THE INFLUENCE OF AIRLINE GROUND TIME TO ON TIMEPERFORMANCE AT HALU OLEO KENDARI AIRPORT

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ABSTRACT
Halu Oleo Kendari Airport in South Konawe, Southeast Sulawesi, has experienced rapid passenger growth but faces issues with delayed departure times due to suboptimal ground services. This study aims to assess the impact of airline ground time on on-time performance. Using quantitative methods including correlation, linearity tests, and simple linear regression analysis, the research found a significant relationship between ground time and on-time performance. The analysis revealed that a zero ground time would increase on-time performance by 61.38%, whereas a one-unit increase in ground time would reduce it by 91.56%. The partial t-test results showed a significance level below 0.05, confirming that ground time significantly affects performance.

Keywords*: block on, block off, ground time, on time performance, influence.*

1. INTRODUCTION

Indonesia is an archipelagic country consisting of many islands spread throughout its territory, where all its residents are separated by the ocean that connects these islands. As a country with many islands, the transportation sector plays an important role in facilitating the mobility of its population. Among the various modes of transportation, air transportation is a vital choice because it is able to reach various islands quickly and efficiently.

The presence of air transportation has opened up new opportunities for the development of education, business and various other activities in regions, regions and throughout the country, which are facilitated through the existence of airports. Airports are spread throughout Indonesia, functioning as providers of airport services, which guarantee security, comfort, efficiency and economic services in flight operations, in addition to supporting other business activities outside flight operations.

The rapid growth of the global aviation industry in recent years has led to a significant increase in the volume of aircraft traffic at airports. To deal with this surge, optimal airport infrastructure and services must be prioritized to support comfort, efficiency and economic value in flight operations. One important aspect to ensure operational standards is optimizing ground time. Ground time refers to the period spent by an aircraft on the apron during ramp service, starting from block-on to block-off time. Optimizing ground time is very important to support on-time performance, which is the main indicator of operational efficiency.

Halu Oleo Airport is an airport located in South Konawe Regency, Southeast Sulawesi Province. Previously known as Wolter Monginsidi Airport, its name was changed to Halu Oleo Airport on 13 February 2010, in honor of Halu Oleo, an honored warrior from Konawe. As a Class 1 Airport Operating Unit, Halu Oleo Airport mainly serves domestic flights. The rapid growth of the aviation industry presents new challenges in managing service efficiency at these airports. Halu Oleo Airport has experienced an increase in passengernumbers from year to year, which is a positivedevelopment, but also requires optimal service improvements to accommodate this growth.

According to air traffic movement data from the Halu Oleo Airport Management Unit (UPBU), in 2023 the number of arriving passengers will reach 1,022,436 people, with a total of 18,669 arriving flights. This shows that air traffic at Halu Oleo Airport is quite busy, so flight operations must be carried out according to a predetermined schedule. Disruptions in the implementation of operations can affect overall flight performance. This disruption can be caused by various factors such as weather conditions, fleet inspections while on the ground, landing delays, and limited apron capacity at Halu Oleo Kendari Airport. To overcome this

potential problem, airport management needs to review aircraft ground time. This review aims to optimize the airline's ground time to ensure on-time departures [1].

Another research by Dikco Vasa Wahyuda and Nuning Agustina Ambarsari, SE, MM in 2022, entitled "The Effect of Delays Due to Flight Operation Handling and Techniques on On-Time Performance on Lion Air Airlines at Adi Soemarmo Airport," offers an analysis of delay factors at Lion Water. This research, which uses regression analysis, concludes that the influence of the independent variables, namely flight operations (X1) and engineering (X2), on the dependent variable, namely on-time performance (Y), is 4.4%, with the remaining 95, 6% is influenced by other factors not examined in this study. The research concluded that flight operations and engineering did not have a significant influence on on-time performance [2].

The third research by Yopi & Adipura in 2022, entitled "Optimization Analysis of Citilink A320 Aircraft Ground Time as an Effort to Improve the Quality of On-Time Performance at PT. Gapura Angkasa Husein Sastranegara International Bandung Airport," revealed that the average ground time for Citilink aircraft is 28 minutes. The airline is making efforts to improve On-Time Performance (OTP) performance by implementing quick handling, eliminating Technical Delay Aircraft Maintenance (TDAM), implementing strategies for determining aircraft flight schedules, and providing support through the workforce [3].

