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Service Improvement Priorities of Train Transport Service: Evidence from Indonesian Economy-Premium Train

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ABSTRACT

The Indonesian Railway Company (PT KAI) may have sustainable growth due to passengers' quality services. This study determines influential indicators and service improvement priorities for the economy-premium train in Indonesia using 284 respondents. An online questionnaire was used to collect data, while the sample was determined using judgment sampling methods. The study used the Exploratory Factor Analysis (EFA) and the Importance-Performance Analysis (IPA). The results show that passengers felt satisfied with the completeness of emergency equipment, security and safety, and professional train staff. However, they were not satisfied with TV show contents, food and beverage prices, and legroom on chairs. The EFA results show nine dimensions and 41 influential indicators of the economy-premium train service qualities. According to the IPA results, the service priorities that should be improved by PT KAI include the availability of internet access and the cabin facilities, especially TV show contents and legroom on chairs. These results can help PT KAI to increase its Customer Satisfaction Index (CSI) score to meet the respondents' expectations and increase the satisfaction and loyalty of the economy-premium train passengers.

INTRODUCTION

A public transport system's success depends on the number of passengers that attracts and maintains the system (de Oña & de Oña, 2014). In case the service quality satisfies passengers, the company may have a sustainable development (Nguyen et al., 2018). Service quality, passenger satisfaction, and loyalty affect the long-term operation, growth, and profit of a service-oriented transport system (Chou & Kim, 2009). Therefore, PT KAI continues to innovate and improve its service quality for passengers to be satisfied and remain loyal. This may also help to find the right solution to reduce complaints from passengers.

PT KAI regularly conducts passenger satisfaction surveys regarding the services on the train and at the station. On a scale of 5, it achieved a CSI of 4.19. In terms of commercial economy trains, PT

KAI achieved a CSI score of 4.17, and mixed trains scored 4.04, the lowest score of all train types (Kinas Consulting, 2019). The CSI score of commercial economy and mixed trains is already in the "High", though it can be increased by improving the quality of services. The study on the economy-premium train services is necessary because there are still complaints and criticisms, specifically seating inconveniences that make passengers switch to other modes of transportation (Kusdianto in Agustien, 2020 kompasiana.com). Additionally, there are also uncertainties of getting desired seats (Triyadi in palembang.tribunnews.com, 2018).

The economy-premium train is PT KAI's latest generation of economy class facilities produced by PT Industri Kereta Api (PT INKA). It has been produced since 2016 to replace a series of business trains that is no longer suitable for use. The economy-premium trains are currently combined with 32 trainsets in Indonesia (GAPEKA PT KAI, 2019a). It has several characteristics, such as seats designed in a 2-2 configuration with two directions facing the middle of the series (PT INKA, 2018). Statistics show that the passenger volume of economy class throughout 2019 was 30.3 million passengers, or 107.4% of the 2018 value (annual report PT KAI, 2019b). PT KAI needs to maintain the satisfaction and the loyalty of its passengers, especially in the economy class, because the number of passengers is higher (61.62%) compared to business class passengers (4.82%) and executives (33.56%) (annual report PT KAI, 2019b). In this case, PT KAI needs to enhance and maximize pleasant passenger experiences.

The number of the economy-premium train passengers is currently increasing yearly, accompanied by a surge in the economy-premium train operated by PT KAI, hence important to maintain and even to improve its service quality. Previous studies found that service factors that have strong influence on improving service quality are staff services (Le-Klähn et al., 2014; Shen et al., 2016), seating factors (Lee et al., 2009; Zhen et al., 2018), comfort assurance (Cao & Cao, 2017; Zhen et al., 2018), reliability and accessibility (Kuo & Tang, 2013; Le-Klähn et al., 2014), food and beverage factors (Kinas Consulting, 2019), ticket prices (Le-Klähn et al., 2014), and information and technology facilities (Dell'Asin et al., 2015). However, there are no studies that explore this service factors into a single model that affected train transport service, specifically using the Indonesia economy-premium train as a case study.

To address the research gap on service improvement priorities of train transport service, this study uses EFA to examine indicators affecting the economy-premium train services as future empirical knowledge. Furthermore, IPA is used to identify indicators to be prioritized for service improvement. Afterward, the improvement plan can be applied to the right target. IPA classifies service indicators into four different quadrants through a helpful method for developing an effective marketing program. The results can be used as input for academics to conduct further research on service indicators affecting passenger satisfaction and loyalty, both in the railway and other modes of transport.

This study is unique and important to be carried out because it is possible to find new indicators that affect the quality of the train transport service. This study advances the latest knowledge about service improvement priorities, especially on the economy-premium train in Indonesia which is then organized as follows; Literature Review (containing theories from previous studies), Research Method (containing research framework, data and variables, analysis approaches), Results Explanation (containing respondent characteristics, descriptive analysis results, EFA results, IPA results, and CSI), and Discussion (supported with managerial implications and demonstrating the limitations and future research).

LITERATURE REVIEW

Service Quality

Since the development of a strong global service industry, quality has played a critical role in creating passenger value. Good service quality directs passengers with past experiences to create a positive corporate image, generate positive preferences (Chien & Chi, 2019), and maintain a competitive advantage (Chou & Kim, 2009). Service providers must focus on improving quality and company image for user satisfaction, which improves passenger loyalty (Nguyen et al., 2018).

Quality is an important element of every business, especially service providers. Service quality can be defined as the result of comparing consumers' expectations and performance of a service (Cronin & Taylor, 1992). Similarly, it can be resulted from the perception of comparing consumer expectations with the actual service performance (Parasuraman et al., 1988). Improving service quality is considered as an important strategy for a company's success in a competitive market (Kim & Lee, 2011).

It is not easy to conceptualize service quality because of the three main characteristics, including intangibility, heterogeneity, and inseparability (Parasuraman et al., 1988). The SERVQUAL scale consists of five dimensions, specifically tangible, reliability, assurance, responsiveness, and empathy. These aspects are widely used in researches related to service quality in various fields, including the transportation sector, such as the urban rail systems in Indonesia (Ansory & Safira, 2018) and the low-cost carrier industry in South Korea (Kim & Lee, 2011).

Shen et al. (2016) studied the quality of urban rail transit services in China with 813 respondents. The results showed that the CSI Suzhou rail transit line one score was 83.27, indicating that the service quality is in a good category but still needs improvement. Among the nine service indicators, safety and security have the highest satisfaction score, followed by direction and guidance. The IPA results showed that equipment and facilities and information distribution/disclosure require serious attention. The results show that the services performed well and should be maintained include ticket service, speediness and convenience, direction and guidance, and safety and security. The convenient facilities for passengers were lack of priority). The most superior indicators of Suzhou rail transit line one, which have performed well and meet expectations, include cleanliness, comfort, and staff service.

