# Analysis of Service Quality in Access by KAI Application Using E-ServQual Method and Root Cause Analysis (RCA)

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#### Abstract

Access by KAI is an official application by PT. Kereta Api Indonesia which is expected to facilitate users in managing their train tickets. Access by KAI hasn't been able to meet the user's expectations, which can be seen from the application rating of 2.4/5.0 and the majority of the 210,637 reviews gave the lowest rating, this shows user dissatisfaction with the quality of service provided in the Access by KAI. Therefore, this study aims to analyze the quality of Access by KAI services from the user's perspective as a reference for providing improvement proposals to improve the quality of services. This research uses the E-ServQual method to identify quality attributes that need improvement and the Root Cause Analysis (RCA) method to propose solutions for enhancing service quality within the application. Based on the results of calculations and analysis, 10 attributes need to be improved service quality because they are negative (-). These negative attributes cause user dissatisfaction while using the application so there are suggestions for improvement from the root causes of problems in quality of service of these attributes.

Keywords: E-ServQual, Root Cause Analysis, Service Quality, User Satisfaction.

#### Abstrak

Access by KAI merupakan aplikasi resmi oleh PT. Kereta Api Indonesia yang diharapkan mampu mempermudah pengguna dalam mengelola tiket kereta api mereka. Access by KAI belum dapat memenuhi harapan dari para penggunanya, Dimana terlihat dari rating aplikasi yang rendah yaitu 2,4/5,0 dan mayoritas dari 210.637 ulasan memberikan penilaian terendah, hal tersebut menunjukkan ketidakpuasan pengguna atas kualitas layanan yang diberikan dalam Access by KAI. Oleh karena itu, penelitian ini bertujuan untuk menganalisis kualitas pelayanan Access by KAI dari perspektif penggunanya sebagai acuan pemberian usulan perbaikan untuk meningkatkan kualitas layanan Access by KAI. Penelitian ini menggunakan metode E-ServQual dalam mengidentifikasi atribut kualitas yang harus diperbaiki serta

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*Citation*: Maulida Dewi Amanda and Dwi Sukma Donoriyanto. 2025. Analysis of of Service Quality in Access by KAI Application Using E-ServQual Method and Root Cause Analysis (RCA). *Journal of Research and Technology* Vol. 11 No. 1 Juni 2025: Page 11–22. metode Root Cause Analysis (RCA) untuk memberikan usulan perbaikan kualitas layanan pada aplikasi. Berdasarkan hasil perhitungan dan analisa, didapatkan 10 atribut yang perlu dilakukan perbaikan dan peningkatan kualitas layanan karena bernilai negatif (-). Atribut negatif tersebut menyebabkan ketidak puasan pengguna selama menggunakan aplikasi sehingga diberikan adanya usulan perbaikan dari akar penyebab masalah dalam kualitas layanan atribut tersebut.

Keywords: E-ServQual, Kepuasan Pengguna, Kualias Layanan, Root Cause Analysis.

### 1. Introduction

The transition from conventional systems to electronic systems has influenced community activities across various sectors of life. One example is in the use of railway transportation, which has always been popular among the public. The annual increase in train passengers has encouraged Indonesia's railway sector to adapt by offering digital-based services for more efficient access. Based on this, in 2014, PT. Kereta Api Indonesia (Persero) launched an application to make it easier for train passengers to manage their tickets. The application is called Access by KAI. As the only official train ticket purchasing application developed by a State-Owned Enterprise (BUMN), Access by KAI naturally attracts public interest in using it.

Access by KAI	
PT. Kereta Api Indonesia	Access
2.4★ 10M+ 3. 214K reviews Downloads Rated for 3+ O	by KA
Install < Share 🗄 Add to wishlist	
This app is available for your device	
2.4 <sup>5</sup> / <sub>2</sub>	

Source: Google Play Store, 2024 Figure 1. Rating Access by KAI on Google Play Store

Based on Figure 1 above, since its launch until September 2024, the Access by KAI application has been downloaded more than 10 million downloads. However, despite the high public interest in downloading the application, its actual usage appears to fall short of user expectations. This is evident from the application's relatively low rating of 2.4 out of 5.0. Furthermore, among the 210,637 reviews, the majority of users gave the lowest rating, indicating that Access by KAI has yet to meet user satisfaction effectively.

