

# Analysis of Customer Satisfaction Index, Importance Performance Index, and Binary Logistic Regression Model Approach to Health Services at Campus C Health Services Center (PLK), Airlangga University, Surabaya

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## Abstract:

Health services are an important factor in improving the degree of health and welfare. Service quality is an effort to meet the expectations and needs of customers. Airlangga University Health Service Center (PLK) is one of several Primary Clinics. In practice, there are health service problems at PLK that need to be evaluated in order to create success in service, one of which is with a community satisfaction survey. The research objectives were to analyze the level of student satisfaction, what services need to be improved and maintained, and to model student satisfaction with health services at the Health Service Center (PLK) Campus C, Airlangga University, Surabaya. The result of the calculation of the Customer Satisfaction Index (CSI) is 66.03%, which means that students are satisfied with the overall health services. Based on the results of Importance Performance Analysis (IPA) it can be concluded that PLK must maintain performance on the variables clean place ( $X_1$ ), neat employees ( $X_2$ ), easy requirements ( $X_8$ ), responsive employees ( $X_9$ ), secured documents ( $X_{15}$ ), Transparency ( $X_{16}$ ), fair service ( $X_{19}$ ) and improve performance on variable wide parking ( $X_4$ ), clear information ( $X_5$ ), easy procedures ( $X_7$ ), employees understand service flow ( $X_{12}$ ), troubleshoot ( $X_{14}$ ), good service explanation ( $X_{17}$ ). The binary logistic regression model can analyze the relationship between predictor variables and student satisfaction with health services as a whole. The model fit test shows that the binary logistic regression model is appropriate. The result of the classification accuracy of quadrant I IPA data is 98% and quadrant II IPA data is 96%.

**Keywords** —PLK Campus C Airlangga University, Servis Center Customer Satisfaction Index (CSI), Importance Performance Analysis (IPA), Binary Logistic Regression Model.

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## I. INTRODUCTION

Health services are an important factor in improving the degree of health and welfare as

stated in Article 19 of Law no. 36 of 2009 namely, "Everyone has the right to obtain health services and the government is responsible for quality, safe, efficient and affordable health efforts for the entire

community" (Kemenkes, 2009) [6]. Improving the quality of services must be carried out jointly, integrated, programmed, directed and consistent with due regard to the needs and expectations of the community so that they can be provided in an appropriate, fast, inexpensive, open, simple and easy manner (Ningtyas, 2017) [7]. Good health services must fulfill five main requirements including, available and continuous, acceptable and appropriate, accessible, affordable, and quality (Azwar,1996) [2].

The definition of service quality is centered on efforts to fulfill the needs of customer desires and the accuracy of their delivery to customer expectations (Fandy Tjiptono, 2004) [3]. PP 47 of 2016 explains that health service facilities include independent health practice places, health centers, clinics, hospitals, pharmacies, blood transfusion units, optics, traditional medicine, and health laboratories (Peraturan Pemerintah, 2016) [9]. There are three different service levels for health care facilities: first level, second level, and third level. The first level health service facilities are basic health administration such as health centers, general practitioners, dentists in private practice, and primary clinics. Airlangga University Health Service Center (PLK) is one of several Primary Clinics.

One of the Pratama Clinic health service providers at Airlangga University in Surabaya that has collaborated with BPJS Health is the Health Service Center (PLK). Airlangga University Health Service Center (PLK) serves BPJS Health participants and also non-BPJS Health participant patients (Unair students participating in Unair health insurance and the general public). The large number of service processes has made the Airlangga University Health Service Center (PLK) has 4 types of administrators namely general administration, management administration, general poly and dental poly. This is in line with the research that was conducted by A. Lukman tahun 2020, the problem that occurs is the lack of service information, namely that most sick patients visit, even though at PLK there are also health services

for visiting healthy patients that can be utilized by patients, namely healthy exercise, individual and group health counseling, and children's health checks (Lukman, 2019) [8]. These problems need to be evaluated in order to create a success in the service. The success obtained from a health service in improving the quality of service is closely related to patient satisfaction. The creation of good and quality health services can be done with a community satisfaction survey.

