

SYSTEMS AND SMILES: A MEDIATION ANALYSIS OF PROCESS AND ENVIRONMENT QUALITY ON AIRPORT PASSENGER LOYALTY

Ema Harifa

Universitas 17 Agustus 1945 Samarinda

Eka Yudhyani

Senior Lecturer, Universitas 17 Agustus 1945 Samarinda



Meiki Permana

Lecturer, Universitas 17 Agustus 1945 Samarinda

<http://doi.org/10.35409/IJBMER.2026.3794>

Received: 16 May 2026/ Published: 26 June 2026

ABSTRACT

This study addresses a critical strategic question in service management: In the competitive airport industry, what truly builds lasting passenger loyalty—flawless operational "Systems" or a welcoming human "Smile"? This research aims to dissect the distinct roles of service process quality ('Systems') and service environment quality ('Smiles') in fostering this loyalty. Moving beyond a simple assessment of direct effects, the study's core purpose is to test the mediating role of customer satisfaction. We seek to uncover the underlying mechanisms of these two crucial dimensions by asking: Is the path to loyalty the same for both? Must an efficient process, like a pleasant environment, first win a passenger's emotional satisfaction to be effective, or can it command loyalty on its own merit?

This research employs a quantitative, causal-explanatory design. Data was collected through a structured survey administered to 480 passengers at APT Pranoto Airport in Samarinda. The conceptual model, comprising seven hypotheses, was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the path coefficients and determine the significance of the proposed relationships, including the direct and mediating effects.

This study reveals a critical asymmetry in how airport passenger loyalty is built, providing a novel distinction between the strategic roles of "Systems" (process quality) and "Smiles" (environment quality). While both factors significantly foster loyalty, the primary finding is that they operate through fundamentally different pathways. The model demonstrated excellent fit (GoF = 0.792). The influence of "Smiles" is entirely indirect; its effect on loyalty is fully mediated by customer satisfaction. This indicates that a pleasant environment and courteous staff must first cultivate passenger satisfaction to earn their loyalty. In contrast, the influence of "Systems" is overwhelmingly direct and dominant. Efficient processes build passenger loyalty directly, bypassing satisfaction as a necessary mediator.

This research lies in this empirical dichotomy. It moves beyond a monolithic view of service quality to offer a more nuanced strategic framework for airport management: investments in "Smiles" are crucial for building emotional goodwill, while investments in "Systems" deliver a more immediate and powerful impact on passenger retention.

Keywords: Service quality; Customer satisfaction; Customer loyalty; Airport service.

1. INTRODUCTION

The global aviation industry has become an increasingly competitive landscape, transforming airports from mere transit hubs into complex service enterprises vying for passenger traffic and airline partnerships. In this environment, achieving customer loyalty has emerged as a critical determinant of an airport's long-term success and financial sustainability (Givestam & Söderlund, 2023). Loyal passengers not only ensure a stable revenue stream through repeat usage but also contribute to positive word-of-mouth, a vital asset in building a strong market reputation. Consequently, understanding the key drivers of passenger loyalty is of paramount importance for airport management and stakeholders.

Extensive research across various service industries has established a strong positive relationship between the quality of service provided and the development of customer loyalty (Prentice & Kadan, 2019). Service quality, however, is not a monolithic concept. It is a multidimensional construct that can be broadly categorized into functional and atmospheric components. This study focuses on two critical dimensions within the airport context: Service Process Quality (SPQ), which pertains to the efficiency, accuracy, and speed of core processes such as check-in, security screening, and baggage handling; and Service Environment Quality (SEQ), which relates to the physical and ambient conditions of the airport, including cleanliness, comfort, signage, and overall atmosphere. Furthermore, the literature consistently highlights the central role of Customer Satisfaction (CS), often positioning it as a key intermediary that links service quality experiences to subsequent loyalty outcomes (Bogicevic et al., 2017).

Despite the consensus on the importance of these variables, a significant gap remains in understanding the distinct mechanisms through which different dimensions of service quality foster loyalty. Much of the existing research either treats service quality as a single construct or fails to simultaneously compare the mediating pathways of its functional and atmospheric components. It is unclear whether the tangible, efficiency-driven aspects of an airport's service (the "systems") build loyalty through the same psychological process as the more intangible, comfort-related aspects (the "smiles"). This study addresses this gap by positing that the mediating role of customer satisfaction may differ significantly depending on the nature of the service quality dimension being considered. The novelty of this research lies in its direct comparison of these two pathways, seeking to uncover whether satisfaction is a universal mediator or if its influence is conditional.

To address the aforementioned gap, this research seeks to answer the following question: How do service process quality and service environment quality distinctly influence passenger loyalty, and what is the specific mediating role of customer satisfaction in these relationships within the context of APT Pranoto Airport? To answer this question, a quantitative study was conducted by collecting survey data from 480 passengers. The data were subsequently analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique to test the proposed conceptual model. This study aims to analyze the direct effects of SPQ and SEQ on both CS and Customer Loyalty (CL), and more importantly, to rigorously test the hypotheses that CS mediates the relationship between each service quality dimension and final passenger loyalty. The findings are expected to provide a more nuanced understanding of the drivers of passenger loyalty, offering valuable insights that can help airport managers make more strategic decisions regarding resource allocation for operational and environmental improvements.

