

Community Perception of Local Public Transportation (*Angkot*) Performance in Palu, Indonesia

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Abstract

The high population growth rate in the world has increased the need for the transportation sector. The people of Palu city use public transportation modes rather than private modes of transportation. These impacts increase the growth particularly relevant to the transportation sector resulting in human dependence on fossil fuels, global warming, poverty, and social inequality. This paper aims to determine the community's level of importance and satisfaction with local transportation (*Angkot*) in Palu City. It is hoped that it can help the interest of the people of Palu City in using city transportation. The method used in this paper is Importance-Performance analysis with Microsoft Excel. Based on the results of the analysis. There are five essential variables whose performance must be improved, then nine critical variables that align with expectations so that these variables must improve, and two parameters that are not important but have an above-average performance level.

Keywords: *Angkot*, Local Public Transportation, Community, Perception.

1. Introduction

The necessity for the transportation industry has increased because of the rapid global population expansion. In addition, growth in the transportation industry now is especially important in light of our dependency on fossil fuels, the environment, poverty, and social injustice (Johansson, Winslott Hicelis, Koglin, & Wretstrand, 2017). Objectively, many large cities in the world want to continue and accelerate the shift from the usage of private transportation to that public transportation (Moslem, Alkharabsheh, Ishmael, & Duleba, 2020). one example of local public transport is paratransit. Paratransit is a public transport that operates in urban traffic that usually does not have fixed schedules on urban roads found in many cities.

In developing countries located in Southeast Asia, Paratransit is one of the most essential local public transport. Paratransit services Most operate in different sizes and shapes, such as ojek in Indonesia and tuk-tuk in Thailand. Furthermore, *Angkot* and bajaj are paratransit found in Indonesia, the jeepney Philippines, and the motto in Vietnam and Cambodia (Wongwiriya, Nakamura, Tanaka, Ariyoshi, & Miura, 2017). Thailand paratransit is the dominant public transport in Thailand's urban areas because it is easier to access, flexible, and cheaper than other public transportation. Songtaew is a paratransit that operates as a significant urban local public transport serving the area along major roads and local roads with fixed routes (Wongwiriya, Nakamura, Tanaka, Ariyoshi, & Miura, 2020). The main problem of the existing paratransit in Thailand is that it needs to be integrated between transportation management and economic growth in the city.

The paratransit that is still found in many Indonesian cities is *Angkot*. *Angkot* is a mode of transport of four-wheeled minibusses that can carry 14 passengers at maximum capacity, which operates along urban

roads with fixed routes (Siahaan, Sitindaon, & Sitohang, 2020). *Angkot* is almost similar to songtaew and tuk-tuk owned by Thailand and jeepneys in the Philippines (Syafriharti, Kombaitan, Kusumantoro, & Syabri, 2018). *Angkot* is one of the public transportation alternatives that are often used, based on the characteristics of the Indonesian people who prefer flexibility and very cheap fares compared to other modes of transportation. However, the quality and user experience of *Angkot* is quite terrible. It is decreasing the public's enthusiasm for using this kind of public transportation, even though, from the user's standpoint, maintaining high standards of quality and comfort is essential (Siahaan, Tarigan, & Hutauruk, 2020). This caused passenger occupancy to drop significantly. In Indonesian cities, the majority of the *Angkot* is managed by the government. Those make it challenging to improve *Angkot* services' quality for users.

Bandung is the capital of West Java Province, the second most populous province in Indonesia, after Jakarta. In 2020, the total population of Bandung City was 2.4 million people with a density of nearly 14,000 people per km² (Rahayu, 2021). The infrastructure for public transportation in Bandung is constructed to serve not only the demands of Bandung but also those of the surrounding area and the Bandung metropolitan area as a whole. In developing nations, the standard of public transportation services is still inadequate; Bandung is one such city. In Bandung, *Angkot* is the most prevalent and generally accessible public transportation. The public's mistrust of *Angkot's* dangerous operation has encouraged people to look for alternate solutions, including using private automobiles. This is a result of Bandung's unreliable public transit system. It is uncomfortable for passengers walking to public transit terminals because of Bandung's climate, which has a high degree of rainfall. According to recent studies, Bandung's traffic is only worsening as the number of private automobiles grows (Wulandari & Weerawat, 2020).

