The Influence Of The 7P Strategy On Passenger Satisfaction And Loyalty At Terminal 3 Soekarno-Hatta Airport: An Operations Management Approach

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Abstract.

The COVID-19 pandemic highlighted the dependence of aeronautical revenue on external factors, making it crucial to increase non-aeronautical revenue. Major global airports like Changi and Incheon have achieved this revenue balance, but Indonesia's five largest airports, including Soekarno-Hatta and I Gusti Ngurah Rai, have not. Balanced non-aeronautical revenue can cover investment and promotional costs without relying on aeronautical income. Soekarno-Hatta, as a major hub, still has limited tenants, and retail and F&B revenues in Terminal 3 have significantly declined. To address this issue, reducing passenger queue times through digitalization and improving airport facilities has become a primary focus.This research uses 400 questionnaires analyzed with structural equation modeling (SEM) using SmartPLS 4.0 software. The focus is on identifying the influence of the 7P—covering product (tenant variety), price, promotion, place, people (service quality), process (self check-in and immigration autogates), and physical evidence (cleanliness and terminal design)—on customer satisfaction and loyalty in Soekarno-Hatta's Terminal 3. Digitalization, such as self check-in and immigration autogates, is expected to reduce queue times, providing passengers with more time to shop and thus increasing non-aeronautical revenue. This study aims to find the most significant factors affecting customer satisfaction and customer loyalty at the airport. The results indicate that product, process and physical evidence have a positive and significant impact on both customer satisfaction and customer loyalty.

Keywords: *7P, kepuasan pelanggan and customer loyalty.*

I. INTRODUCTION

The COVID-19 pandemic has made us realize that aeronautical revenue is highly dependent on external factors, highlighting the importance of increasing non-aeronautical revenue until its proportion equals that of aeronautical revenue. Non-aeronautical revenue can help cover investment and promotional costs without relying on aeronautical revenue [1]. Major global airports like Changi, Incheon, Kuala Lumpur, and Zurich have already achieved this balance, but Indonesia's five largest airports—Soekarno-Hatta (Jakarta), I Gusti Ngurah Rai (Bali), Juanda (Surabaya), Sultan Hasanuddin (Makassar), and Kualanamu (Medan)—have yet to reach such a proportionate balance.Global major airports tend to implement the "airport in the mall" concept, offering a wide range of tenants similar to shopping malls. I Gusti Ngurah Rai Airport in Bali already has a comprehensive set of tenants, including branded goods and well-known F&B outlets, while Soekarno-Hatta in Jakarta still lacks a complete variety of tenants. The airports in Surabaya, Makassar, and Medan have even fewer tenants, with mostly lesser-known local brands. At the end of 2021 and early 2022, Terminal 3 at Soekarno-Hatta experienced a retail and F&B revenue drop of more than 20% per month, posing a significant issue for the airport.

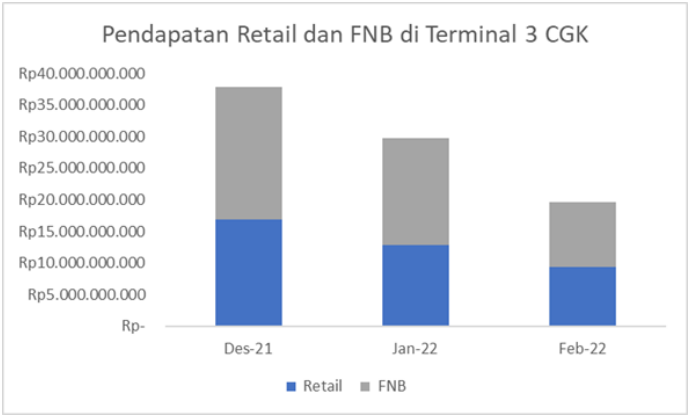


Fig 2. Retail and F&B Revenue at Terminal 3 over 3 months.

