

Analysis of the Achievement of On-time Performance Perception in Air Transportation Activities

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Abstract- This study aims to analyze the factors that affect the achievement of on time performance perception in air transportation activities at Yogyakarta International Airport. The factors analyzed include human resources, weather conditions, peak seasons and airline performance. Flight punctuality is one of the main indicators in the assessment of the quality of air transportation services, which has a direct impact on passenger satisfaction. The research method used is a quantitative approach with data collection through questionnaires distributed to airplane passengers at Yogyakarta International Airport. The sample of this study amounted to 100 respondents who were selected using the simple random sampling method. The analysis technique used is multiple linear regression to test the influence of independent variables on dependent variables. The results of the study show that weather conditions, peak seasons and airline performance have a significant effect on the perception of flight punctuality. However, the human resource variable did not have a significant effect, indicating that the professionalism of human resource at the airport did not directly affect passengers' perception of flight punctuality. This finding is expected to be a reference for airports and airlines in improving flight services to better meet passenger expectations.

Keywords: *airline performance, human resources, on-time performance, peak season, weather conditions*

INTRODUCTION

The aviation industry in Indonesia is currently developing rapidly in recent decades, as evidenced by the increase in the number of passengers and airlines since the introduction of aviation industry regulations (Utama & Rezki, 2021). Statistical data on the development of the number of passengers in Indonesia is the 7th fastest in the world and it is estimated that there will be 390 million passengers in 2037. This major development requires excellent service performance for all aviation industry players in Indonesia, from airlines to airports. Good cooperation from all aviation stakeholders is the main key to providing the best service to airplane passengers so that their satisfaction can be maintained and even increased (Ozturk et al., 2025)

One of the variables for achieving passenger satisfaction is on-time performance. Punctuality of flight schedules is one of the main services received by passengers. This service is a benchmark for increasing competitiveness between airlines (Hajko & Badanik, 2020). The achievement of on time performance will not be maximized if it is not supported by a number of factors. It is estimated that there are a number of variables that affect on time performance, including human resources, weather conditions, peak seasons, and airline performance. The professionalism of human resources in the airport environment has an impact on on-time performance where these activities require the dedication of

human resources in their operation. The more trained the human resources, the higher the level of on-time performance created, so that there are no delays in all lines, both departure, arrival, and baggage loading and unloading processes at the airport (Mardiansyah et al., 2025). The following factors that are estimated to affect on time performance are weather conditions. Weather factors can cause flight delays such as snow or water clearance from the runway area, bad weather at the departure airport or destination airport and others. The climate in Indonesia, which is tropical, makes weather conditions often disrupt this performance, especially when the rainy season changes to drought or vice versa (Lui et al., 2022).

Next is the peak season, which is a season of the need to travel from one place to another at the highest point (Pamungkas & Pitanatri, 2025). This demand is actually only temporary in a certain demand condition, but if it is not managed and prepared properly, it will greatly affect the performance on time performance. Examples of peak seasons include long holidays and religious holidays (Dobruszkes et al., 2022). Airline performance is a measure of the overall success of an airline over a certain period of time in carrying out or carrying out a predetermined task or work (Wu et al., 2024). It is believed that the higher the performance of the airline, the higher the level of on-time performance.

The novelty in this study lies in the integration of internal and external factors of airlines in analyzing passengers' perception of on time performance (OTP). Previous research generally only focused on operational aspects or technical timeliness of flights, while this study combines human resource variables, weather conditions, *peak* seasons, and airline performance in one comprehensive research model. In addition, this study not only measures OTP based on actual data on flight delays, but also based on customer perception of the airline's service quality. This approach provides a new perspective because it is able to illustrate how operational and service factors simultaneously affect passengers' assessment of flight punctuality, especially in the modern aviation industry which has a high level of mobility and competition.

Based on the above explanation, the purpose of this study is to test the influence of human resources, weather conditions, peak seasons and airline performance on on time performance.

