Modeling The Success of Face Recognition Boarding Using the Delone and Mclean Framework: A Case Study in Daop II Bandung

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Abstrak

This study aims to describe and test the success model of information systems in face recognition boarding services in Operation Area II (Daop II) Bandung using the DeLone and McLean framework. The approach used is quantitative using the Structural Equation Modelling–Partial Least Squares (SEM-PLS) method. Primary data was collected from 118 respondent service users through a questionnaire. The model was tested based on six constructs: system quality, information quality, service quality, usability, user satisfaction, and net benefits. The results of the analysis show that most of the relationships between variables are statistically significant. The quality of information and services has a positive effect on user usage and satisfaction. Instead, the quality of the system only affects usage and is not significant to satisfaction. User satisfaction proves to be the most powerful predictor of net benefits. This research makes a theoretical contribution to the testing of the DeLone and McLean models in the Indonesian public transportation sector and expands the context of its application to biometric systems.

Kata Kunci: Face Recognition, Information Systems, User Satisfaction, Delone and Mclean, Public Transportation.

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Submission: 10-08-2025
Revision: 28-10-2025
Received: 27-11-2025
Published: 31-12-2025

1. Introduction

Digital transformation has become an integral part of the development of the public and private sectors in Indonesia. However, as a developing country, Indonesia still faces various challenges in the digitalization process, especially in the 3T (disadvantaged, frontier, and outermost) areas. The main obstacles faced include limited infrastructure, low digital literacy of the community, and policies that are not fully adaptive to technological changes. Data security and privacy protection issues are also factors that slow down the acceptance of technology by the public at large (Gusman, 2024).

Information technology has played an important role in supporting the efficiency and quality of services in various sectors. In the field of transportation, the use of the Internet of Things (IoT) has driven operational efficiency and improved user experience through vehicle monitoring systems, route management, and integration with digital applications. Various platforms such as Gojek, Grab, and Traveloka are clear examples of technology adoption that changes people's access patterns to transportation services. This change also encourages digital transformation in public transportation service providers, including State-Owned Enterprises (SOEs) such as PT Kereta Api Indonesia (Persero).

PT Kereta Api Indonesia (KAI) has developed a number of technology-based services to improve the passenger experience. Among them are the Access by KAI application, check-in counter (CIC) service, AI-based virtual assistant (Nilam), and face recognition system for the boarding process. The Access by KAI application allows ticket booking and the use of e-boarding passes without physical tickets. CIC provides self-service for ticket printing and cancellation. Meanwhile, Nilam is present as a virtual assistant who responds to questions in real-time. The main innovation that is the focus of this study is the face recognition boarding service, which allows passengers to enter the platform area just by scanning their face, without the need to show a physical ticket (Zulvia & Putri, 2025).

This face recognition service requires passengers to register initially through the officer or the Access by KAI application. Once registered, passengers can use this system at various stations that already support the service. One of the operational areas that has implemented this system is the Bandung Operational Area (Daop) II, which includes Bandung, Kiaracondong, Cimahi, and other areas in central to eastern West Java.

Bandung Station has been a pioneer in the implementation of this system since the trial in September 2022, then officially used at the North Gate as of October 1, 2022. The expansion of services to Kiaracondong Station will be carried out at the end of August 2024.

However, in its implementation, the service faces various challenges. One of them is a policy that requires the use of face recognition for the boarding process, which is considered discriminatory against passengers who do not want to use this service. Non-user passengers are only given access to the platform for a limited time (10 minutes before departure), raising concerns and resistance, especially regarding the protection of personal data such as the Population Identification Number (NIK) used in the system.

Observations at Bandung Station and Kiaracondong Station show that most passengers are still reluctant to use this service. The main reasons include a lack of understanding of the benefits of the system, concerns about data security, and the perception that the system does not provide significant efficiency. Some passengers even consider this system to be just a means of data collection by KAI.