1.1 Service Quality in the Airport Context

Service quality is recognized as a critical antecedent of customer perceptions and behavioral intentions (Berry et al., 1988). In complex service settings like airports, service quality is inherently multidimensional. Following the framework proposed by Brady & Cronin Jr. (2001), it can be deconstructed into distinct components, including the quality of the physical environment and the quality of the service process or outcome. This study adopts this perspective, focusing on:

Service Process Quality (SPQ). This dimension refers to the functional aspect of the service delivery. In an airport, it represents the passenger's evaluation of the efficiency, accuracy, and timeliness of core procedures, particularly with the integration of smart technologies (Santoso & Wijaya, 2024). It answers the question: "How smoothly did I get from the entrance to the gate?" High SPQ is characterized by short waiting times, seamless check-in and security procedures, and reliable baggage handling.

Service Environment Quality (SEQ). This dimension, often referred to as the "servicescape" (Bitner, 1992), encompasses the tangible and ambient conditions in which the service is delivered. It includes factors such as cleanliness, terminal comfort, availability of amenities, clarity of signage, and the overall atmosphere. It answers the question: "How comfortable and pleasant was my time at the airport?"

1.2 The Effect of Service Quality on Customer Satisfaction

Customer satisfaction is defined as a customer's overall evaluation of their consumption experience, resulting from a comparison between pre-purchase expectations and post-purchase performance (Oliver, 1980). It is a key indicator of service performance and a direct precursor to long-term customer relationships.

The functional quality of a service is a fundamental driver of satisfaction. When core processes are efficient and reliable (SPQ), they meet or exceed passengers' primary expectations of a hassle-free journey. Recent studies confirm that seamless operational performance in airports, driven by efficient processes, directly enhances passenger satisfaction (Nguyen et al., 2023). Therefore, we hypothesize:

H1: Service Process Quality (SPQ) has a significant positive effect on Customer Satisfaction (CS).

Simultaneously, the physical environment in which a service is delivered profoundly influences a customer's affective and cognitive responses (Bitner, 1992). A clean, comfortable, and aesthetically pleasing airport environment (SEQ) can evoke positive emotions, reduce perceived stress, and enhance the overall service experience, thereby significantly increasing satisfaction levels (Li & Cui, 2024). Thus, we propose:

H2: Service Environment Quality (SEQ) has a significant positive effect on Customer Satisfaction (CS).

1.3 The Link Between Customer Satisfaction and Customer Loyalty

Customer Loyalty (CL) is considered the ultimate goal for service organizations and is defined as a deep-seated commitment to re-patronize a preferred service consistently in the future (Oliver, 1980). This commitment has both an attitudinal component (positive feelings and recommendations) and a behavioral component (repeat usage).

The relationship between satisfaction and loyalty is one of the most robust tenets in

marketing literature. Satisfied customers are far more likely to develop a favorable attitude and repurchase intentions, acting as the cognitive and emotional foundation upon which long-term loyalty is built (Hassan & Hanif, 2024). Therefore, we hypothesize:

H3: Customer Satisfaction (CS) has a significant positive effect on Customer Loyalty (CL).

1.4 The Direct Effect of Service Quality on Customer Loyalty

While satisfaction is a crucial intermediary, certain dimensions of service quality may also exert a direct influence on loyalty. Highly efficient and reliable processes (SPQ) can create a form of functional dependency or "lock-in." Passengers may become loyal to an airport simply because it consistently offers the most reliable and convenient travel experience, a rational choice that solidifies into behavioral loyalty (Chen & Lee, 2025).

H4: Service Process Quality (SPQ) has a significant positive effect on Customer Loyalty (CL).

Similarly, an exceptionally pleasant and memorable service environment (SEQ) can create a unique affective bond with the customer. The positive experience derived from the airport's atmosphere itself can be a powerful differentiator, fostering attitudinal loyalty directly as passengers become emotionally attached to the airport as a "place" (Martinez-Garcia & Rodriguez-Molina, 2024).

H5: Service Environment Quality (SEQ) has a significant positive effect on Customer Loyalty (CL).

1.5 The Mediating Role of Customer Satisfaction

As established in the Introduction, the novelty of this study lies in testing the distinct mediating pathways. A mediator variable explains the process through which an independent variable influences a dependent variable. The traditional service-profit chain suggests that quality leads to satisfaction, which in turn leads to loyalty. We propose to test this mediating mechanism separately for both dimensions of service quality. The argument is that efficient processes (SPQ) lead to satisfaction, which then nurtures loyalty.

H6: Customer Satisfaction (CS) mediates the relationship between Service Process Quality (SPQ) and Customer Loyalty (CL).

