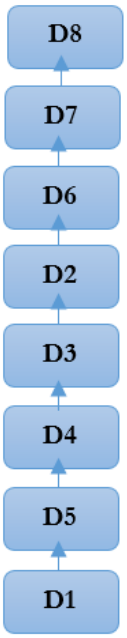

Fig. 2. ISM-based attribute model.

The results of the MICMAC analysis (*Fig. 3*) show that the service quality dimensions identified by the Airqual RL model do not have independent variables. Therefore, no factor can be separated from the system. The dimensions of "reliability and assurance" have a high impressibility and effectiveness on the system and any modest change over these factors will make any major changes to the system. "Tangles, Responsiveness and Tangibles" dimension have a high effectiveness and low impressibility on the system. Dimensions of ", customer satisfaction, safety and security and customer loyalty" have high impressibility and low effectiveness on the system.

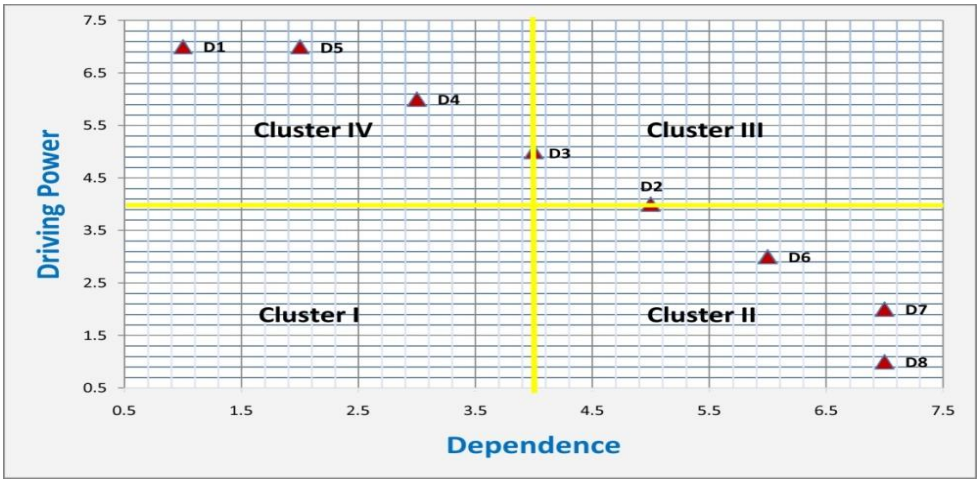

Fig. 3. MicMac analysis diagram.

This part of the research was conducted as a descriptive and cross-sectional study of customers of 6 organizational units of the aviation industry using a 35-item questionnaire with a standard 5-grade Likert scale and modified SERVQUAL in eight dimensions of tangibles, reliability, assurance, empathy, responsiveness, safety and security, monitoring customer satisfaction, and customer loyalty. Data analysis was performed by paired t-test of SPSS software. Paired t-test evaluated the trait mean differences. Organizational units were surveyed twice in two time periods. Findings of the service quality gap analysis model are shown in *Tables 4-10*. The quality gap is the result of the difference in expectations from perceptions. The questionnaire of this research section has 8 sub-tests and Items 1 to 8 is related to sub-test 1, items 9 to 18 is related to sub-test 2, items 19 to 24 is related to sub-test 3, items 25 to 27 is related to sub-test 4, items 28 and 29 is related to sub-test 5, item 30 is related to sub-test 6, items 31 and 32 is related to sub-test 7 and items 33 to 35 is related to sub-test 8. The score of each subscale is derived from the calculation of the total score of each single item in sub-scale and to calculate the total score of the variable, the score of all the items is gathered together. The higher the score shows the higher the quality of service. The findings of the service quality gap analysis model are shown in *Tables 4-10*. The quality gap is the result of differentiation of expectations from perceptions. Based on the findings, expectations from quality of reverse support service in the organization that has been studied in terms of empathy are higher than the current situation.