Table 1. Number of Passengers FR Boarding and Manual Boarding

Month	Bandung Station			Kiaracondong Station		
	FR	**Non-Fr**	**Total**	**FR**	**Non-Fr**	**Total**
January	37.553	94.944	132.497	15.377	61.597	76.974
February	30.485	71.403	101.888	13.619	49.173	62.792
March 13	9.000	16.662	25.662	4.112	12.141	16.253
Total	77.038	183.009	260.047	33.108	122.911	156.019

Source: Passenger Transport Unit Data

Data from the Daop II Bandung Passenger Transportation Unit shows that in the period from January to March 13, 2025, the number of face recognition users is still far below manual boarding users. At Bandung Station, only about 30% of passengers use face recognition, and the number tends to decrease every month. Meanwhile, at Kiaracondong Station, face recognition users have not reached 25% of the total passengers. This reinforces the urgency to evaluate the success of the implementation of this service from the user's point of view.

In order to understand the success rate of the implementation of this system from the perspective of the user, a comprehensive evaluative approach is needed. One of the evaluative models that is widely used in information systems research is the Information System Success Model developed by DeLone and McLean in 1992. This model is designed to measure the success of information systems through six main dimensions, namely system quality, information quality, use, user satisfaction, individual impact, and organizational impact. In the context of PT KAI's digital services, for example, the KAI Access application has shown how a high system quality in terms of ease of use can motivate consumers and create a positive experience that encourages them to actively use the application. This reinforces the relevance of the DeLone and McLean models in evaluating the effectiveness of technology-based information systems in the public transportation sector (Zulvia & Shinta Yerina, 2023).

As information technology developed increasingly dynamic and complex, DeLone and McLean revised the model in 2003 by adding several important aspects. The revision includes the addition of the service quality dimension as an indicator that represents the quality of interaction between users and information system service providers. In addition, the dimensions of individual impact and organizational impact are unified into a single component, namely net benefits. This model emphasizes that the three dimensions of quality, namely system quality, information quality, and service quality, contribute significantly to the level of user satisfaction and ultimately have an impact on the benefits resulting from the use of the system (DeLone & McLean, 2003)

This model has proven to be relevant and applicable in various research contexts, including in the education, health, public services, and technology-based transportation sectors. In further research, (Petter et al., 2008) affirms that the Information System Success Model remains relevant to be used to assess the effectiveness of modern information systems, not only from the technical aspect, but also includes the dimensions of user behavior and the results obtained as a whole. Based on this, this study adopts the DeLone and McLean model to measure user perception of the success of the face recognition boarding system through the dimensions of system quality, information quality, and service quality, as well as evaluate its influence on system usage, user satisfaction, and net benefits felt in the operational area of Daop II Bandung.

Hypothesis Development

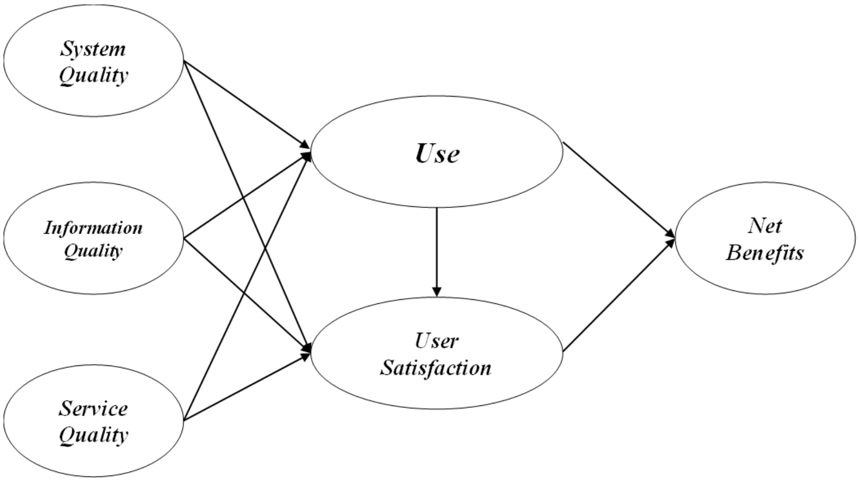

Figure 1. Conceptual Framework
Source: Development by Researcher (2025)