In research conducted by Junianto et al. (2021) on the Traveloka application found that E-ServQual analysis can help in identifying factors that cause low levels of user satisfaction with some features in the Traveloka application, especially in the ease of use and efficiency factors, which affect the overall quality of e-travel services.

To address this issue, a service quality analysis of the Access by KAI application was conducted using the E-ServQual method. E-ServQual is a method used to analyze the extent to which service quality can effectively and efficiently meet relevant customer needs. This method is expected to help identify areas of the application that require improvement. The selection of the E-ServQual method is due to its ability to as the dimensions of E-ServQual are capable of encompassing the fundamental needs of users in the Access by KAI service. Consequently, this method is expected to give more accurate and comprehensive identification results. (Bohórquez et al., 2024).

To improve the service quality of the Access by KAI application, it is essential to propose service quality improvements to better meet user satisfaction. Therefore, the Root Cause Analysis (RCA) method is employed, as it can identify the root causes of issues in the Access by KAI application. This allows for the resolution or prevention of these issues by providing recommendations for addressing the factors contributing to the low service quality of the application (Widhianingsih & Wahyuni, 2024).

Customer service quality is intended as a response to customer needs and the fulfillment of their goals. In addition, customer satisfaction can also be influenced by various factors including how efficient the services they get, the availability of systems that can make it easier for them, the fulfillment of their needs, the security provided by the company to customers when using services, the company's responsiveness to customer complaints, and compensation services if there is a loss received by the customer. In return, customers respond with positive feedback to the company (Kim et al., 2024). According to Ginting et al. (2023), customer satisfaction is a condition where the needs, desires, and expectations of customers regarding a product are met. By paying attention to customer satisfaction, entrepreneurs and business owners can learn about the complaints and feedback from customers who receive services or products (Syafarudin, 2021).

Based on this, the low rating of the Access by KAI application listed on Google PlayStore (2.4/5.0) indicates that the level of satisfaction felt by users with the application is 48% of the total, so it is necessary to analyze the factors that cause low service quality in the Access by KAI application with the aim of being a reference in providing improvement solutions. This study is expected to assist the company, in this case, Access by KAI, in formulating subsequent policies to improve their service quality in order to fulfill the satisfaction of Access by KAI application users.

## 2. Method

## 2.1 Research Flow

The methodology in this study consists of an explanation of the research flow. The following Figure 2 explains the steps of this research.

The data collection method in this study consists of collecting primary data and secondary data. Primary data is obtained from the results of filling out questionnaires filled out online by respondents through google form. Secondary data is obtained indirectly, either through sources on the internet, journals and books that provide information about the level of service quality at Access by KAI. The population used in this research is users of the Access by KAI



Source: Research Flow, 2024 Figure 2. Flowchart

In this study, the sampling was conducted using the Lemeshow formula. According to Wahyuningtyas & Habib, (2024), the lemeshow formula is to calculate the number of samples because the population is unknown.

$$n = \frac{z^2 p(1-p)}{d^2} = \frac{1.96^2 0.5(1-0.5)}{0.10^2} = 96.04 \sim 97 \tag{1}$$

Based on the results of the calculation of the lemeshow formula, the results obtained were 97 respondents. The respondents used in this study were 100 respondents. So the number of respondents is considered sufficient because  $N \ge N'$ .

# 2.2 E-ServQual

According Jameel et al. (2021), E-ServQual refers to the extent to which a website can facilitate efficient and effective shopping, purchasing, and delivery of products and services.