The community satisfaction survey is a comprehensive activity to measure the level of community satisfaction with the quality of services provided by health service providers. Researchers used the Customer Satisfaction Index (CSI), Importance Performance Analysis (IPA), and a binary logistic regression model approach. The Customer Satisfaction Index (CSI) is a complex estimate of the value of customer satisfaction by considering the estimated quality significance level. The CSI method has a deficiency in identifying the priority attributes of the resulting attributes (Pranata, et al., 2019) [10]. Therefore, another alternative method is needed to overcome these deficiencies, namely Importance Performance Analysis (IPA). The Importance Performance Analysis (IPA) method has the advantage of showing product or service attributes that need to be increased or decreased which are presented in the form of quadrants with their respective categories which are relatively easy to understand (Angraini et al, 2015) [1]. In addition, there is a binary logistic regression analysis which is expected to be able to analyze the relationship between variables that influence student satisfaction with health services at the Health Service Center (PLK) Campus C, Airlangga University, Surabaya so that it can provide a classification based on overall satisfaction or dissatisfaction with health services at the Health Service Center (PLK), Campus C, Airlangga University, Surabaya.

Based on the description of this background, research will be conducted on student satisfaction with health services at the Health Service Center (PLK) Campus C, Airlangga University, Surabaya.

Research on student satisfaction with health services at the Health Service Center (PLK) Campus C, Airlangga University, Surabaya has never been carried out so that it can be used as a reference for improving, increasing, and developing the quality of service at these institutions.

**II. RESEARCH METHODS**

The data source used in this study is primary data obtained by conducting a survey of students who examine and seek treatment at the Airlangga University Surabaya Health Service Center (PLK) from May to June 2023. The data collection technique in this study used a purposive sampling technique, namely selecting respondents with certain considerations and goals. In this study, the target population to be selected were all students from Campus C, Airlangga University, Surabaya. The samples taken were respondents who had special criteria, namely students on campus C who examined and received treatment at the Health Service Center (PLK) Universitas Airlangga Surabaya, namely 96 respondents. The research variable namely:

TABEL 1  
 Variable Respon (Y)

No	Variable	Information	Meaning
1	Y	Campus C Student Satisfaction with Health Services	0 = Not Satisfied 1 = Satisfied

TABEL 2  
 Variable Predictor (X)

No	Dimensions	Variable	Information
1	<i>(Tangible)</i>	(X <sub>1</sub> )	The service room is clean and tidy
2		(X <sub>2</sub> )	Polite and neat appearance of employees
3		(X <sub>3</sub> )	Adequate information center
4		(X <sub>4</sub> )	Spacious and

No	Dimensions	Variable	Information
			secure parking area
5	<i>(Reliability)</i>	(X <sub>5</sub> )	The ability of employees to provide information that is clear and easy to understand
6		(X <sub>6</sub> )	Employees are not discriminatory in serving the community
7		(X <sub>7</sub> )	Ease of service procedures
8		(X <sub>8</sub> )	Compliance with service requirements
9	<i>(Responsive)</i>	(X <sub>9</sub> )	Responsiveness of employees in responding to community needs and complaints
10		(X <sub>10</sub> )	The speed of employees in responding to consumer needs and complaints
11		(X <sub>11</sub> )	The accuracy of the implementation of the service time schedule
12		(X <sub>12</sub> )	Employees have good knowledge of service mechanisms
13	<i>(Assurance)</i>	(X <sub>13</sub> )	Clarity and certainty of employees in providing services
14		(X <sub>14</sub> )	Employees are able to overcome

No	Dimensions	Variable	Information
			complaints in the service process
15		( $X_{15}$ )	Community personal data documents as a requirement for the implementation of services are guaranteed security
16		( $X_{16}$ )	Transparency and accountability in providing services
17		( $X_{17}$ )	Employees are able to direct service users who do not understand the flow of services
18	(Empathy)	( $X_{18}$ )	Employees care about the problems faced by customers
19		( $X_{19}$ )	Justice gets service in the service process
20		( $X_{20}$ )	Employees appreciate if there are suggestions and criticisms from customers

The step of data analysis carried out are as follows:

1. Describe and analyze the opinions of respondents from the answers selected on the questionnaire regarding students satisfaction with health services at the Airlangga University Health Service Center (PLK) Surabaya.
2. Analyzing the level of students satisfaction with health services at the Airlangga University Surabaya Health Service Center (PLK)

based on the Customer Satisfaction Index (CSI) by conducting validity tests, conducting reliability tests, determining the Mean Important Score (MIS), calculating Weighted Factors (WF), determining the Mean Satisfaction Score (MSS), calculate the Weight Score (WS), and calculate the Customer Satisfaction Index (CSI).