The results of paired t-test (trait mean differences) are listed in *Tables 4-10*. The significance level of paired t-test of all subjects is less than 0.05, so the null hypothesis is rejected and the difference between the means is significant.

Table 4. Gap quality analysis of reverse support services - unit 1.

Dimension	Expectations	Perceptions	Gap
Tangibles	4.1875±0.26517	3.125±0.17678	-1.0625±0.44194
Reliability	4.2500±0.35355	3.45±0.07071	-0.8±0.28284
Assurance	4.167±0.23570	3.415±0.12021	-0.7517±0.11549
Empathy	3.833±0.23570	3.835±0.23335	-0.0017±0.00236
Responsiveness	4.25±0.35355	3.75±0.35355	0.5±0.00-
Safety and security	4.5±0.70711	2.5±0.70711	-2.00±0.00
Customer satisfaction	4.00±0.00	3.75±0.35355	-0.25±0.35355
Customer loyalty	4.167±0.23570	3.665±0.47376	-0.5017±0.70946
Paired t-test results sig. =0.020			
Average perceptions	3.4365	Average expectations	4.3385

Table 5. Gap quality analysis of reverse support services - unit 2.

Dimension	Expectations	Perceptions	Gap
Tangibles	3.8750±0.17678	3.87±0.17678	0.00±0.35355
Reliability	4.2±0.28284	3.5±0.84853	-0.70±0.56569
Assurance	4.085±0.12021	3.83±1.18087	-0.25±1.06066
Empathy	4.165±0.23335	3.67±1.41421	-0.495±1.18087
Responsiveness	3.75±0.35355	3.75±1.06066	0.00±1.41421
Safety and security	4.00±0.00	4.50±0.70711	0.5±0.70711
Customer satisfaction	4.00±0.00	3.50±0.70711	-0.5±0.70711
Customer loyalty	4.00±0.00	3.665±0.94045	-0.335±0.94045
Paired t-test results sig. =0.000			
Average perceptions	3.7865	Average expectations	4.0188

Table 6. Gap quality analysis of reverse support services - unit 3.

Dimension	Expectations	Perceptions	Gap
Tangibles	4.1875±0.26517	3.3125±0.26517	-0.875±0.35355
Reliability	4.05±0.7071	3.55±0.35355	-0.50±0.42426
Assurance	4.50±0.00	3.585±0.12021	-0.915±0.82731
Empathy	4.00±0.00	3.165±0.23335	-0.835±0.23335
Responsiveness	4.00±0.00	3.25±1.06066	-0.75±1.06066
Safety and security	4.50±0.70711	4.00±0.00	-0.5±0.70711
Customer satisfaction	4.00±0.00	4.50±0.70711	-0.5±0.70711
Customer loyalty	3.665±0.47376	4.00±0.00	0.335±0.47376
Paired t-test results sig. =0.001			
Average perceptions	3.2849	Average expectations	4.1010

Table 7. Gap quality analysis of reverse support services - unit 4.

Dimension	Expectations	Perceptions	Gap
Tangibles	4.00±0.00	2.75±0.00	-1.25±0.00
Reliability	4.20±0.28284	3.30±0.00	-0.9±0.28284
Assurance	4.00±0.00	3.00±0.00	-1.00±0.00
Empathy	4.335±0.47376	3.50±0.240142	-0.835±0.71418
Responsiveness	4.00±0.00	1.5±0.00	-2.5±0.00
Safety and security	4.50±0.70711	4.00±0.00	-0.5±0.70711
Customer satisfaction	4.25±0.35355	2.00±0.00	-2.25±0.35355
Customer loyalty	4.165±0.23335	2.33±0.00	-1.835±0.23335
Paired t-test results sig. =0.015			
Average perceptions	2.7979	Average expectations	4.2375

Table 8. Gap quality analysis of reverse support services - unit 5.