Likewise, a superior service environment (SEQ) is expected to foster loyalty by first making the customer satisfied. The positive feelings generated by the airport's atmosphere are the crucial link that translates a pleasant experience into a loyal commitment.

H7: Customer Satisfaction (CS) mediates the relationship between Service Environment Quality (SEQ) and Customer Loyalty (CL).

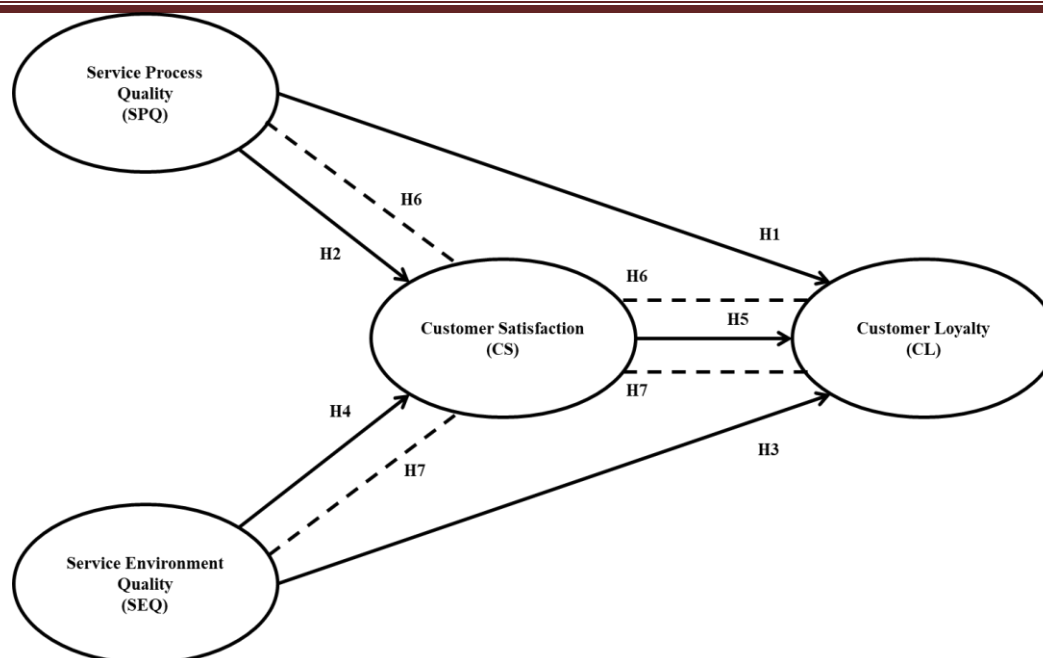


Figure 1. Research Framework

2. RESEARCH METHOD

This study employed a quantitative, causal-explanatory research design to test the hypothesized relationships between variables. The population consisted of all passengers at APT Pranoto Airport, Samarinda, with an average monthly passenger volume of 70,521, serving as the population reference. To determine a representative sample size, Slovin's formula was used with a 5% margin of error, which calculated a minimum requirement of 398 respondents. This study successfully collected data from 480 respondents, exceeding the minimum threshold and thus ensuring the sample's adequacy to represent the population with 95% confidence. A purposive sampling method was utilized, with criteria requiring participants to be at least 18 years old and to have traveled through the airport within the last six months. Data collection was conducted over four weeks using a structured questionnaire. Ethical approval was secured from the university's research committee, and the rights of respondents were protected by obtaining informed consent from all participants, who were assured of their complete anonymity and the confidentiality of their data.

The research instrument was a questionnaire that used a 5-point Likert scale. Its contents were designed to measure the four core constructs of the study: Service Process Quality (SPQ), Service Environment Quality (SEQ), Customer Satisfaction (CS), and Customer Loyalty (CL), with all measurement items adapted from previously validated research. The validity and reliability of the instrument were rigorously assessed before the main analysis. Data processing and analysis were performed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique. The analysis followed a two-step procedure: first, the measurement model was evaluated for reliability and validity. Afterwards, the structural model was analyzed using a bootstrapping procedure to test the hypotheses. Finally, the overall model quality and fit were comprehensively

evaluated through a set of model quality indices, including assessments of the model's explanatory power (ARS and AARS), predictive effect (APC), and goodness-of-fit (GoF). Diagnostic checks were also performed to ensure the model was free from multicollinearity (AFVIF) and to validate the stability of the causal linkages (SPR, RSCR, and SSR).

Table 1. Operationalization of Research Variables

Item	Statement
SPQ1	Information about flights and airport services was easy to find.
SPQ2	The requirements for check-in and security were clear and reasonable.
SPQ3	The overall process, from arrival to boarding, was simple and easy to follow.
SPQ4	The time it took to complete all procedures (e.g., check-in, security) was acceptable.
SEQ1	The airport's facilities (e.g., waiting areas, restrooms, signage) were clean and comfortable.
SEQ2	The airport staff were responsive and quick to assist me when I needed help.
SEQ3	The staff appeared knowledgeable and capable of handling passenger inquiries.
SEQ4	I felt that the airport staff were professional and courteous throughout my interaction with them.
CS1	Overall, I am satisfied with my experience at this airport today.
CS2	My experience at this airport met my expectations.
CS3	I believe that choosing to fly through this airport was a wise decision.
CL1	I will likely use this airport for my future travels in this region.
CL2	I would recommend this airport to my friends, family, or colleagues.
CL3	This airport is my first choice when traveling.