On time performance (OTP) and delay cannot be separated, because delay is the opposite of On time performance (OTP). On time performance (OTP) is the timeliness that can be achieved by a flight [4]. while delays are explained in Law of the Republic of Indonesia Number 1 of 2009 concerning Aviation.

Delay is defined as a time difference between the scheduled departure or arrival time and the actual departure or arrival time [5]. Meanwhile, according to Eurocontrol, delay is the time lapse which occurs when a planned event does not occur at the planned time [6].

Based on the description above, the research problem can be formulated as follows: "How does airline ground time influence on-time performance at Halu Oleo Kendari Airport?" This research aims to explore the relationship between aircraft ground time and on-time performance, assess the effectiveness of current operational practices, and propose improvements to increase airport efficiency and service quality. The results of this research will provide valuable insight into optimizing airport operations, as well as contribute to a broader understanding of how ground time management affects overall flight performance in a busy and growing aviation environment such as Halu Oleo Airport.

2. METHODS

2.1 Research Design

This research uses quantitative research methods which allow precise and objective measurement of the variables involved, namely ground time and on-time performance. In this context, these variables can be measured in clear and definite units of time, namely in minutes. Through a quantitative approach, research results can be expressed in numerical form which allows accurate identification and measurement of the relationship and influence between ground time and on-time performance. Using this method allows in-depth analysis to evaluate the extent to which airline ground time influences on-time performance at Halu Oleo Kendari Airport.

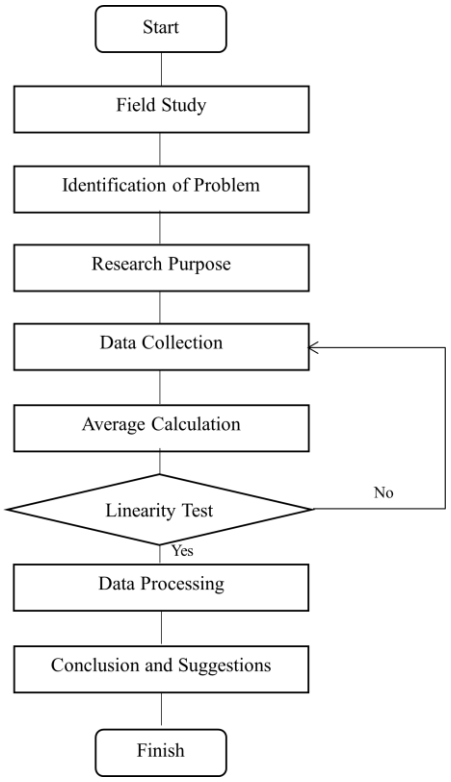

Figure 1. Quantitative Research Flowchart

2.2 Research Variables

The independent variable (X) and variable (Y) in this study are as follows.

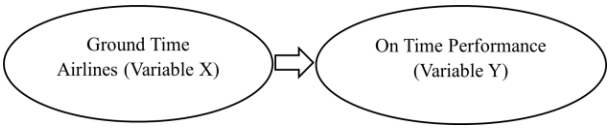

Figure 2. Research Variable

1. Variable X (Independent Variable) is a variable that influences other variables. This variable can also be referred to as stimulus, predictor, antecedent, and exogenous [7]. This variable is

named (X) in the study which is the average flight ground time for each airline.

2. Variable Y (Dependent Variable) is a variable that is influenced by an independent variable. This variable becomes the result of the existence of an independent variable . This variable is named (Y) in the study which is in the form of punctuality of flight departure.

2.3 Population, Sample, and Object

Population is all elements in research including objects and subjects with certain characteristics and characteristics [8]. The population taken by study was from the daily flight schedule at Halu Oleo Kendari Airport. The sample is part of the number and characteristics of the population [9], sample used is ground time and deviation on-time performance (OTP) from January 2019 to December 2023. Object used during this research is the ground time and OTP of flight scheduled at Halu Oleo Kendari Airport. This data will be analyzed further to answer the research hypothesis, namely knowing how airline ground time influences ontime performance at Halu Oleo Kendari Airport.