H1: The quality of the face recognition boarding system has a positive effect on the use of the system
H2: The quality of the face recognition boarding system positively affects the level of user satisfaction
H3: Quality The information produced by face recognition boarding has a positive impact on the use of the system
H4: Quality The information produced by face recognition boarding has a positive effect on user satisfaction
H5: The quality of face recognition boarding services has a positive influence on the use of the system
H6: The quality of face recognition boarding services positively affects user satisfaction levels
H7: The use of face recognition boarding has a positive influence on user satisfaction
H8: The use of face recognition boarding has a positive effect on net benefits
H9: Face recognition boarding user satisfaction has a positive influence on net benefits.

2. Methods

This study uses a quantitative approach. The data obtained is presented in the form of numbers and analysed statistically. Primary data was collected directly through the distribution of questionnaires to users of face recognition boarding services both online and offline. Meanwhile, secondary data is obtained from reliable sources, including historical information from the Daop II Bandung Passenger Transportation Unit, which serves to support and complement.

The population in this study is long-distance train passengers in the Bandung Operational Area II area, which includes Bandung Station and Kiaracondong Station. Because the exact population is not known, the sample was determined using the Lemeshow formula with a minimum sample number of 96 respondents. The sampling technique used is non-probability sampling with a purposive sampling approach, which is to select respondents based on the criteria that they have used face recognition boarding services at Daop II Bandung.

Table 2. Variable Operations

Variable	Dimension	Source
System Quality	1. Easy of use 2. Reliability 3. Security 4. Response time 5. System stability	(DeLone & Mclean, 1992)
Information Quality	1. Accuracy 2. Consistency 3. Timelines 4. Completeness	(DeLone & Mclean, 1992)
Service Quality	1. Tangible 2. Reliability	(Parasuraman et al., 1988)

Variable	Dimension	Source
	3. Responsiveness 4. Assurance 5. Emphaty	
Use	1. Frequency of use 2. Dependency 3. Independence 4. Efficiency	(DeLone & McLean, 2003)
Use Satisfaction	1. Overall satisfaction 2. Expectation confirmation 3. Trust 4. Comfort 5. Sustainability	(DeLone & McLean, 2003)
Net Benefits	1. Effectiveness 2. Efficiency 3. Productivity 4. Service improvement	(DeLone & McLean, 2003)

Source: Development by Researchers (2025)

3. Results and Discussion

3.1 Characteristics of Respondents

The characteristics of the respondents are the general identity of the respondents who use face recognition boarding at Daop II Bandung. Contains gender, age, occupation, frequency of use of face recognition boarding and comparison using face recognition boarding and manual boarding. The research was conducted for approximately two weeks (June 7 to June 25, 2025) with a total of 118 respondents. The following is a comparison of the results of the characteristics of respondents using face recognition boarding at Daop II Bandung.

Table 3. Respondent Characteristics

Characteristics	Number (People)	Percentage (%)
Gender		
Woman	67	57%
Man	51	43%
Age		
<12 Years	-	-
13 – 28 Years	92	78%
29 – 44 Years	20	17%
45 – 60 Years	6	5%
> 60 Years	-	-
Duration of Use of Face Recognition Boarding		
<6 Months	41	35%
6 – 12 Months	38	32%
>1 Year	39	33%
Frequency of Use of Face Recognition Boarding		
Every time you take a long-distance train	89	75%
1-2 times a month	25	21%
Once Every Two Months	4	3%

Source: Research Results (2025)

The majority of respondents in this study were women, 57%, showing that the users of the face recognition boarding system in Daop II Bandung were dominated by women.