2.1 Structural Equation Modeling Research

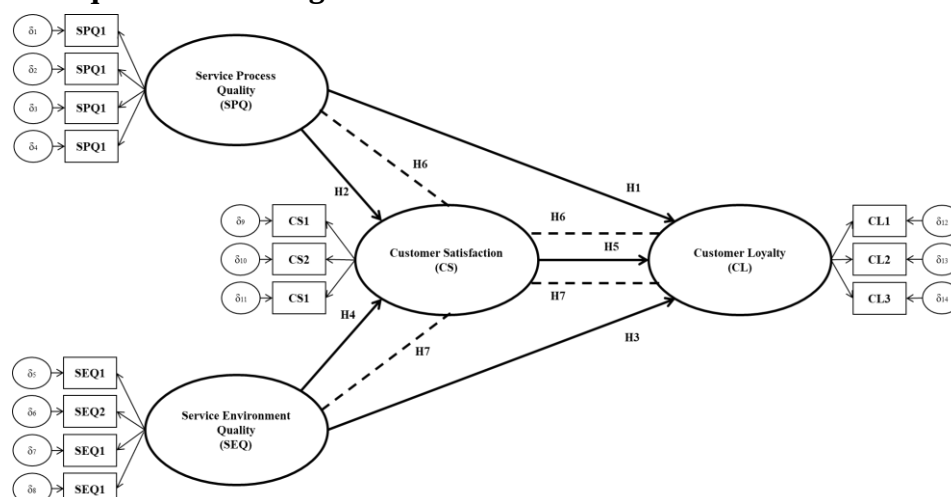


Figure 2. Structural Equation Modeling Research

2.2 Outer Model (Measurement Model)

The outer model, or measurement model, defines how each latent variable (construct) is measured by its respective indicators.

Service Process Quality (SPQ) Variable:

$$SPQ1 = \lambda_1 SPQ + \delta_1 \quad (1)$$

$$SPQ2 = \lambda_2 SPQ + \delta_2 \quad (2)$$

$$SPQ3 = \lambda_3 SPQ + \delta_3 \quad (3)$$

$$SPQ4 = \lambda_4 SPQ + \delta_4 \quad (4)$$

Service Environment Quality (SEQ) Variable:

$$SEQ1 = \lambda_5 SEQ + \delta_5 \quad (5)$$

$$SEQ2 = \lambda_6 SEQ + \delta_6 \quad (6)$$

$$SEQ3 = \lambda_7 SEQ + \delta_7 \quad (7)$$

$$SEQ4 = \lambda_8 SEQ + \delta_8 \quad (8)$$

Customer Satisfaction (CS) Variable:

$$CS1 = \lambda_9 CS + \delta_9 \quad (9)$$

$$CS2 = \lambda_{10} CS + \delta_{10} \quad (10)$$

$$CS3 = \lambda_{11} CS + \delta_{11} \quad (11)$$

Customer Loyalty (CL) Variable:

$$CL1 = \lambda_{12} CL + \delta_{12} \quad (12)$$

$$CL2 = \lambda_{13} CL + \delta_{13} \quad (13)$$

$$CL3 = \lambda_{14} CL + \delta_{14} \quad (14)$$

Notation Key:

λ (Lambda): The loading factor, which is the coefficient representing the contribution of each indicator to its latent variable.

δ (Delta): The measurement error associated with each indicator.

2.3 Inner Model (Structural Model)

The *inner model*, or structural model, shows the causal relationships (influences) among the latent variables. Based on the arrows in the diagram, there are two structural equations.

Equation for Customer Satisfaction (CS). The Customer Satisfaction variable is influenced by Service Process Quality and Service Environment Quality.

$$CS = \gamma_1 SPQ + \gamma_2 SEQ + \zeta_1 \quad (15)$$

Equation for Customer Loyalty (CL). The Customer Loyalty variable is influenced by Service Process Quality, Service Environment Quality, and Customer Satisfaction.

$$CL = \gamma_3 SPQ + \gamma_4 SEQ + \beta_1 CS + \zeta_2 \quad (16)$$

Notation Key:

γ (Gamma): A path coefficient that indicates the magnitude of the influence of an independent (exogenous) latent variable on a dependent (endogenous) latent variable.

β (Beta): A path coefficient that indicates the magnitude of the influence of one endogenous latent variable on another.

ζ (Zeta): The structural error, which is the residual variance of an endogenous latent variable that is not explained by the model.