The utilization of public transit is predicted to decline as more people use private transport in major cities. Private transportation has risen in Indonesia consequence of the large number of individuals who move to personal vehicles. This is not inversely proportional to the ratio of roads that do not increase so that it can impact the environment, such as congestion in urban areas and pollution to air quality. Developed countries carry out the diversion of private vehicles into public vehicles. Reducing the use of private vehicles is a practical way to avoid traffic chaos, increasing rates of accidents, violations, and increasing air pollution. as is now the case in several metropolitan cities in Indonesia. In addition, One way to increase people's preference for using public transport over private transport is to provide sufficient information about public transport.

Given the conditions that exist in terms of providing services to customers in transportation modes, the occupancy rate of passengers might be affected. (Firmansyah, Putra, & Safitri, 2021). The provision of quality and a good level of service tends to increase the occupancy of public transport passengers. However, public transport services in Palu city still need quality and comfort improvements. Public transport in operation could be more feasible. The vehicles used are ancient and unkempt. This study aims to determine the level of importance and satisfaction of the community towards local transportation in Palu City. It is hoped that it will help the interest of the people of Palu City in using city transportation.

2. Literature Review

2.1 Paratransit (*Angkot*)

Paratransit is a passenger transport with a group travel system available for use by the general public (Wulandari, R, 2020). The local government or private sector can manage paratransit. Paratransit's have a fixed route with a fare that the government or private companies have determined for each trip. Most of the developing countries with lower middle incomes depend on paratransit, one of the reliable modes of transportation (Joewono, Matthew, & Rizki, 2021).

Angkot is one type of paratransit that has developed in Indonesia. In general, *Angkot* is a term for local transportation in Indonesia, which refers to various types of cars, vans, and minibusses with a capacity of 12-14 seats (Nugroho & Zusman, 2018). The need of the lower middle class for public transportation that has flexibility in terms of mobility and filling the gap between private cars and public transportation is

the cause of City transport developing in Indonesia. *Angkot* has a fixed travel route without having a fixed itinerary and stops (Sha'bana. Y, 2017). Instead, it is a stop that suits the demands of passengers and is spread out in the urban layout to operate.

As explained in the journal (Swada. S, 2017), considering the facts with the demand for traffic needs for economic development and population growth in Southeast Asia. This has led to a high proportion of the transportation sector in CO₂ emissions, which is a significant factor in climate change. The existence of public transportation or paratransit aims to reduce air pollution and increase the efficiency of the public transport system in Southeast Asia. Public transport is being developed in developing countries, such as trains, MRT and BRT. However, in its development, it requires very high costs, so in developing countries choose another alternative to the mode of transportation to be developed, namely paratransit.

2.2 Quality of Service

The quality of the waiter is a benchmark to determine the level of satisfaction from consumers. The quality of servers usually describes the aggregate perception of paratransit (*Angkot*) service users towards the service experience (Jaiswal, Manoj, & Tiwari, 2022). Many factors affect the quality of *Angkot* services, such as comfort, safety, time efficiency to take the transportation route, vehicle feasibility, and accessibility to supporting infrastructure. Service quality is related to the positive effects of consumer or passenger behavior intentions. It can be used to evaluate people's availability to choose specific transportation modes (Chuenyindee, et al., 2022).

To provide quality transportation services. Many parameters affect the quality of public transport services. Although, there is no definite and precise working system or method to categorize service quality parameters. As explained in the parameters – the parameters are divided into several dimensions that affect the quality of public transportation services and user satisfaction, including service availability, accessibility, tickets, information, travel time, comfort, and security. (Allen, 2020)(Ibrahim. A. N. H., 2020)

Providing a satisfied public transport system in urban areas is the desire of transport users. However, the reality is that the use of public transportation (*Angkot*) from year to year has decreased. The cause of the decline in *Angkot's* condition is the inadequate level of service provided by the Provider (Kriswardhana, Hayati, & Kusdiyanto, 2022). In this situation, user satisfaction with *Angkot* is reduced. This is due to several factors, such as reliability, catchability, assurance, and empathy. Therefore the need for public perception or skepticism To increase public interest in using *Angkot*. Public perception is essential to know people's wishes regarding *Angkot* so that people want to use *Angkot*.