As a primary hub, Soekarno-Hatta should have non-aeronautical revenue balanced by diverse and appealing tenants. However, the reality is that tenants in Terminal 3 remain limited. Other regional airports have fewer tenants and less recognized brands, with small airports only offering profitable minimarts. This indicates that non-aeronautical business development has not been maximized and requires further analysis.To increase non-aeronautical revenue, it is essential to reduce passenger queuing time through a digital ecosystem in airports. Digitalization plays a key role in this, with facilities such as self-check-in kiosks and immigration autogates. Self-check-in is a touchscreen digital kiosk where passengers can print their boarding passes without having to queue at counters, while immigration autogates use biometric technology to verify passports, reducing waiting time at immigration.

This technology is expected to reduce passenger queue time, giving them more time to shop before boarding, thereby increasing the potential for transactions in airports. Additionally, Terminal 3 has undergone renovations to improve customer satisfaction by enhancing facilities and comfort.The analysis will also cover operational factors of airport services within the 7P: Place, Promotion, Product, Price, Process, Physical Evidence, and People. Soekarno-Hatta Airport, particularly Terminal 3, will be analyzed regarding non-aeronautical business issues (F&B and retail). Customer satisfaction is crucial in airport business, as customer loyalty encourages spending in the airport. The marketing mix factors include: a) Product such as airport facilities such as seating, restrooms, Wi-Fi, and tenant variety; b) Price such as parking fees, food and beverage prices; c) Promotion such as special offers from airport loyalty programs and flight ticket promotions; d) Place such as departure gate and check-in locations; e) People such as services provided by airport staff; f) Process such as self-check-in, immigration autogates, and security screening; g) Physical Evidence such as cleanliness of the terminal and airport interior design.

II. METHODS

This study investigates the influence of the 7P on customer satisfaction and loyalty by using descriptive quantitative methode. Descriptive research aims to illustrate phenomena, while verifiable research test hypotheses based on prior literature. The focus of this research is passengers departing from Terminal 3 of Soekarno-Hatta International Airport selected due to a significant drop in non-aeronautical income over the past two months. The population in this study includes all passengers in Terminal 3. Sample was selected using non-probability sampling technique, this study uses two methods to determine sample size: Slovin's formula (1960) and the Krejcie and Morgan table (1970), the sample size is 400 respondents.

Data Collection and Sources

This research use both primary and secondary data. Data collection methods include:

a. Questionnaires – written sets of question distributed to gather responses from individuals who have traveled through Terminal 3
b. Observation – direct observation of the research subject, particularly during pre-research phases to capture on-site phenomena
c. Literature review – to collect foundational concepts, theories, and secondary data from journals, books, reports, and previous studies

Validity and Reliability Tests

Validity test is a test to know whether a measurement tool is considered valid for its intended purpose. Construct validity is assessed using SmartPLS 4.0 software, via convergent and discriminant validity. Convergent validity examines the loading factor for each indicator, where values greater than 0.5 are valid. Discriminant validity compares the square root of average variance extracted (AVE) for each construct with the correlation between constructs, ensuring sufficient discriminant validity when the AVE square root is greater than the correlation values.Reliability test refers to the internal consistency and stability of the measurement scale. Using Partial Least Square (PLS) software, reliability is confirmed if the composite reliability output exceeds 0.7.

Data Analysis Techniques

The data analysis techniques utilize descriptive statistical analytics proposed to analyze collected data and identify characteristics of respondents and their responses concerning customer satisfaction and loyalty at Terminal 3. The answer are scored in Likert scale 1 (strongly disagree) to 5 (strongly agree).

Hypothesis Testing Design

Hypotheses test the effect between latent variables. The t-test is used to measure the individual effect of independent variables on the dependent variable. Hypotheses are accepted if significance is <0.05, and the regression coefficient aligns with the hypothesis. The t-test criteria are if Ho: $\gamma 1 = 0$; no significant partial effect of each variable and if H1: $\gamma 1 \neq 0$; a significant partial effect of each variable.Additionally, the Sobel test measures the mediating effect of variables. Baron and Kenny (1986) state that a variable is considered intervening if it influences the relationship between independent and dependent variables.