3. Analyzing the attributes of students satisfaction with health services at the Airlangga University Surabaya Health Service Center (PLK) that need to be improved and maintained using Importance Performance Analysis (IPA) by calculating the average per attribute from the reality column ( $X_{ij}$ ) and the expectation column ( $Y_{ij}$ ) so that we get ( $\bar{X}_I$ ) and ( $\bar{Y}_I$ ), calculate the average ( $\bar{X}_I$ ) and ( $\bar{Y}_I$ ) to get the limits of ( $\bar{X}$ ) dan ( $\bar{Y}$ ), make a Cartesian diagram plot, and make a Cartesian diagram interpretation according to the variables entered in quadrants I, II, III, and IV so that conclusions can be drawn.
4. Modeling students satisfaction with health services at the Airlangga University Health Service Center (PLK) Surabaya University by testing the parameters of the binary logistic regression model simultaneously and individually, estimating the binary logistic regression model, testing the suitability of the binary logistic regression model, and calculating the APPER of the binary logistic regression model.

### III. RESULTS AND DISCUSSION

#### A. Validitas Test

All Validity test is used to measure the validity or validity of a questionnaire. A questionnaire is said to be valid if the questions on the questionnaire are able to reveal something that will be measured by the questionnaire (Ghozali, 2016) [4]. The hypothesis used in testing the validity as follows:

$H_0: \rho = 0$  (invalid attribute or question item)

$H_1: \rho \neq 0$  (valid attribute or question item)

The researcher used statistic application to analyze the validity test with a critical area, namely  $H_0$  was rejected if the  $p - value \leq \alpha = (0,05)$ . The validity test is applied to the expectation and reality data, each of which has 20 predictor variables (X) from 5 dimensions of service quality. The results of the validity test are as follows:

TABEL 3  
Validity Test on Expected Data

Variable	p-value	Decision	Conclus
$X_1$	0,001	Reject $H_0$	Valid
$X_2$	0,001	Reject $H_0$	Valid
$X_3$	0,000	Reject $H_0$	Valid
$X_4$	0,003	Reject $H_0$	Valid
$X_5$	0,000	Reject $H_0$	Valid
$X_6$	0,000	Reject $H_0$	Valid
$X_7$	0,001	Reject $H_0$	Valid
$X_8$	0,000	Reject $H_0$	Valid
$X_9$	0,001	Reject $H_0$	Valid
$X_{10}$	0,000	Reject $H_0$	Valid
$X_{11}$	0,001	Reject $H_0$	Valid
$X_{12}$	0,001	Reject $H_0$	Valid
$X_{13}$	0,000	Reject $H_0$	Valid
$X_{14}$	0,000	Reject $H_0$	Valid
$X_{15}$	0,000	Reject $H_0$	Valid
$X_{16}$	0,001	Reject $H_0$	Valid
$X_{17}$	0,001	Reject $H_0$	Valid
$X_{18}$	0,000	Reject $H_0$	Valid
$X_{19}$	0,001	Reject $H_0$	Valid
$X_{20}$	0,003	Reject $H_0$	Valid

Based on the results of the validity test on the expectation data, it was found that all question variables had a  $p - value \leq \alpha = (0,05)$  which resulted in a decision to reject  $H_0$  so that it can be concluded that all questions in the questionnaire can measure the same aspect, which means it is valid.