A research was conducted on 16 service indicators analyzed through factor analysis with 466 passengers of public transport in Munich, Germany (Le-Klähn et al., 2014). The results showed that there are 4 dimensions of public transportation service quality, including traveling comfort, service quality, accessibility, and additional features. This research was then continued using the Discriminant Function Analysis method to identify important factors for passenger satisfaction. In general, passengers felt satisfied with public transportation services in Munich. Several service indicators met passenger expectations, including punctuality, reliability, network connection, and frequency. Furthermore, service indicators with the lowest score and need improvement include staff service, comfort while waiting at bus stops or train stations, and ticket prices. Another study used factor analysis with 265 bus passengers as respondents in Jakarta and Yogyakarta (Budiono, 2009). A total of 14 service indicators were grouped into two factors, specifically functional and soft factors. Functional quality factors consisting of frequency, price, punctuality, and travel time have a stronger effect on increasing passenger satisfaction than soft factors. Overall, bus transportation services quality was still below the passenger's expectations.

A study was conducted on 851 high-speed train passengers in China by analyzing the importance and performance of 17 service indicators (Zhen et al., 2018). The results showed that the most

important service indicators for passenger satisfaction on the Shanghai-Nanjing HSR high-speed train include staff attitude, the convenience of purchasing tickets, and ease of travel access. The results of the study also found that to improve passenger satisfaction of the Shanghai-Nanjing HSR could increase the indicators of toilet sanitation and seat comfort.

Kuo & Tang (2013) investigated the satisfaction of a high-speed train in Taiwan in the elderly market segment. The study focused on the influence of service quality and company image on passenger satisfaction and behavioral intention. According to the results, in passenger satisfaction, environmental accessibility (such as facilities for disabilities and signage legibility) is important than hardware quality, staff attitude, and adaptability.

PT KAI conducts annual customer satisfaction research to evaluate its products and services. The measurements are made using the customer focus approach on stations and trains. The dimensions assessed on the train include physical aspects of the trains and foods and beverages, non-physical aspects, and timeliness. According to the results, overall passenger satisfaction with PT KAI services had a CSI score of 4.19, while train dimensions had a score of 4.22 from a scale of 5. This means that passenger satisfaction with PT KAI services is in the "high" category, and train service meets passenger expectations. The non-physical aspects, including the punctuality of the train, had a relatively higher CSI score. The physical aspects of foods and beverages had a relatively lower CSI score. For this reason, improvement needs to the physical aspects of foods and drinks on the train and maintaining its advantages, such as train cleanliness, comfort, the temperature in the train, supporting facilities, and other things directly related to passengers while traveling (Kinas Consulting, 2019).

Customer Satisfaction Index (CSI)

Sweden was the first country to conduct a passenger satisfaction survey in 1989 with the Swedish Customer Satisfaction Index (SCSI). In 1995, the American Customer Satisfaction Index (ACSI) was released (Fornell et al., 1996). Additionally, in 2000 the European Customer Satisfaction Index was published, while Indonesia has had the Indonesian Customer Satisfaction Index since 1999 (Irawan, 2003). The CSI measurement is conducted to determine the level of passenger satisfaction with the measured product/service, used as a reference by most companies to determine future targets. Without CSI, management may not set objective in increasing customer satisfaction. Furthermore, an index is also needed to evaluate the level of passenger satisfaction regularly. The comparison of the CSI scores from yearly can be used as a reference to improve service quality. This involves eliminating poor services and maximizing services those deemed important.

The CSI calculation uses the average score of the level of importance and performance of each indicator. CSI can be calculated as follows (Bhote, 1996):

$$CSI = \frac{T}{5Y} x \ 100\%$$

Where:

T   = score of importance x performance
5   = maximum score used on the measurement scale
Y   = total score of importance average

The overall level of respondent satisfaction is shown by the following criteria (Bhote, 1996), (a) 0.81 - 1.00 very satisfied; (b) 0.66 - 0.80 satisfied; (c) 0.51 - 0.65 sufficiently satisfied; (d) 0.35 - 0.5 less satisfied; and (e) 0.00 - 0.34 not satisfied. The maximum CSI score is 1.00, while the score below

0.50 indicates low service performance. The CSI score above 0.80 indicates the high level of satisfaction toward service performance.

RESEARCH METHOD

Research Framework

Literature review shows that many indicators of service quality can be adapted into this study, including high-speed train services (Chou & Kim, 2009; Kuo & Tang, 2013; Lee et al., 2009; Wu et al., 2011; Zhen et al., 2018), intercity passenger rail (Fernandes & Sarmento, 2013; Losada-Rojas et al., 2019; Oliveira et al., 2019), public transportation (Budiono, 2009; Cao & Cao, 2017; Dell'Asin et al., 2015; Le-Klähn et al., 2014; Thompson & Schofield, 2007), urban rail (Ansory & Safira, 2018; Shen et al., 2016; Soltanpour et al., 2020), and also the low-cost carriers industry (Kim & Lee, 2011).

According to Zhen et al. (2018), practitioners cannot rely on service quality studies conducted in various rail transit services, conventional trains, and high-speed trains to design and improve their train transport services. This is because of differences in quality demands from passengers for each different type of train. Therefore, there is a need for a study on the quality of the economy-premium train services. There are also cultural differences between countries that allow indicator mismatch when applied in different service areas (Wu et al., 2011). However, this study adjusts the indicators adopted with the culture in Indonesia. It applies the EFA method to determine influential indicators that affect the quality of the economy-premium train services and the IPA method to obtain the strongest service indicators and priorities for improvement.

Data and Variables

This study uses primary data from questionnaires distributed online with an interval scale. Data were obtained from the measurement results using a five point Likert scale. The questionnaire was designed based on the literature and modified based on its relevance to Indonesia's economy-premium train services. The contents were tested for the quality of the data by 10 experts familiar with the preparation of the questionnaire and understood the economy-premium train services, including lecturers, officials at PT KAI's passenger commercial unit, PT KAI operational employees directly handling the economy-premium trains, and train lovers. The questionnaire was revised based on feedback from these experts and distributed through social media with train lovers' help. Credit voucher incentives of IDR 50.000 (fifty thousand rupiahs) were given to ten lucky respondents who had completed all the questionnaire contents.

