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# Service Quality Assessment of Ngurah Rai International Airport Using Fuzzy Servqual and Importance Performance Analysis Methods

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**Abstract.** Ngurah Rai International Airport in Bali serves as a critical gateway for tourists, especially in the post-pandemic era. This study evaluates the service quality of the airport using the Fuzzy Servqual and Importance Performance Analysis (IPA) methods. A sample of 100 respondents was analyzed to assess five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. The findings indicate that several attributes of the service require improvement, particularly in terms of adequacy of infrastructure, service clarity, and responsiveness to passenger feedback. The IPA analysis identified two attributes as high-priority areas for improvement. Recommendations for enhancing service quality are proposed to better align with passenger expectation and satisfaction.

**Keywords:** service quality, fuzzy ServQual, *importance performance analysis*, Ngurah Rai Airport, customer satisfaction

***Abstrak.*** *Bandara Internasional Ngurah Rai di Bali berperan sebagai pintu gerbang penting bagi wisatawan, terutama di era pasca-pandemi. Penelitian ini mengevaluasi kualitas layanan bandara menggunakan metode Fuzzy Servqual dan Importance Performance Analysis (IPA). Sampel sebanyak 100 responden dianalisis untuk menilai lima dimensi kualitas layanan: keandalan, tangibilitas, daya tanggap, jaminan, dan empati. Temuan menunjukkan bahwa beberapa atribut layanan memerlukan perbaikan, terutama dalam hal kecukupan infrastruktur, kejelasan layanan, dan daya tanggap terhadap umpan balik penumpang. Analisis IPA mengidentifikasi dua atribut sebagai prioritas utama untuk diperbaiki. Rekomendasi untuk meningkatkan kualitas layanan diajukan agar lebih selaras dengan harapan dan kepuasan penumpang.*

***Kata kunci:*** *kualitas layanan, fuzzy servqual,* importance performance analysis*, bandara ngurah rai, kepuasan pelanggan*

## INTRODUCTION

Ngurah Rai International Airport-Bali serves as the main gateway for tourists visiting Bali post-pandemic. Service quality is a key factor in ensuring tourist satisfaction (Zygiaris et al., 2022).

Table 1. Number of Domestic Passengers

| Months | Number of Domestic Passengers |
|---|---|
| January | 348.289 |
| February | 324.030 |
| March | 350.368 |
| April | 378.701 |
| May | 397.457 |
| June | 463.549 |
| July | 438.339 |
| August | 444.386 |
| September | 422.977 |
| October | 437.834 |
| November | 410.035 |
| December | 474.758 |
| Total | 4.890.723 |

Source: Primary data, 2024

Based on Table 1, the high number of passengers must be addressed by providing adequate facilities and infrastructure that meet applicable standards, enabling the company to sustain and meet tourist expectations. Service quality evaluation of a product or service can be measured using the Fuzzy Servqual set *(Stefano et al., 2015)*. We define service quality as perceived by the customer. In addition, the perceived quality is the comparison between the perception and customer expectation. *Service quality is defined as perceived by the customer, where perceived quality is a comparison between perception and customer expectations. The Fuzzy Servqual method measures service quality across five dimensions: reliability, responsiveness, assurance, empathy, and tangibles. This approach can effectively address issues related to service quality assessment* (Firdaus et al., 2020).

The next stage involves using the IPA (Importance Performance Analysis) method. This method assesses the extent to which passengers are satisfied with the company's performance and the extent to which service providers understand passengers' expectations of the services provided (Lai & Hitchcock, 2015). The IPA method has the advantage of accurately identifying which service attributes require improvement and which should be maintained (O'Leary & Lee, 2022). From this analysis, recommendations for improving service quality attributes can be provided to align with the expectations of Ngurah Rai International Airport-Bali users.

## RESEARCH METHODE

The sampling method used is based on the Slovin formula. The sample consists of 100 respondents with a 10% margin of error. The data will then be analyzed using the Triangular Fuzzy Number (TFN) algorithm.