People in Palu city prefer to switch to private vehicles as their primary choice of transportation used. According to data from the Palu city transportation agency, only 46 public transport are still actively operating in Palu city on January 11, 2022, due to the place to wait for city transportation due to the absence of routes or routes that are passed by the city transportation. This impacted people who wanted to use city transportation in need of negotiations and waste time to get to their destination. Compared with the private vehicles of the people of hammer city, it can save time to get to the destination in Palu city.

3. Methodology

A study or survey cannot be separated from an object and subject of study. The performance of services and the interests of city transportation are the objectors of this study. The subject of this study is people who use city transportation services. The location of this research was carried out in Palu City.

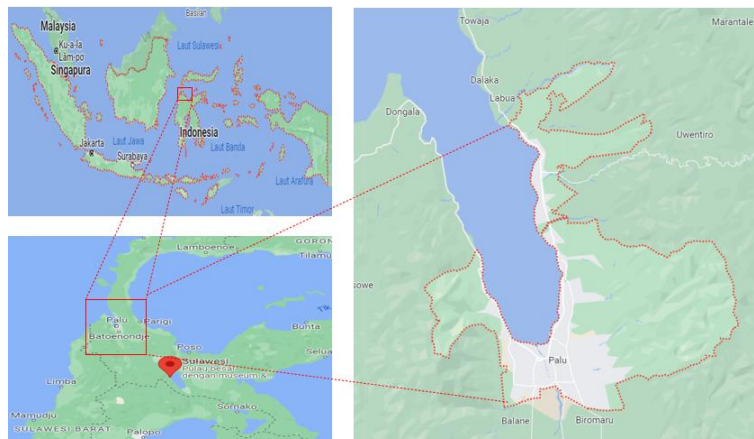


Figure 1. Survey Location In Palu

Research methodology is an activity carried out to obtain or collect data needed in research by approach. The method used in this study is an explanatory survey, while the method used to assess customer satisfaction of city transportation users uses the Importance-Performance Analysis (IPA) method. The analysis begins with distributing a questionnaire to the research subjects, which consists of two parts: the importance of these parameters in research and how these parameters perform on city transportation. A questionnaire with a Likert scale (five levels) is a tool used to measure the level of importance and level of satisfaction/performance of city transportation. This Likert scale was developed by Rensis Likert (1932) and is known as *Likert's Summated Rating*.

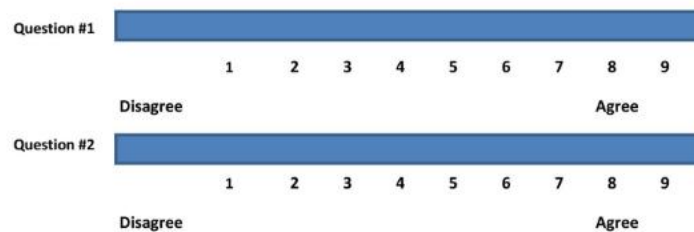


Figure 2. Likert scale

Quadrant analysis is the basis of the most used disaggregated model for evaluating quality. Importance-performance is the most well-known quadrant analysis using importance and performance as the coordinate points of the graph IPA by dividing each of the two dimensions (Monicaba, 2022). Performance attribute and Importance attribute) into two levels, the nature/equipment of the product or service into four categories or categories in 1 diagram. As an example of the use of the IPA plot: in figure 1 there are 4 quadrants separated by a line, the four quadrants are each named Q1, Q2, Q3, Q4. In quadrant Q (Bi & Zhang, 2019)² is called *keep up the excellent work*, the parameters in this quadrant already have good performance, and the parameters are critical. Thus the parameter positioned one can be considered the principal strength and competitive advantage of the product or service, the parameter in Q2 has low performance, but this parameter is essential.