Dimension	Expectations	Perceptions	Gap
Tangibles	4.00±0.00	2.75±0.00	-0.75±0.70711
Reliability	4.20±0.28284	3.30±0.00	-0.4±0.98995
Assurance	4.00±0.00	3.00±0.00	-0.5±0.70711
Empathy	4.335±0.47376	3.50±0.240142	-0.335±1.42128
Responsiveness	4.00±0.00	1.5±0.00	-2.00±0.70711
Safety and security	4.50±0.70711	4.00±0.00	0.5±0.70711
Customer satisfaction	4.25±0.35355	2.00±0.00	-1.75±1.06066
Customer loyalty	4.165±0.23335	2.33±0.00	-1.00±0.46669
Paired t-test results sig. =0.016			
Average perceptions	2.8812	Average expectations	3.6817

Table 9. Gap quality analysis of reverse support services-unit 6.

Dimension	Expectations	Perceptions	Gap
Tangibles	4.50±0.70711	3.375±0.88388	-1.125±0.17678
Reliability	4.55±0.21213	3.90±0.84853	-0.65±0.6364
Assurance	4.165±0.23335	3.50±0.70711	-0.665±0.47376
Empathy	4.835±0.23335	4.00±0.94752	-0.835±0.71418
Responsiveness	4.50±0.70711	2.00±0.70711	-2.50±0.00
Safety and security	4.50±0.70711	4.50±0.70711	0.00±0.00
Customer satisfaction	4.75±0.35355	2.50±0.70711	-2.25±0.35355
Customer loyalty	4.665±0.47376	3.67±1.41421	-0.995±0.94045
Paired t-test results sig. =0.000			
Average perceptions	3.4306	Average expectations	4.4959

Table 10. Analysis gap quality analysis of reverse support services –hole of organization.

Dimension	Expectations	Perceptions	Gap
Tangibles	4.0417±0.45954	3.1979±0.49846	-0.8437±0.53599
Reliability	4.1583±0.4358	3.50±0.43275	-0.6583±0.46604
Assurance	4.0417±0.4463	3.3892±0.52478	-0.6525±0.51111
Empathy	4.1672±0.4198	3.6117±0.60147	-0.5556±0.71879
Responsiveness	4.00±.0.47673	2.6250±1.15059	-1.3750±1.18944
Safety and security	4.25±0.62158	3.9167±0.79296	-0.333±0.98473
Customer satisfaction	4.125±0.48265	3.0417±1.05439	-1.0833±1.2029
Customer loyalty	4.0544±0.50911	3.3325±0.84184	-0.7219±0.86241
Paired t-test results sig. =0.004			
Average perceptions	3.1966	Average expectations	4.0979

In summary, it can be saying that customers of unit 1, find that empathy dimension, customers of unit 2, and unit 4, 5 and 6, find that safety and Security dimensions, customers of unit 3, find that loyalty are close to their expectations more than other dimensions of quality. As well as customers of organizational unit 1, find that tangibles dimension, customers of organizational unit number 2 find that reliability dimension, customers of organizational unit 3, find that assurance dimension, customers of organizational unit 4, find that customer satisfaction dimension, customers of organizational unit 5, find that responsiveness dimension, customers of organizational unit 6, find that responsiveness dimensions far from their expectations more than other dimensions of quality. The customers of the entire organization find that safety and security dimensions are close to their expectations more than other dimensions of quality while organizational unit 6 has been better at dimensions more than all. As well as customers find that responsiveness are far from their expectations more than other dimensions and organizational units 4 and 6 are weaker in this dimension than other units. *Fig. 4* shows the position of the dimensions of service quality in the organization under study. The results show that the prioritization of Airqual RL dimensions in terms of quality assessment from the respondents' point of view is as follows:

- *Safety and security dimensions (lowest quality gap).*
- *Empathy dimension.*
- *Assurance dimension.*
- *Reliability dimension.*
- *Customer loyalty dimension.*
- *Tangibles dimension.*
- *Customer satisfaction dimension.*
- *Responsiveness dimension (highest quality gap).*

Fig. 4. Gap quality analysis of reverse support services the studied airline industry companies.

Fig. 5 shows a pie chart of the frequency percentage of the RL Airqual dimension quality measurements from the respondents' point of view, in which the area of the pie is divided into 100 degrees (percent) and the quality of RL Airqual dimensions will fill a part of pie's area in terms of the frequency percentage.