TABEL 4  
Validity Test on Real Data

Variable	p-value	Decision	Conclus
$X_1$	0,000	Reject $H_0$	Valid
$X_2$	0,003	Reject $H_0$	Valid
$X_3$	0,001	Reject $H_0$	Valid
$X_4$	0,002	Reject $H_0$	Valid
$X_5$	0,001	Reject $H_0$	Valid
$X_6$	0,000	Reject $H_0$	Valid
$X_7$	0,000	Reject $H_0$	Valid
$X_8$	0,000	Reject $H_0$	Valid
$X_9$	0,002	Reject $H_0$	Valid
$X_{10}$	0,001	Reject $H_0$	Valid
$X_{11}$	0,001	Reject $H_0$	Valid
$X_{12}$	0,000	Reject $H_0$	Valid
$X_{13}$	0,003	Reject $H_0$	Valid
$X_{14}$	0,002	Reject $H_0$	Valid
$X_{15}$	0,000	Reject $H_0$	Valid
$X_{16}$	0,001	Reject $H_0$	Valid
$X_{17}$	0,002	Reject $H_0$	Valid
$X_{18}$	0,001	Reject $H_0$	Valid
$X_{19}$	0,000	Reject $H_0$	Valid
$X_{20}$	0,001	Reject $H_0$	Valid

Based on the results of the validity test on the real data, it was found that all question variables had a  $p - value \leq \alpha = (0,05)$  which resulted in a decision to reject  $H_0$  so that it can be concluded that all questions in the questionnaire can measure the same aspect, which means it is valid.

**B. Reliability Test**

The reliability test is carried out to measure the extent to which a measuring instrument can be trusted or relied upon. High or low reliability is indicated by a number called the reliability coefficient. The results of the reliability test on the expectation and reality data are presented as follows:

TABEL 5  
Reliability Test on Expected Data

Value Cronbach's Alpha	Conclus
0,680	high reliability

Based on Table 3 it can be seen that the results of the analysis on the expectation data with the results of calculations using the high reliability



statisticaplication with a Cronbach's alpha value of 0.680 which means it has a value between 0,6 to 0,8.

TABEL 6  
Reliability Test on Real Data

Value Cronbach's Alpha	Concluss
0,611	high reliability

Based on Table 3 it can be seen that the results of the analysis on the expectation data with the results of calculations using the high reliability statisticaplication with a Cronbach's alpha value of 0.611 which means it has a value between 0,6 to 0,8.

C. Analysis of Customer Satisfaction Index (CSI)

Measurement of the Customer Satisfaction Index was carried out to determine the index of service user satisfaction and to be used as a reference for establishing a special strategy to maintain and increase student satisfaction with health services at the Health Service Center (PLK) Campus C, Airlangga University, Surabaya. The results of the CSI calculation are as follows:

TABEL 7  
Results of Customer Satisfaction Index (CSI)

Variable	Mean Importance Score (MIS <sub>j</sub> )	Weight Factors (WF <sub>j</sub> )	Mean Satisfaction Score (MSS <sub>j</sub> )	Weight Score (WS <sub>j</sub> )
X <sub>1</sub>	4,188	5,505	4,376	24,088
X <sub>2</sub>	4,080	5,362	4,135	22,175
X <sub>3</sub>	2,870	3,771	2,756	10,395
X <sub>4</sub>	4,320	5,677	2,395	13,595
X <sub>5</sub>	4,096	5,383	2,782	14,976
X <sub>6</sub>	2,817	3,702	2,609	9,659
X <sub>7</sub>	4,004	5,262	2,558	13,462
X <sub>8</sub>	4,251	5,587	4,276	23,889
X <sub>9</sub>	4,398	5,780	4,369	25,250
X <sub>10</sub>	2,808	3,691	2,480	9,154
X <sub>11</sub>	2,668	3,506	2,427	8,509
X <sub>12</sub>	4,228	5,557	2,377	13,208
X <sub>13</sub>	2,775	3,647	2,406	8,775
X <sub>14</sub>	4,216	5,540	2,597	14,387
X <sub>15</sub>	4,069	5,347	4,256	22,759
X <sub>16</sub>	4,366	5,737	4,093	23,481

Variable	Mean Importance Score (MIS <sub>j</sub> )	Weight Factors (WF <sub>j</sub> )	Mean Satisfaction Score (MSS <sub>j</sub> )	Weight Score (WS <sub>j</sub> )
X <sub>17</sub>	4,308	5,662	2,206	12,492
X <sub>18</sub>	4,005	5,264	3,933	20,704
X <sub>19</sub>	4,435	5,829	4,328	25,229
X <sub>20</sub>	4,216	5,540	2,522	13,977
Total	77,118		Total	330,168

$$\text{Value CSI} = \frac{330,168}{5} = 66,033$$

Based on Table 7, the results of the calculation of the CSI value obtained a value of 66,033%. This value is in the value interval "66-80" meaning that students are satisfied with the health services at the Health Service Center (PLK) Campus C, Airlangga University, Surabaya as a whole. Even though they have received a very good CSI score, the Health Service Center (PLK) Campus C, Airlangga University, Surabaya, needs to improve and maintain the quality of service at its institution.