LITERATURE REVIEW

On Time Performance

On time performance is a measure of an airline's ability to provide flight services on time or in other words the airline's ability to complete flight activities on time according to a predetermined schedule (Rostamian et al., 2023). Providing timely service is a requirement for every airline operating in Indonesia (Achmad et al., 2024).

Delay and on time performance are inseparably linked, because delay is the opposite of on time performance. On time performance is the punctuality that can be achieved by flights, while delays are described in Law of the Republic of Indonesia No. 1 of 2009 concerning aviation (Anugrah et al., 2025). Delay is defined as the time difference between the predetermined schedule for departure or arrival and the actual time of its implementation (Mataram et al., 2022).

On time performance has an important role because the aircraft achieves its functional value when it is flying in the air. How passengers or customers rate the timeliness of a service (Balkhis et al., 2024). This is a personal perception that is formed based on the experience, expectations and information received by passengers regarding the departure and arrival schedule of the aircraft (Ali et al., 2024).

Human Resources

To achieve goals optimally, the most important thing is to start from the aspect that most supports the achievement of these goals, namely human resources. Human resources play a crucial role and are the main factor in realizing the goals of an organization or company (Andrianto et al., 2022). Compared to other resources such as capital or technology, human resources have an advantage because humans control and utilize these resources. Human resources are a crucial factor that cannot be separated from the sustainability of the organization, both in the form of institutions and companies and are the key in determining organizational growth and development (Prifti et al., 2025). Human resources can be defined as individuals who work as movers, thinkers, and planners in an organization or company, who combine mental and physical abilities to achieve common goals (Alexandro, 2025). Human resources are assets that include thoughts, emotions, skills, desires, knowledge, motivation, energy and work. Human resources are an important element in an organization, often referred to as the workforce or employees (Kiran et al., 2022).

Labor has a strategic role as a production factor that is very important for the success of the organization. With the development of the times and the growing number of workers, human resources are required to have adequate abilities and expertise to be able to compete and meet the needs of the organization (Abdukodirovich, 2025). Human resources have an important role in encouraging organizational progress in accordance with the vision and mission that has been set (Murdiono & Susita, 2024). The success of an organization is inseparable from the contribution of the performance of human resources with the best quality that they provide. In addition to quality, quantity is also an important factor, because the ability to complete tasks on time shows effective performance. Human resources who have optimal quality and quantity of work are expected to be able to help organizations or companies in achieving competitive advantages (Anzeala et al., 2025).

Based on the above explanation, the first hypothesis built is as follows
H₁: Human resources have a significant effect on on time performance.

Weather Conditions

Weather has a close relationship with various human activities both directly and indirectly (Hia et al., 2025). One example is a flight that can be delayed due to heavy rain, thunderstorms or other extreme weather conditions. Weather refers to atmospheric conditions at a specific location and time. In simple terms, weather is the variation of atmospheric conditions over a short period of time. Weather elements include air temperature, air pressure, humidity, wind speed and direction, presence of clouds and rainfall (Amin et al., 2025).

Weather can be interpreted as a state or behavior of the atmosphere at a certain time whose nature changes from time to time (Tomilo et al., 2025). Indonesia as a subtropical country has 2 seasons in 1 year, namely drought and rain. Each season has its own uniqueness, especially during the rainy season because the weather can change at any time and can affect the flight schedule (Adzan et al., 2025).

Based on the above explanation, the second hypothesis built is as follows

H₂: Weather conditions have a significant effect on on on time performance.

Peak Season

Peak season adalah suatu musim dimana permintaan berada di titik paling tinggi (Chaitarin et al., 2025). Seasonally is the occurrence of an imbalance in the tourism phenomenon which can be divided into peak season and low season (Evangelinos et al., 2025). When the peak season increases, there will be a surge in demand for transportation facilities from one place to another, hotel occupancy will increase, tourist attractions will experience a surge in visitors, the demand for places to eat will also increase, and it will also have an impact on road traffic that is quite dense and even tends to be jammed at a number of points (Bisht et al., 2025). On the other hand, the low season is a condition in which tourist business activities have experienced a significant decline (Vlassas, 2025).