2.4 Data Collection Techniques

The research employes data collecting approaches such as documentation analysis. Documentation analysis is the results or evidence obtained by researchers when carrying out interview or observation techniques which can be in the form of documents, photos or so on [10].

2.5 Research Instruments

An instrument is a tool used to measure an object measure or collect from a variable. In this case, the instrument has the meaning as a tool for obtaining and collecting research data, as a process for finding results and conclusions from research [11]. In this final project research, the authors used a research instrument in the form of daily log flights to SAMSS Airport, Balikpapan, from January 2019 to December 2023.

2.6 Data Analysis Techniques

Quantitative research methods are research that is full of numeric nuances in data collection techniques in the field [12]. Quantitative research methods can provide an overview of the population in general. In quantitative research, what is highlighted is the relationship between research variables and testing hypotheses that have been previously formulated. Even though the description also contains narrative or is descriptive in nature, as correlational (relationship) research, the focus lies on explaining the relationships between variables.

3. RESULT AND DISCUSSION

Based on the data that has been tabulated in the table, it can be seen that there are variations in the average ground time and deviation on-time performance (OTP) between various airlines at Halu Oleo Kendari Airport during the period January 2019 to December 2023. Analysis of this data shows several interesting patterns and trends regarding the relationship between ground time and OTP.

In this research, Indonesian airline codes are included. The airline code consists of two letters (two letter code) which aims to identify reservations, fare tickets, flight schedules, proof of cargo delivery, and interline telecommunications between airlines. [13]

In general, Garuda Indonesia (GA) airlines tend to have a consistent average ground time, ranging from 57 to 59 minutes almost every month, with some exceptions in certain months such as February 2020 and November 2023 where ground time decreased drastically to 43 minutes and 42 minutes respectively. In these periods, OTP deviation also tends to be low, indicating that when ground time is shorter, Garuda Indonesia's OTP is better, with lower deviation. This shows that efficiency in managing ground time can contribute positively to OTP performance.

Citilink (QG) also shows a similar pattern, where the average ground time ranges from 48 to 56 minutes. Although Citilink often shows a higher OTP deviation compared to Garuda Indonesia, especially in certain months such as March 2021 and May 2021, where the deviation reached 19 minutes, there are indications that longer ground time may contribute to an increase in OTP deviation. This suggests that Citilink may face challenges in maintaining operational efficiency during longer periods of ground time.

Other airlines such as Lion Air (JT), Batik Air (ID), and Wings Air (IW) also show variations in their ground time and OTP deviation. Lion Air, for example, tends to have shorter ground times in most months, but this is often accompanied by higher OTP deviations, as seen in February 2019 and March 2020. This could suggest that aggressive ground time reductions may not always be proportional to with improved OTP performance, and may require better management in terms of flight preparation and aircraft maintenance.

Batik Air and Wings Air, although showing smaller fluctuations in ground time compared to other airlines, still faced quite significant OTP deviations in some periods, such as in December 2020 and September 2022. This shows that although their ground time is relatively stable, other factors may impact their OTP performance, such as unexpected operational conditions or technical problems.

In this research, the mean calculation is used to calculate the average airline ground time for each month from January 2019 to December 2023. This process involves adding up the airline's ground time per day in one month, which is then divided by the number of days in that month. The results of this calculation provide

variable X for the ground time column and variable Y for the on-time performance (OTP) deviation column.

Table 1. Correlation Test Results

Correlations

		Ground Time	On Time Performance
Ground Time	Pearson Correlation	1	-.809**
	Sig. (2-tailed)		<,001
	N	300	300
On Time Performance	Pearson Correlation	-.809**	1
	Sig. (2-tailed)	<,001	
	N	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

After the mean calculation is complete, the next step is to carry out a correlation test to assess the ground time and on-time performance variables. The results of the correlation test show that the two variables have a significance value of <0.001, which means there is a significant correlation between the two. Apart from that, the correlation coefficient or Pearson correlation of -0.809 indicates a very strong correlation between ground time and OTP, which means that an increase in ground time tends to be followed by a decrease in on-time performance. The degree of relationship guideline shows that the correlation coefficient between 0.80 and 1.000 falls into the very strong correlation category, so this result strengthens the finding that ground time has a significant effect on OTP.