D. Analysis of Importance Performance Analysis (IPA)

Importance Performance Analysis (IPA) is used to compare consumer judgments between importance and performance. The service quality dimensions used are the five service quality dimensions developed by Parasuraman et al (Tjiptiono and Chandra, 2011) [11]. Explanation of the position of the variable dimensions of Tangible can be explained as follows:

TABEL 8  
Position of Tangible Dimension Variables

Position	Variable	Information
Quadrant I	X <sub>1</sub>	The service room is clean and tidy
	X <sub>2</sub>	Polite and neat appearance of employees
Quadrant II	X <sub>4</sub>	Spacious and secure parking area
Quadrant III	X <sub>3</sub>	Adequate information center

Explanation of the position of the variable dimension of reliability can be explained as follows:

TABEL 9

Position of Reliability Dimension Variables

Position	Variable	Information
Quadrant I	$X_8$	Compliance with service requirements
Quadrant II	$X_5$	The ability of employees to provide information that is clear and easy to understand
	$X_7$	Ease of service procedures
Quadrant III	$X_6$	Employees are not discriminatory in serving the community

Explanation of the position of the responsive dimension variable can be explained as follows:

TABEL 10

Position of Responsive Dimension Variables

Position	Variable	Information
Quadrant I	$X_9$	Responsiveness of employees in responding to community needs and complaints
Quadrant II	$X_{12}$	Employees have good knowledge of service mechanisms
Quadrant III	$X_{10}$	The speed of employees in responding to consumer needs and complaints
	$X_{11}$	The accuracy of the implementation of the service time schedule

Explanation of the position of the assurance dimension variable can be explained as follows:

TABEL 11

Position of Assurance Dimension Variables

Position	Variable	Information
Quadrant I	$X_{15}$	personal data documents are guaranteed security
	$X_{16}$	Transparency and accountability in providing services
Quadrant II	$X_{14}$	Employees are able to overcome complaints in the service process
Quadrant III	$X_{13}$	Clarity and certainty of employees in providing services

Explanation of the position of the empathy dimension variable can be explained as follows:

TABEL 12

Position of Empathy Dimension Variables

Position	Variable	Information
Quadrant I	$X_{19}$	Justice gets service in the service process
Quadrant II	$X_{17}$	Employees are able to direct service users who do not understand the flow of services
Quadrant III	$X_{20}$	Employees appreciate if there are suggestions and criticisms from customers
Quadrant IV	$X_{18}$	Employees care about the problems faced by customers

### E. Parameter Test of Binary Logistic Regression Model

Testing the parameters of the binary logistic regression model is carried out simultaneously and individually/partial. The response variable tested is the overall result of the assessment between dissatisfied given a value of "0" and satisfied given a value of "1". The predictor variables tested are predictor variables that fall into quadrant I which has a high expected value and high reality value and quadrant II which has a high expected value while

the reality value is low on the results of the Importance Performance Analysis (IPA) analysis.

1. Simultaneous Test

Simultaneous testing is carried out to determine whether the model is significant and to examine the role of the dependent variable in the model together with the following hypotheses:

$$H_0: \beta_1 = \beta_2 = \dots = \beta_7 = 0$$

$$H_1: \text{there is at least one } \beta_j \neq 0, j = 1, 2, \dots, 7$$

The critical area is  $H_0$  rejected if  $p - value < \alpha = 0,05$

Simultaneous test results obtained as follows:

TABEL 13

Simultaneous Test Results Quadrant I IPA

<b>p - value</b>	<b>Decision</b>
0,001	Reject $H_0$

In Table 13, the p-value = 0,001 is obtained so that the value  $p - value < \alpha = 0,05$ . Based on these results, the decision is to reject  $H_0$ , which means that at least one predictor variable has an effect.

