

The Satisfaction Customer Analysis of Airport Services: A Case Hang Nadim Airport Batam

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ABSTRACT

Purpose: Hang Nadim Airport is the only airport in Batam. And recently, Hang Nadim Airport closed some of their flight route. This cause less plane to fly, and will increase the potential of flight delays. Flight rescheduling can be main reason of dissatisfaction. But besides that, this paper will also focus on check-in service speed, check-in hospitality, comfortability, security, hygiene, food & beverages, providing accurate information, pricing, online services, and facilities provided for the indicators on service satisfaction. The method used in this research is Interpretative phenomenological analysis (IPA). The data obtained are: Hang Nadim Airport needs to improve on providing accurate information about departure and arrival time and facilities, food & beverages; pricing; and online services are the lowest priority at Hang Nadim Airport, and check-in service speed; check-in hospitality; comfortability; security; and hygiene is where Hang Nadim Airport needs to keep up the good work.

Design/methodology/approach: Analyzing data collected from Interpretative Phenomenological Analysis (IPA) questionnaire.

Findings: Indicators that need to be improved, or keep up for Hang Nadim Airport. This way, they can give satisfying service towards passengers.

Research limitations/implications: This paper is very limited on sample size. We were only able to collect total of 109 respondents, which is very small compared to Hang Nadim Airport user.

Practical implications: Giving inputs toward Hang Nadim Airport many indicators to be improved, or keep up, in hope it will be implemented in the future.

Originality/value: The analysis process of this research paper is originally made by authors and purely based on research and study.

Paper type: Research paper.

Keyword: Air Transportation, Flight Rescheduling, Satisfaction, Service Quality.

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I. INTRODUCTION

Air transportation has been one of the most important aspect in human civilization. Every day, hundreds if not thousands airplanes cross around the globe carrying passengers to their destinations. And with the growth in human population, air transportation becomes more reliable, effective, and efficient. Air transportation also contributes in growing global economy. Because with air transportation, tourist from across the world can travel with ease. Due to improved worldwide connectivity, the air transportation sector has grown dramatically in recent decades, driving the growth of most economies and particularly the top earners in the tourism sector. (Adedoyin et al., 2020).

Currently in Indonesia, there are atleast 683 airports, and 29 of them are international airports. Indonesian airport growth is quite quick; several of them have even achieved top flight rankings globally. For instance, in the Top 20 Fastest Growing World Airports Hub Connectivity 2017 list, Soekarno-Hatta Airport was ranked 10th (Setiawan et al., 2018). Soekarno-Hatta airport itself has a area of 2.137,82 hectare. With the current

ongoing development work, Soekarno-Hatta airport will be able to serve up to 100 million passengers annually by the year 2025.

According to the National Development Planning Agency's 2013 projection, there will be 265 million people living in Indonesia by the year 2018. Every year, Indonesia's growing population has led to a greater need for transportation, which can also lead to an increase in the country's air traveler numbers, which have increased significantly in recent years (Prastiwi et al., 2021). In Semarang, Central Java, Jenderal Ahmad Yani International Airport is one of the fastest-growing airport in this country. According to information gathered from the Central Bureau of Statistics of Central Java, the number of flights at Jenderal Ahmad Yani International Airport increased from 22,800 in 2011 to 38,600 in 2017. However, Jenderal Ahmad Yani International Airport's old terminal can only handle 800,000 passengers annually (Ithmaanna et al., 2022). With the lack of passengers capacity, this can lead to mismatch of arrival and departure time with the schedule, which then can cause discomfort for passengers.

Meanwhile in Batam, which mostly where this research is going to take place in. There is only one airport in Batam, which is Hang Nadim Airport. At Hang Nadim Airport, there is a yearly growth in the number of travelers, bags, and planes. Due to the tourism and trade industries' rapid growth in Batam, the region needs to have reliable transportation infrastructure (Saninah et al., 2020). Hang Nadim itself has a size of 1.760 hectare. And based from the statistic (source: BP Batam), despite having growth in population and tourism, the amount of passengers from Hang Nadim Airport is decreasing from the year 2017 to 2020. However, the reason of this decrease is because Hang Nadim Airport closed some of their flight route, which means there will be lesser plane to fly.