This study has an unknown number of populations with samples determined by the judgment sampling method as follows, (1) having traveled by the economy-premium train at least two-three times; (2) willing to assist in the data collection process; and (3) having minimum high school education/equivalent. Target sampling was conducted using the incidental sampling method, which means that sample by chance (Sugiyono, 2015). Anyone who accidentally or incidentally received the questionnaire could be used as a sample.

The spreading of the questionnaire online was conducted in the second week of August 2020. The number of respondents who filled out the questionnaire was 328 passengers, though 284 (86.59%) were processed. The questionnaire was supposed to be completed in over 7.5 minutes. Any that mentioned the trains ridden other than the economy-premium trains were excluded from the data set.

Analysis Approaches

The primary data were processed using IBM SPSS statistics 23 software and Microsoft Excel. There are 10 dimensions in the study with 67 service indicators, as shown in Table 1. The first research method applied is the Exploratory Factor Analysis (EFA) to determine influential indicators affecting the quality of the economy-premium train services. This was followed by the Importance-Performance Analysis (IPA) to identify the level of importance and performance of service indicators. Strong service indicators are obtained and priority improved by PT KAI to increase passenger satisfaction and loyalty. The average level of importance and performance was obtained directly from the questionnaire data.

Table 1. Service indicators within the research

Statement	Service Indicators	References
1. Reliability		
P1	Trains are always clean	(Ansory &
P2	Trains are always in excellent condition	Safira, 2018;
P3	Trains operate on time	Chien & Chi,
P4	Frequency/number of trips	2019; Kim & Lee,
P5	The trip schedule	2011;
P6	The time allotted to get on and off the trains	Parasuraman et
P7	Security and safety	al., 1988)
P8	Personal security guarantee	
2. Train Staff		
P9	Train staff with appearance clean, tidy, and professional	(Ansory &
P10	Train staff are polite and friendly	Safira, 2018;
P11	Train staff are experts in their fields	Chien & Chi,
P12	Train staff provide the best service	2019; Chou &
P13	Train staff are responsive in helping passengers	Kim, 2009; Kim
P14	Train staff are informative	& Lee, 2011; Kuo
P15	Train staff can handle problems in abnormal situations	& Tang, 2013;
P16	Train staff are effective and efficient in solving passenger problems	Shen et al., 2016;
P17	Train officers have good initiatives in fulfilling passenger demands	Wu et al., 2011)
P18	Good initiatives from train staff in providing information through broadcasting services	
P19	Good attitude from train security personnel services	
P20	Train staff give special attention to female passengers, children, elderly, and disabled	
P21	Call center service availability	
3. Facility Comfort		
P22	Cabin space comfort	(Ansory &
P23	Train speed comfort	Safira, 2018;
P24	Availability of facilities (seats, TV, power outlets, emergency equipment, air conditioning, etc.)	Chien & Chi, 2019; Kim & Lee,
P25	Physical facilities are visually appealing (color of seats, TV layout, ad placement, etc.)	2011; Parasuraman et
P26	Up-to-date equipment	al., 1988)
4. Accessibility		
P27	Easy access to seats, toilets, and dining cabin	(Kuo & Tang,
P28	Ease of finding the location of seats, toilets, and dining cabin	2013; Shen et al.,
P29	Ease of access to the train entrance and exit	2016; Zhen et al.,
P30	Fulfillment of access for disabled passengers	2018)

Table 1. Service indicators within the research (continued)

Statement	Service Indicators	References
5. Environmental Factors		
P31	Lighting level	(Chou & Kim,
P32	Degree of air conditioning	2009; Lee et al.,
P33	Noise level	2009; Wu et al.,
P34	Enjoyment of traveling atmosphere	2011)
6. Sitting Factors		
P35	Getting a seat as you wish	(Lee et al., 2009;
P36	Seating position	Shen et al.,
P37	Legroom on chairs	2016)
P38	Armrest Chair	
P39	Seat width	
P40	Footrest on chair	
P41	Chair shape	
P42	Chair material	
7. Physical Aspects of Foods and Beverages		
P43	Menu variations	(Kinas
P44	Food taste quality	Consulting,
P45	Food hygiene	2019)
P46	Food display	
P47	Serving time speed	
P48	Price of foods and beverages	
8. Supporting Facilities		
P49	TV volume level	(Cao & Cao,
P50	TV show content	2017; Dell'Asin
P51	The layout of advertisements/promotions in the cabin	et al., 2015;
P52	Reading/magazine facilities	Fernandes &
P53	Cell phone signal strength	Sarmento, 2013;
P54	Internet access	Kinas
P55	Availability of electrical outlets	Consulting,
P56	Emergency equipment	2019; Shen et al.,
P57	Toilet sanitary conditions	2016; Zhen et al.,
P58	Toilet equipment (water availability, jets shower, tissue, hand soap, trash can, air freshener)	2018)
9. Ticket Services		
P59	The affordability of tickets	(Budiono, 2009;
P60	Competitive ticket prices	Dell'Asin et al.,
P61	Many choices of ticket purchase routes	2015; Le-Klähn
P62	Differences of ticket pricing in weekend and weekday	et al., 2014)
P63	Differences of ticket pricing for each type of seat	
P64	Ease of ticket cancellation and travel schedule changes	
10. Policy Socialization		
P65	Information dissemination regarding policies/rules/itinerary	(Haryono, 2005)
P66	Socialization activities related to policies/rules	
P67	Frequency of policy socialization	

Source: taken from various sources (2020)

Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis (EFA) is a classic formal measurement model used when observed and latent dimensions are measured at the interval level (Leonard, 2005). The EFA identifies the similarity of several indicators shown by a high correlation value. The high correlation value on

several indicators is examined to form a factor/dimension. The EFA is used on condition that the researcher does not have preliminary information, hence necessary to group indicators into a dimension. According to Hair et al. (2010), factor analysis can reduce a set of original variables into several new aspects, called factors. Factor analysis produces factors/dimensions with a minimum loss of information.

Studies often use the EFA method to explore factors that influence service quality, including bus transportation in Indonesia (Budiono, 2009), high-speed trains in Taiwan (Kuo & Tang, 2013; Wu et al., 2011), public transportation in Germany (Le-Klähn et al., 2014), Spain and Sweden (Dell'Asin et al., 2015), railway logistics in Australia (Ghaderi et al., 2017), and urban rail in Iran (Soltanpour et al., 2020) and the UK (Ross et al., 2020). In this study, the researchers used indicators from previous studies to examine the service quality of the Indonesian economy-premium train.