$$H_0: \beta_1 = \beta_2 = \dots = \beta_7 = 0$$

$$H_1: \text{there is at least one } \beta_j \neq 0, j = 1, 2, \dots, 6$$

The critical area is  $H_0$  rejected if  $p - value < \alpha = 0,05$

Simultaneous test results obtained as follows:

TABEL 14

Simultaneous Test Results Quadrant II IPA

<b>p - value</b>	<b>Decision</b>
0,735	Accept $H_0$

In Table 14, the p-value = 0,735 is obtained so that the value  $p - value > \alpha = 0,05$ . Based on these results, the decision is to accept  $H_0$ , which means that one not predictor variable has an effect.

2. Partial Test

Partial test is carried out if the test results are simultaneously significant. Partial test is used to test the effect of  $\beta_j$  individually with the following hypotheses:

$$H_0: \beta_j = 0; j = 1, 2, \dots, 7$$

$$H_1: \beta_j \neq 0$$

The critical area is  $H_0$  rejected if  $p - value < \alpha = 0,05$

Partial test results obtained as follows:

TABEL 15

Partial Test Results Quadrant I IPA

<b>Variable</b>	<b>p - value</b>	<b>Conclus</b>
$X_1$	0,038	Significant
$X_2$	0,045	Significant
$X_8$	0,043	Significant
$X_9$	0,048	Significant
$X_{15}$	0,875	Not Significant
$X_{16}$	0,683	Not Significant
$X_{19}$	0,355	Not Significant

The partial test results quadrant I IPA are variables  $X_1, X_2, X_8$ , and  $X_9$  value  $p - value < \alpha = 0.05$ . Based on these results, the decision is to reject  $H_0$ , which means that the predictor variable has a significant effect. In the variables  $X_{15}, X_{16}$  and  $X_{19}$  the value  $p - value > \alpha = 0.05$ . Based on these results, the decision is to accept  $H_0$ , which means that the predictor variable has no significant effect.

$$H_0: \beta_j = 0; j = 1, 2, \dots, 6$$

$$H_1: \beta_j \neq 0$$

The critical area is  $H_0$  rejected if  $p - value < \alpha = 0,05$

Partial test results obtained as follows:

TABEL 16

Partial Test Results Quadrant II IPA

<b>Variable</b>	<b>p - value</b>	<b>Conclus</b>
$X_4$	0,601	Not Significant
$X_5$	0,948	Not Significant
$X_7$	0,622	Not Significant
$X_{12}$	0,340	Not Significant



$X_{14}$	0,377	Not Significant
$X_{17}$	0,145	Not Significant

The partial test results quadrant II IPA are variables  $X_4, X_5, X_7, X_{12}, X_{14}$ , and  $X_{17}$  the value  $p - value > \alpha = 0.05$ . Based on these results, the decision is to accept  $H_0$ , which means that the predictor variable has no significant effect.

**F. Binary Logistic Regression Model**

Simultaneous and partial testing showed that the predictor variable had an effect on student customer satisfaction with health services at PLK. The results of binary logistic regression testing quadrant I IPA obtained the logit transformation equation as follows:

$$g(X) = -0,142 + 13,587X_1 - 14,400X_2 - 13,828X_8 + 14,497X_9 + 0,406X_{15} + 0,913X_{16} + 2,721X_{19}$$

The logistic regression model is obtained as follows:

$$\pi(X) = \frac{e^{(-0,142+13,587X_1-14,400X_2-13,828X_8+14,497X_9+0,406X_{15}+0,913X_{16}+2,721X_{19})}}{1 + e^{(-0,142+13,587X_1-14,400X_2-13,828X_8+14,497X_9+0,406X_{15}+0,913X_{16}+2,721X_{19})}}$$

The results of binary logistic regression testing quadrant II IPA obtained the logit transformation equation as follows:

$$g(X) = 6,864 + 0,673X_4 - 0,062X_5 - 4,16X_7 + 0,858X_{12} - 0,759X_{14} - 1,666X_{17}$$

The logistic regression model is obtained as follows:

$$\pi(X) = \frac{e^{(6,864+0,673X_4-0,062X_5-4,16X_7+0,858X_{12}-0,759X_{14}-1,666X_{17})}}{1 + e^{(6,864+0,673X_4-0,062X_5-4,16X_7+0,858X_{12}-0,759X_{14}-1,666X_{17})}}$$