Determination of attribute membership degree

$$Z = \frac{TFN * \mu_x}{\sum \mu_x} \quad (1)$$

Fuzzy calculation

$$\textit{Fuzzification:}\ \mu M(X) \begin{cases} 0; & x \leq a, x \geq c \\ \frac{x-a}{b-a}; & a \leq x \leq b \\ \frac{c-x}{c-b}; & b \leq x \leq c \end{cases}, \textit{Defuzzification centroid}: Z = \frac{\sum_{i=0}^{n} z_i X(z_i)}{\sum_{i=0}^{n} \mu X(z_i)} \quad (2)$$

Next, the average level of attributes is calculated.

$$X = \frac{\text{Xi}}{n}\ ,\ Y = \frac{\sum \text{Yi}}{n} \quad (3)$$

$$Tki = \frac{Xi}{Yi} . 100\% \quad (4)$$

Implementation of the Cartesian diagram

$$X = \frac{\sum_{i=n}^{k} Xi}{n}, Y = \frac{\sum_{i=n}^{k} Yi}{n} \quad (5)$$

## RESULT AND DISCUSSION

### Fuzzy Servqual Analysis

The fuzzification process is carried out to determine the scores that respondents must assign to each criterion proposed in the questionnaire. The values used to determine the weight/score are as follows: Poor (P) with values 1, 2, 3; Fairly Good (FG) with values 2, 3, 4; and Very Good (VG) with values 3, 4, 5. The fuzzification calculations for the importance and satisfaction attributes are as follows:

Table 2. *Fuzzification*

| Code | Attribute | TFN | | |
|---|---|---|---|---|
| | | P | FG | VG |
| **Tangible** | | | | |
| A1 | Adequacy of the number of seats in the departure waiting area | 2,57 | 3,37 | 4,22 |
| A2 | Cleanliness and tidiness in the airport environment | 2,8 | 3,5 | 4,21 |

| | | | | |
|---|---|---|---|---|
| A3 | Condition and equipment of public facilities provided, such as prayer rooms and toilets | 2,71 | 3,39 | 4,16 |
| A4 | The service statements/guidelines at the airport are visually appealing | 2,52 | 3,49 | 4,10 |
| A5 | Adequacy of the number of trolleys | 2,58 | 3,35 | 4,19 |
| A6 | Arrangement and adequacy of check-in counters | 2,6 | 3,33 | 4,02 |
| A7 | Comfort of air circulation/AC in the waiting area | 2,43 | 3,3 | 4,37 |
| **Reliability** | | | | |
| B8 | Passenger service procedures that are straightforward | 2,43 | 3,32 | 4,27 |
| B9 | Services at the airport are provided accurately from the moment passengers arrive | 2,61 | 3,28 | 4,13 |
| B10 | Ease and speed of the baggage claim process | 2,39 | 3,32 | 4,09 |
| **Responsiveness** | | | | |
| C11 | Airport staff are always willing to assist passengers | 2,43 | 3,35 | 4,35 |
| C12 | When passengers encounter issues at the airport, employees genuinely strive to help resolve them | 2,53 | 3,33 | 4,21 |
| C13 | Staff are able to provide explanations/communicate effectively | 2,58 | 3,48 | 4,24 |
| C14 | Passengers are served promptly/quickly by airport staff | 2,45 | 3,33 | 4,26 |
| **Assurance** | | | | |
| D15 | The airport provides security guarantees with the presence of airport security | 2,5 | 3,41 | 4,30 |
| D16 | Airport staff are friendly and polite in providing services | 2,58 | 3,37 | 4,32 |
| **Empathy** | | | | |
| E17 | The airport's operating hours are suitable/comfortable for passengers | 2,35 | 3,49 | 4,40 |
| E18 | Airport employees prioritize passengers' interests | 2,57 | 3,45 | 4,2 |
| E19 | Ease of submitting complaints | 2,61 | 3,35 | 4,07 |
| E20. | The airport responds to and addresses feedback or suggestions provided | 2,52 | 3,32 | 4,19 |

Sources: Primary Processed Data, 2024

**Defuzzification Process**

The defuzzification process converts the results of the analysis in the form of fuzzy values (in the form of fuzzy numbers) into concrete or crisp values, which can be easily interpreted for performance evaluation or decision-making.