Electronic services aim to provide customer satisfaction by meeting their needs without physical interaction. The dimensions used in E-ServQual include efficiency, system availability, fulfillment, privacy, responsiveness, contact, and compensation (Çelik, 2021). E-Service Quality is defined as customer's evaluation and opinions regarding service quality in virtual marketplace. E-Service Quality encompasses the entire customer journey, including pre-purchase evaluation, product purchase, and post-purchase activities (Ashiq & Hussain, 2024). According to Ahlawat (2021), service quality begins with the needs of the users and ultimately ends with users' perceptions. Sari & Dwi Fatrianto (2023) explained that the calculation of E-ServQual involves identifying the gap between expectations and perceptions of E-ServQual questionnaires. The calculation begins with determining the E-ServQual expectation score and the E-ServQual perception score based on the following formula:

$$\overline{P}_{1} = \frac{\sum Pi}{n}$$

$$\overline{E}_{1} = \frac{\sum Hi}{n}$$
(2)
(3)

description:

 $\overline{P1}$ = Average value of the perception level $\sum Pi$ = Total perception value per indicator $\overline{E1}$ = Average value of the expectation level $\sum Ei$ = Total expectation value per indicatorn= Number of respondents

Oktamala & Zuraidah (2021), explained Subsequently, that E-ServQual value or the gap between attributes is calculated using a formula to identify which attributes contribute to the low service quality of the Access by KAI application. Additionally, a dimensional gap calculation is performed to determine whether each E-ServQual dimension in Access by KAI application has met user satisfaction. The formula used is as follows:

$$E - ServQual Score = \overline{P_1} - \overline{E_1}$$

Gap value classification:

- 1. Negative gap value (< 0) indicates "not satisfactory" due to a discrepancy between user perception and expectation.
- 2. Gap value equal to zero (= 0) indicates "satisfactory" as it shows that the service quality meets user expectations.
- 3. Positive gap value (> 0) indicates "very satisfactory" as it demonstrates that the service quality exceeds user satisfaction levels.

# 2.3 E-ServQual Attributes

In this study, the dimensions of E-Servqual are outlined into several attributes that will serve as the basis for developing the questionnaire, namely:

(4)

Variable	Indicator	Attribute
	EF1	Access by KAI is easy to use (Alnaim et. al. 2022)
Efficiency	EF2	Information on Access by KAI is well presented (Alnaim et. al. 2022)
Lincicity	EF3	Access by KAI makes it easy for users to complete transactions quickly (Alnaim et. al. 2022)
	SA1	Access by KAI functions properly when used (Alnaim et. al. 2022)
System	SA2	Access by KAI does not freeze (become inaccessible) when used (Alnaim et. al. 2022)
Availability	SA3	Access by KAI does not errors when searching for information or processing transactions (Alnaim et. al. 2022)
	FU1	Access by KAI provides accurate train departure schedules (Suryawardani et. al., 2022)
Fulfilment	FU2	Booking descriptions on Access by KAI are clear and accurate (Suryawardani et. al., 2022)
	FU3	Information received after transactions is clear and accurate (Suryawardani et. al., 2022)
	PR1	Access by KAI has adequate security features (Alnaim et. al. 2022)
Privacy	PR2	Access by KAI does not share user's personal information (Alnaim et. al. 2022)
	PR3	Access by KAI protects information about user's transactions (Alnaim et. al. 2022)
	RE1	Access by KAI responds to user needs (Suryawardani et. al., 2022)
Responsiveness	RE2	Access by KAI responds to user complaints (Suryawardani et. al., 2022)
	RE3	Access by KAI strives to resolve user issues while using the application (Suryawardani et. al., 2022)
Contact	CT1	Access by KAI provides users with access to communicate via social media, phone, or email (Parwita et. al. 2022)
	CT2	Access by KAI provides contact information for customer service (Parwita et. al. 2022)
Compensation	CP1	Access by KAI is willing to handle ticket refunds (Parwita et. al. 2022)
	CP2	Access by KAI provides compensation for incorrect schedule information on the application (Parwita et. al. 2022)

Table 1. Attributes of Each Variable

Source: Data Processing Results, 2024

## 2.4 Root Cause Analysis (RCA)

According Widhianingsih & Wahyuni (2024), the Root Cause Analysis (RCA) method is an approach used as a tool to identify and analyze a failure in a system and to find solutions to pressing problems. It aims to understand the root causes of a situation and address them effectively to prevent the recurrence of similar issues. According Huda et. al. (2024), root cause analysis can be performed using various tools, one of which is the 5W+1H investigation tool. The 5W+1H method involves examining problems through questions of what, where, why, who, when, and how to thoroughly understand the issue at hand.