Based on age group, the most respondents were in the age range of 13–28 years old, 78%, which according to the BPS classification (2023) is included in Generation Z and some young Millennials. This age group is known to have high exposure to digital technology, so they tend to be more adaptive to technology-based transportation service innovations.

Judging from the experience of use, most respondents 35% have used the face recognition boarding system for less than six months. Meanwhile, the highest frequency of use was shown by respondents who always used the system every time they traveled by long-distance train, which was 75%. These findings indicate that most of the respondents are active and regular users of facial recognition-based boarding systems.

3.2 Analysis of Research Instruments

a. Validity Test

The validity test aims to evaluate the data that has been collected to measure the extent of the research in accordance with actual field conditions. This test is seen from the value of rcount compared to rtable. The rtable value is seen from the formula df = n-2. In this study there were 118 respondents, so the df was 116, which was 0.1809. The following is the validity test in this study:

Table 4. Validity Test Results

Variable	r count	r table	Description
System Quality	0.611	0.1809	Valid
	0.624	0.1809	
	0.615	0.1809	
	0.718	0.1809	
	0.601	0.1809	
Information Quality	0.602	0.1809	
	0.733	0.1809	
	0.750	0.1809	
	0.640	0.1809	
Service Quality	0.693	0.1809	
	0.772	0.1809	
	0.687	0.1809	
	0.757	0.1809	
	0.694	0.1809	
Use	0.684	0.1809	
	0.666	0.1809	
	0.657	0.1809	
	0.636	0.1809	
User Satisfaction	0.695	0.1809	
	0.766	0.1809	
	0.695	0.1809	
	0.753	0.1809	
	0.690	0.1809	
Net Benefits	0.704	0.1809	
	0.644	0.1809	
	0.676	0.1809	
	0.664	0.1809	
	0.687	0.1809	

Source: Research Results (2025)

Based on the results of the analysis, all items in each variable have a rcount value that exceeds the rtable value of 0.1809. This indicates that all statements in the questionnaire instrument meet the validity requirements through the Pearson correlation test.

b. Reliability Test

The reliability test aims to assess the extent to which a research instrument shows consistency of results in a sustainable manner. According to (Hair et al., 2010) an instrument is said to be reliable if it has an alpha reliability coefficient value that exceeds 0.70. The results of the reliability test calculation in this study are presented as follows.

Table 5. Reliability Test Results

Indicator	Cronbach's Alpha	Reliability Coefficient	Description
28	0.966	0.07	Reliable

Source: Research Results (2025)

Based on the results of the reliability test, the research instrument consisting of 28 indicators obtained a Cronbach's Alpha value of 0.966, indicating a very high level of internal consistency. This value is well above the minimum recommended threshold, which is 0.70, as stated by (Hair et al., 2010) who stated that Cronbach's Alpha value ≥ 0.70 is considered adequate to demonstrate reliability in social science research. Thus, all indicators in this instrument are declared reliable and can be used consistently in measuring the constructs being studied.

3.3 Delone & McLean Analysis Using SEM-PLS

a. Measurement Model Compatibility Test (Outer Model)

The outer model analysis in this study consists of four testing stages: individual item reliability through loading factor values, internal consistency reliability using composite reliability, convergent validity based on the average variance extracted (AVE), and discriminant validity testing using the Fornell-Larcker Criterion.