Table 3. *Defuzzification of Satisfaction Attributes*

| Code | Attribute | μ (x) | | | Defuzzyfication |
|---|---|---|---|---|---|
| | | P | FG | VG | |
| **Tangible** | | | | | |
| A1 | Adequacy of the number of seats in the departure waiting area | 0,43 | 0,63 | 0,78 | 3,54 |
| A2 | Cleanliness and tidiness in the airport environment | 0,2 | 0,5 | 0,79 | 3,78 |
| A3 | Condition and equipment of public facilities provided, such as prayer rooms and toilets | 0,29 | 0,61 | 0,84 | 3,65 |
| A4 | The service statements/guidelines at the airport are visually appealing | 0,48 | 0,51 | 0,9 | 3,53 |
| A5 | Adequacy of the number of trolleys | 0,42 | 0,65 | 0,81 | 3,54 |
| A6 | Arrangement and adequacy of check-in counters | 0,41 | 0,66 | 0,98 | 3,52 |
| A7 | Comfort of air circulation/AC in the waiting area | 0,57 | 0,7 | 0,63 | 3,39 |
| **Reliability** | | | | | |
| B8 | Passenger service procedures that are straightforward | 0,57 | 0,68 | 0,73 | 3,41 |
| B9 | Services at the airport are provided accurately from the moment passengers arrive | 0,39 | 0,72 | 0,87 | 3,52 |
| B10 | Ease and speed of the baggage claim process | 0,62 | 0,68 | 0,91 | 3,38 |
| **Responsiveness** | | | | | |
| C11 | Airport staff are always willing to assist passengers | 0,57 | 0,65 | 0,65 | 3,41 |
| C12 | When passengers encounter issues at the airport, employees genuinely strive to help resolve them | 0,47 | 0,67 | 0,79 | 3,5 |
| C13 | Staff are able to provide explanations/communicate effectively | 0,42 | 0,53 | 0,76 | 3,59 |
| C14 | Passengers are served promptly/quickly by airport staff | 0,55 | 0,67 | 0,74 | 3,43 |
| **Assurance** | | | | | |
| D15 | The airport provides security guarantees with the presence of airport security | 0,5 | 0,59 | 0,7 | 3,5 |
| D16 | Airport staff are friendly and polite in providing services | 0,42 | 0,63 | 0,68 | 3,55 |
| **Empathy** | | | | | |
| E17 | The airport's operating hours are suitable/comfortable for passengers | 0,65 | 0,51 | 0,6 | 3,38 |
| E18 | Airport employees prioritize passengers' interests | 0,43 | 0,55 | 0,8 | 3,58 |
| E19 | Ease of submitting complaints | 0,39 | 0,65 | 0,93 | 3,54 |
| E20. | The airport responds to and addresses feedback or suggestions provided | 0,48 | 0,68 | 0,81 | 3,48 |