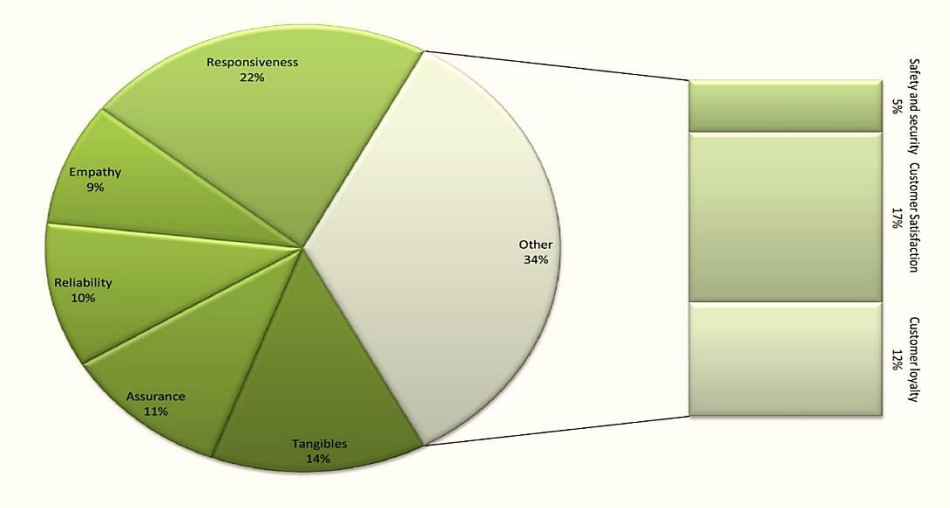

Fig. 5. Pie chart of the frequency percentage of the RL Airqual dimension quality measurements from the respondents' point of view.

5 | Conclusions

Due to the importance of the airline industry in the country's economy and industry, quality in this industry has a great impact. Quality assurance in the airline industry requires quality adequacy in the various sectors involved in manufacturing including materials, equipment, manpower, standards, production processes, management, etc. that is why the establishment of the Standard for Quality in Airline Industry, Spatial Organizations and Defense Industries 9100 EN BS and the National Standard of Iran 7770 INSO will be very effective. Although quality is defined according to the customer's perception, it is evident that compliance of standard is a requirement that is not distorted by the customer's request. Minimum quality is a desirable standard of society and has characteristics that prevent harm to society and the maximum quality to the extent that the customer pays for it and is pleasing to obtain it.

According to the findings, the highest gap is in the "responsiveness" dimension and the lowest gap is in the "safety and security" dimensions. In this research, the most opportunities are in the "responsiveness"

dimension, which is proposed to focus on scientific and executive activities. Improving relationships with investors, financial assurance, social participation, facilitating collaboration with other organizations, improving work conditions, improving work quality and deploying responsiveness mechanisms in an organization can facilitate the improvement of the gap of responsiveness dimension. Results of service quality assessment in air industry showed that proposed model has a suitable fit. Examining three dimensions of service quality, customer satisfaction, customer loyalty and safety and security in this model can also highlight the importance of planning in the future to improve air industry services quality. This model demonstrates that the air industry can well enhance organizational performance along with increasing the quality-of-service delivery and focusing on safety and security, with an emphasis on improving customer satisfaction and loyalty.

The quality gap is the result of the difference in expectations from perceptions. Quality focuses on the dimensions of services. Service quality reflects customer perceptions of service dimensions. Different services of organizational units can create different quality gaps. Suggestions for improving and standardizing the services of the organization's units are presented as follows:

- *Using behavioral integration, senior management teams can build operational capabilities and achieve effective and positive performance.*
- *Having a culture, a shared vision and flexible managers can be effective.*
- *Discipline, support, and trust are background complementary and irreplaceable features that must be provided in the organization.*

Questionnaire Gap Analysis Quality of service

Dear respondent,
Regards, this questionnaire has been designed to analyze the service quality gap for the use in the master's thesis entitled "Evaluation of organizational performance based on the main factors of success of the reverse supply chain categorized by data envelopment analysis with service quality approach." Your valuable comments and accurate answers will be of great help in achieving the goals of this dissertation. Thank you in advance for your valuable cooperation and time.