Research Hypotheses:

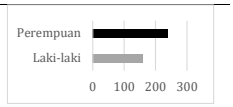
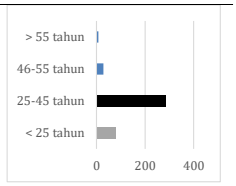
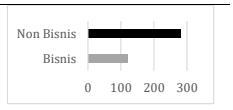
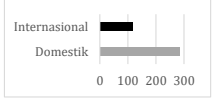
H1: Product affects customer satisfaction.
H2: Price affects customer satisfaction.
H3: Place affects customer satisfaction.
H4: Promotion affects customer satisfaction.
H5: People affect customer satisfaction.
H6: Process affects customer satisfaction.
H7: Physical evidence affects customer satisfaction.
H8: Customer satisfaction affects customer loyalty.

III. RESULT AND DISCUSSION

Descriptive Statistic

This section presents a detailed analysis of the primary data obtained from the online distribution of questionnaries. The respondents were individuals who had traveled through Terminal 3 of Soekarno-Hatta International Airport between 2022 and 2024. In this study, repondents were categorized into four distinct demographic characteristics such as flight purposes and age, flight purpose and type of flight, flight purpose and gender, and flight purpose and age.

Table 1. Research responses.

No.	Karakteristik	Karakteristik	Frekuensi	(%)	Grafik
1.	Jenis kelamin	Laki-Laki	160	40%	
		Perempuan	240	60%	
		Jumlah	400	100%	
2.	Usia	< 25 tahun	78	19,5%	
		25-45 tahun	286	71,5%	
		46-55 tahun	28	7%	
		> 55 tahun	8	2%	
		Jumlah	400	100%	
3.	Tujuan terbang	Bisnis	121	30,25%	
		Non Bisnis	279	69,75%	
		Jumlah	400	100%	
4.	Jenis penerbangan	Domestik	284	71%	
		Internasional	116	29%	
		Jumlah	400	100%	

The demographic characteristics and flight patterns of the respondents are depicted in the tables. The majority of respondents are female (60%), and most fall within the productive age group of 25-45 years (71.5%). A larger portion of the respondents travel for non-business purposes (69.75%), with the majority choosing domestic flights (71%). In terms of travel purposes and age, non-business trips are more common across all age groups, with 69.5% of respondents aged 25-45 engaging in non-business travel. A similar trend is observed for business travel, where the majority also fall within the 25-45 age group. Domestic flights

dominate both business and non-business travel, particularly for non-business purposes. Gender distribution shows that men slightly dominate business trips (55.4%), while women overwhelmingly dominate non-business trips (66.7%). Overall, women are more likely to travel, particularly for non-business purposes. Age-wise, those aged 25-45 years are the most frequent flyers for both domestic and international flights. The age group under 25 is significant for domestic flights, while those over 55 are the least frequent travelers across all categories.

Table 2. Descriptive Data.

Variabel	Indikator	Mean	Median	Standard deviation
Product	**x11**	4.522	5.000	0.587
	x12	4.490	5.000	0.587
	x13	4.457	5.000	0.598
Price	**x21**	4.107	4.000	0.849
	x22	4.225	4.000	0.774
Place	**x31**	4.357	4.000	0.721
	x32	4.348	4.000	0.712
	x33	4.372	4.000	0.699
	x34	4.330	4.000	0.686
Promotion	**x41**	4.308	4.000	0.744
	x42	4.195	4.000	0.801
People	**x51**	4.447	5.000	0.642
	x52	4.492	5.000	0.632
Process	**x61**	4.348	4.000	0.698
	x62	4.513	5.000	0.608
	x63	4.455	5.000	0.627
	x64	4.375	4.000	0.655
Physical evidence	**x71**	4.442	5.000	0.646
	x72	4.402	5.000	0.667
	x73	4.430	5.000	0.633
	x74	4.490	5.000	0.624
	x75	4.435	5.000	0.649
	x76	4.397	4.000	0.640
Customer satisfaction	**y11**	4.543	5.000	0.577
	y12	4.480	5.000	0.612
Customer loyalty	**z11**	4.540	5.000	0.603
	z12	4.322	4.000	0.754