Figure 1 Air Transport Traffic Flow in Hang Nadim Airport

And for that, this study will focus on the impact of closing flight route. Because with less plane, hang nadim airport will face the challenge of passenger capacity. Reduced safety, comfort, security, and service at the airport may result from a shortage of passenger capacity in the terminal. Additionally, it may increase the likelihood of flight delays (Ithmaanna et al., 2022). Delays and interruptions to the schedule, particularly at congested airports, have an effect by spreading throughout the entire airport network. Congestion and delays have a significant negative impact on the economy and environment that affects the entire aviation system in addition to operational bottlenecks and passenger dissatisfaction (Zografos et al., 2017).



Figure 2 Hang Nadim Airport Entrance



Figure 3 Hang Nadim Airport View on Google Maps

A. Air Transportation

Transportation is one of the main reason why human civilizations will keep growing. With transportation, humans can trade goods such as food, material, and even technology. The development of all nations' economies now relies heavily on their transportation infrastructure (Guerrero-Ibáñez et al., 2018). Therefore, to grow a

civilization, we need to focus on transportation. Because the more efficient the transportation, the more civilization can develop as well.

Air transportation contributes in global economic growth. In recent decades, both emerging and established economies have used tourism as a key sector and an engine of economic growth and development. This is due to the fact that rising tourist numbers signal global growth, and this period of development has seen a variety of ways in which tourism can affect a nation's economic activities. Through a variety of direct and indirect tourist-related activities, tourism contributes around 15% to the GDP (Balsalobre-Lorente et al., 2021).

One of the most reliable ways to transport is by air transportation. Air transportation provides reliable way to transport from far away in a short time. However, air transportation also has its flaws. 1.4% of the world's greenhouse gas (GHG) emissions come from international aviation travel. Even though the percentage is small, it cannot be ignored due to its rapid expansion because, by 2030, air travel will overtake all other forms of international transportation (Hong et al., 2019).

Therefore, better flight scheduling management is needed so we can reduce the needs to fly more airplanes. Besides that, usage of biofuel is also useful. The most promising alternative for future sustainable international air travel—or maybe the only practical one to meet the mitigation goals by 2050—is biofuel, which can cut CO₂ emissions by 80% compared to conventional jet fuel (Hong et al., 2019).

B. Transportation Comfortability

Transportation has become a part of human's life. With the growth of human population, there is no doubt that transportation demand will rise. And with the rise of the usage of transportation, the traffic volume of transportation will decline (i. e., road, and air path volume). Therefore, this will cause a transportation discomfortability. According to the United Nations Population Fund and the Population Reference Bureau, these issues will get worse as the world's population continues to expand and people move more frequently to cities. Therefore, there is a critical need to increase transportation's efficiency and safety (Guerrero-Ibáñez et al., 2018).

High population density, the expansion of motor cars and associated infrastructure, and the proliferation of ridesharing and delivery services all contribute to the widespread global issue known as traffic congestion. According to research from 2018, the total cost of lost productivity in the United States as a result of congestion is \$87 billion (Afrin & Yodo, 2020). Therefore, many country and companies should focus on making an efficient and resilient transportation. With the development of technology and the establishment of new airports, the demand for airline vehicles has significantly risen in recent years. There are also significant advantages for the tourism sector, including for all sectors in both developed and developing nations (Shukrullaevich & Bakhriddinovna, 2020).

Private transportation can be the most reliable way to travel to some places. However, private transportation can also be the main reason for transportation discomfortability. Due to In cities where the usage of private motor vehicles (PMVs) is increasing, traffic externalities like pollution, congestion, and delays are also increasing (Agrawal et al., 2020). According to a Texas Transportation Institute analysis, Americans spend over 42 hours per year trapped in traffic and waste more than 3 billion gallons of fuel annually, costing the nation a total of \$160 billion, or \$960 every passenger (Guerrero-Ibáñez et al., 2018).