Based on the correlation test results from the table above, it can be seen that ground time and on time performance have a significance value of <0.001, from this table you can also see a correlation coefficient or Pearson correlation of -0.809.

Next, to understand whether the relationship between the two variables is linear, a linearity test was carried out using a scatter plot graph. Scatterplot shows the relationship between variables in the form of meeting points of quantitative values between one variable and another variable [14]. The linearity test results show that the relationship between ground time and OTP is linear, which can be seen from the pattern of dots on the scatter plot which tends to form a straight line. This shows that the appropriate analysis method for this data is simple linear regression.

The linearity test is used to determine the relationship pattern between ground time and OTP deviation. After the correlation test is carried out, it is followed by a linearity test. This is done to find out whether the two variables have a linear relationship or not so that the use of the regression method can be determined in the next step. The data used in the linearity test are the results of calculating the mean in the form of variables X (ground time) and Y (OTP deviation) which are then entered into the SPSS application so that the scatter plot graph is obtained as follows.

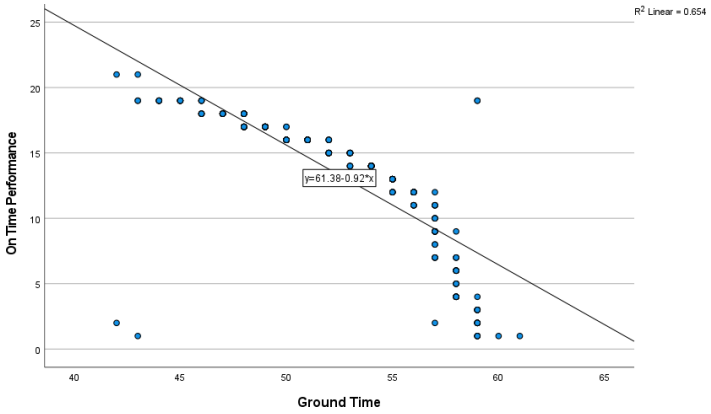

Figure 3. Scatter Plot Graphics

Table 2. Simple Linear Regression Test Results

Source	SS	df	MS	Number of obs	=	300
				F(1, 298)	=	562.77
Model	4676.60561	1	4676.60561	Prob > F	=	0.0000
Residual	2476.39439	298	8.31004828	R-squared	=	0.6538
				Adj R-squared	=	0.6526
Total	7153	299	23.9230769	Root MSE	=	2.8827

Y	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
X	-.9155633	.0385944	-23.72	0.000	-.9915154	-.8396111
_cons	61.37623	2.033417	30.18	0.000	57.37455	65.3779

From the results of the regression test analysis above, the following regression equation can be obtained:

$$Y = 61{,}37623 - 0{,}9155633X$$

Y = Dependent variable (on time performance)

X = Independent variable (ground time)

Based on the results of a simple linear regression analysis between ground time and on-time performance variables, the equation Y = 61.37623 - 0.9155633X is obtained. This equation shows that if ground time is zero or fixed, on-time performance will be at the level of 61.37623%, which can be rounded up to 61.38%. The regression coefficient of -0.9155633 shows that every one unit increase in ground time will reduce on-time performance by 0.9155633 units, or around 91.56%. This confirms that there is a negative relationship between ground time and OTP, where increasing ground time has the potential to reduce on-time performance.

Table 3. T-test Result

Source	SS	df	MS	Number of obs	=	300
				F(1, 298)	=	562.77
Model	4676.60561	1	4676.60561	Prob > F	=	0.0000
Residual	2476.39439	298	8.31004828	R-squared	=	0.6538
				Adj R-squared	=	0.6526
Total	7153	299	23.9230769	Root MSE	=	2.8827

Y	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
X	-.9155633	.0385944	-23.72	0.000	-.9915154	-.8396111
_cons	61.37623	2.033417	30.18	0.000	57.37455	65.3779

Additional testing is needed, namely using the t test. The t statistical test basically shows how much influence an independent variable individually has in explaining variations in the dependent variable [15]. From the table above, the calculated t value is -23.72 and the significance value or P > | t | = 0.000. These results are then compared with the t table value and the probability value of 0.05.

Judging from the t table, the t table value for the 298th and = 0.025 is 1.96796, this value is compared with the calculated t value to determine whether the hypothesis is accepted or rejected.