Table 2 summarizes the statistical analysis of several indicators related to passenger satisfaction and loyalty at Terminal 3 Soekarno-Hatta Airport. The product received high praise, with average ratings between 4.457 and 4.522 and a median of 5.000, indicating strong approval among respondents. In contrast, the price aspect showed lower average ratings (4.107 to 4.225) and a median of 4.000, suggesting that improvements are needed. Other areas like place, promotion, and process also demonstrated positive evaluations, though some respondents expressed concerns about the effectiveness of promotions and the pricing strategy.Overall, customer satisfaction was notably high, with averages ranging from 4.480 to 4.543 and a consistent median of 5.000. However, customer loyalty presented mixed results, with some indicators reflecting lower levels of commitment. This analysis indicates that while most aspects are well-received, there is significant opportunity for improvement in pricing and promotional strategies to enhance customer perception and foster greater loyalty.

SEM Analysis

In this study, the research results will be analyzed using the Partial Least Square Structural Equation Modeling (PLS-SEM) method through the SmartPLS4 software. PLS-SEM is an approach used to model complex relationship between latent variable that cannot be directly measured and is particularly suitable for goal-oriented predictive models, especially when the sample size is small, the data is non-normal or the model has a complex structure [2]. The SEM PLS analysis is conducted through two analyses: the measurement model analysis (outer model) and the structural model analysis (inner model).

Outer Model Measurement

The first step in hypothesis testsing using SmartPLS 4 is to assess the validity and reliability of the measurement model. Convergent validity is tested by examining the Average Variance Extracted (AVE) and outer loadings, while discriminant validity is tested using the Fornell-Larcker Criterion or Heteroit-Monotrait

Ratio (HTMT). Construct reliability is measured through Composite Reliability (CR) and Cronbach's Alpha [3]. The validity test determines whether the questionnaire is valid, providing insight into the instrument's ability to measure what it is supposed to [4]. This research used SmartPLS 4 to conduct three types of validity tests: convergent validity, discriminant validity, and collinearity testing for the outer model. The convergent validity test confirms that each indicator adequately explains its latent variable, in [2] state that an outer loading value of 0.5 or higher is considered valid.

Fig 3. Output result of SEM-PLS model.

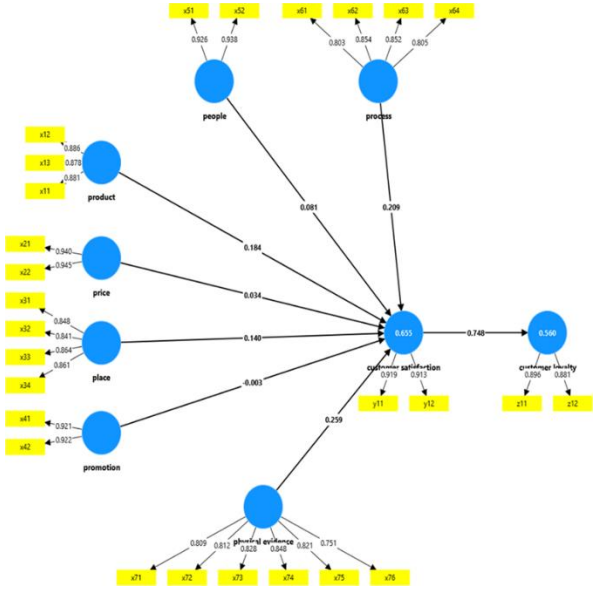


Figure 3 shows the SEM-PLS model output, with blue circles representing the independent variables (X1, X2, etc.), connected to yellow boxes, which are indicators of each variable. Blue X circles points toward intervening variable (Y), and intervening variable pointing toward the dependent variable (Z). To determine convergent validity, the outer loadings are checked. All outer loadings exceed 0.5, indicating that all variables meet convergent validity.

Table 3. Cronbach alpha, composite reliability, and average variance extracted value.