Therefore, public transportation has received attention and support from the government. When the government is dealing with issues like traffic jams, overcrowding, high motorization, and other environmental effects, public transit is acknowledged as one of the most effective external cost-saving and motorized travel negative effect solutions. The means of transportation allow the general population to share a vehicle and travel about in a certain area. Examples include buses, trains, taxis, ferries, etc. (Chan et al., 2020). However, overcrowding affects the majority of public transportation. In Delhi, it is predicted that 29% of potential bus passengers are willing to switch from PMVs to buses even if the buses have room for comfortable standing (Agrawal et al., 2020).

C. Flight Rescheduling

Flight Rescheduling can affect passengers satisfaction and experience. Flight rescheduling can be caused by many reasons, mostly are extreme weathers. But, with the right flight scheduling management, extreme weathers can be avoided. Even if bad weather is unavoidable, the loss can be reduced by effective and prudent flight planning (Lin & Wang, 2018).

Besides passengers satisfaction and experience, flight reschedule can leads to financial risk for stakeholders. For instance, it is estimated that the entire cost of delays will approach \$32.9 billion just for flights within the US. The airline corporation, which lost \$8.3 billion, and the passengers, who lost \$16.7 billion, each bore a significant portion of the loss. Following the utilization of the infrastructure, the airports bear the majority of the expenditures for the air traffic controllers (Kammoun et al., 2020). Therefore, the flight rescheduling should not be done without any clear logical reason.

There are two main reasons of flight rescheduling. The first main reason is uncertain disruption event, such as bad weather. Bad weather can be considered as extraordinary circumstance, because it can affects flight via visibility. The capacity of an airport must be limited in order to prevent mishaps while aviation operations are in progress. If matching planes are still on the ground, the flights affected by this disruption often receive changed arrival times. This is so that the flights can absorb the delay on the ground rather than in the air, which is safer and less expensive (Woo & Moon, 2021).

Flight administration is the secondary factor. The ground delay program is a typical method used by the central authorities to regulate the release schedules of particular flights scheduled to arrive at an airport (GDP). Prior to taking off towards the destination airport, airplanes on the ground are delayed using the GDP. The new flight schedule produced through GDP decision-making might not, however, be the most advantageous one for an airline. The updated schedule is more in line with the operating needs of the central authorities. When the initial flight schedule is exhausted, the airline seeks to swap out the slots that have not yet been used in order to create a strategy that more effectively achieves its goals (Woo & Moon, 2021).

II. METHODOLOGY

Flight rescheduling has been a problem since it can reduce transportation discomfortability (Guerrero-Ibáñez et al., 2018). This issue has been found ever since modern transportation invented. The main reason flight rescheduling can become a problem is because it can lead to negative passengers satisfaction and experience, and also financial risk for stakeholders (Kammoun et al., 2020). Therefore, this research will mainly focuses on the topic.

This research will be using Interpretative Phenomenological Analysis (IPA) method which will focus on collecting and analyzing data. IPA is a technique for assessing how well service users are performing in relation to their expectations (Rifai et al., 2022). The IPA analysis, also known as the quadrant analysis, is used to assess the relationship between consumer perceptions and goals for enhancing the quality of goods and services (Rifai & Arifin, Analysis of The Level of Passenger Satisfaction With Services And Transport Facilities-Based Integration in Jakarta 2020).

One of the key advantages of putting together a research and scientific modeling is data (Rifai et al. The data mining applied for the prediction of highway roughness due to overloaded trucks, 2015). We will use questionnaire that is designed to give us valuable data to analyze and helps to understand this problem more, so we can resolve the problem. The questionnaire requires atleast 100 respondents who experienced Hang Nadim Airport Batam, and after we collected the responds, we will proceed to problem identification and solving. The process of systematic scientific research must begin with the identification of the right problem (Rifai et al., 2016).

In Indonesia, airport minimum service standards are arranged in Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 30/2021 about Minimum Service Standards for Air Transport Passenger. This regulation replaces the previous regulation, number PM 185, 2015, and consider providing protection and service for air transportation users. The minimum service standards include: muslim prayer room, clean toilet, food and beverages, internet (wi-fi), security, smoking room, and baggage handling service. Hang Nadim Airport Batam currently already fulfils these standards.