3. RESULTS AND DISCUSSIONS

The data from these 480 respondents paints a sharp picture of the dominant passenger characteristics at APT Pranoto Airport, Samarinda, a key gateway in East Kalimantan. The emerging profile is not that of a typical tourist, but rather a portrait of a professional on a business trip. Three out of every four passengers are male (75%), and the majority are in their peak productive years, between 36 and 55 years old. This age demographic suggests they are likely experienced managers, technical experts, consultants, or government officials in strategic positions. This profile aligns perfectly with their primary reason for travel: 60% are flying for work or business purposes. This reflects Samarinda's vital role as the governmental and commercial hub in a province that is the heart of Indonesia's natural resource industry. These are the economic drivers for traveling for important meetings, project supervision, or forging business partnerships. While there are segments of passengers traveling for family matters (25%) or leisure (15%), it is clear that the pulse of activity at this airport is largely sustained by these business travelers. In essence, the narrative from this data is about the activity of mature, established male professionals who rely on the efficiency of air travel through APT Pranoto Airport to keep the wheels of economy and governance turning in East Kalimantan.

Table 2. Respondent Profile

Characteristic	Category	Number of Aircraft Passengers (n=480)	Percentage (%)
Gender	Male	360	75%
	Female	120	25%
Age	Age (18-25)	86	18%
	Age (26-35)	97	20%
	Age (36-45)	121	25%
	Age (46-55)	129	27%
	Age (56>)	47	10%
Travel Needs	Work or Business	287	60%
	Family	120	25%
	Other (Vacation, etc.)	73	15%

Source: processed data

Table 3. Descriptive Statistics

Variable	Average	STDEV.P	Min	Max
Service Process Quality (SPQ)	4,2635	0,5918	3	5
Service Environment Quality (SEQ)	3,8593	0,3608	3	3
Customer Satisfaction (CS)	3,8979	0,3291	3	5
Customer Loyalty (CL)	4,7958	0,4030	4	5

Source: processed data

The descriptive statistics analysis provides an initial overview of the perceptions of the 480 passengers at APT Pranoto Samarinda Airport regarding four key variables. The ratings appear

to be based on a 5-point scale, where higher scores indicate a more positive perception. Overall, the most striking finding is the exceptionally high level of Customer Loyalty (CL). With an average of 4.80, this score is approaching the maximum value. Furthermore, the score range is only from 4 to 5, meaning not a single respondent gave a neutral or negative rating for their loyalty. This indicates that passengers consistently have a very strong intention to reuse the airport's services. Service Process Quality (SPQ) was also rated very positively, with an average of 4.26. This suggests that passengers are highly satisfied with process-related aspects such as check-in efficiency, baggage handling speed, and the smoothness of the boarding process. Although the perception is very positive, the standard deviation of 0.59 indicates some variation in the experiences felt by passengers. On the other hand, Service Environment Quality (SEQ) and Customer Satisfaction (CS) have scores that are good but not as high as the other two variables, with averages of 3.86 and 3.90, respectively. These scores show that passengers tend to be satisfied, but their perception is not as strong as it is for the service process and loyalty. What is interesting is that the standard deviation for both variables is very low (0.36 and 0.33, respectively), signaling a very strong consensus among passengers. In other words, nearly all respondents agree on a "good" level of satisfaction and environmental quality, but it has not yet reached a "very good" level. In summary, the data shows that passengers at APT Pranoto Airport are extremely loyal and highly value the efficient quality of the service process. However, there is a consensus that the quality of the physical environment and the overall level of satisfaction, while positive, still have room for improvement to match the superior perceptions of the service process and customer loyalty.

Table 4. Combined loadings and cross-loadings

Construct item	SPQ	SEQ	CS	CL	Type	SE	P value
SPQ1	0.880	0.036	0.531	-0.278	Reflect	0.041	<0.001
SPQ2	0.870	0.036	0.539	-0.266	Reflect	0.041	<0.001
SPQ3	0.876	-0.044	-0.530	0.279	Reflect	0.041	<0.001
SPQ4	0.875	-0.027	-0.539	0.264	Reflect	0.041	<0.001
SEQ1	-0.018	0.937	0.175	0.005	Reflect	0.041	<0.001
SEQ2	0.027	0.928	-0.091	-0.020	Reflect	0.041	<0.001
SEQ3	0.089	0.912	0.034	-0.027	Reflect	0.041	<0.001
SEQ4	-0.105	0.859	-0.128	0.045	Reflect	0.041	<0.001
CS1	0.298	-0.053	0.905	-0.220	Reflect	0.041	<0.001
CS2	-0.451	-0.006	0.925	0.225	Reflect	0.041	<0.001
CS3	0.153	0.055	0.963	-0.009	Reflect	0.041	<0.001
CL1	-0.106	-0.023	0.083	0.983	Reflect	0.040	<0.001
CL2	0.148	0.026	-0.134	0.976	Reflect	0.040	<0.001
CL3	-0.041	-0.002	0.050	0.976	Reflect	0.040	<0.001

Source: processed data

This table presents the results of the measurement model evaluation, which is crucial for establishing the reliability and validity of the constructs used in this study. The analysis focuses

on the indicator loadings to assess both convergent and discriminant validity. First, it is important to note that all indicator loadings are highly significant, with p-values of <0.001 . This indicates that the relationship between each indicator and its respective latent construct is statistically significant and not due to chance. All constructs were modeled using reflective indicators.