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Customer loyalty	0.734	0.736	0.882	0.790
Customer satisfaction	0.808	0.809	0.912	0.839
People	0.849	0.853	0.930	0.869
Physical evidence	0.896	0.899	0.921	0.659
Place	0.876	0.877	0.915	0.729
Price	0.875	0.876	0.941	0.888
Process	0.848	0.848	0.898	0.687
Product	0.857	0.857	0.913	0.778
Promotion	0.821	0.821	0.918	0.848

Table 4. Fornell Larcker Criterion.

	customer loyalty	customer satisfaction	people	physical evidence	place	price	process	product	promotion
customer loyalty	0.889								
customer satisfaction	0.748	0.916							
people	0.610	0.651	0.932						
physical evidence	0.710	0.753	0.703	0.812					
place	0.696	0.700	0.645	0.741	0.854				
price	0.586	0.611	0.562	0.677	0.709	0.943			
process	0.738	0.752	0.733	0.815	0.771	0.650	0.829		
product	0.709	0.725	0.688	0.769	0.720	0.667	0.785	0.882	
promotion	0.644	0.638	0.604	0.692	0.764	0.684	0.715	0.725	0.921

Table 5. Variance Inflation Factor (VIF) value.

	VIF
X1.2	2,123
X1.3	1,946
X2.1	2,787
X2.2	2,787
X3.1	1,840
X3.2	1,996
X3.3	2,054
X3.4	2,071
X4.1	1,850
X4.2	1,850
X5.1	2,312
X5.2	2,312
X6.1	1,585
X6.2	1,992
X6.3	2,028
X6.4	1,838
X7.1	1,766
X7.2	1,869
X7.3	2,488
X7.4	2,320
X7.5	1,777
X7.6	1,600
Y1.1	1,662
Y1.2	1,662
Z1.1	1,448
Z1.2	1,448
X1.1	2,040

Table 3 presents values for Cronbach's Alpha, Composite Reliability (rho_a), Composite Reliability (rho_c), and Average Variance Extracted (AVE), where all values meet the required thresholds (AVE > 0.5). Next, discriminant validity was assessed by ensuring the square root of the AVE for each variable exceeded the correlation with other variables, as shown in Table 4 (Fornell-Larcker Criterion). All variables met discriminant validity. Collinearity testing was also conducted using the Variance Inflation Factor (VIF), where no VIF values exceeded 5, indicating no collinearity issues in the model.The reliability test was performed to assess the consistency of the measurement instrument. According to [5], Cronbach's Alpha should be ≥ 0.70 to be considered reliable. All variables met this criterion, with values ranging from 0.715 to 0.889. Additionally, Rho_A values exceeded the 0.7 threshold [6], and Rho_C values were above 0.6 [7] [8], confirming the reliability of all variables. Therefore, the model is considered both valid and reliable.

Inner Model Measurement

After the measurement model was validated for reliability and validity, the structural model was tested to assess the relationships between latent constructs. Path coefficients were analyzed to determine the strength of the relationships, while t-statistics and p-values were used to evaluate their statistical significance. Aditionally, the R-Square (R^2) value was applied to measure the predictive power of the model [9].

Table 6. R-square and R-square adjusted value.

	R-square	R-square adjusted
customer loyalty	0.560	0.559
customer satisfaction	0.655	0.649

Table 6 shows that the R-square value for customer satisfaction is 0.655, indicating that the path from all X variables to the Y variable can be explained by 65.5% (good). Meanwhile, the R-square value for customer loyalty is 0.560, meaning that the path from all X variables to the Z variable can be explained by 56% (good). Given that both R-square values are satisfactory, we can proceed with hypothesis testing in the following section.The bootstrapping technique was utilized to estimate the sample distribution through resampling, generating t-statistics and p-values for hypothesis testing. A p-value < 0.05 indicates a significant relationship, rejecting the null hypothesis that there is no relationship between latent variables [10].Path analysis was employed to examine direct and indirect relationships between independent variables (X1, X2, X3…X7) and the dependent variables (Y1), as well as the relationship between Y1 and Z1. The Partial Least Square Structural Equation Modeling (SEM-PLS) approach was used with SmartPLS 4 software. The hypothesis testing results are presented in Table 4 below.