Table 6. Test Results of Measurement Model

Laten Variable		Validity			Reliability		
Variable	**Code**	**LF**	**FL**	**Description**	**AVE**	**CR**	**Description**
System Quality	SQ1	0.763	0.776	Valid	0.602	0.883	Reliable
	SQ2	0.760		Valid			
	SQ3	0.755		Valid			
	SQ4	0.853		Valid			
	SQ5	0.742		Valid			
Information Quality	IQ1	0.771	0.827	Valid	0.683	0.896	Reliable
	IQ2	0.864		Valid			
	IQ3	0.872		Valid			
	IQ4	0.795		Valid			
Service Quality	SVQ1	0.818	0.827	Valid	0.684	0.915	Reliable
	SVQ2	0.859		Valid			
	SVQ3	0.801		Valid			
	SVQ4	0.851		Valid			
	SVQ5	0.803		Valid			
Use	U1	0.822	0.815	Valid	0.664	0.888	Reliable
	U2	0.831		Valid			
	U3	0.795		Valid			
	U4	0.812		Valid			
User Satisfaction	US1	0.808	0.826	Valid	0.689	0.915	Reliable
	US2	0.861		Valid			
	US3	0.812		Valid			
	US4	0.849		Valid			
	US5	0.800		Valid			
Net Benefits	NB1	0.820	0.799	Valid	0.639	0.898	Reliable
	NB2	0.782		Valid			
	NB3	0.796		Valid			
	NB4	0.775		Valid			
	NB5	0.823		Valid			

Source: Research Results (2025)

Based on the results of the evaluation of the model fit, it was shown that all indicators had a loading factor value of ≥ 0.5, which indicates that each indicator is valid in reflecting the latent construct measured (Hair et al., 2021). The construct reliability test through convergent validity was carried out by referring to the average variance extracted (AVE) value, where all constructs had an AVE value of ≥ 0.5, which indicates adequate convergent validity. Meanwhile, the results of the composite reliability (CR) test, which were all above the threshold value of 0.7, indicated that these indicators had good internal consistency in measuring their respective constructs (Hair et al., 2021). In the discriminant validity test, Fornell-Larcker and HTMT analyses showed some values exceeding the 0.90 threshold, although cross-loading confirmed that each indicator contained the corresponding construct. This shows that the validity of discrimination has not been fully met, indicating a potential overlap of perceptions between constructs.

b. Path Coefficient Test

The path coefficient test aims to determine the direction and magnitude of the direct influence between variables in the model. The range of coefficient values is between -1 to +1, where values close to +1 indicate a strong positive relationship, while values close to -1 indicate a strong negative relationship. Meanwhile, a coefficient value close to 0 reflects a weak or even insignificant relationship between the variables being tested.

Table 7. Path Coefficient Test Results

Variable	SQ	IQ	SVQ	U	U.S.	NB
System Quality				0,303	0,020	
Information Quality				0,333	0.372	
Service Quality				0,289	0,330	
Use					0,219	0,165
User Satisfaction						0,746
Net Benefits						

Source: Research Results (2025)

Based on the results of the path coefficient analysis, all paths in the structural model show a positive relationship direction, which means that any increase in one variable in the model will be followed by an increase in other variables that have a direct relationship. The System Quality, Information Quality, and Service Quality variables have been proven to have an influence on the Use variable, as well as contributing to the Net Benefits variable. These results show that information quality has a stronger influence on net benefit than the other two variables, while the effect of system quality on net benefit is relatively weak. Furthermore, the Use variable also affects User Satisfaction and Net Benefits, which indicates that the intensity of system use also shapes the satisfaction and benefits felt by users, even though the influence is not dominant. The path with the strongest influence is found in the relationship between User Satisfaction and Net Benefits, which shows that user satisfaction is the most important factor in increasing the net benefits of the system used.

c. Coefficient of Determination (R2)

R-Square (R^2) indicates the magnitude of the proportion of variance of endogenous constructs that can be explained by exogenous constructs in a model. This indicator is used to assess how well the model describes the phenomenon being studied. In the context of social and behavioral research, (Chin, 1998) states that an R^2 value above 0.33 indicates a weak level of influence, a ≥ value of 0.50 indicates a moderate influence, and a ≥ value of 0.75 indicates a strong influence. Thus, the higher the R^2 value, the greater the ability of the exogenous construct to explain changes in the endogenous construct.