Gender: Female ☐ Male ☐
age category: Under 30 ☐ 30 to 40 ☐ 40 to 50 ☐ above 50 ☐
Education level: Undergraduate ☐ Masters ☐ Doctorate ☐
Average monthly frequency of using the organization's services:
less than 5 ☐ 5 to 20 ☐ more than 20 ☐

Respectfully express your valuable opinion.

Expressions	***Customer expectations***				
	Totally agree	**agree**	**No opinion**	**disagree**	**Totally disagree**
1-Physical facilities should be easily accessible.					
2-The physical environment must be attractive and clean.					
3-Signs are visible and appropriate.					
4-Reverse support service equipment must be up to date.					
5-The working hours of the organization must be appropriate.					

6-Reverse support service documentation must be relevant and orderly.					
7-Reverse support service professionals should have a well-groomed appearance.					
8-Physical facilities must be provided following the type of service provided.					
9-Transactions must be done carefully.					
10-The services provided should meet the customer's needs in terms of time, communication and convenience.					
11-The speed of service provided must be suitable.					
12-The services provided must be able to meet customer expectations throughout the supply chain.					
13-The flexibility of service delivery should be suited.					
14-Services must be provided on time.					
15-Ease of access to the product must be appropriate.					
16-The level of performance must be maintained by the supplier.					
17-To maximize the value of the entire supply chain, service delivery must have a competitive advantage.					
19-Customer concerns should be understood by experts.					
20-Reverse support experts need to have the right attitude.					
21-Reverse support experts must have sufficient technical knowledge.					
22-Reverse support experts must have the appropriate skills and expertise.					
23-Reverse support experts need to gain customer trust.					
24-Transactions must have adequate security.					
25-Customers need to be able to communicate easily with the organization.					
26-Customers' specific needs must be understood.					
27-Reverse support experts must have adequate and appropriate attention and patience with customers.					
28-Reverse support experts should be willing to help customers.					
29-The speed of responding to complaints should be appropriate.					
30-The provision of technical services must be along with the observance of product safety principles.					
31-The environmental conditions of the organization must satisfy the customer.					
32-The quality of services provided must satisfy customers					
33-The customer must be willing to refer to the organization in the future.					
34-Customers should recommend this organization to the public.					
35-The benefits of this organization must be shared with others.					

References

[1] Chonsalasin, D., Jomnonkwao, S., & Ratanavaraha, V. (2021). Measurement model of passengers' expectations of airport service quality. *International journal of transportation science and technology*, *10*(4), 342-352. https://doi.org/10.1016/j.ijtst.2020.11.001

[2] Shah, F. T., Syed, Z., Imam, A., & Raza, A. (2020). The impact of airline service quality on passengers' behavioral intentions using passenger satisfaction as a mediator. *Journal of air transport management*, *85*, 101815. https://doi.org/10.1016/j.jairtraman.2020.101815

[3] Adabavazaeh, N., & Nikbakht, M. (2019, January). Interpretive structural modeling analysis of reverse supply chain critical success factors in air industry. *2019 15th Iran international industrial engineering conference (IIIEC)* (pp. 99-105). IEEE. DOI: 10.1109/IIIEC.2019.8720737

[4] Woo, M. (2019). Assessing customer citizenship behaviors in the airline industry: investigation of service quality and value. *Journal of air transport management*, *76*, 40-47. https://doi.org/10.1016/j.jairtraman.2019.02.006

[5] Stamolampros, P., & Korfiatis, N. (2019). Airline service quality and economic factors: an ARDL approach on US airlines. *Journal of air transport management*, *77*, 24-31. https://doi.org/10.1016/j.jairtraman.2019.03.002