### 3. Result and Discussion

### 3.1 Gap Calculation

In analyzing the user satisfaction of the Access by KAI application, it is necessary to calculate the E-ServQual (Gap) value. Later, this calculation will be the basis for improving application services in order to meet the expectations of users. The following is Table 2. which shows the E-ServQual (Gap) value for each attribute based on the results of distributing questionnaires to 100 respondents melalui Google Form, where the criteria for respondents who can fill out this questionnaire are users of the Access by KAI application who have carried out transactions in the application at least once.

Indicator	Average Perception Level	Average Expectation Level	Gap
EF1	4,15	4,12	0,03
EF2	4,14	4,12	0,02
EF3	3,20	4,15	-0,95
SA1	3,28	4,13	-0,85
SA2	3,15	4,22	-1,07
SA3	3,33	4,34	-1,01
FU1	4,25	4,12	0,13
FU2	3,60	4,14	-0,54
FU3	4,24	4,14	0,10
PR1	4,14	4,00	0,14
PR2	4,19	4,04	0,15
PR3	4,21	4,17	0,04
RE1	3,39	4,18	-0,79
RE2	3,20	4,20	-1,00
RE3	3,25	4,27	-1,02
CT1	3,59	3,42	0,17
CT2	4,16	4,00	0,16
CP1	3,65	4,16	-0,51
CP2	3.65	4.14	-0.49

Table 2. Calculation of E-ServQual Value (Gap) for Each Attribute

Source: Data Processing Results, 2024

Based on the results in table 2 above, it can be observed that there are 10 attributes with negative (-) values, namely SA2, RE3, SA3, RE2, EF3, SA1, RE1, FU2, CP1, and CP2. Prioritization of improvements is carried out on attributes with the largest negative value (-) to the smallest.

## 3.2 Root Cause Analysis with 5W+1H

In the 5W+1H analysis, based on the results of problem identification obtained earlier, these results are then used to establish benchmarks for improving and enhancing service quality and reducing the level of user complaints for the Access by KAI application. The following is an analysis of improvements using the 5W + 1H method for attributes of the Access by KAI application with negative values:

Table 3.	5W-	+1H Analysis
		Access by KAI freeze (become inaccessible) when used (SA2)
	1.	Lack of user understanding
What	2.	Incompetent developers
vv nat	3.	Inadequate server
	4.	Less than optimal server maintenance
	1.	Users are unaware of the minimum device specifications required
Why	2.	Developers lack expertise and are unresponsive
winy	3.	Database is less effective
	4.	The application continues to have problems even though improvements have been made
Where	Th	he issue occurs within the Access by KAI application, affecting various features such as
XX 71	the	e home menu, booking, and payment
When	Im	imediately, to prevent prolonged disruptions and ensure user satisfaction
Who		sers, Access by KAI development team, and KAI management
	1.	Provide clear information through social media to educate users about the minimum
	2	device specifications needed for the Access by KAI application
	2.	Access by KAI leam:
		- Expand compatibility to include more device types.
Harr		- Minimize the application's specification requirements.
пом		- Reduce the application's size.
		- Flovide additional training and knowledge to developers to nandle application issues
	3	Ontimize the database in the application with regular maintenance
	3. 4	Ontimizing existing policies and conducting regular monitoring and evaluation of the
		ongoing maintenance of servers
A	Acces	ss by KAI does not attempt to resolve user issues when using the application (RE3)
	4.	Customer Service team is not responsive enough
W/leat	5.	Development team does not understand user needs
wnat	6.	Repair is less than optimal
	7.	Policies and SOPs are not running well
	1.	Slow response to user reports
Why	2.	Lack of survey and understanding of user feedback
w iiy	3.	Application still does not work optimally after being fixed
	4.	Lack of performance monitoring and evaluation
Where	Pr	oblems with user communication with the app development team, which can be done
	th	rough the help center, social media, and Google Play Store reviews.
When	Im	imediately, to prevent prolonged disruptions and ensure user satisfaction
Who	De	eveloper, Customer Service team, KAI management
	1.	Supervise and evaluate the performance of the customer service team on a regular basis
	2	so that they can respond quickly to user complaints
How	2.	Organizing brainstorming between developers in understanding the problems faced by
	r	application users based on existing feedback
	3.	Optimizing existing SOPs and problem handling policies along with regular monitoring
1 2222	a h	and evaluation of their performance $V$ A Lange subscription of the propagation of the propagation $(S \land 2)$
Acces	<u>s by</u> 1	Appearing error in the application
What	1. 2	Inadequate server
vv nat	2. 3	Lack of user understanding
	J. 1	The existence of bugs
Why	2	Server overload when users increase dramatically
,, iiy	3.	Not understanding the minimum device specifications as a condition of use
Where	Pr	oblems occur in the ordering and transaction features of the Access by KAI application
-	-	