Thus, the parameter Q1 can be called that this parameter is a drawback and needs to be improved from *Angkot*. The parameters in Q3 are those with low performance and low importance. Thus, they can be called a minor drawback of city transport. While the parameters in Q4 are also called excessive possibilities, the parameters in this quadrant have high performance, but the importance of those parameters is very low. Thus, this parameter wastes only resources and is not needed for the development of public transport.

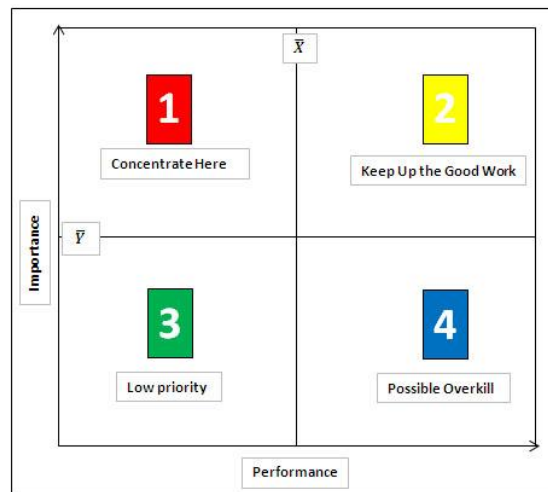


Figure 3. IPA Diagram (Phadernrod. B, 2019)

Paratransit service quality parameters include all qualitative and quantitative service parameters that influence user perception of paratransit (*Angkot*) services. User perception is helpful to make it easier to determine the parameters that will be used for the assessment of the improvement of the level of service quality. Public perception of city transportation is a factor forming parameter that can improve the quality of city transportation services so that the increase results are in accordance with what is expected by city transportation users. Thus, the Importance-Performance analysis method is suitable for use in this case. (Sharma, 2020)

Table 1. IPA Attributes of *Angkot*

Domain	Code	Attributes
Responsiveness (Responsiveness)	RES1	Driver's responsiveness to the provision of special needs passengers
	RES2	Driver responsiveness to an estimated distance of city and passenger transport stops
	RES3	Responsiveness of the driver or staff to complaints from passengers
	RES4	Service hours of operation to paratransit availability per day
	RES5	Availability of paratransit at night and on holidays
Assurance (Guarantee or assurance)	A1	The driver's ability to carry out his duties
	A2	Driver's ability to communicate, such as friendliness and manners in service
	A3	Security against criminal acts such as robbery and pickpocketing in paratransit
	A4	Vehicle safety and comfort
	A5	The existence of security staff in the <i>Angkot</i>
Tangible (Physical evidence)	RE1	Vehicle condition is it suitable for use
	RE2	When I ride <i>Angkot</i> , I feel comfortable and safe
	RE3	Cleanliness in city transport
	RE4	Air quality in city transportation, including the temperature in city transportation
	RE5	Availability of facilities for passengers in wheelchairs
Empathy (note)	EM1	Driver's ability to drive
	EM2	Driver's attention to passengers with special needs
	EM3	Whether the driver loads passengers according to capacity (Density)
	EM4	Some contacts can be contacted if you want to complain

Domain	Code	Attributes
	EM5	The ability of the driver to consider the comfort in the <i>Angkot</i> against the selection of passengers carrying excessive luggage
Reliability	REL1	Punctuality to the destination
(Reliability)	REL2	Is there a route that has been set
	REL3	Appropriate rates that have been set
	REL4	Ease of payment, such as whether it needs iris restriction
	REL5	Efficient vehicle speed

The following is a comparison of the parameters used with several previous journals.