[6] Gupta, H. (2018). Evaluating service quality of airline industry using hybrid best worst method and VIKOR. *Journal of air transport management*, *68*, 35-47. https://doi.org/10.1016/j.jairtraman.2017.06.001

[7] Farooq, M. S., Salam, M., Fayolle, A., Jaafar, N., & Ayupp, K. (2018). Impact of service quality on customer satisfaction in Malaysia airlines: a PLS-SEM approach. *Journal of air transport management*, *67*, 169-180. https://doi.org/10.1016/j.jairtraman.2017.12.008

[8] Yimga, J. (2017). Airline on-time performance and its effects on consumer choice behavior. *Research in transportation economics*, *66*, 12-25. https://doi.org/10.1016/j.retrec.2017.06.001

[9] Leonnard, L. (2018). The performance of SERVQUAL to measure service quality in private university. *Journal on efficiency and responsibility in education and science*, *11*(1), 16-21.

[10] Pitt, L., Watson, R., King, R., Hartman, A., Hartzel, K., Papageorgiou, E., & Gerwing, T. (1994). Longitudinal measurement of service quality in information systems: a case study. *ICIS 1994 proceedings*, *46*. https://aisel.aisnet.org/icis1994/46

[11] Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of marketing*, *49*(4), 41-50.

[12] Guide Jr, V. D. R., & Van Wassenhove, L. N. (2009). OR FORUM—the evolution of closed-loop supply chain research. *Operations research*, *57*(1), 10-18.

[13] TEMPLAATKA. (n.d.). *Logistic customer service - definition, elements, strategies*. (**In Polish**). Retrieved May 20, 2021, from https://www.templatka.pl/logistyczna-obsluga-klienta.html

[14] Coyle J. J., Bardi, E. L., & Langley, C. J. (2002). *Logistics management*. Polskie Wydawnictwo Ekonomiczne SA. (**In Polish**).

[15] Zeithaml, V. A., Parasuraman, A., Berry, L. L., & Berry, L. L. (1990). *Delivering quality service: Balancing customer perceptions and expectations*. Simon and Schuster.

[16] Qolipour, M., Torabipour, A., Khiavi, F. F., & Malehi, A. S. (2018). Assessing medical tourism services quality using SERVQUAL model: a patient's perspective. *Iranian journal of public health*, *47*(1), 103-110.

[17] Naik, C. K., Gantasala, S. B., & Prabhakar, G. V. (2010). Service quality (SERVQUAL) and its effect on customer satisfaction in retailing. *European journal of social sciences*, *16*(2), 231-243.

[18] Alotaibi, M. M. (2015). *Evaluation of AIRQUAL scale for measuring airline service quality and its effect on customer satisfaction and loyalty* (PhD Thesis, Crandfield University). Retrieved from http://dspace.lib.cranfield.ac.uk/handle/1826/9651

[19] Yousapronpaiboon, K. (2014). SERVQUAL: measuring higher education service quality in Thailand. *Procedia-social and behavioral sciences*, *116*, 1088-1095. https://doi.org/10.1016/j.sbspro.2014.01.350

[20] Kramarz, M. (2014). *Elementy logistyczne obsługi klienta w sieciach dystrybucji. Pomiar, ocena, strategie*. Difin SA. https://depot.ceon.pl/handle/123456789/5214

[21] Kułyk, P., Michałowska, M., & Kotylak, S. (2017). Assessment of customer satisfaction with logistics service in the light of the results of the research. *Management*, *21*(1), 205-222. DOI: 10.1515/manment-2015-0089

[22] TEMPLATKA. (n.d.). Logistic customer service – definition. (**In Polish**). Retrieved May 20, 2021, from https://www.templatka.pl/logistyczna-obsluga-klienta.html#:~:text=Logistyczna%20obs%C5%82uga%20klienta%20definiowana%20jest,w%20jak%20najd%C5%82u%C5%BCszym%20okresie%20czasu%22.

[23] Carman, J. M. (1990). Consumer perceptions of service quality: an assessment of T. *Journal of retailing*, *66*(1), 33.