Companies, especially those engaged in the tourism sector, are required to always be sensitive to changes in demand trends during peak and low seasons (Gkarane et al., 2025). Accuracy in predicting when peak and low seasons will occur is needed so that companies can anticipate well. The failure of the company to estimate this condition will have a major impact on the company's sustainability because it cannot anticipate a surge in demand or a decrease in demand (Olawuyi & Kleynhans, 2025).

Based on the above explanation, the third hypothesis built is as follows

H₃: Peak season has a significant effect on on on time performance.

Airline Performance

Performance is a description of a person's success in carrying out a certain task or job within a certain period of time. This success is measured based on pre-set work standards, targets or goals (Oliveira et al., 2023). Performance refers to any form of action, activity or implementation that is carried out to achieve certain goals or objectives. In general, performance includes things that an employee does and does not do (Obafemi, 2024). Performance is an important and inseparable part of the implementation of organizational tasks. Performance reflects the results of activities or work carried out by individuals or a group in an organization, which are influenced by various factors with the aim of realizing organizational targets within a certain period of time (Grace et al., 2025).

This performance reflects the extent to which the airline can meet various aspects of operational, financial and customer service while still paying attention to environmental safety and sustainability. In the context of the aviation industry, airline performance is the main benchmark in assessing the competitiveness, service quality and reputation of the company in the eyes of consumers and business partners (Oztirak, 2025).

Based on the above explanation, the fourth hypothesis built is as follows

H₄: Airline performance has a significant impact on on-time performance.

Research Model

Based on the theoretical foundation and research objectives, the research model is built in Figure 1.

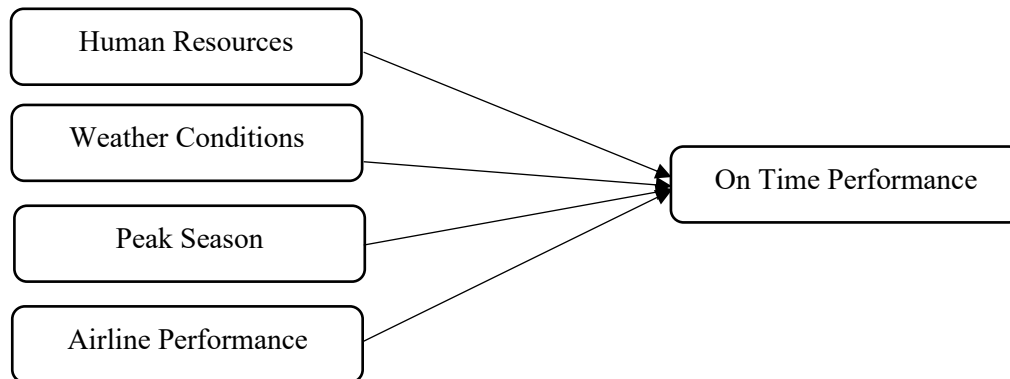


Figure 1. Research Model

METHODOLOGY

Place, Subject and Object of Research

The place where the research was carried out was at Yogyakarta International Airport. The subjects of this study are all airplane passengers, while the object of this research is Yogyakarta International Airport. This airport was chosen because of its role as a relatively new airport with modern infrastructure that replaces Adisutjipto Airport. This airport is strategic in supporting air transportation in the Yogyakarta area, especially since Yogyakarta is a tourist destination with a surge in passengers in the peak season.

Types of Research

This type of research uses quantitative method research. In general, quantitative research methods can be interpreted as research methods based on the philosophy of post-positivism, which is used for research on objects in natural conditions (Ghanad, 2023). Quantitative research is a type of research that produces new findings through statistical procedures or other quantification methods. The quantitative approach focuses more on certain phenomena in human life that have specific characteristics, namely variables (Miller & Lengler, 2025). In this approach, the relationship between variables is analyzed using statistical test tools and objective theories.

Population and Sample

A research population is a collection of units of analysis, such as individuals, objects or events that have similar characteristics or are related to the research topic (Willie, 2024). Based on the definition of the population, the population of this study can be defined as all airplane passengers at Yogyakarta International Airport.