Table 2. Comparisons of *Angkot* services attributes

CODE	(Sharma D. P., 2020)	(Caesaron, 2021)	(Sinha, 2017)	(Olawole, 2021)	(Umme, 2022)
RES1	✓	✓	X	✓	✓
RES2	✓	✓	✓	X	✓
RES3	✓	✓	X	✓	X
RES4	✓	✓	X	✓	✓
RES5	✓	✓	✓	✓	X
A1	✓	✓	✓	✓	✓
A2	✓	✓	✓	✓	X
A3	✓	✓	✓	✓	✓
A4	✓	✓	✓	✓	✓
A5	✓	✓	X	X	X
RE1	✓	✓	X	X	✓
RE2	✓	✓	✓	X	✓
RE3	✓	✓	X	X	✓
RE4	✓	✓	✓	✓	X
RE5	✓	✓	✓	✓	✓
EM1	✓	✓	✓	X	X
EM2	✓	✓	✓	X	✓
EM3	✓	✓	X	✓	X
EM4	✓	✓	X	X	X
EM5	✓	✓	X	✓	X
REL1	✓	✓	✓	✓	✓
REL2	✓	✓	✓	✓	X
REL3	X	✓	X	✓	✓
REL4	X	X	X	X	✓
REL5	X	✓	X	X	X

4. Results and Discussion

The questionnaire distribution is carried out by sharing the google form link through social media. There were 48 respondents with different characteristics. Respondents consisted of 27 men and 21 women with ages ranging from 21 to 30 years, as many as 25 people, 10 people aged 31 – 40 years, 4 people aged 41 – 50 years, and 1 person aged under 10 years. Respondents with undergraduate education were 30 respondents one respondent had an S2 education, 1 respondent had an S3 degree, 12 respondents were high school graduates, and the remaining 3 people were junior high school graduates. For employment, of the 20 respondents who were not yet 8 of them were unemployed and the rest were students, 18

respondents were self-employed, 1 responded was police and 5 respondents were a private employees. As for the income of 18 respondents still not earning, 3 respondents have income below IDR.1,000,000, 25 respondents have income between 1,000,000 – 5,000,000, 8 respondents have Income ranges from 6,000,000 – 10,000,000. While the other 7 respondents had incomes above 10,000,000.

Table 3. Respondents' characteristic

Variables	Category	Frequency	Percentages (%)
Gender	Male	27	56,25
	Female	21	43,75
Age	under 10	1	2.08
	10 - 20	8	16.67
	21 - 30	25	52.05
	31 - 40	10	20.83
	41 - 50	4	8.37
	51 - 60	0	0
	over 60	0	0
	Education Background	Elementary School	0
JHS		3	6.25
SHS		12	25
Bachelor		30	62.5
Master		2	4.17
Doctor		1	2.08
Job	Entrepreneur	18	37.5
	Government	4	8.33
	Police	1	2.08
	Army	0	0
	Private employee	5	10.42
	Unemployed	20	41.67
Income/Month	No salary	18	37.5
	< IDR 1.000.0000	3	6.25
	1.000.000 - 5.000.000	12	25
	6.000.000 - 10.000.000	8	16.67
	> IDR 10.000.000	7	14.58

Based on the data that has been collected. A survey has been filled out by the respondents above, regarding the interests and satisfaction of city transportation users using the parameters that have been determined. IPA diagram cartesians can be seen in figure 4.