Importance-Performance Analysis (IPA)

The IPA is a diagnostic tool used to evaluate service quality from the passenger perspective in many industries (Azzopardi & Nash, 2013). Although several studies have assessed the relative importance of various service indicators for passenger satisfaction, many have not provided input to be emphasized to improve the existing services (Zhen et al., 2018). The IPA classifies service indicators into four quadrants on the Cartesian diagram (Figure 1) based on importance and the perceived performance.
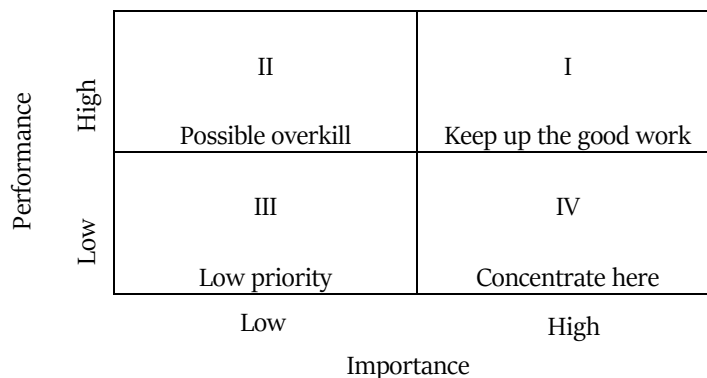

Figure 1. Importance-Performance Analysis (IPA) framework
Source: Martilla and James, 1977 in Zhen et al. (2018)

Figure 1 shows that service indicators that are important but have relatively low performance (which are in quadrant IV) should be prioritized for further improvement. The indicators in this quadrant are considered important, yet their performance does not meet expectations, leading to dissatisfaction. Therefore, these indicators are a major threat to overall passenger satisfaction. Low performance requires immediate attention and the highest priority in resources and efforts (Azzopardi & Nash, 2013). Indicators already performing well (those in quadrant I) need to be maintained because they are critical for satisfaction. The company should strive to maintain the achievements made. According to Zhen et al. (2018), the indicators in quadrants II and III are classified as not yet very important in increasing overall passenger satisfaction. The IPA method can classify service indicators into four different quadrants to help achieve this study's objectives. Specifically, it helps identifying the economy-premium train service indicators that require improvement to meet passenger expectations.

RESULTS

Validity and Reliability Test Results

The 67 service indicators used have a high validity with the corrected item-total correlation value for each indicator above 0.3 (the resulting value ranges from 0.324 - 0.728). According to the reliability test results, all study indicators have a high level of reliability with a Cronbach's Alpha value of 0.971. Therefore, the research instrument fulfilled the validity and reliability test.

Respondent Characteristics

Table 2 shows the demographic characteristics of the respondents. In this study, most respondents were males, specifically 213 (75.00%). Also, most of the respondents aged between 18-25 years, specifically 110 individuals (38.73%). The most recent education level was bachelor (S1), 118 individuals (41.55%). Most respondents were private employees/state-owned enterprises, totaling 114 (40.14%). In terms of income, most respondents earn between IDR 1,500,000 up to IDR 5,000,000 (32.39%).

Table 2. Demographic and travel characteristics of respondents

Characteristics: Demographic	N	%	Characteristics: Trip Profile	N	%
Gender			Travel purpose		
Female	71	25.00	Business/work	80	28.17
Male	213	75.00	Commute/usual trip/study	35	12.32
Age			Recreation/visiting family	158	55.63
18 - 25 years old	110	38.73	Others	11	3.87
26 - 35 years old	85	29.93	Frequent trips		
36 - 45 years old	64	22.54	5-7 times in a week	4	1.41
46 - 55 years old	18	6.34	1-4 times in a week	14	4.93
> 56 years old	7	2.46	2-3 times in a month	78	27.46
Current education level			Once in a month	38	13.38
Elementary-High school/equivalent	116	40.85	Once in 2-3 months	99	34.86
Diploma (D1-D3)	23	8.10	Others	51	17.96
Bachelor (S1)	118	41.55	Travel time		
Master-Doctoral (S2-S3)	27	9.51	2 - 6 hours	161	56.69
Occupation			6 - 10 hours	102	35.92
Civil servant/Armed forces/Police	12	4.23	exceed 10 hours	21	7.39
Private employees/State-owned enterprises	114	40.14			
Entrepreneur	40	14.08			

Table 2. Demographic and travel characteristics of respondents (continued)

Characteristics: Demographic	N	%	Characteristics: Trip Profile	N	%
Lecturer/Teacher/Educator	9	3.17			
Students/College students	67	23.59			
Others	42	14.79			
Income					
< IDR 1.500.000	78	27.46			
IDR 1.500.000 to IDR 5.000.000	92	32.39			
IDR 5.000.000 to IDR 10.000.000	51	17.96			
IDR 10.000.000 to IDR 15.000.000	26	9.15			
> IDR 15.000.000	37	13.03			

Source: processing result of primary data (2020)

A: Argo Parahyangan   G: Sawunggalih   L: Jayakarta
B: Mutiara Selatan   H: Kutojaya Utara   M: Kertajaya
C: Harina   I: Sancaka   N: Mutiara Timur
D: Pangandaran   J: Fajar/Senja Utama   O: Sribilah
E: Tawangjaya   Yogya/Solo   P: Sriwijaya
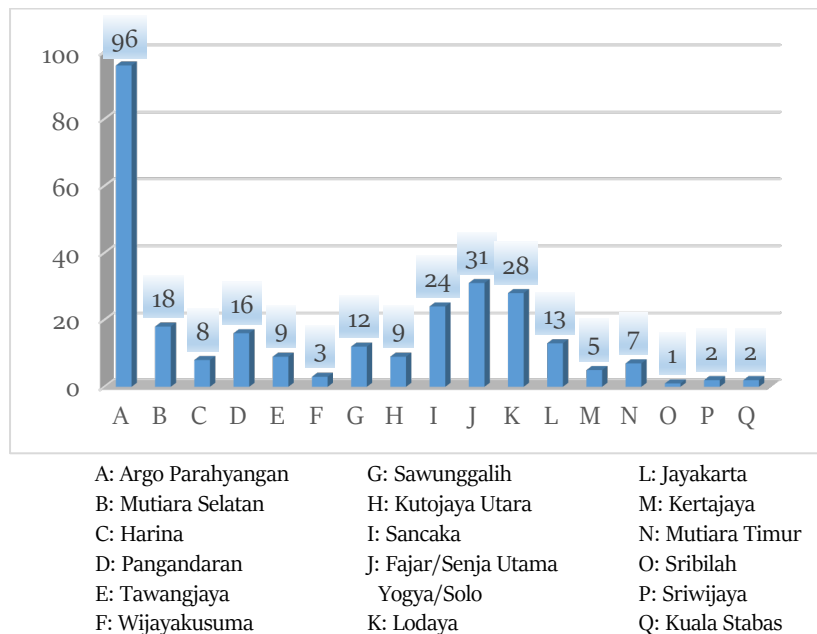F: Wijayakusuma   K: Lodaya   Q: Kuala Stabas