Convergent validity assesses whether the indicators intended to measure a specific construct are indeed highly correlated with it. This is evaluated by examining the outer loadings of the indicators on their own constructs. The results demonstrate strong convergent validity across all four constructs: Service Process Quality (SPQ). The four indicators for SPQ show very high loadings, ranging from 0.870 to 0.880. Service Environment Quality (SEQ): The indicators for SEQ also exhibit excellent loadings, ranging from 0.859 to 0.937. Customer Satisfaction (CS): The three indicators for CS have strong loadings between 0.905 and 0.963. Customer Loyalty (CL): The CL construct shows exceptionally high loadings, with its three indicators ranging from 0.976 to 0.983. Since all outer loadings are well above the commonly accepted threshold of 0.70, we can confidently conclude that the measurement model has strong convergent validity. Each set of indicators reliably measures its intended underlying construct.

Discriminant validity ensures that a construct is empirically distinct from other constructs in the model. Based on the cross-loadings analysis, an indicator's loading on its own construct should be substantially higher than its loading on any other construct. The table confirms this: the SPQ1 indicator loads strongly on its own construct, SPQ (0.880), but weakly on SEQ (0.036), CS (0.531), and CL (-0.278). Similarly, the SEQ1 indicator's loading on SEQ (0.937) is far greater than its cross-loadings on any other construct. This pattern is consistent across all indicators for all constructs in the model. In every case, an indicator's loading on its designated construct is significantly higher than its cross-loading on any other construct.

In summary, the analysis of the outer model demonstrates excellent psychometric properties. The high, significant outer loadings confirm the reliability of the indicators and establish strong convergent validity. Furthermore, the clear pattern of high outer loadings and low cross-loadings confirms discriminant validity, indicating that the four constructs: PQ, SEQ, CS, and CL are distinctly and accurately measured. This robust measurement model provides a solid foundation for interpreting the results of the structural model.

The analysis results indicate that the Model Fit and Quality Indices have met the required criteria. All ten (10) parameters satisfied the thresholds recommended by Kock (2015) and Tenenhaus *et al.* (2005):

- 1) Average Path Coefficient (APC) = 0.358 ($P < 0.001$). This index measures the average strength of all path relationships in the model. The APC result of 0.358 with a significance level of $P < 0.001$ indicates that, on average, the hypothesized causal relationships in the model are strong and highly statistically significant.
- 2) Average R-squared (ARS) = 0.734 ($P < 0.001$). The ARS measures the model's overall explanatory power. A value of 0.734 indicates that the model explains approximately 73.4% of the variance in the dependent variables on average. This signifies a very high level of explanatory power.
- 3) Average Adjusted R-squared (AARS) = 0.732 ($P < 0.001$). Similar to ARS, the AARS measures explanatory power but adjusts for the number of predictors. The value of 0.732 (73.2%) is also highly significant, confirming the model's robust explanatory power.

-
- 4) Average Block VIF (AVIF) = 2.228. The AVIF is an indicator used to detect multicollinearity. The rule of thumb is that the value should be below 5, and ideally below 3.3. The result of 2.228 is below the ideal threshold, meaning the model is free from multicollinearity issues.
 - 5) Average Full Collinearity VIF (AFVIF) = 2.126. The AFVIF is a more stringent measure of multicollinearity. The value of 2.126 is also well below the ideal threshold of 3.3, further confirming the absence of collinearity issues.
 - 6) Tenenhaus GoF (GoF) = 0.792. The Goodness-of-Fit (GoF) index measures the overall fit of the model (both measurement and structural models). A value above 0.36 is considered large. The result of 0.792 indicates that the model has a very large overall fit, signifying high model validity.
 - 7) Simpson's Paradox Ratio (SPR) = 0.800. The SPR is an indicator used to ensure the absence of causal anomalies in the data. An acceptable value is ≥ 0.7 . The result of 0.800 meets this criterion, meaning the relationships between variables are not misleading.
 - 8) R-squared Contribution Ratio (RSCR) = 0.986. The RSCR ensures that all predictors make a healthy contribution to the R-squared. An acceptable value is ≥ 0.9 . The result of 0.986 meets this criterion, indicating no issues with R-squared contributions.
 - 9) Statistical Suppression Ratio (SSR) = 1.000. The SSR detects suppression effects, where a relationship between variables is hidden. An acceptable value is ≥ 0.7 . The result of 1.000 indicates that no suppression effects are present in the model.
 - 10) Nonlinear Bivariate Causality Direction Ratio (NLBCDR) = 1.000. The NLBCDR verifies whether the direction of the hypothesized cause-and-effect relationships is supported by the data. The ideal value is 1. The result of 1.000 provides strong support for the direction of causality proposed in the model.