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When	Immediately, to prevent prolonged disruptions and ensure user satisfaction
Who	Users, Access by KAI application development team, KAI management
	1. The developer team immediately fixes the bugs in the transaction area.
TT	2. Optimizing the database in the face of a surge in application users at a time
How	3. Provide clear information through social media owned to educate users regarding the
	minimum device specifications in using the Access by KAI application
	Access by KAI does not respond to user complaints (RE2)
What	Customer Service team is not responsive
	1. Slow response to user reports
Why	2. User complaints do not get enough attention
5	3. User complaints take too long to process
	Problems occur in user communication with the app development team which can be done
Where	in the help center feature, social media, and Google Play Store reviews.
When	Immediately, to prevent prolonged disruptions and ensure user satisfaction
Who	Customer Service Team
	Supervise and evaluate the performance of the customer service team regularly so that they
How	can respond quickly to user complaints about problems encountered.
Acc	cess by KAI does not make it easy for users to complete transactions quickly (EF3) (EF3)
1100	1 Lack of user understanding about transaction
What	2. The flow of the transaction process is quite complicated for users
	3. Non-optimized transaction features
	1. Do not understand the flow of the transaction process in the application
Why	2. Transaction flow has too many steps
·· 11	3. The transaction system is not stable due to bugs
Where	Problems occur with the transaction feature in the Access by KAI application
When	Immediately, to prevent prolonged disruptions and ensure user satisfaction
Who	Access by KAI application development team. KAI management
	1 Provide clear information through social media owned to educate users about transaction
	steps in the Access by KAI with various payment methods available.
How	2. Simplify the flow of the transaction process in the Access by KAI
	3. Fixing bugs in the transaction process that cause users to fail to make payments
	Access by KAI does not work properly when used (SA1)
	1. App is slow to respond
	2 The application does not display the home menu
What	3 Inadequate server
	4. Lack of user understanding
	1. Long processing time
	2. Application features cannot be used
Why	3. Database is less effective when there is a surge of users at a time resulting in overload
	4. Not understanding the minimum device specifications as a condition of use
	Problems occur in the Access by KAI application which can occur in various features in it
Where	such as the home menu, ordering and navment
When	Immediately, to prevent prolonged disruptions and ensure user satisfaction
Who	Users Access by KAI application development team. KAI management
	1. The developer team immediately fixes the bugs in the affected areas
	2. Optimize the database in the face of a surge in application users at a time
How	3. Provide clear information through social media owned to educate users regarding the
	minimum device specifications in using the Access by KAI application
	Access by KAI does not respond to user needs (RE1)
	1. Customer Service team lacks understanding of user needs
What	2. Development team lacks understanding of user needs
Whv	1. Lack of user feedback research
· j	-