Figure 2. Chart of the economy-premium train most often used by respondents
Source: processing result of primary data (2020)

Table 2 shows the travel characteristics of the respondents. The economy-premium train most often used by respondents is the Argo Parahyangan train (See Figure 2), Jakarta-Bandung route is 96 individuals (33.80%) with a travel time of 2-6 hours (56.69%). The majority of respondents' travel purposes were recreation/visiting family as many as 158 individuals (55.63%). The most frequent trips were once in 2-3 months, constituted by 99 individuals (34.86%).

The cross-tabulation results based on travel purposes showed that the highest percentage of male passengers, 54.46% (116 individuals), traveled using the economy-premium trains for recreation/visiting family. The majority of respondents aged 18-25 years and 26-35 years and the

latest education level is elementary-high school/equivalent and Bachelor (S1). In terms of occupation, most of the respondents were students and employees of private/state-owned enterprises traveling for business/work and recreation/visiting family. From the overall cross-tabulation results, the respondents are mostly young people under 35, going for recreational trips/visiting family.

Descriptive Analysis Result

The results show that passengers were satisfied with the economy-premium train services, especially the completeness of emergency equipment, security and safety, and clean, tidy, and professional train staff. Security and safety indicators also have a high satisfaction index in Shen et al. (2016). However, they are not considered important by travelers on urban interchanges intermodal (Dell'Asin et al., 2015). Also, train staff has low satisfaction with public transport in Germany (Le-Klähn et al., 2014). Passengers are not satisfied with TV show content, food and beverage prices, and legroom on chairs. This is in line with Zhen et al. (2018), which stated that seat comfort in the Shanghai-Nanjing HSR increases passenger satisfaction.

Table 3 shows the average importance and performance values of the 67 service indicators. The higher the gap value, the farther the passenger's expectations on the service performance. The highest gap value is the service indicator P50, TV show contents (gap value = 1.56), then P54, internet access (gap value = 1.52), and P48, food and beverage prices (gap value = 1.27). The TV show contents are rarely updated, with limited internet access in all the economy-premium train cabins. Also, the price of foods and beverages on the train is still considered expensive by most passengers. PT KAI can improve these three indicators to enhance passenger satisfaction on trips by regularly updating TV program content, installing internet access on trips, and providing competitive food and beverage prices.

Table 3. The average value of importance and performance, level of conformity, GAP, and CSI of the economy-premium train service indicators

Indicators	Median		Level of Conformity	GAP	S = X * Y
	Importance (X)	Performance (Y)			
P1	4.743	4.204	88.64%	0.539	19.940
P2	4.680	4.201	89.77%	0.479	19.658
P3	4.718	4.130	87.54%	0.588	19.488
P4	4.511	4.000	88.68%	0.511	18.042
P5	4.430	3.873	87.44%	0.556	17.157
P6	4.585	4.194	91.47%	0.391	19.226
P7	4.771	4.475	93.80%	0.296	21.352
P8	4.683	4.236	90.45%	0.447	19.837
P9	4.722	4.447	94.18%	0.275	20.999
P10	4.725	4.345	91.95%	0.380	20.532
P11	4.736	4.398	92.86%	0.338	20.828
P12	4.701	4.299	91.46%	0.401	20.210
P13	4.694	4.222	89.95%	0.472	19.816

Table 3. The average value of importance and performance, level of conformity, GAP, and CSI of the economy-premium train service indicators (continued)

Indicators	Median		Level of Conformity	GAP	S = X * Y
	Importance (X)	Performance (Y)			
P14	4.683	4.239	90.53%	0.444	19.854
P15	4.637	4.127	88.99%	0.511	19.137
P16	4.623	4.123	89.19%	0.500	19.063
P17	4.616	4.046	87.64%	0.570	18.676
P18	4.662	4.187	89.80%	0.475	19.518
P19	4.676	4.271	91.34%	0.405	19.972
P20	4.711	4.239	89.99%	0.472	19.973
P21	4.697	4.229	90.03%	0.468	19.864
P22	4.704	4.130	87.80%	0.574	19.430
P23	4.658	4.201	90.17%	0.458	19.569
P24	4.687	3.979	84.90%	0.708	18.647
P25	4.563	3.817	83.64%	0.746	17.418
P26	4.525	3.627	80.16%	0.898	16.410
P27	4.634	4.204	90.73%	0.430	19.482
P28	4.701	4.405	93.71%	0.296	20.706
P29	4.658	4.345	93.27%	0.313	20.241
P30	4.563	3.715	81.40%	0.849	16.952
P31	4.715	4.401	93.35%	0.313	20.752
P32	4.648	4.025	86.59%	0.623	18.706
P33	4.602	3.768	81.87%	0.835	17.339
P34	4.690	4.391	93.62%	0.299	20.594
P35	4.525	3.687	81.48%	0.838	16.681
P36	4.454	3.683	82.69%	0.771	16.405
P37	4.430	3.218	72.66%	1.211	14.256
P38	4.511	3.718	82.44%	0.792	16.772
P39	4.504	3.782	83.97%	0.722	17.031
P40	4.408	3.356	76.12%	1.053	14.793
P41	4.465	3.616	80.99%	0.849	16.146
P42	4.528	3.718	82.12%	0.810	16.837
P43	4.556	3.775	82.84%	0.782	17.199
P44	4.553	3.553	78.04%	1.000	16.175
P45	4.641	4.187	90.21%	0.454	19.429
P46	4.553	3.782	83.06%	0.771	17.217
P47	4.574	3.912	85.53%	0.662	17.893
P48	4.433	3.158	71.25%	1.275	14.002
P49	4.475	3.296	73.64%	1.180	14.750
P50	4.458	2.901	65.09%	1.556	12.934