The number of the research population is quite large and very difficult to take all, so samples are used to test the research model that is built. A sample is defined as a part of a population that has similar characteristics and can be used to support research (Hossan et al., 2023). The method used is probability sampling because of the known number of populations. The estimated determination of the number of population is taken within a certain period of time according to the official publication from the International Airport, namely the monthly average number of aircraft passengers at the airport is 6046 people in 2025. The sampling technique used is simple random sampling, which is taking random samples according to the criteria of the research population (Noor et al., 2022).

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{6.046}{1 + 6.046 \cdot (1\%^2)}$$

$$n = \frac{6.046}{1 + 6.046 \cdot (0,01)}$$

$$n = \frac{6.046}{1 + 60,46}$$

$$n = \frac{6.046}{61,46} = 98,37$$

Based on the calculation above, the number of research samples was determined to be 100 respondents.

Data Types and Data Collection Methods

This type of research data is primary data, which is data that is directly collected from the answers of research respondents which will then be used to answer the research objectives (Daruhadi & Sopiati, 2024). In seeking answers to research respondents, questionnaires were used as a method of data collection, where respondents were asked to answer all questions in the questionnaire. The distribution of questionnaires is carried out directly to airplane passengers at Yogyakarta International Airport, by involving filling out questionnaires by passengers who are waiting for flights or have just arrived at the airport. The researcher will approach the passengers and ask them to fill out the questionnaire, so that the data obtained is more relevant and timely.

Research Variables

This study has 2 variables, namely independent and dependent. Independent variables are variables that affect or cause changes in dependent variables (Makwana et al., 2023). In this study, the independent variables used are human resources, weather conditions, peak seasons and airline performance. Dependent variables are variables that are influenced or that are caused by the existence of independent variables (Makwana et al., 2023). On time performance is the dependent variable used.

Measurement Scale

In an assessment, the answer is the key to the success of an assessment (Tanujaya et al., 2022). Giving a scale to each answer to a question must be done precisely. The answer

will provide the final score of an assessment. The respondents' answer scale uses the Likert scale, with scales ranging from Strongly Agree (scale 5) to Strongly Disagree (scale 1).

Validity and Reliability Tests

The validity test is related to the extent to which a research variable measures what is being measured (Olmsted, 2024). A question instrument is considered valid if the question is able to reveal information that is in accordance with the purpose of its measurement. To measure the level of validity in this study, the Pearson Product Moment correlation technique was used.

Reliability tests refer to the extent to which research instruments can be trusted in collecting data and are able to reveal accurate information in the field (Olmsted, 2024). In this study, the reliability test uses Cronbach's Alpha where a variable is considered reliable if the value of Cronbach's Alpha > 0.6 (Rozali et al., 2022).

Hypothesis Test

This study uses multiple linear regression because the number of independent variables is more than 2. Regression is a measurement tool used to measure the presence or absence of correlations between variables. Regression analysis is defined as an analysis of the dependence of a variable on another variable, namely an independent variable in order to make an estimate or prediction of the average value of a variable depending on the known value of an independent variable (Sun et al., 2023). To analyze the influence of various independent factors on dependent variables, the method that can be used is multiple linear regression analysis. An independent variable is declared to have a significant influence on the dependent variable if it has a sig value of 0.05 at most, if it is above it, it is declared insignificant (Abebe, 2024).

RESULT

Validity Test Results

Based on the research data of 100 respondents, the results of data processing for validity test were obtained as stated in Table 1. An instrument is declared valid if it has a calculated r-value of at least 0.1966. Based on Table 1, it can be concluded that all research question items are declared valid because they have a calculated r value above 0.1966.