Source: Primary Processed Data, 2024

Table 4. *Defuzzification of expectation attributes*

| Code | Attribute | μ (x) | | | Defuzzification |
|---|---|---|---|---|---|
| | | P | FG | VG | |
| **T*angible*** | | | | | |
| A1 | Adequacy of the number of seats in the departure waiting area | 0,33 | 0,27 | 0,33 | 3,68 |
| A2 | Cleanliness and tidiness in the airport environment | 0,5 | 0,14 | 0,22 | 3,31 |
| A3 | Condition and equipment of public facilities provided, such as prayer rooms and toilets | 0 | 0,09 | 0,38 | 4,49 |
| A4 | The service statements/guidelines at the airport are visually appealing | 0 | 0,16 | 0,44 | 4,37 |
| A5 | Adequacy of the number of trolleys | 0,4 | 0,32 | 0,48 | 3,66 |
| A6 | Arrangement and adequacy of check-in counters | 0,25 | 0,26 | 0,43 | 3,85 |
| A7 | Comfort of air circulation/AC in the waiting area | 1 | 0,15 | 0,29 | 2,74 |
| **Reliability** | | | | | |
| B8 | Passenger service procedures that are straightforward | 0 | 0,21 | 0,41 | 4,32 |
| B9 | Services at the airport are provided accurately from the moment passengers arrive | 0,14 | 0,46 | 0,46 | 3,88 |
| B10 | Ease and speed of the baggage claim process | 0,5 | 0,27 | 0,5 | 3,55 |
| **R*esponsiveness*** | | | | | |
| C11 | Airport staff are always willing to assist passengers | 0,7 | 0,27 | 0,36 | 3,23 |
| C12 | When passengers encounter issues at the airport, employees genuinely strive to help resolve them | 0,3 | 0,36 | 0,41 | 3,74 |
| C13 | Staff are able to provide explanations/communicate effectively | 0,29 | 0,28 | 0,36 | 3,77 |
| C14 | Passengers are served promptly/quickly by airport staff | 0,33 | 0,31 | 0,43 | 3,73 |
| **A*ssurance*** | | | | | |
| D15 | The airport provides security guarantees with the presence of airport security | 0,2 | 0,39 | 0,38 | 3,84 |
| D16 | Airport staff are friendly and polite in providing services | 0,14 | 0,24 | 0,38 | 4,02 |
| **E*mpathy*** | | | | | |
| E17 | The airport's operating hours are suitable/comfortable for passengers | 0 | 0,2 | 0,42 | 4,33 |
| E18 | Airport employees prioritize passengers' interests | 0 | 0,25 | 0,5 | 4,25 |
| E19 | Ease of submitting complaints | 0,2 | 0,29 | 0,49 | 3,93 |
| E20. | The airport responds to and addresses feedback or suggestions provided | 0 | 0,2 | 0,48 | 4,31 |

Source: Primary Processed Data, 2024

**Fuzzy Servqual Analysis**

The Fuzzy Servqual analysis is conducted by examining the gap between the service expected by passengers and the passengers' assessment of the service provided by Ngurah Rai International Airport Bali. A negative gap (-) indicates that the perceived service does not meet the expected service. If the gap approaches zero, it means that the gap is smaller, and the company's performance aligns with the criteria expected by passengers. The Servqual analysis for each dimension can be outlined as follows, in order from the largest gap to the smallest gap for each dimension:

Table 5. Fuzzy Servqual Analysis

| No. | Attribute | Experience | Expectation | Gap |
|---|---|---|---|---|
| **Empathy** | | | | |
| 1. | The airport's operating hours are suitable/comfortable for passengers | 3,378 | 4,328 | -0,95 |
| 2. | The airport responds to and addresses the feedback or suggestions provided | 3,478 | 4,308 | -0,83 |
| 3. | Airport employees prioritize passengers' interests | 3,576 | 4,25 | -0,674 |
| 4. | Ease of submitting complaints | 3,539 | 3,926 | -0,39 |
| | *Mean* | 3,493 | 4,203 | -0,71 |
| **Reliability** | | | | |
| 1. | Passenger service procedures that are straightforward | 3,414 | 4,324 | -0,91 |
| 2. | Services at the airport are provided accurately from the moment passengers arrive | 3,52 | 3,883 | -0,363 |
| 3. | Ease and speed of the baggage claim process | 3,376 | 3,549 | -0,173 |
| | *Mean* | 3,437 | 3,919 | -0,428 |
| **Assurance** | | | | |
| 1. | Airport staff are friendly and polite in providing services | 3,549 | 4,019 | -0,47 |
| 2. | The airport provides security guarantees with the presence of airport security | 3,504 | 3,839 | -0,34 |
| | *Mean* | 3,527 | 3,929 | -0,4 |
| **Tangible** | | | | |
| 1. | Condition and equipment of public facilities provided, such as prayer rooms, toilets, and so on | 3,65 | 4,49 | -0,84 |
| 2. | Service statements/guidelines at the airport are visually appealing | 3,532 | 4,37 | -0,838 |
| 3. | Arrangement and adequacy of check-in counters | 3,518 | 3,855 | -0,337 |
| 4. | Adequacy of the number of seats in the departure waiting area | 3,542 | 3,681 | -0,139 |
| 5. | Adequacy of the number of trolleys | 3,54 | 3,656 | -0,12 |
| 6. | Cleanliness and tidiness of the environment inside and outside the airport | 3,783 | 3,306 | 0,476 |
| 7. | Comfort of air circulation/AC in the waiting area | 3,939 | 2,736 | 0,657 |
| | *Mean* | 3,566 | 3,728 | -0,162 |
| **Responsiveness** | | | | |
| 1. | Passengers are served promptly/quickly by airport staff | 3,434 | 3,727 | -0,29 |