Table 3. The average value of importance and performance, level of conformity, GAP, and CSI of the economy-premium train service indicators (continued)

Indicators	Median		Level of Conformity	GAP	S = X * Y
	Importance (X)	Performance (Y)			
P51	4.394	3.687	83.89%	0.708	16.200
P52	4.525	3.528	77.98%	0.996	15.964
P53	4.641	3.658	78.83%	0.982	16.978
P54	4.750	3.229	67.98%	1.521	15.337
P55	4.732	4.384	92.63%	0.349	20.746
P56	4.736	4.549	96.06%	0.187	21.545
P57	4.715	4.000	84.84%	0.715	18.859
P58	4.697	3.982	84.78%	0.715	18.706
P59	4.588	3.782	82.43%	0.806	17.351
P60	4.553	3.711	81.52%	0.842	16.897
P61	4.711	4.384	93.05%	0.327	20.653
P62	3.824	3.546	92.73%	0.278	13.559
P63	3.694	3.327	90.09%	0.366	12.291
P64	4.627	4.095	88.51%	0.532	18.947
P65	4.602	4.134	89.82%	0.468	19.024
P66	4.500	4.032	89.59%	0.468	18.143
P67	4.472	3.908	87.40%	0.563	17.478
TOTAL	307.180	-	-	-	1216.583
CSI			$0.7921 \cong 0.79$		

Source: processing result of primary data (2020)

Exploratory Factor Analysis (EFA) Result

The EFA is used to determine factors affecting the quality of the economy-premium train services by exploring the 67 indicators asked in the questionnaire. The factors were extracted with the following criteria; the overall Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO MSA) value was above 0.5 (Malhotra & Birks, 2006), the Sig./Probability value on Bartlett's Test of Sphericity was less than 0.05 (Malhotra & Birks, 2006), an eigenvalue greater than 1 (Kaiser, 1960) is maintained and a loading factor value greater than 0.4 (Hair et al., 2010). Reliability analysis (Cronbach's alpha) was used to assess the correlation between each identified factor's indicators. All factors with a Cronbach's alpha value above 0.6 are accepted (Sujarweni, 2014). Table 4 shows the EFA results with 9 factors/dimensions and 41 service indicators suitable for the economy-premium trains with an overall KMO MSA value of 0.939 and a probability value of 0.00. The nine factors formed explain 68.67% of the total variance with each dimension given a name/label based on the suitability of the individual indicators grouped labeling professional train staff, seating factors, comfort assurance, reliability, food and beverage factors, cabin facilities, accessibility, dynamic pricing factors, and information and technology facilities.

Table 4. Exploratory factor analysis of the economy premium-train dimension

No.	Service Indicator	Dimensions/Factors								
		F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9
Professional Train Staff										
1	Train staff are polite and friendly	0.652								
2	Train staff are experts in their fields	0.629								
3	Train staff provide the best service	0.699								
4	Train staff are responsive in helping passengers	0.736								
5	Train staff are informative	0.747								
6	Train staff can handle problems in abnormal situations	0.733								
7	Train staff are effective and efficient in solving passenger problems	0.718								
8	Train staff have good initiatives in fulfilling passenger demands	0.787								
9	Good initiatives from train staff in providing information through broadcasting services	0.707								
10	Good attitude from train security personnel services	0.719								
11	Train staff give special attention to female passengers, children, elderly, and disabled	0.646								
12	Call center service availability	0.579								
Seating Factors										
13	Legroom on chairs		0.764							
14	Armrest Chair		0.709							
15	Seat width		0.788							
16	Footrest on chair		0.777							
17	Chair shape		0.848							
18	Chair material		0.702							
Comfort Assurance										
19	Lighting level			0.704						
20	Enjoyment of traveling atmosphere			0.745						

Table 4. Exploratory factor analysis of the economy premium-train dimension (continued)

No.	Service Indicator	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9
21	Availability of electrical outlets			0.682						
22	Emergency equipment			0.501						
Reliability										
23	Trains are always in excellent condition				0.524					
24	Trains operate on time				0.738					
25	Frequency/number of trips				0.658					
26	The trip schedule				0.665					
Food and Beverage Factors										
27	Menu variations					0.402				
28	Food taste quality					0.522				
29	Food display					0.707				
30	Serving time speed					0.742				
Cabin Facilities										
31	Cabin space comfort						0.620			
32	Availability of facilities (seats, TV, power outlets, emergency equipment, air conditioning, etc.)						0.629			
33	Physical facilities are visually appealing (color of seats, TV layout, ad placement, etc.)						0.586			
34	Up-to-date equipment						0.518			
Accessibility										
35	Easy access to seats, toilets, and dining cabin							0.705		
36	Ease of finding the location of seats, toilets, and dining cabin							0.654		
37	Ease of access to the train entrance and exit							0.667		
Dinamic Pricing Factors										
38	Differences of ticket pricing in weekend and weekday								0.824	
39	Differences of ticket pricing for each type of seat								0.783	

Table 4. Exploratory factor analysis of the economy premium-train dimension (continued)

No.	Service Indicator	Dimensions/Factors								
		F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9
Information and Technology Facilities										
40	Reading/magazine facilities									0.738
41	Internet access									0.840
Eigenvalue		15.93	3.09	1.58	1.47	1.38	1.34	1.29	1.07	1.01
Variance (%)		38.84	7.54	3.86	3.57	3.35	3.28	3.16	2.60	2.47
Cumulative variance (%)		38.84	46.38	50.24	53.81	57.17	60.45	63.60	66.21	68.67
Reliability coefficient (α)		0.94	0.91	0.82	0.79	0.74	0.83	0.82	0.69	0.69

Source: Processing Result of SPSS Data (2020)

The first factor, professional train staff (α= 0.94), explains 38.84% of the variance, including 12 indicators, and reflects the importance of train staff in providing the best service for passengers. The second one, seating factor (α= 0.91), explains 7.54% of the variance, consisting of 6 indicators relating to the comfort of the seats passengers expect while traveling. The third factor (α= 0.82) includes four indicators relating to lighting levels, the atmosphere of the trip, the availability of electrical outlets, and the completeness of emergency equipment, labeled comfort assurance, and explains 3.86% of the total variance. The fourth factor, reliability (α= 0.79), explains 3.57% of the variance, consisting of four service indicators related to the company's ability to provide services accurately and reliably. The fifth factor, foods and beverages (α= 0.74), explains the 3.35% of the variance, including four indicators of physical condition and taste of the foods and beverages offered and served during the trip. The sixth factor, cabin facilities (α= 0.83), consists of four indicators, including the availability and completeness of cabin facilities explaining 3.28% of the variance. The seventh factor, accessibility (α= 0.82), relates to the degree of easy access/reach of passengers on the train, consisting of three service indicators. This factor explains 3.16% of the variance. The eighth factor is the dynamic pricing (α= 0.69), explaining 2.60% of the variance and consists of 2 indicators related to applying different prices for certain conditions and times. The ninth factor, information and technology facilities (α= 0.69), consists of two indicators on reading facilities and internet access during the trip and explains 2.47% of the total variance.