Table 1. Validity Test Results

Variable	Item	R Count	Remarks
Human Resources (X1)	X1.1	0,774	Valid
	X1.2	0,853	Valid
	X1.3	0,804	Valid
	X1.4	0,848	Valid
	X1.5	0,790	Valid
Weather Conditions (X2)	X2.1	0,869	Valid
	X2.2	0,903	Valid
	X2.3	0,796	Valid
	X2.4	0,901	Valid

Table 1. Validity Test Results (cont')

Variable	Item	R Count	Remarks
Peak Season (X3)	X2.5	0,881	Valid
	X3.1	0,857	Valid
	X3.2	0,806	Valid
	X3.3	0,869	Valid
	X3.4	0,822	Valid
Airline Performance (X4)	X3.2	0,806	Valid
	X4.1	0,782	Valid
	X4.2	0,772	Valid
	X4.3	0,725	Valid
	X4.4	0,793	Valid
On Time Performance (Y)	X4.5	0,706	Valid
	Y.1	0,781	Valid
	Y.2	0,749	Valid
	Y.3	0,856	Valid
	Y.4	0,804	Valid

Source: Authors

Reliability Test Results

Next, the results of the reliability test will be described in Table 2, where an instrument is declared reliable if it has a Cronbach Alpha value of at least 0.6.

Table 2. Reliability Test Results

Variable	Cronbach's Alpha	Standard	Remarks
Human Resources (X1)	0,865	0,6	Reliable
Weather Conditions (X2)	0,918		Reliable
Peak Season (X3)	0,905		Reliable
Airline Performance (X4)	0,810		Reliable
On Time Performance (Y)	0,808		Reliable

Source: Authors

From Table 2, it can be concluded that all research variables are reliable because they have Cronbach's Alpha value above 0.6.

Hypothesis Test Results

Table 3 will present the results of the research hypothesis test, where a variable has a significant influence if it has a sig value of at least 0.05.

Table 3. Hypothesis Test Results

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
1 (Constant)	1,922	1,1469		1,308	0,194
X1	0,020	0,060	0,024	0,338	0,736
X2	0,140	0,060	0,179	2,312	0,023
X3	0,236	0,053	0,367	4,494	0,000
X4	0,338	0,070	0,395	4,818	0,000

Source: Authors

Based on the results of Table 3 in the Sig. column, it was found that only the X1 variable or Human Resources had a Sig value above 0.05 or the Human Resources variable

did not have a significant influence on On Time Performance (Y), while the variables Weather Conditions (X2), Peak Season (X3), and Airline Performance (X4) had a significant influence on On Time Performance (Y).

DISCUSSION

The Influence of Human Resources on Time Performance

Table 3 gives the result that the value of sig. Human Resources is 0.736 or above 0.05. These results show that Human Resources do not have a significant influence on On Time Performance, so hypothesis 1 which states that Human Resources have a significant effect on On Time Performance is not supported. The influence of human resources on on time performance is not significant for several reasons, namely: on time performance is influenced by many factors other than human resources, such as the airline's operational technicalities, passenger delays and disturbances beyond the control of human resources at the airport. Although human resources play an important role, their influence may not be dominant in the context of airport operational complexity. The absence of human resources influence on on time performance can occur because flight punctuality is more influenced by external factors such as weather, air traffic density, and aircraft technical conditions. In addition, the airline's standardized operational systems are able to reduce dependence on individual employee factors.

The Influence of Weather Conditions on Time Performance

The value of sig. The X2 variable shows a value of 0.023 or below 0.05 so that it can be concluded that there is a significant influence of weather conditions on on time performance. From these findings, hypothesis 2 which states that weather conditions have a significant effect on on time performance is supported. This is because bad weather such as heavy rain, strong winds or thick fog can cause the smooth running of the flight schedule to be disrupted such as delayed departure or arrival of aircraft which then has an impact on passengers' perception of flight punctuality. Weather conditions have a significant effect on the on time performance of flights because bad weather such as heavy rain, fog, storms, and strong winds can hinder the take off and landing process. This factor often causes flight delays in order to maintain the safety and security of airline operations.