| No. | Attribute | Experience | Expectation | Gap |
|---|---|---|---|---|
| 2. | When passengers encounter issues at the airport, employees genuinely strive to help resolve them | 3,495 | 3,741 | -0,246 |
| 3. | Staff are able to provide explanations/communicate effectively | 3,593 | 3,765 | -0,172 |
| 4. | Airport staff are always willing to assist passengers | 3,414 | 3,227 | 0,188 |
| | *Mean* | 3,484 | 3,615 | -0,13 |

Source: Primary Processed Data, 2024

From the table above, it can be seen that the order of the gaps from largest to smallest for each dimension starts with the empathy dimension, which has an average gap of -0.71. The second position is the reliability dimension, with an average gap of -0.428. In third place is the assurance dimension, with an average gap of -0.4. In fourth place is the tangible dimension, with an average gap of -0.162. Finally, in the last position is the responsiveness dimension, with an average gap of -0.13.

**Importance Performance Analysis (IPA)**

Importance Performance Analysis is conducted by calculating the total scores for service performance and the importance/expectations of passengers at Ngurah Rai International Airport Bali. Then, the values (average performance score) and (average importance score) are calculated and mapped in a Cartesian diagram using SPSS software.

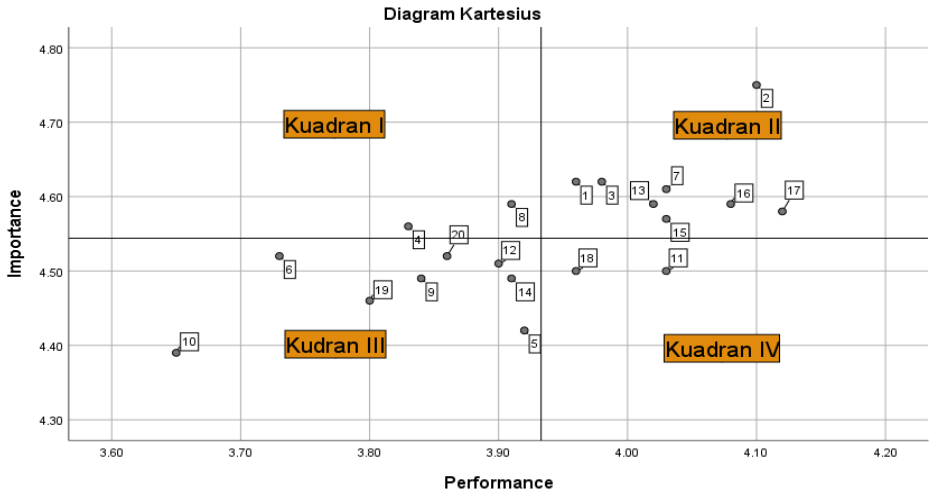
Table 6. Level of Alignment n IPA

| Code | Attribute | Calculation | | $\bar{X}$ | $\bar{Y}$ | Level of Alignment (%) | Decision Hold / Action |
|---|---|---|---|---|---|---|---|
| | | Experience | Expectation | | | | |
| A1 | Adequacy of the number of seats in the departure waiting area | 396 | 462 | 3,96 | 4,62 | 85,71 | Action |
| A2 | Cleanliness and tidiness in the airport environment | 410 | 475 | 4,1 | 4,75 | 86,32 | Action |
| A3 | Condition and equipment of public facilities provided, such as prayer rooms and toilets | 398 | 462 | 3,98 | 4,62 | 86,15 | Action |
| A4 | The service statements/guidelines at the airport are visually appealing | 383 | 456 | 3,83 | 4,56 | 84 | Action |
| A5 | Adequacy of the number of trolleys | 392 | 442 | 3,92 | 4,42 | 88,69 | Hold |
| A6 | Arrangement and adequacy of check-in counters | 373 | 452 | 3,73 | 4,52 | 82,52 | Action |
| A7 | Comfort of air circulation/AC in the waiting area | 403 | 461 | 4,03 | 4,61 | 87,42 | Hold |
| B8 | Passenger service procedures that are straightforward | 391 | 459 | 3,91 | 4,59 | 85,19 | Action |
| B9 | Services at the airport are provided accurately from the moment passengers arrive | 384 | 449 | 3,84 | 4,49 | 85,52 | Action |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| B10 | Ease and speed of the baggage claim process | 365 | 439 | 3,65 | 4,39 | 83,14 | Action |
| C11 | Airport staff are always willing to assist passengers | 403 | 450 | 4,03 | 4,5 | 89,56 | Hold |
| C12 | When passengers encounter issues at the airport, employees genuinely strive to help resolve them | 390 | 451 | 3,9 | 4,51 | 86,47 | Action |