Table 7. Path Coefficient Test Result.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
customer satisfaction -> customer loyalty	0.748	0.749	0.032	23.411	0.000
people -> customer satisfaction	0.081	0.078	0.060	1.352	0.177
physical evidence -> customer satisfaction	0.259	0.269	0.078	3.306	0.001
place -> customer satisfaction	0.140	0.138	0.082	1.707	0.089
price -> customer satisfaction	0.034	0.036	0.058	0.588	0.557
process -> customer satisfaction	0.209	0.205	0.065	3.230	0.001
product -> customer satisfaction	0.184	0.181	0.065	2.822	0.005
promotion -> customer satisfaction	-0.003	-0.004	0.057	0.059	0.953

Table 7 presents the results of the path coefficient model test, which includes p-values for various relationships between factors in the 7P model and customer satisfaction. A p-value below 0.05 indicates a significant relationship, while a value above 0.05 suggests no significant relationship. In this study, Physical Evidence and Process both showed strong positive effects on customer satisfaction, each with a p-value of 0.001. Product also demonstrated a significant impact with a p-value of 0.005, highlighting its importance in meeting customer expectations.Conversely, the relationship between People and customer satisfaction had a p-value of 0.177, indicating insufficient evidence to reject the null hypothesis. Place's p-value of 0.089 was close to significance but still not accepted, while Price and Promotion showed even higher p-values of 0.557 and 0.953, respectively, suggesting no significant influence on customer satisfaction. Overall, only Physical Evidence, Process, and Product were found to have significant relationships with customer satisfaction among the seven hypotheses tested.

Table 8. Indirect Effect Path Coefficient Test Results.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
X1 -> Y1 -> Z1	0,089	0,086	0,046	1,945	0,052
X2 -> Y1 -> Z1	0,067	0,068	0,035	1,925	0,054
X3 -> Y1 -> Z1	0,039	0,041	0,043	0,910	0,363
X4 -> Y1 -> Z1	-0,020	-0,022	0,039	0,520	0,603
X5 -> Y1 -> Z1	0,029	0,032	0,041	0,721	0,471
X6 -> Y1 -> Z1	0,182	0,183	0,048	3,785	0,000
X7 -> Y1 -> Z1	0,276	0,275	0,050	5,504	0,000

In addition to the direct effects, indirect effects were also examined through intervening analysis. In this analysis, we examined the relationships between various factors in the 7P model and customer loyalty, focusing on those with p-values below 0.05, indicating statistical significance. The results showed that Physical Evidence has a p-value of 0.001, demonstrating that the physical aspects of service or product environments significantly influence customer loyalty. Customers tend to feel more loyal when they are impressed by the quality of the surroundings, as positive physical evidence enhances their overall experience and trust, thereby fostering loyalty.Additionally, Process revealed a p-value of 0.002, indicating that efficient and effective service processes significantly impact customer loyalty. A smooth and seamless experience encourages customers to return and choose the same services or products in the future. Product also had a notable p-value of 0.006, signifying a significant relationship between product quality and customer loyalty. When products meet or exceed customer expectations, loyalty towards the brand increases. Overall, the analysis concluded that Physical Evidence, Process, and Product all have significant effects on customer loyalty, as evidenced by their p-values below 0.05.

IV. CONCLUSION

Based on the research findings and analysis presented in Chapter IV of this thesis, several conclusions can be drawn. First, Price, Place, Promotion, and People do not have a significant impact on passenger Customer Satisfaction at Terminal 3 Soekarno-Hatta Airport. In contrast, Customer Satisfaction is shown to positively and significantly influence Customer Loyalty. Additionally, Product, Process, and

Physical Evidence all positively impact Customer Satisfaction.Moreover, Product, Process, and Physical Evidence have a positive indirect effect on Customer Loyalty. Overall, while Product, Process, and Physical Evidence demonstrate a highly significant effect on Customer Loyalty, the factors of Price, Place, Promotion, and People do not significantly influence Customer Loyalty. These findings highlight the critical role of product quality, service processes, and physical attributes in fostering customer satisfaction and loyalty.

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