Table 8. R-Square Test Results

Variable	R-Square	Description
Use (U)	0.720	Moderate
User Satisfaction (US)	0.736	Moderate
Net Benefit (NB)	0.746	Moderate

Source: Research Results (2025)

The results of the R-Square test show that the exogenous constructs in the model have a fairly good ability to explain the variability of endogenous constructs. In detail, 72% of the variance of the Use variable can be explained by the construct that affects it, 73.6% of the variance of User Satisfaction can be explained by the related construct, and 74.6% of the variance of Net Benefit can also be explained by the variables in the model. Based on the classification put forward by (Chin, 1998) The three R-Square values are included in the moderate category. Thus, the structural model used in this study has sufficient clarity in representing the relationships between constructs, although it has not reached a very strong level of explanation.

d. Effect Size (f2)

The analysis of effect size (f^2) complements the results of the path coefficient test, as it not only assesses the significance of the relationships between variables but also provides insight into the magnitude of influence that exogenous constructs exert on endogenous constructs within the model. The interpretation of the f^2 value is categorized into three levels: a value of 0.02 indicates a small effect, 0.15 indicates a medium effect, and 0.35 or higher represents a large effect.

Table 9. Effect Size Test Results (f2)

Categories	F-Square	Description
System Quality (SQ) → Use (U)	0.094	Small effect
System Quality (SQ) → User Satisfaction (US)	0.000	No effect
Information Quality (IQ) → Use (U)	0.124	Small effect

Information Quality (IQ) → User Satisfaction (US)	0.145	Small effect
Service Quality (SVQ) → Use (U)	0.127	Small effect
Service Quality (SVQ) → User Satisfaction (US)	0.155	Small effect
Use (U) → User Satisfaction (US)	0.051	Small effect
Use (U) → Net Benefit (NB)	0.049	Small effect
User Satisfaction (US) → Net Benefit (NB)	1.004	Large effect

Source: Research Results (2025)

Based on the results of the effect size (f^2) test, most of the relationships between variables in the model showed influence in the small category. The variables of system quality, information quality, and service quality each had a small effect on use and user satisfaction, except for system quality on user satisfaction which had no effect ($f^2 = 0.000$). In addition, the use variable also has a small influence on user satisfaction and net benefit. The largest influence was found on the user satisfaction path to net benefit with a value of f^2 of 1.004, which was included in the large effect. These findings suggest that although most influences are minor, user satisfaction has a very dominant role in explaining the net benefits of using the system.

e. Hypothesis Test

In the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, hypothesis testing is carried out to determine the extent to which the relationships between constructs in the model are statistically significant. This hypothesis test is measured through several key indicators. First, the path coefficient value is used to show the direction and strength of the relationship between latent variables. This value ranges from -1 to +1, where getting closer to +1 or -1 signifies an increasingly strong influence.

Furthermore, the test was carried out by paying attention to the t-statistics value, which was obtained through the bootstrapping process. The t-value is used to determine whether the influence between the variables is significant. In general, the relationship is said to be significant if the t-value is greater than 1.96 at a significance level of 5% ($\alpha = 0.05$). In addition, the p-value is also an important indicator in measuring the significance of the relationship. If the p value is less than 0.05, then the proposed hypothesis is acceptable because it shows a significant influence between variables.

Table 10. Hypothesis Test Results

Categories	Original Sample	T Statistics	P Values	Explanation
System Quality (SQ) → Use (U)	0,303	2,118	0.035	Accepted
System Quality (SQ) → User Satisfaction (US)	0.020	0.162	0.871	Rejected
Information Quality (IQ) → Use (U)	0.333	3.240	0.001	Accepted
Information Quality (IQ) → User Satisfaction (US)	0.372	3.743	0.000	Accepted
Service Quality (SVQ) → Use (U)	0.289	2.603	0.010	Accepted
Service Quality (SVQ) → User Satisfaction (US)	0.330	3.973	0.000	Accepted
Use (U) → User Satisfaction (US)	0.233	2.231	0.026	Accepted
Use (U) → Net Benefit (NB)	0.165	1.988	0.047	Accepted
User Satisfaction (US) → Net Benefit (NB)	0.746	10.164	0.000	Accepted