| C13 | Staff are able to provide explanations/communicate effectively | 402 | 459 | 4,02 | 4,59 | 87,58 | Hold |
| C14 | Passengers are served promptly/quickly by airport staff | 391 | 449 | 3,91 | 4,49 | 87,08 | Hold |
| D15 | The airport provides security guarantees with the presence of airport security | 403 | 457 | 4,03 | 4,57 | 88,18 | Hold |
| D16 | Airport staff are friendly and polite in providing services | 408 | 459 | 4,08 | 4,59 | 88,89 | Hold |
| E17 | The airport's operating hours are suitable/comfortable for passengers | 412 | 458 | 4,12 | 4,58 | 89,96 | Hold |
| E18 | Airport employees prioritize passengers' interests | 396 | 450 | 3,96 | 4,5 | 88 | Hold |
| E19 | Ease of submitting complaints | 380 | 446 | 3,8 | 4,46 | 85,2 | Action |
| E20 | The airport responds to and addresses feedback or suggestions provided | 386 | 452 | 3,86 | 4,52 | 85,4 | Action |
| Mean X and Y | | | | 3,933 | 4,544 | 86,55 | |

Source: Primary Processed Data, 2024

The results of the calculations for the average performance score and average importance score are then mapped in a Cartesian diagram, aiming to determine the position of



each attribute in which quadrant. The alignment measurement is performed to identify the priority order for service improvements.

Source: Data primary, 2024

**Pict 1** Cartesian Diagram

Based on the Cartesian diagram, there are two attributes out of 20 in the service quality dimension that are located in Quadrant I, namely attribute no. 4 with an alignment score of 84%, and attribute no. 8 with an alignment score of 85.19%. Quadrant I is the area that contains factors considered important by passengers, but in reality, these factors do not meet expectations (the actual performance is still very low). The attributes in Quadrants II, III, and IV are listed in the explanation table provided above. Quadrant II is the area that contains factors considered important by passengers and factors that are considered to be in line with their expectations, so the company must maintain the quality of its service. Quadrant III is the area that contains factors considered less important by passengers and, in reality, are just average or not very special. Quadrant IV is the area that contains factors considered less important by passengers, but in reality, they are accepted or perceived as excessive and are performed very well by the company.

This aligns with the research conducted by Simpson et al.(2020) titled "Efforts to Improve Service Quality to Meet Passenger Satisfaction Using Importance Performance Analysis and Fuzzy-Service Quality Approach," which explains that attributes in the tangible and reliability dimensions are located in Quadrant I, requiring improvement. Zakariah et al. (2016) found several elements in IPA and SERVQUAL that can complement each other and transform the results into strategic actions. Hence, combining both IPA and SERVQUAL may be beneficial in providing a new avenue for service quality measurement in the higher education industry.