The T test (partial) was carried out to test the significance of the regression coefficient. The T test results show a significance value or P > | t | = 0.000, which is below the threshold of 0.05. This indicates that the ground time regression coefficient has a statistically significant effect on on-time performance. The negative calculated t value (-23.72) compared to the t table value (-1.96796) shows that the ground time variable does have a significant influence on OTP. Thus, the alternative hypothesis (H1) is accepted, while the null hypothesis (H0) is rejected.

In this analysis, several factors that influence airline ground time are identified, including the de-boarding process, baggage loading and unloading, ground handling, ramp maintenance, and passenger boarding. The de-boarding process involves disembarking passengers from the aircraft to the arrivals area after the wheel chocks and boarding bridge are installed. The baggage loading and unloading process includes baggage handling before departure and after the plane lands. Ground handling includes various operational activities on the ground, such as baggage handling, cargo, aircraft maintenance and security checks. Ramp maintenance involves care and maintenance of the aircraft while it is on the apron, including checking systems and replacing components. The boarding process is when passengers enter the plane and take their seats before the flight begins.

Although this research provides useful insight into the influence of ground time on on-time performance, there are several limitations that need to be noted. First, this research only focuses on ground time as a factor influencing OTP, while other factors such as weather conditions and air traffic control also play an important role but are not discussed in this research. Second, this research is limited to airlines operating at Halu Oleo Kendari Airport during the research period, from January 2019 to December 2023. Airlines that are not operating or have just started operating after this period are not included in the research.

By considering these limitations, it is hoped that future research can improve and expand the analysis by including other factors that influence OTP and explain in more detail how each of these factors interacts and influences overall flight performance.

4. CONCLUSION

After conducting research related to the titles and problems described in the previous chapters, it can be concluded that there is a significant influence between airline ground time and on-time performance at Halu Oleo Kendari Airport. This conclusion is based on the results of the simple linear regression analysis and t test (partial) that have been carried out.

In the regression analysis, it was found that there is a constant of 61.37623 which explains that if the ground time variable is zero or fixed, then the level of on-time performance will increase by 61.37623%, which is rounded up to 61.38%. In addition, the regression results show that every one unit increase in ground time will reduce on-time performance by 0.9155633 units or around 91.56%. These findings confirm the existence of a negative relationship between ground time and on-time performance, where increasing ground time has a negative impact on airline OTP performance.

Furthermore, the results of the t test (partial) show a significance value or P > | t | of 0.000, which is below the 0.05 threshold. This indicates that the regression coefficient of the ground time variable has a statistically significant effect on on-time performance. Furthermore, the calculated t-value (-23.72) which is smaller than the t-table value (-1.96796) further strengthens the conclusion that the ground time variable has a significant influence on on-time performance. Therefore, the alternative hypothesis (H1) is accepted, while the null hypothesis (H0) is rejected.

From the overall analysis and tests that have been carried out, it can be concluded that airline ground time does have a significant influence on on-time performance. Factors that influence ground time include the process of de-boarding, boarding, loading and unloading baggage, ramp maintenance, and ground handling activities. All of these factors contribute to determining how effectively ground time can be optimized and, ultimately, how well an airline can maintain on-time performance.

Based on the results of research conducted at Halu Oleo Kendari Airport and the conclusions that have been explained, several suggestions can be given to improve airline performance and airport operations as a whole.

First, considering the significant influence of ground time on on-time performance at Halu Oleo Kendari Airport, the airport is advised to optimize existing facilities, both airside and landside. Optimizing these facilities is important to support airline performance, so that ground time can be minimized and operational efficiency can be increased. This is in line with research

findings which show that ground time has a direct impact on an airline's ability to achieve on-time performance.

Second, because ground time is influenced by several factors, such as the process of de-boarding, boarding, loading and unloading baggage, ramp maintenance, and ground handling, airports need to consider providing service options to airlines regarding the use of third parties who are competent in handling these aspects. the. By choosing quality and reliable third party services, airlines can be more efficient in managing ground time, which in turn will help them achieve optimal on-time performance.

By implementing these suggestions, it is hoped that Halu Oleo Kendari Airport can improve operational efficiency and support airlines in achieving better flight performance, especially in terms of on-time performance.

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