Source: Research Results (2025)

Hypothesis 1: The Effect of System Quality to Usage

The results of the hypothesis test showed that the quality of the system had a significant effect on usage, with a coefficient value of 0.303, t-statistic of 2.118, and p-value of 0.035. This indicates that the higher the user's perception of the stability, ease of access, and reliability of the face recognition system, the greater their tendency to use it. These findings are in line with the DeLone & McLean (2003) model which places the quality of the system as an early determinant in the success of information systems. Research (Yuniarti et al., 2021) It shows that the quality of the system including aspects of stability, reliability, and ease of access has a positive and significant effect on the intensity of the use of public digital services.

Hypothesis 2: The Effect of System Quality to User Satisfaction

This hypothesis is rejected because the coefficient value is only 0.020, t-statistic 0.162, and p-value 0.871. These results show that the quality of the system has no significant effect on user satisfaction. In other words, even if the system runs smoothly and is accessible, it is not enough to build satisfaction. These results are consistent with research (Iswanto et al., 2025) Regarding the implementation of face recognition at train stations, who said that service factors and clarity of information are more dominant in influencing satisfaction.

Hypothesis 3: The Effect of Information Quality to Usage

The results of the analysis showed that the quality of information had a positive and significant influence on usage, with a coefficient value of 0.333, t-statistic of 3.240, and p-value of 0.001. Accurate, clear, and timely information has been proven to encourage the intensity of using face recognition systems. This supports the findings (Petter et al., 2008) which emphasizes that information quality is a key element in the use of information systems. These findings are in line with the results of the IATA Global Passenger Survey 2024 which reported that passengers highly value access to all travel information from one unified location, and as many as 84% of biometric users expressed satisfaction with their experience when using the system (Iata, 2024). Thus, the quality of structured and easy-to-understand information not only increases users' sense of security and confidence, but also encourages them to continue to use the system actively.

Hypothesis 4: The Influence of Information Quality to User Satisfaction

The quality of information has also been shown to have a significant effect on user satisfaction, with a coefficient of 0.372, t-statistic 3.743, and p-value of 0.000. Information that is delivered appropriately and relevantly can increase user satisfaction. These findings are supported by a study in the Electronic Citizen Administration Service System (SLAWE) that shows that information quality is good—which includes relevance, accuracy, and has a positive and significant effect on user satisfaction (Alfareza et al., 2024). . In addition, according to (Zulvia et al., 2022) the quality of information presented accurately, on time, and relevant has an important role in shaping user satisfaction with digital services.

Hypothesis 5: Effect of Service Quality to Usage

The quality of service showed a significant influence on usage with a coefficient value of 0.289, t-statistic of 2.603, and p-value of 0.010. The service of the officer who is responsive and helps in the use of the face recognition system is proven to encourage the intensity of use. Research by (Iswanto et al., 2025) It shows that the presence of officers when there is a system problem increases the user's confidence to continue using digital services.

Hypothesis 6: The Effect of Service Quality to User Satisfaction

Service quality also has a strong influence on user satisfaction, with a coefficient value of 0.330, t-statistic of 3.973, and p-value of 0.000. Professional, empathetic, and responsive service creates a positive experience for users. Study by (Azmia & Adam, 2021) It shows that the dimensions of services provided by information system providers, including responsiveness, reliability, and attention to user needs, play an important role in shaping the perception of whether or not users are satisfied with the system used.

Hypothesis 7: The Effect of Use to User Satisfaction

This hypothesis was accepted with a coefficient of 0.233, t-statistic of 2.231, and a p-value of 0.026. This shows that the experience of using the system directly contributes to user satisfaction. Users who are used to using face recognition systems tend to feel more satisfied because the system is considered helpful and efficient. These findings are in line with the results of the study (Shidqi et al., 2020) which states that user experience has a significant positive relationship with user satisfaction. In other words, the higher the frequency or level of user habituation in using the system, the level of satisfaction felt will also increase.