The Influence of Peak Season on Time Performance

In Table 3, the value of sig. X3 is 0.000 so it can be concluded that there is a significant influence of peak season on on time performance. These results support hypothesis 3, namely that peak season has a significant effect on on time performance. During the holiday season, the number of passengers increases dramatically compared to normal days, which often leads to longer queues at check-in, security check-in and boarding areas. In addition, air traffic congestion can also trigger flight delays, both at departure and arrival. As a result, passengers tend to have different perceptions of flight punctuality, especially if they experience delays or disruptions to the plane's departure and

arrival schedules. Peak season affects on time performance because the increasing number of passengers and flight schedule density can cause queues at the airport, service delays, and increased risk of delayed departures and arrivals. This condition requires airlines and airport managers to increase operational effectiveness during periods of crowded passengers.

The Influence of Airline Performance on Time Performance

Table 3 shows the value of sig. X4 of 0.000 or below 0.005 so that there is a significant influence of airline performance on time performance, so hypothesis 4 that airline performance has a significant effect on on time performance can be supported. The airline's performance includes various aspects, such as the timeliness of departure and arrival, speed in handling baggage, boarding efficiency, and response in the face of operational constraints. If the airline is able to run its operations well and minimize delays, passengers will have more confidence that the airline has good time management. On the other hand, if there are frequent delays, slow service or unclear communication, passengers can have a bad perception of the airline's punctuality. Airline performance affects on time performance because of the quality of operational management, fleet readiness, service efficiency, and the ability of airlines to manage flight schedules to determine the level of punctuality. The better the airline's performance, the greater the chances of the flight operating on time and increasing passenger satisfaction.

CONCLUSION

This research concludes that passengers' perceptions of flight on-time performance at Yogyakarta International Airport are largely determined by complex operational dynamics, particularly those involving external factors and airline management. Through multiple linear regression analysis, it was found that weather conditions, peak season phenomena, and airline performance have a statistically significant influence on how passengers assess on-time performance. Natural factors such as heavy rain or fog have proven to be unavoidable technical obstacles in the takeoff and landing processes. Meanwhile, passenger surges during the holiday season, along with airlines' effectiveness in managing fleet readiness and baggage handling speed, serve as crucial benchmarks for passenger satisfaction. A notable contrast was observed in the human resources variable, where the professionalism of airport staff did not have a significant direct impact on passengers' perceptions of on-time performance.

A striking contrast was found in the human resources variable, where the professionalism of airport staff did not have a significant direct impact on passengers' perceptions of punctuality. This finding suggests that standardized airport operational systems are able to minimize the impact of individual employee factors, leading passengers to view delays as the result of technical issues or natural factors beyond human control. As a practical implication, airport operators and airlines are advised to focus more on improving operational mitigation strategies during peak periods and strengthening schedule information systems to maintain public trust. These findings are expected to serve

as a foundation for stakeholders in formulating policies that are more adaptive to the growing challenges of air mobility.

LIMITATION & IMPLEMENTATIONS

Limitations

1. The use of regression analysis is the only method used in this study to see the influence of variable factors on on-time performance. While this method can show relationships between variables, it does not yet fully capture the subjective aspects of passenger perception. The use of other methods, such as qualitative approaches, can provide deeper insights into the factors that affect on time performance
2. The limited number of respondents in this study involved only 100 respondents who were taken directly. While this number is sufficient for quantitative analysis, wider coverage with a larger sample count can improve the accuracy and generalization of the study results, especially if it covers different types of passengers based on flight routes, airlines or frequency of travel.
3. Limited to one location and time of data collection. The data in this study was collected only at Yogyakarta International Airport in a certain period, so the results of the study do not necessarily reflect on time performance at other airports or under different conditions. Seasonal factors, such as the difference between peak and low seasons, can also affect on time performance and need to be considered in future research.

Implementations

Further research is recommended to take topics like this, should add other variables that can affect on time performance such as the quality of airport facilities, landside capacity, baggage management systems or aviation regulatory policies. Analyze the on time performance of various other airports to see if the results of this study are specific to Yogyakarta International Airport or can be applied more widely. Expand the scope of respondents, for example by comparing the perception of on-time performance between domestic and international passengers to gain more comprehensive insights. Conduct additional qualitative studies, such as interviews with airport and airline management, to gain a deeper understanding of the factors that affect on-time performance.

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