The structural model was analyzed to test the research hypotheses. The findings for each hypothesis, organized by direct and mediation effects, are detailed below, culminating in a narrative discussion that synthesizes all results.

Direct Effects Analysis (H1-H5): The analysis of the direct relationships revealed that all five hypotheses (H1-H5) were strongly supported.

- 1) H1: Service Process Quality (SPQ) $\rightarrow$ Customer Loyalty (CL) The analysis confirmed a strong, positive, and significant effect of Service Process Quality on Customer Loyalty ($\beta = 0.807$; $T = 19.545$; $p < 0.001$). This finding supports H1, indicating that improvements in the service process are a powerful driver of customer loyalty. SPQ alone was found to explain 65.1% of the variance in Customer Loyalty ($R^2 = 0.651$).
- 2) H2: Service Process Quality (SPQ) $\rightarrow$ Customer Satisfaction (CS) Similarly, H2 was supported, revealing an even stronger positive and significant effect of Service Process Quality on Customer Satisfaction ($\beta = 0.922$; $T = 22.645$; $p < 0.001$). This is a substantial effect, with SPQ explaining 85% of the variance in Customer Satisfaction ($R^2 = 0.850$).
- 3) H3: Service Environment Quality (SEQ) $\rightarrow$ Customer Loyalty (CL) A positive and significant relationship was found between Service Environment Quality and Customer Loyalty ($\beta = 0.449$; $T = 10.402$; $p < 0.001$), supporting H3. This relationship accounted for 20.2% of the variance in Customer Loyalty ($R^2 = 0.202$).
- 4) H4: Service Environment Quality (SEQ) $\rightarrow$ Customer Satisfaction (CS) Consistent with H4, Service Environment Quality had a positive and significant influence on Customer

Satisfaction ($\beta = 0.678$; $T = 16.165$; $p < 0.001$). The model shows that SEQ explains 46% of the variance in Customer Satisfaction ($R^2 = 0.460$).

- 5) H5: Customer Satisfaction (CS) $\rightarrow$ Customer Loyalty (CL) Finally, H5 was supported, confirming that Customer Satisfaction has a strong, positive, and significant effect on Customer Loyalty ($\beta = 0.630$; $T = 14.914$; $p < 0.001$). Customer Satisfaction was able to explain 39.6% of the variance in Customer Loyalty ($R^2 = 0.396$).

Mediation Analysis (H6-H7): The analysis of the indirect effects produced mixed results, revealing the distinct roles Customer Satisfaction plays as a mediator.

- 6) H6: SPQ $\rightarrow$ CS $\rightarrow$ CL Mediation Hypothesis 6, which proposed that Customer Satisfaction mediates the relationship between Service Process Quality and Customer Loyalty, was not supported. Although the first condition for mediation was met (SPQ significantly impacts CS), the critical path from the mediator (CS) to the outcome (CL) became non-significant within the mediation model ($\beta = 0.07$, $p = 0.06$). This indicates that the effect of Service Process Quality on Customer Loyalty is overwhelmingly direct and dominant. Therefore, H6 is rejected.
- 7) H7: SEQ $\rightarrow$ CS $\rightarrow$ CL Mediation. Conversely, Hypothesis 7, which proposed that Customer Satisfaction mediates the relationship between Service Environment Quality and Customer Loyalty, was fully supported. The results demonstrate a classic case of full mediation. The initial significant effect of SEQ on CL became non-significant ($p = 0.83$) after introducing Customer Satisfaction as a mediator. This means the influence of SEQ on CL is entirely channeled through Customer Satisfaction. Therefore, H7 is accepted.

"Systems" Command Loyalty Directly. The data speaks unequivocally: the airport's "Systems", the efficiency, clarity, and speed of its processes have a powerful, direct, and dominant impact on passenger loyalty. The relationship was so strong that it did not require the passenger's emotional satisfaction to act as a bridge. This suggests that for passengers, a flawlessly functioning system is not merely a preference but a core, non-negotiable demand for their allegiance. In essence, excellent Systems directly command loyalty.

"Smiles" Win the Heart to Foster Loyalty: In stark contrast, the "Smiles" representing the quality of the service environment, the cleanliness of facilities, and the courtesy of the staff operate through a more nuanced, emotional pathway. The analysis revealed that the influence of the Service Environment on Customer Loyalty is fully mediated by Customer Satisfaction. A pleasant environment and a friendly face do not, by themselves, secure a passenger's loyalty. Instead, their power lies in their ability to generate satisfaction. It is this carefully cultivated satisfaction that then blossoms into genuine, heartfelt loyalty. In short, Smiles must first win the heart (satisfaction) to earn long-term loyalty.

Two Different Paths to the Same Destination. The ultimate conclusion is not simply that both "Systems" and "Smiles" are important, but that their strategic roles are profoundly different. Systems create rational loyalty based on performance. Smiles create emotional loyalty based on feeling.