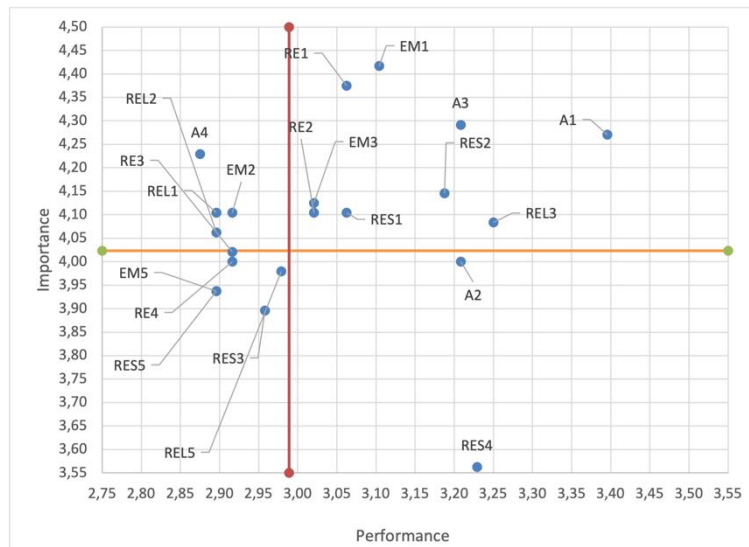


Figure 4. IPA diagram of *Angkot* services

The intersecting red lines were obtained from the average importance level of 4.02 and the average satisfaction level of 2.99. In quadrant 1, passengers feel that the parameters in quadrant I are critical. Meanwhile, the perception of *Angkot* users towards the level of performance or satisfaction with *Angkot* is below average. This causes the management to have to process or improve the quality of service parameters in quadrant I. There are five parameters in this quadrant, namely, REL1 (Punctuality to destination), REL2 (a route that has been set), EM2 (driver attention to passengers with special needs), RES3 (cleanliness in public transport), and A4 (Safety and comfort of users).

The use of *Angkot* in the last five years has been greatly reduced due to the emergence of competitors in public transportation that offer better advantages, such as online application-based public transportation. This can be seen that currently, the *Angkot* operating in the city of Palu has 46 units left. Some very important parameters such as RE1 (*Angkot* condition), RE2 (feel comfortable when riding *Angkot*), EM1 (driver's ability to drive), EM3 (loading passengers according to capacity), RES1 (Special attention to passengers with special needs), RES2 (*Angkot* stopping distance to passengers), A1 (Driver's ability to perform his duties), A3 (safety from acts robbery and criminal), and REL3 (the appropriate fare that has been set) has been very well done and maintained with a high level of performance because the *Angkot* passengers are satisfied with such performance. Some parameters that are in quadrant two close to quadrant one, if the performance cannot be appropriately executed can cause these parameters to be at risk of falling into the first quadrant.

Some of the exact Parameters are in quadrant III. categorized as parameters that have a low priority importance level are REL5 (Efficient vehicle speed), EM5 (selection of passengers carrying excessive goods), RES5 (Availability of *Angkot* at night), RES3 (Responsiveness of the driver or staff in responding to protests or complaints), and RE4 (The quality of the air in the *Angkot* including temperature). This attribute is considered unimportant and does not have average performance. This is called a negligible possibility.

The two parameters in quadrant IV are RES4 (hours of *Angkot* service operation per day) and A2 (the ability of the driver to communicate). This parameter is considered unimportant but has a high degree of satisfaction. Passengers are delighted with the performance of such parameters. All efforts to improve even better service on this attribute are in vain because the supporters are satisfied. Therefore, management should consider allocating their resources to improve parameters that are in quadrant 1 to obtain better benefits.

5. Conclusion

In this journal, the IPA method is discussed and applied to measure the performance of *Angkot* from a community perspective. Based on the research results, the government or *Angkot* service providers in Palu city must focus and allocate in quadrant 1 to improve the quality of service and public interest Palu City in the use of *Angkot*. The parameters in quadrant 1 are REL1 (Punctuality to the destination), REL2 (a predetermined route), EM2 (driver attention to passengers with special needs), RE3 (cleanliness in public transport), AM4 (Safety and comfort of users). The RES4 parameter is unimportant, but the service provider/government is overfocusing on this parameter. Therefore, the government should have allocated funds to quadrant 1.