For this research, we will use some indicators that is required from various literature reviewed. The indicators used will be designed to gain information about user satisfaction towards Hang Nadim Airport. The indicators are: check-in service speed (Bruno et al., 2019); check-in hospitality (Bruno et al., 2019); comfortability (Kotopouleas & Nikolopoulou, 2018); security (Hättenschwiler et al., 2018); hygiene (Bae & Chi, 2021); food & beverages (Chiappa et al., 2019); providing accurate information (departure and arrival time) (Zhou et al., 2022); pricing (Abdella et al., 2021); online services (Lee et al., 2019); and facilities provided.

III. RESULTS AND DISCUSSION

Table 1 questionnaire results

<i>No.</i>	<i>Indicators</i>	<i>X (Performance)</i>	<i>Y (Importance)</i>
<i>A1</i>	<i>Check-in service speed</i>	<i>3.95</i>	<i>4.51</i>
<i>A2</i>	<i>Check-in hospitality</i>	<i>3.93</i>	<i>4.40</i>
<i>A3</i>	<i>Comfortability</i>	<i>3.93</i>	<i>4.52</i>
<i>A4</i>	<i>Security</i>	<i>4.74</i>	<i>4.74</i>
<i>A5</i>	<i>Hygiene</i>	<i>3.88</i>	<i>4.47</i>
<i>A6</i>	<i>Food & beverages</i>	<i>3.22</i>	<i>3.45</i>
<i>A7</i>	<i>Providing accurate information (departure and arrival time)</i>	<i>3.77</i>	<i>4.71</i>
<i>A8</i>	<i>Pricing</i>	<i>3.64</i>	<i>4.26</i>
<i>A9</i>	<i>Online services</i>	<i>3.82</i>	<i>4.19</i>
<i>A10</i>	<i>Facilities provided</i>	<i>3.86</i>	<i>4.44</i>