Importance-Performance Analysis (IPA) Results

Figure 3 classifies 41 service attributes from the EFA result into 4 quadrants in the Cartesian diagram. A total of 22 service indicators (numbers 1-12, 19-24, 31, 35-37) falls into quadrant I, which means that 53.66% of them meet passenger expectations. Only 1 service indicator (2.44%) falls into quadrant II, specifically number 25 (frequency/number of trips). It already has a good performance, yet passengers do not consider this service indicator important. A total of 16 service indicators (numbers 13-18, 26-30, 33-34, 38-40) with a percentage of 39.02% falls into quadrant III, considered to be less important, and their service conditions are below average. Finally, 2 service indicators fall into quadrant IV, which means 4.88% of service indicators are strong and should be prioritized for PT KAI improvement due to their low performance. According to passengers, these service indicators have a high level of importance. The two service indicators include number 41 (internet access) and

32 (availability of facilities: chairs, TV, electrical outlets, emergency equipment, and air conditioning).
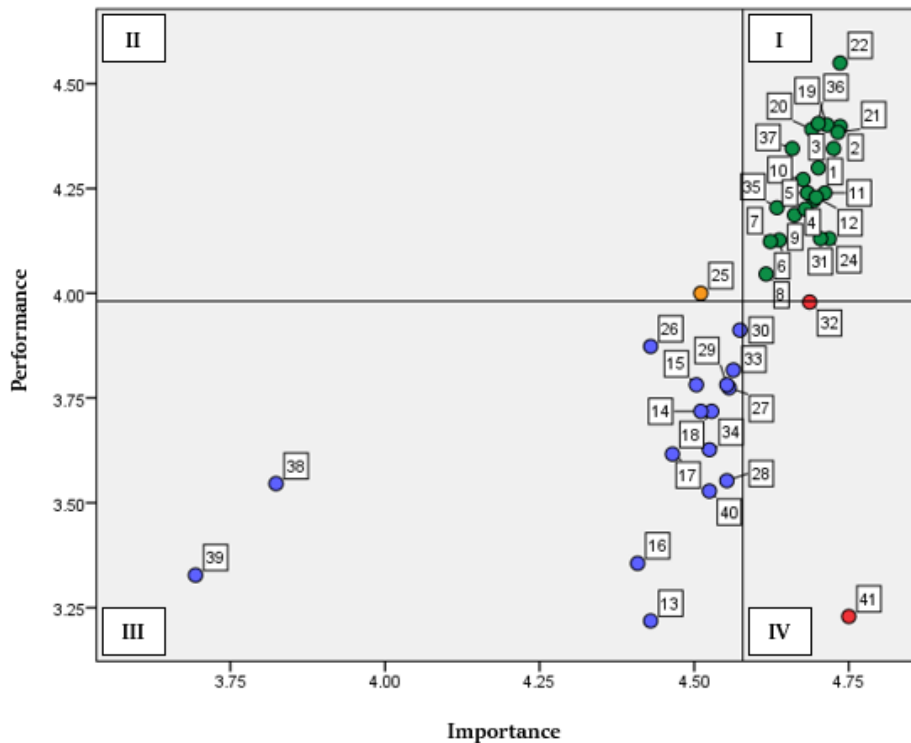

Figure 3. Diagram of Importance-Performance Analysis (IPA) result
Source: Processing Result of SPSS Data (2020)

Customer Satisfaction Index (CSI)

Measurement of the CSI on the economy-premium trains determines the economy-premium train users' passenger satisfaction score. The CSI score can be used as a reference by PT KAI to determine the goals for increasing passenger satisfaction. Table 3 shows that the economy-premium trains' CSI score is 0.79, which is in the range of 0.66 - 0.88. This means that passengers are "satisfied" with the service performance of the economy-premium trains. However, there is still room for improvement in its service quality to create a high level of satisfaction and loyalty from the economy-premium train passengers.

DISCUSSION

This study explores service indicators that affect service quality using the EFA method and identifies priorities for improving service quality by applying the IPA method. These two methods are applied to provide significant insights into improving the quality of Indonesia's economy-premium train services.

According to the EFA results, 41 service indicators that cluster to form nine dimensions explain 68.67% of the cumulative variance with each dimension given a name/label based on the suitability of the individual indicators grouped labeling professional train staff, seating factors, comfort

assurance, reliability, food and beverage factors, cabin facilities, accessibility, dynamic pricing factors, and information and technology facilities. Each dimension formed has at least two interrelated indicators. This study is in line with Shen et al. (2016), which established that train staff and facility convenience affects the perceived quality. The seating factor also affects the comfort of high-speed train travel in Korea (Lee et al., 2009) and China (Zhen et al., 2018). The comfort assurance affects the quality of service on high-speed trains (Zhen et al., 2018) and urban transit (Cao & Cao, 2017) in China, an assessment factor in PT KAI's Customer Satisfaction Research (Kinas Consulting, 2019). Reliability and accessibility affect the quality of service on public transportation in Munich, Germany (Le-Klähn et al., 2014). Foods and beverages factor is assessed on the train in PT KAI's Customer Satisfaction Research (Kinas Consulting, 2019). The information facilities and technology are also in line with research on urban interchanges in Madrid and Gothenburg (Dell'Asin et al., 2015). However, in Dell'Asin et al. (2015), the information leans towards board indicators, while in this study, it is more inclined to reading facilities during the trip. The dynamic pricing factor is a new dimension found in this study, not in the literature used. This study's dynamic pricing factor reveals the variance in ticket prices at different times and the application of various prices based on the seat location. In the existing literature, the ticket factor focuses on the types and the availability of rescheduling facilities (Dell'Asin et al., 2015) and the convenience of purchasing tickets (Shen et al., 2016; Zhen et al., 2018).