WhereProblems occur in user communication with the app development team, which can be done in the help center, social media, and Google Play Store reviews.WhenImmediately, to prevent prolonged disruptions and ensure user satisfactionWhoDeveloper, Customer Service team, KAI managementOrganize brainstorming between developers in understanding the problems faced by application users based on existing feedback, so that the improvements obtained can be right on target.Booking descriptions on Access by KAI are not clear and accurate (FU2)WhatOrdering system errorWhyThere is a bug in the booking system in the applicationWhenImmediately, to prevent prolonged disruptions and ensure user satisfactionWhoAccess by KAI application development teamHowFixing bugs in the Access by KAI application booking systemAccess by KAI application booking systemAccess by KAI application booking systemAccess by KAI not willing to handle ticket refunds (CP1)1.Compensation services are not well described in the applicationWhat2.The flow of the refund claim process is quite complicated for users3.1.1.Lack of user access to compensation in the applicationWhyProblems occur with compensation services by the Access by KAI applicationWhat0.1.1.1.1.1.1.2.1.2.3.2.
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<ul> <li>When Immediately, to prevent prolonged disruptions and ensure user satisfaction</li> <li>Who Developer, Customer Service team, KAI management</li> <li>Organize brainstorming between developers in understanding the problems faced by application users based on existing feedback, so that the improvements obtained can be right on target.</li> <li>Booking descriptions on Access by KAI are not clear and accurate (FU2)</li> <li>What Ordering system error</li> <li>Why There is a bug in the booking system in the application</li> <li>Where Problems occur with the booking feature in the Access by KAI application</li> <li>Mhom Access by KAI application development team</li> <li>How Fixing bugs in the Access by KAI application booking system</li> <li>Access by KAI application development team</li> <li>How Fixing bugs in the Access by KAI application booking system</li> <li>Access by KAI not willing to handle ticket refunds (CP1)</li> <li>Compensation services are not well described in the application</li> <li>What 2. The flow of the refund claim process is quite complicated for users</li> <li>Lack of user access to compensation in the application</li> <li>Why 2. Refund flow has too many steps</li> <li>The system is not running properly and the lack of responsiveness of the related parties</li> <li>Problems occur with compensation services by the Access by KAI application</li> <li>When Immediately, to prevent prolonged disruptions and ensure user satisfaction</li> <li>When Immediately, to prevent prolonged disruptions and ensure user satisfaction</li> <li>Why 2. Refund flow has too many steps</li> <li>The system is not running properly and the lack of responsiveness of the related parties</li> <li>Problems occur with compensation services by the Access by KAI application</li> <li>Immediately, to prevent prolonged disruptions and ensure user satisfaction</li> <li>When Immediately, to prevent prolonged disruptions and e</li></ul>
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3. Improve the refund service in a special team to process refunds more quickly and
responsively.
Access by KAI does not provide compensation for incorrect schedule information on the application
(CP2)
1. Users have difficulty reporting train schedule information errors
What 2. Compensation process is time-consuming and unclear
3. Lack of information
1. Customer service is not responsive
Why 2. There is no clear notification regarding the deadline for compensation
3. Compensation terms are not explained in detail
Where Problems occur with compensation services by the Access by KAI application
When Immediately, to prevent prolonged disruptions and ensure user satisfaction
Who Developer, Customer Service team, KAI management
1. Supervise and evaluate the performance of the customer service team on a regular basis
so that they can respond quickly to user questions about problems related to
How compensation entitlement
2. Provide clear information through social media to educate users about the flow of the
compensation claim process in a clear and easy-to-understand manner
Source: Data Processing Results. 2024

Based on Table 3, the causes of the low service quality in the priority improvement attributes can be identified, along with solutions that can be provided to the Access by KAI application. These improvements aim to enhance service quality in the attributes requiring

attention to ensure user satisfaction and optimize performance within the Access by KAI application management team.

## 4. Conclusion

Based on the results and discussion in this study, it can be concluded as follows:

- The service quality of the Access by KAI application from the user's perspective shows that 10 out of 19 service attributes received negative scores. These attributes are SA2, RE3, SA3, RE2, EF3, SA1, RE1, FU2, CP1, CP2, indicating that users are still dissatisfied with these attributes. Improvement strategies are needed to enhance these service aspects.
- 2. Proposed improvements are provided as a reference to enhance service quality and reduce user complaints about the Access by KAI application. These recommendations are formulated using the Root Cause Analysis (RCA) method for each prioritized attribute requiring improvement. The proposed solutions address various issues, including user education about the requirements and conditions for accessing the Access by KAI application, bug fixes causing application errors, expanding the application's coverage, server optimization, improving coordination among teams, optimizing existing policies and standard operating procedures (SOPs) to function more effectively, and other specific suggestions for each attribute

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