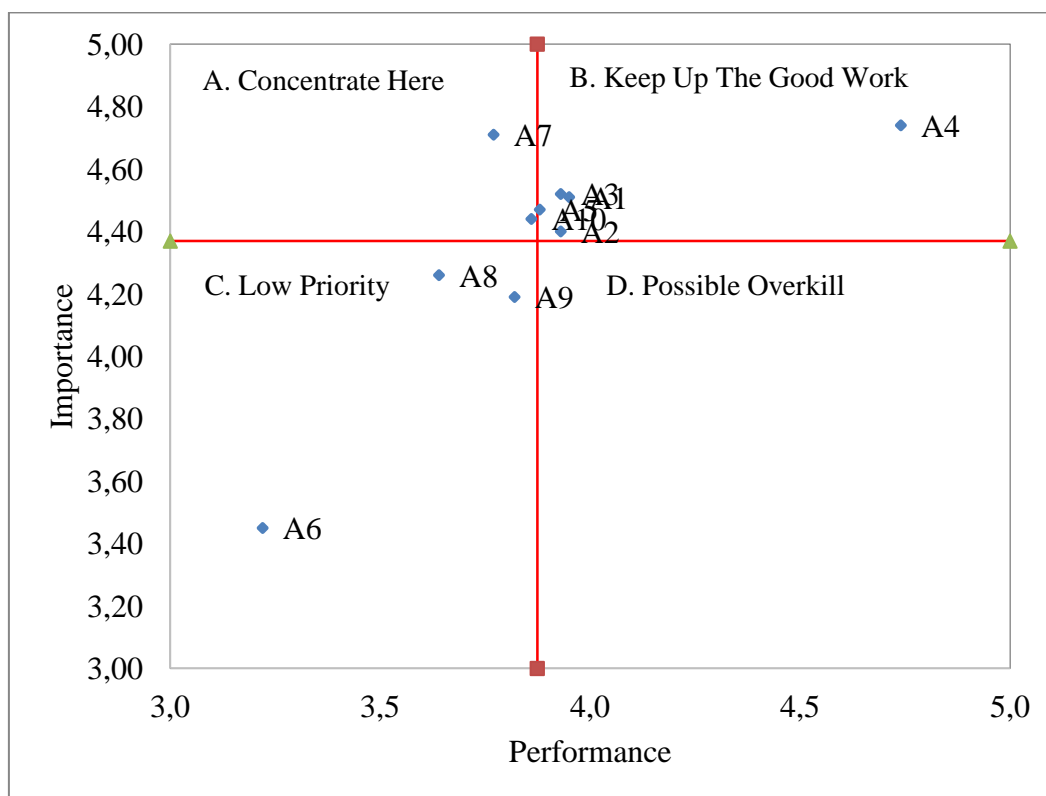


Figure 4 IPA Matrix Result

The total respondents are 109 persons, where 101 people already used Hang Nadim Airport, and the data from 8 people who didn't use Hang Nadim Airport service are not included in the calculation. From the 101 respondents, 72 of them are males, and 29 are females. The age range are: 78 people of 11-20 years old; 22 people of 21-30 years old; and 1 of 31-40 years old. Most of our respondents are students with total of 86 people, 8 people are businessman, and 7 people are entrepreneur. And lastly 1 person with income less than 1 million rupiah per month; 4 people with income range of 1-2 million rupiah; 14 people with 3-4 million rupiah; 27 people with income range of 4 -5 million rupiah; 7 people with 5-10 million rupiah; 7 people with more than 10 million rupiah per month; and 41 people with no fixed income. The mean of (X) performance is 3.87, and (Y) importance is 4.37.

A. Quadrant A. Concentrate Here

Hang Nadim Airport really dissappoint passengers at providing information about departure and arrival time. They achieve just 3.77 performance point. Even though it is close to the 3.87 mean mark, it is still behind. With this, providing accurate information about departure and arrival time is in quadrant A, where they really need to concentrate there so they can give a better service quality to their passengers. Facilities provided on Hang Nadim Airport is also in this quadrant. These indicators accumulate 3.86 performance point, with just 0.01 deficient point from the 3.87 mean.

B. Quadrant B. Keep Up the Good Work

In this quadrant, passengers expect a higher-than-average performance, and Hang Nadim Airport delivers it. For check-in service speed, we got x (performance) and y (importance) of (3.95,4.51). And from the 101 respondents, most people from businessman and entrepreneur groups are the ones who fills check-in service speed as most important. Check-in hospitality is also in quadrant B, with x (performance) and y (importance) of (3.93, 4.40). This indicates that most respondents are satisfied with the check-in hospitality that Hang Nadim Airport offers. Hang Nadim Airport can give comfortable service to their passengers. This can be seen from Figure 1 with x (performance) and y (importance) of (3.93, 4.52). Security is the one sector where Hang Nadim Airport really focuses at. With x (performance) and y (importance) of (4.74, 4.74) it is one of the best sector in quadrant B. And lastly, hygiene. Hang Nadim Airport almost falls to quadrant A with just surplus of 0.01 on performance. But with 3.88 performance point, Hang Nadim Airport's Hygiene is still in the quadrant B.

C. Quadrant C. Low Priority

Quadrant C is where low priority indicators are placed. The indicators perform poor, but with less demand from passengers, it is not a serious matter, hence the name low priority. Food & beverages are where Hang Nadim Airport falls short. With 3.22 point, lower than the 3.87 mean. But it is not a serious matter, as most respondents does not prioritize food & beverages there. And after a deeper research, most of the respondents prefer to bring their own food or eat before they arrive at the airport. Pricing is also in quadrant C, where most passengers don't prioritize it. This is because Hang Nadim Airport is the only airport in Batam, Indonesia, so it can give the most logical pricing to the passengers. And lastly, online services are also in quadrant C, where it is a low priority for passengers.

IV. CONCLUSION

This paper is made to conduct a research about service satisfaction at Hang Nadim Airport. And based from the method used, and results that we get. First, Hang Nadim Airport needs to improve on providing accurate information about departure and arrival time. This can be decreased by minimalizing flight reschedule. Most of flight reschedule can be avoid by manage a better flight schedule and route. Second, facilities provided at Hang Nadim Airport is still poor. Most respondents expect a better facility provided from Hang Nadim Airport, but in reality it is not fulfilled. Third, food & beverages; pricing; and online services are the lowest priority at Hang Nadim Airport. With this in mind, Hang Nadim Airport can concentrate more on providing accurate information and better facilities. Lastly, check-in service speed; check-in hospitality; comfortability; security; and hygiene is where Hang Nadim Airport needs to keep up the good work. Most respondents are expecting a good quality on those indicators and they can provide it.