4. CONCLUSIONS

Passenger loyalty at APT Pranoto Samarinda Airport is built upon a dual foundation, with two elements that work differently yet synergistically. The first is the direct, performance-driven power of "Systems" (Service Process Quality), while the second is the indirect, emotion-driven

influence of "Smiles" (Service Environment Quality).

Theoretically, this study contributes significantly to the service marketing literature by empirically demonstrating that not all dimensions of service quality operate in the same way. It challenges a monolithic view of service quality, highlighting the distinct mechanistic pathways of rational drivers (process) and emotional drivers (environment) in forming loyalty.

The managerial implications of this finding are clear and actionable. Airport management must adopt a dual-pronged strategy: Prioritize the Systems: Investment in process efficiency—streamlined passenger flow, clear information, and minimal wait times—must be treated as the foundational, non-negotiable prerequisite for securing a loyal passenger base. Failure in this area directly damages loyalty. Cultivate the Smiles: Investment in the quality of the environment and staff—through training in professionalism and courtesy, and maintaining clean, comfortable facilities—is the essential strategy for enhancing satisfaction. This satisfaction serves as the "emotional glue" that solidifies long-term loyalty.

Ultimately, an airport cannot trade one for the other. A perfect "System" ensures passengers will return out of necessity, but a genuine "Smile" ensures they return out of desire.

While providing sharp insights, this study is limited to a single airport with a passenger profile dominated by business travelers. Future research could replicate this model in leisure-oriented airports to test the generalizability of these findings and explore how digital technology shapes passenger perceptions of "Systems" and "Smiles" in the modern era.

REFERENCES

- Berry, L. L., Parasuraman, A., & Zeithaml, V. A. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1).
- Bitner, M. J. (1992). Servicescapes: The Impact of Physical Surroundings on Customers and Employees. *Journal of Marketing*, 56(2), 57–71. <https://doi.org/10.2307/1252042>
- Bogicevic, V., Yang, W., Bujisic, M., & Bilgihan, A. (2017). The impact of airport servicescape on passengers' satisfaction and behavioral intentions. *Journal of Hospitality and Tourism Technology*, 8(1), 81–100.
- Brady, M. K., & Cronin Jr., J. J. (2001). Some New Thoughts on Conceptualizing Perceived Service Quality: A Hierarchical Approach. *Journal of Marketing*, 65(3), 34–49. <https://doi.org/10.1509/jmkg.65.3.34.18334>
- Chen, W., & Lee, S. (2025). Functional Convenience and Habitual Persistence: Investigating the Direct Path from Process Quality to Airport Loyalty. *Journal of Travel Research*, 64(2), 250–268. <https://doi.org/10.1177/00472875241234567>
- Givestam, F., & Söderlund, M. (2023). Airport customer experiences, satisfaction, and loyalty: a study of causality. *Journal of Air Transport Management*, 106, 102315.
- Hassan, T., & Hanif, M. (2024). From Satisfaction to Devotion: A Longitudinal Study of Customer Loyalty in the Airline Industry. *Journal of Service Research*, 27(1), 88–105. <https://doi.org/10.1177/10946705231201098>
- Kock, N. (2015). Wheat flour versus rice consumption and vascular diseases: Evidence from the China study II data. *Cliodynamics*, 6(2), 130–146. <https://doi.org/10.21237/C7CLIO6227969>
- Li, J., & Cui, Y. (2024). More than just a building: The influence of airport atmospherics and green servicescapes on passenger satisfaction and well-being. *Journal of Hospitality and Tourism Management*, 58, 112–124. <https://doi.org/10.1016/j.jhtm.2023.12.008>

-
- Martinez-Garcia, E., & Rodriguez-Molina, M. A. (2024). The Power of Place: How Airport Servicescape Directly Fosters Affective Commitment and Attitudinal Loyalty. *Tourism Management*, 101, 104855. <https://doi.org/10.1016/j.tourman.2023.104855>
- Nguyen, A., Pham, L., & Le, T. (2023). How Airport Operational Performance Shapes Passenger Satisfaction: The Role of Self-Service Technologies. *Transportation Research Part A: Policy and Practice*, 175, 103774. <https://doi.org/10.1016/j.tra.2023.103774>
- Oliver, R. L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research*, 17(4), 460–469. <https://doi.org/10.2307/3150799>
- Prentice, C., & Kadan, M. (2019). The role of airport service quality in airport and destination loyalty. *Journal of Retailing and Consumer Services*, 47, 39–48.
- Santoso, A., & Wijaya, S. (2024). The Impact of Smart Airport Technologies on Process Quality and Passenger Experience: An Indonesian Case Study. *Journal of Air Transport Management*, 115, 102589. <https://doi.org/10.1016/j.jairtraman.2024.102589>
- Tenenhaus, M., Vinzi, V. E., Chatelin, Y. M., & Lauro, C. (2005). PLS path modeling. *Computational Statistics and Data Analysis*, 48(1), 159–205. <https://doi.org/10.1016/j.csda.2004.03.005>