## CONCLUSIONS

Based on the analysis results, it can be concluded that passengers at Ngurah Rai International Airport Bali assess that the satisfaction they obtain from the performance of Ngurah Rai International Airport Bali is not fully in line with their interests or expectations. Eleven out of 20 attributes require improvement, which are: (A1) adequacy of the number of seats in the departure area, (A2) cleanliness and tidiness of the environment inside and outside the airport, (A3) condition and equipment of public facilities provided, such as prayer rooms, toilets, and so on, (A4) service statements/signage at the airport are visually appealing, (A6) arrangement and adequacy of check-in counters, (B8) passenger service procedures that are straightforward, (B9) services at the airport are provided accurately from the moment passengers arrive, (B10) ease and speed of the baggage claim process, (C12) when passengers encounter problems at the airport, employees genuinely strive to help resolve them, (E19) ease of submitting complaints, (E20) the airport responds to and addresses the feedback or suggestions provided. Therefore, improvements need to be made because the alignment scores of these eleven attributes are ≤ 86.55%.

There are 2 out of 20 attributes that are the main priority for improvement because they are located in Quadrant I, where attributes in this quadrant have high importance but low

satisfaction with the performance provided. These attributes are: (A4) service statements/signage at the airport are visually appealing, and (B8) passenger service procedures that are straightforward.

Based on this research and discussion, the company needs to improve the quality of services, which can be done by adding the number of seats in the departure area, ensuring cleanliness and tidiness of the environment both inside and outside the airport, improving the condition of public facilities such as prayer rooms, toilets, etc., clarifying service statements/signage at the airport, arranging check-in counters to be more easily found and increasing their number to avoid long queues, clarifying the service procedures provided to passengers, assisting passengers by providing accurate information regarding their travels from the moment they arrive, facilitating the baggage claim process, being diligent in helping passengers resolve any issues they encounter, simplifying the complaint submission process, and responding to every feedback or suggestion provided by passengers carefully.

## BIBLIOGRAPHY

Firdaus, I., Farikhin, & Surarso, B. (2020). Application of Fuzzy Servqual Method to Measure User Satisfaction of Mooc Service Quality. *E3S Web of Conferences*, *202*, 14007. https://doi.org/10.1051/E3SCONF/202020214007

Lai, I. K. W., & Hitchcock, M. (2015). Importance–performance analysis in tourism: A framework for researchers. *Tourism Management*, *48*, 242–267. https://doi.org/10.1016/J.TOURMAN.2014.11.008

O'Leary, J. T., & Lee, G. (2022). Importance-Performance Analysis in Tourism. *Encyclopedia of Tourism*, 1–2. https://doi.org/10.1007/978-3-319-01669-6_371-2

Simpson, G. D., Patroni, J., Teo, A. C. K., Chan, J. K. L., & Newsome, D. (2020). Importance-performance analysis to inform visitor management at marine wildlife tourism destinations. *Journal of Tourism Futures*, *6*(2), 165–180. https://doi.org/10.1108/JTF-11-2018-0067

Stefano, N. M., Casarotto Filho, N., Barichello, R., & Sohn, A. P. (2015). A Fuzzy SERVQUAL Based Method for Evaluated of Service Quality in the Hotel Industry. *Procedia CIRP*, *30*, 433–438. https://doi.org/10.1016/J.PROCIR.2015.02.140

Zakariah, M. R., Zakariah, S., & Pyeman, J. (2016). IPA vs. SERVQUAL: Service Quality Measurement for Higher Education Industry. *Proceedings of the 1st AAGBS International Conference on Business Management 2014 (AiCoBM 2014)*, 139–150. https://doi.org/10.1007/978-981-287-426-9_12

Zygiaris, S., Hameed, Z., Ayidh Alsubaie, M., & Ur Rehman, S. (2022). Service Quality and Customer Satisfaction in the Post Pandemic World: A Study of Saudi Auto Care Industry. *Frontiers in Psychology*, *13*, 842141. https://doi.org/10.3389/FPSYG.2022.842141/BIBTEX