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REFERENCES

- Abdella, J. A., Zaki, N., Shuaib, K., & Khan, F. (2021). Airline ticket price and demand prediction: A survey. *Journal of King Saud University - Computer and Information Sciences*, 33(4), 375–391. <https://doi.org/10.1016/j.jksuci.2019.02.001>
- Adedoyin, F. F., Bekun, F. V., Driha, O. M., & Balsalobre-Lorente, D. (2020). The effects of air transportation, energy, ICT and FDI on economic growth in the industry 4.0 era: Evidence from the United States. *Technological Forecasting and Social Change*, 160, 120297. <https://doi.org/10.1016/j.techfore.2020.120297>
- Afrin, T., & Yodo, N. (2020). A Survey of Road Traffic Congestion Measures towards a Sustainable and Resilient Transportation System. *Sustainability*, 12(11), 4660. <https://doi.org/10.3390/su12114660>
- Agrawal, K., Suman, H. K., & Bolia, N. B. (2020). Frequency Optimization Models for Reducing Overcrowding Discomfort. *Transportation Research Record: Journal of the Transportation Research Board*, 2674(5), 160–171. <https://doi.org/10.1177/0361198120912230>
- Bae, W., & Chi, J. (2021). Content Analysis of Passengers' Perceptions of Airport Service Quality: The Case of Honolulu International Airport. *Journal of Risk and Financial Management*, 15(1), 5. <https://doi.org/10.3390/jrfm15010005>
- Balsalobre-Lorente, D., Driha, O. M., Bekun, F. V., & Adedoyin, F. F. (2021). The asymmetric impact of air transport on economic growth in Spain: fresh evidence from the tourism-led growth hypothesis. *Current Issues in Tourism*, 24(4), 503–519. <https://doi.org/10.1080/13683500.2020.1720624>
- Bruno, G., Diglio, A., Genovese, A., & Piccolo, C. (2019). A decision support system to improve performances of airport check-in services. *Soft Computing*, 23(9), 2877–2886. <https://doi.org/10.1007/s00500-018-3301-z>
- Chan, W. C., Wan Ibrahim, W. H., Lo, M. C., Suaidi, M. K., & Ha, S. T. (2020). Sustainability of Public Transportation: An Examination of User Behavior to Real-Time GPS Tracking Application. *Sustainability*, 12(22), 9541. <https://doi.org/10.3390/su12229541>