Bibliography

- Allen, J. M. (2020). Modelling service-specific and global transit satisfaction under travel and user heterogeneity. *Transportation Research Part A: Policy and Practice*, 113, 509-528.
- Bi, J. W., & Zhang, J. (2019). Wisdom of crowds: Conducting importance-performance analysis (IPA) through online reviews. *Tourism Management*, 70,, 460-478.
- Caesaron, D. M. (2021). Evaluation of Online-Based Ride-Hailing Services Using Service Quality (Servqual) Method, Refined Kano Model, Importance Performance Analysis (IPA), and Quality Function Deployment (QFD). *ComTech: Computer, Mathematics and Engineering Applications*12(2), 75-88.
- Ibrahim. A. N. H., B. M. (2020). Rail-based Public Transport Service Quality and User Satisfaction—A Literature Review. *Promet-Traffic & Transportation.* , 32(3):423–435.
- Isradi, M., Farhan, M.N., Rifai, A.I., Mufhidin, A., & Prasetijo, J. (2021) Analysis of Passenger Satisfaction with LRT Jakarta Services Route Velodrome-Boulevard Utara, *International Journal of Transportation and Infrastructure*, pp 26-35
- Monicaba, M. V. (2022). Enhancing the Public Transportation Service in Rajkot. *A Thesis Submitted to Gujarat Technological University*.
- Olawole, M. O. (2021). An empirical study of commuters' satisfactions with taxi service quality in Abeokuta, Nigeria. *Transportation Research Interdisciplinary Perspectives*, 11, 100434.
- Phadermod. B, C. R. (2019). Importance-performance analysis based SWOT analysis. *International journal of information management.* , 44, 194-203.
- Rifai, A. I., Hadiwardoyo, S. P., Correia, A. G., & Pereira, P. A. (2016). Genetic Algorithm Applied for Optimization of Pavement Maintenance under Overload Traffic: Case Study Indonesia National Highway. *Applied Mechanics and Materials (Vol. 845)* (pp. 369-378). Trans Tech Publications Ltd.
- Rifai, A. I., Hadiwardoyo, S. P., Correia, A. G., Pereira, P., & Cortez, P. (2015). The data mining applied for the prediction of highway roughness due to overloaded trucks. *International Journal of Technology*, 6(5), 751-761
- Rifai, A. I., Rafianda, D. F., Isradi, M., & Mufhidin, A. (2021). Analysis Of Customer Satisfaction On The Application Of The Covid-19 Protocol At The Inter-City Bus Terminal. *International Journal of Engineering, Science and Information Technology*, 1(1), 75-81.
- Rifai, A. I., Rulianto, B., Isradi, B., Mufhidin, A. (2021), A Comparative Analysis of the Effectiveness of Airport Public Transport System in Jakarta, *World Journal of Business, Project and Digital Management* 1 (02), pp 22-31
- Rifai, A. I., Danang L. Nugroho, Isradi, M., & Mufhidin, A. (2021), Analysis of Impact COVID-19 on Parking Characteristics in the Office Area: Case of Jakarta City, *Proceedings of the International Conference on Industrial Engineering and Operations Management*, Harbin, China, pp 487-495
- Sawada. S, M. Y. (2017). Estimating Fuel Consumption of Angkot in the Local Medium-sized City in Indonesia. *Journal of the Eastern Asia Society for Transportation Studies*, 2299-2309.
- Sha'bana. Y, M. K. (2017). Simulation of lumbar and neck angle flexion while ingress of paratransit (Angkot) in Indonesia as a preliminary design study. *Journal of Mechatronics, Electrical Power, and Vehicular*, 70 - 75.
- Sharma, D. P. (2020). Determination of service quality attributes based on user perception for paratransit

- services in developing country like India.. *Transportation Research Procedia*, 48, 3577-3594.
- Sharma, D. P. (2020). Determination of service quality attributes based on user perception for paratransit services in developing country like India.. *Transportation Research Procedia*, 48, 3577-3594.
- Sinha, S. e. (2017). User's assessment of Auto Rickshaw: A Paratransit mode for mid-sized city in India. *Proceedings of the Eastern Asia Society for Transportation Studies.Vol. 11*. INDIA: Eastern Asia Society for Transportation.
- Umme, A. A. (2022). Gap Analysis between Women Passengers' Perception and Expectations about Bus Service: A Case Study on Bangladesh.. *Journal of Transportation Technologies*, 12(2),, 258-285.
- Wulandari. R, A. W. (2020). Designing Paratransit Information Displays For Batu City,Indonesia: Design Needs And User Suggestions. *International Conference on Operations and Supply Chain Management*.