The IPA method is applied using 41 indicators of EFA results and the data regarding the survey's importance and performance. According to the IPA results in the Cartesian diagram, 22 indicators fall into Quadrant I. This means that 53.66% of services performed well and met passenger expectations. These indicators are train staff are polite and friendly (no.1); train staff are experts in their fields (no.2); train staff provide the best service (no.3); train staff are responsive in helping passengers (no.4); train staff are informative (no.5); train staff can handle problems in abnormal situations (no.6); train staff are effective and efficient in solving passenger problems (no.7); train staff have good initiatives in fulfilling passenger demands (no.8); good initiatives from train staff in providing information through broadcasting services (no.9); good attitude from train security personnel services (no.10); train staff give special attention to female passengers, children, elderly, and disabled (no.11); call center service availability (no.12); lighting level (no.19); enjoyment of traveling atmosphere (no.20); availability of electrical outlets (no.21); emergency equipment (no.22); trains are always in excellent condition (no.23); trains operate on time (no.24); cabin space comfort (no.31); easy access to seats, toilets, and dining cabin (no.35); ease of finding the location of seats, toilets, and dining cabin (no.36); and ease of access to train entrance and exits (no.37). Of the 22 indicators falling in Quadrant I, 19 forms the dimensions of professional train staff, comfort assurance, and accessibility. PT KAI provides the best service and fulfills passenger expectations for these three dimensions. PT KAI needs to keep and maintain the service quality indicators already in this quadrant I. The best service of train staff of the urban rail transit (Shen et al., 2016) and high-speed train (Zhen et al., 2018) in China also fulfills passenger expectations. However, in public transport services in Munich, Germany (Le-Klähn et al., 2014), the staff service has a low score and priority for improvement. The comfort assurance dimension also performed well in the urban interchanges in Gothenburg and Madrid (Dell'Asin et al., 2015) and in the urban rail transit in China (Shen et al., 2016). The accessibility dimension also fulfills passenger expectations in the high-speed train in China (Zhen et al., 2018). The results of this study provide knowledge that the dimensions of professional staff, comfort assurance, and accessibility need to maintain the best service for passengers satisfaction and loyalty.

There is only one indicator in Quadrant II, number 25, frequency/number of trips indicator. This means that 2.44% of the service indicators provide excess service and show that PT KAI has been

efficient and effective in providing its services. In contrast to the study result on the quality of bus passenger service in Jakarta and Yogyakarta (Budiono, 2009), the frequency of trips has not satisfied the passengers. In this study, it provides knowledge that transport services in Indonesia, the frequency of train trips has met the passengers needs, while it has not met the passengers needs in bus transport.

A total of 16 service indicators (39.02%) falls into quadrant III with a low level of performance and importance. These indicators are legroom on chairs (no.13); armrests chair (no.14); seat width (no.15); footrest on the chair (no.16); chair shape (no.17); chair material (no.18); the trip schedule (no.26); menu variations (no.27); food taste quality (no.28); food display (no.29); serving time speed (no.30); physical facilities are visually appealing (color of seat, TV layout, ad placement, etc.) (no.33); up-to-date equipment (no.34); differences of ticket pricing in weekend and weekday (no.38); differences of ticket pricing for each type of seat (no.39); and reading/magazine facilities (no.40). Of the 16 service indicators included in quadrant III, 12 relates to seating, foods and beverages, and dynamic pricing factors. PT KAI may postpone improving the service quality indicators in quadrant III. However, based on the level of satisfaction, passengers are not satisfied with the service indicator of legroom on chairs, hence PT KAI should pay more attention to it. The seat comfort indicator is also an increasing priority for passenger satisfaction of Shanghai-Nanjing HSR (Zhen et al., 2018).

In Quadrant IV, there are two service indicators (4.88%) prioritized for improvement by PT KAI, which increases satisfaction and loyalty of the economy-premium train passengers, including the availability of facilities (seats, TV, power outlets, emergency equipment, air conditioning, etc.) (number 32) and internet access (number 41). The descriptive analysis shows that the facilities with a low level of satisfaction are legroom on chairs and TV show content. On the other hand, power outlets, emergency equipment, and air conditioning are at a fairly high level of satisfaction. PT KAI has not provided internet access on the economy-premium trains, which is an opportunity to increase passenger satisfaction. This service improvement meets the expectations of 68.66% of respondents technologically literate and young passengers under 35 years of age.

The score of the Customer Satisfaction Index (CSI) for the economy-premium trains is 0.79, which means that passengers are satisfied. The CSI score will increase if PT KAI implements the recommendations for improving the service indicators as explained above.

THEORETICAL AND MANAGER IMPLICATION

Theoretically, the results showed that nine dimensions are affecting the quality of the economy-premium train services in Indonesia labeling professional train staff, seating factors, comfort assurance, reliability, food and beverage factors, cabin facilities, accessibility, dynamic pricing factors, and information and technology facilities. In this study, the dynamic pricing factor is a new dimension of service quality. Three dimensions have performed well and meet passenger expectations, including professional train staff, comfort assurance, and accessibility. Meanwhile, the dimensions of seating, foods and beverages, and dynamic pricing factors have a low performance level and are not considered very important. There are two main indicators of the economy-premium trains with a strong influence and priority for PT KAI improvement, including internet access during the trip and facilities of the legroom on chairs and up-to-date TV program content. This study enriches the indicators of service quality in the train transport service, especially railways in Indonesia, which can be used as a basis for further research.

The results also serve as input for PT KAI to increase long-term passenger satisfaction and loyalty. The management should understand the importance of a marketing strategy for the passenger

segment under 35 years of age by providing internet access during the trip and regularly updating TV program content as an alternative means of entertainment during trips using the economy-premium train. Improving this service indicator is easier and more effective to be implemented than redesigning or renovating train cars to increase the comfort of legroom on chairs. Furthermore, managers should understand passengers' needs and create a positive emotional affinity when traveling. Overall, each service indicator plays an important role in increasing passenger loyalty. This study helps managers identify the strongest service indicators and priority improvements by PT KAI with the maximum available resources and the right target.

LIMITATION AND FUTURE RESEARCH

The research was conducted during the Covid-19 pandemic, hence the questionnaires were distributed online. For this reason, there was no direct interaction with the respondents. The research used a closed questionnaire with answer choices, hence there was no opportunity for respondents to provide input or other suggestions outside the given statements. Furthermore, many service indicators on the train were used in the research. Future studies should examine and identify service indicators at stations and their facilities. Elderly respondents can also be targeted because, in this study, 91.20% of respondents aged below 45 years.

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