Hypothesis 8: The Effect of Use to Net Benefits

The effect of use on net benefits was received with a coefficient of 0.165, t-statistic of 1.988, and p-value of 0.047. The use of the system has been proven to contribute to the perception of benefits such as time efficiency, reduced queues, and ease of the boarding process. These results are in line with the survey (Iata, 2024), where users who actively use biometric boarding find it more time-saving and convenient.

Hypothesis 9: The Effect of User Satisfaction to Net Benefits

This hypothesis shows the strongest influence with a coefficient of 0.746, t-statistic of 10.164, and p-value of 0.000. User satisfaction is the main determinant of the formation of net benefits from the system. Satisfied users will find it easier to see the added value of using technology. DeLone & McLean (2003) also assert that satisfaction is an important mediating variable that links use to benefits.

Table 11. Comparison of FR Boarding and Manual Boarding Uses

Comparison	Respondent	Percentage (%)
Face Recognition Boarding	102	86%
Boarding Manual	16	14%

Source: Research Results (2025)

Most of the respondents in this study were users of the face recognition-based boarding system, which was 86%, while the other 14% still used the manual boarding method. The high percentage of use of biometric systems reflects the high level of technology acceptance and user preference for service processes that are automated, efficient, and minimal physical contact. This condition indicates the successful implementation of the face recognition system in supporting digital transformation in the public transportation sector, especially in the context of passenger departure services.

These findings are in line with the results of testing several key hypotheses in the framework (DeLone & McLean, 2003) which shows that the System Quality (SQ), Information Quality (IQ), and Service Quality (SVQ) variables have a significant effect on Use (U). Theoretically, this strengthens the argument that the technical functionality of the system, the clarity and accuracy of the information conveyed, and the quality of services provided to users simultaneously contribute to increasing the intensity of the use of biometrics-based boarding systems.

Furthermore, the dominance of face recognition boarding users provides an empirical basis for the validity of the relationship between the next variable, namely between Use (U) and User Satisfaction (US), and between Use and Net Benefit (NB). High usage is believed to be an early determinant in the formation of user satisfaction, which in this model is shown to have the strongest influence on the perception of net benefits. This means that the high frequency of use not only reflects the practical acceptance of technology, but also contributes to the achievement of efficiency, ease of access to services, and the perception of added value in the eyes of users. Thus, Use can be positioned as a strategic mediation variable that bridges the quality of systems and services with the end result in the form of benefits perceived by users, as illustrated in the information system success model developed by DeLone and McLean.

4. Conclusion

Based on the results of the analysis and testing of the DeLone and McLean information system success models, it can be concluded that the face recognition system in the train boarding process shows a high level of effectiveness. This is shown by the significant influence of the variables of system quality, information quality, and service quality on the use of the system by passengers. The majority of respondents in this study stated that they had used the system, which reflects the high level of adoption and acceptance of biometric technology in the public transportation environment. In addition, the use of the system has been proven to increase user satisfaction, which ultimately has a positive impact on the perception of net benefits, such as time efficiency, ease of service access, and reduced queues. Therefore, the face recognition system can be considered effective in improving the quality of departure services, and has the potential to continue to be developed and expanded in other stations.

As a follow-up to these findings, it is recommended that transportation service providers, especially PT Kereta Api Indonesia (Persero), continue to improve the quality of face recognition systems, including technical stability and user interfaces, as well as ensure clarity of information conveyed through gate screens and other information media. In addition, increasing the capacity of officers in the field who focus on responsiveness and empathy also needs to be done so that the user experience remains positive despite technical constraints. For further research, it is recommended to explore other factors such as the perception of biometric data security and user trust in privacy protection, given that these issues are important concerns in the adoption of digital identity-based technologies.

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