- Chiappa, G., Atzeni, M., & Loriga, S. (2019). Profiling airport travellers based on their perceptions, satisfaction and intention to recommend food and beverage services. *European Journal of Tourism Research*, 23, 172–190. <https://doi.org/10.54055/ejtr.v23i.396>
- Guerrero-Ibáñez, J., Zeadally, S., & Contreras-Castillo, J. (2018). Sensor Technologies for Intelligent Transportation Systems. *Sensors*, 18(4), 1212. <https://doi.org/10.3390/s18041212>
- Hättenschwiler, N., Sterchi, Y., Mendes, M., & Schwaninger, A. (2018). Automation in airport security X-ray screening of cabin baggage: Examining benefits and possible implementations of automated explosives detection. *Applied Ergonomics*, 72, 58–68. <https://doi.org/10.1016/j.apergo.2018.05.003>
- Hong, Y., Cui, H., Dai, J., & Ge, Q. (2019). Estimating the Cost of Biofuel Use to Mitigate International Air Transport Emissions: A Case Study in Palau and Seychelles. *Sustainability*, 11(13), 3545. <https://doi.org/10.3390/su11133545>
- Ithmaanna, S., Murwono, D., Sartono, W., & Muthohar, I. (2022). Analysis of Exit Taxiway in the Northern Terminal of Jenderal Ahmad Yani International Airport Semarang. *IOP Conference Series: Earth and Environmental Science*, 1000(1), 012001. <https://doi.org/10.1088/1755-1315/1000/1/012001>
- Kammoun, M. A., Turki, S., & Rezg, N. (2020). Optimization of Flight Rescheduling Problem under Carbon Tax. *Sustainability*, 12(14), 5576. <https://doi.org/10.3390/su12145576>
- Kotopouleas, A., & Nikolopoulou, M. (2018). Evaluation of comfort conditions in airport terminal buildings. *Building and Environment*, 130, 162–178. <https://doi.org/10.1016/j.buildenv.2017.12.031>
- Lee, K.-F., Haque, A., Maulan, S., Abdullah, K., & Tarofder, A. K. (2019). Risk Reduction in Online Flight Reservation: The Role of Information Search. *Journal of Reviews on Global Economics*, 8, 886–899. <https://doi.org/10.6000/1929-7092.2019.08.76>
- Lin, H., & Wang, Z. (2018). Fast Variable Neighborhood Search for Flight Rescheduling After Airport Closure. *IEEE Access*, 6, 50901–50909. <https://doi.org/10.1109/ACCESS.2018.2869842>
- Prastiwi, D. A., Sugito, & Kartikasari, P. (2021). Analysis non-poisson systems cases of queuing passenger aircraft at Ahmad Yani Airport. *Natural Science: Journal of Science and Technology*, 10(1), 01–05. <https://doi.org/10.22487/25411969.2021.v10.i1.15452>
- Rifai, A. I., & Arifin, F. (2020). Analysis of The Level of Passenger Satisfaction With Services And Transport Facilities-Based Integration in Jakarta. *Journal of World Conference (JWC)*, 2(2), 66–73. <https://doi.org/10.29138/PRD.V2I2.211>
- Rifai, A. I., Hadiwardoyo, S. P., Correia, A. G., & Pereira, P. (2016). Genetic Algorithm Applied for Optimization of Pavement Maintenance under Overload Traffic: Case Study Indonesia National Highway. *Applied Mechanics and Materials*, 845, 369–378. <https://doi.org/10.4028/www.scientific.net/AMM.845.369>
- 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. <https://doi.org/10.14716/ijtech.v6i5.1186>
- Rifai, A. I., Thalib, H., Prayogo, D., & Isradi, M. (2022). Customer Satisfaction and Road Performance in Long Segment Maintenance Contract: Application of an Urban Road Network. *UIJRT: United International Journal for Research & Technology*, 03(09). <https://uijrt.com/articles/v3/i9/UIJRTV3190002.pdf>
- Saninah, T. N., Rushayati, S. B., & Hermawan, R. (2020). Urban forest development at landside of Hang Nadim Batam Airport based on the microclimate and noise study. *IOP Conference Series: Earth and Environmental Science*, 528(1), 012064. <https://doi.org/10.1088/1755-1315/528/1/012064>
- Setiawan, M., Surjokusumo, S., Ma'soem, D., Johan, J., Hasyim, C., Kurniasih, N., Sukoco, A., Dhaniarti, I., Suyono, J., Sudapet, I., Nasihien, R., Mudjanarko, S., Wulandari, A., Ahmar, A. S., & Wajdi, M. (2018). Business Centre Development Model of Airport Area in Supporting Airport Sustainability in Indonesia. *Journal of Physics: Conference Series*, 954, 012024. <https://doi.org/10.1088/1742-6596/954/1/012024>
- Shukrullaevich, A. F., & Bakhriddinova, A. N. (2020). Transportation System in Tourism Logistics. *Наука, Техника и Образование*, 6(70), 68–70. <https://cyberleninka.ru/article/n/transportation-system-in-tourism-logistics>
- Woo, Y.-B., & Moon, I. (2021). Scenario-based stochastic programming for an airline-driven flight rescheduling problem under ground delay programs. *Transportation Research Part E: Logistics and Transportation Review*, 150, 102360. <https://doi.org/10.1016/j.tre.2021.102360>
- Zhou, H., Li, W., Jiang, Z., Cai, F., & Xue, Y. (2022). Flight Departure Time Prediction Based on Deep Learning. *Aerospace*, 9(7), 394. <https://doi.org/10.3390/aerospace9070394>
- Zografos, K. G., Madas, M. A., & Androutsopoulos, K. N. (2017). Increasing airport capacity utilisation through optimum slot scheduling: review of current developments and identification of future needs. *Journal of Scheduling*, 20(1), 3–24. <https://doi.org/10.1007/s10951-016-0496-7>