**G. Goodness of Fit Test**

The goodness of fit test is used to determine whether the model with the dependent variable is an appropriate model or not (Hosmer and Lemeshow, 2000) [5]. The hypotheses:

$H_0$ : The binary logistic regression model is suitable

$H_1$ : The binary logistic regression model is not suitable

The critical area is  $H_0$  rejected if  $p - value < \alpha = 0,05$

The Hosmer and Lemeshow test results quadrant I IPA were obtained as follows:

TABEL 17

Hosmer and Lemeshow Test Results quadrant I IPA

Hosmer and Lemeshow Test	p - value
	1,000

Table

17 shows the results of the Hosmer and Lemeshow Test with a  $p - value = 1,000$  so that the value  $p - value > \alpha = 0,05$ . Based on these results, the decision is to accept  $H_0$ , which means that the binary logistic regression model is suitable.

The Hosmer and Lemeshow test results quadrant II IPA were obtained as follows:

TABEL 18

Hosmer and Lemeshow Test Results quadrant II IPA

Hosmer and Lemeshow Test	p - value
	0,619

Table

18 shows the results of the Hosmer and Lemeshow Test with a  $p - value = 0,619$  so that the value  $p - value > \alpha = 0,05$ . Based on these results, the decision is to accept  $H_0$ , which means that the binary logistic regression model is suitable.

**H. Apparent Error Rate (APPER)**

The proportion of misclassification resulting from resubstitution is called the Apparent Error Rate (APPER). Following are the results of the classification APPER:

TABEL 19

Results of the Classification APPER Quadrant I IPA

Observation	Predictions		Total
	0	1	
0	3	1	4
1	1	91	92
Total	4	92	96

The calculation of the APPER values is:

$$\begin{aligned}
 APPER &= \frac{1+1}{3+1+1+91} \times 100\% \\
 &= \frac{2}{96} \times 100\% \\
 &= 0,02083
 \end{aligned}$$

Classification Accuracy = 100% - 2% = 98%

Based on the result the probability of error in classifying objects in the quadrant I IPA is 2%, so that the accuracy of the classification is 98%.

TABEL 20

Result the Classification APPER Quadrant II IPA

Observation	Predictions		Total
	0	1	
0	0	4	4
1	0	92	92
Total	0	96	96

The calculation of the APPER values is:

$$\begin{aligned}
 APPER &= \frac{4+0}{0+4+0+92} \times 100\% \\
 &= \frac{4}{96} \times 100\% \\
 &= 0,041667
 \end{aligned}$$

Classification Accuracy = 100% - 4% = 96%

Based on the result the probability of error in classifying objects in the quadrant II IPA is 4%, so that the accuracy of the classification is 96%.

## I. CONCLUSIONS

The level of student satisfaction with health services at the Airlangga University Surabaya Health Service Center (PLK) is based on the calculation results of the Customer Satisfaction Index (CSI) value of 66.03353%, which means students are satisfied with health services at the Campus C Health Service Center (PLK) Airlangga University Surabaya. Based on the result of Importance Performance Analysis (IPA) it can be concluded that PLK must maintain performance on the variables clean place

( $X_1$ ), neat employees ( $X_2$ ), easy requirements ( $X_8$ ), responsive employees ( $X_9$ ), secured documents ( $X_{15}$ ), Transparency ( $X_{16}$ ), fair service ( $X_{19}$ ) and improve performance on variable wide parking ( $X_4$ ), clear information ( $X_5$ ), easy procedures ( $X_7$ ), employees understand service flow ( $X_{12}$ ), troubleshoot ( $X_{14}$ ), good service explanation ( $X_{17}$ ). The binary logistic regression model can analyze the relationship between predictor variables and student satisfaction with health services as a whole. The model fit test shows that the binary logistic regression model is appropriate.

The result of the classification accuracy of quadrant I IPA data is 98% and quadrant II IPA data is 96%.

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