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THE IMPACT OF THE TERMINAL INSPECTION UNIT'S RAPID RESPONSE IN MITIGATING BAGGAGE HANDLING SYSTEM CONSTRAINTS ON OTP (ON-TIME PERFORMANCE) AT JUANDA INTERNATIONAL AIRPORT TERMINAL 2

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Abstract

Airport operational performance is highly dependent on the reliability of its supporting facilities, one of which is the Baggage Handling System (BHS). Disruptions to the BHS have the potential to interfere with On-Time Performance (OTP) and passenger satisfaction. This qualitative study aims to analyze the impact of the Terminal Inspection (TI) Unit's rapid response in mitigating BHS constraints on OTP at Terminal 2 of Juanda International Airport. Data was collected through field observations and in-depth interviews with three key parties, namely the Terminal Inspection Unit, the Mechanical Unit, and representatives from Singapore Airlines. The results show that despite not having written standard procedures, the TI Unit has implemented a quick and effective response by acting as a central coordinator. Coordination between units is considered excellent through layered communication channels, although there are differences in perception regarding work pressure. BHS disruptions have not directly caused significant flight delays thanks to contingency procedures, but they have the potential to indirectly affect OTP through domino effects such as long queues and a decline in service quality. This study recommends the development of written SOPs, crisis communication training, and the strengthening of an integrated monitoring system to improve airport operational resilience.

Keywords: Baggage Handling System, On-Time Performance, Terminal Inspection, Operational Management

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INTRODUCTION

Airport operational performance is a key reflection of the quality of a country's air transportation services. In the airport ecosystem, On-Time Performance (OTP) is a critical indicator that directly affects passenger satisfaction and airline efficiency (Siahaan et al., 2023). Achieving optimal OTP depends not only on the punctuality of the flight itself, but also on the smooth operation and reliability of key terminal facilities, one of which is the Baggage Handling System (BHS).

The BHS is a critical facility responsible for the baggage handling process, from check-in to loading onto the aircraft, and vice versa. Disruptions to the BHS, such as breakdowns or malfunctions, can cause significant delays in the baggage delivery process, which ultimately has a negative impact on flight departure schedules. The reliability of the BHS is directly related to the quality of service experienced by passengers (Aziz & Syaputra, 2024). However, the effectiveness of supervision by the Terminal Inspection Unit in maintaining this reliability, in the context of rapid response to Baggage Handling System (BHS) disruptions, has not been widely studied.

To minimize the impact of BHS disruptions on flight operations, the role of the Terminal Inspection (TI) Unit is essential. Terminal Inspection is tasked with supervising and inspecting facilities at the airport, including the BHS, to ensure that operational activities comply with established standards (Faizah & Widagdo, 2024).

Juanda International Airport, particularly Terminal 2, faces ongoing challenges in maintaining high OTP levels. The key to incident management is the implementation of structured procedures, especially in the initial handling phase. An in-depth analysis is needed to understand (1)How the Terminal Inspection (TI) Unit's rapid response procedures are implemented in the initial handling of Baggage Handling System (BHS) constraints in the field. Furthermore, the success of handling BHS constraints is highly dependent on the synergy and communication between related units. Therefore, it is important to evaluate (2)How the perception and coordination between the TI Unit, Mechanical Unit, and Airlines in managing BHS constraints can affect problem resolution time. Ultimately, all these efforts must be based on key performance indicators, so it is necessary to empirically examine (3)How the impact of delays in handling BHS involving the TI Unit and Mechanical Unit affects the On-Time Performance (OTP) of flights. I conducted this research with the aim of analyzing the impact of the Terminal Inspection unit's rapid response to the constraints experienced by the Baggage Handling System on On-Time Performance (OTP) at Terminal 2 of Juanda International Airport, referring to the problem formulation that has been established.

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LITERATURE REVIEW

On-Time Performance (OTP) is a critical indicator for measuring the efficiency of airport operations. According to Siahaan et al. (2023), OTP not only affects passenger satisfaction, but also has an impact on the overall performance of airlines. A study conducted by Ginting et al. (2022) shows that flight delays can cause losses for airlines in the form of additional costs, such as compensation for meals and money, and can reduce passenger confidence. At Juanda International Airport, OTP is a major factor in evaluating service quality (Faizah & Widagdo, 2024).

The Baggage Handling System (BHS) is a critical facility in airport operations that is responsible for handling passenger baggage from check-in to loading onto the aircraft. According to Aziz and Syaputra (2024), disruptions or obstacles that occur in the BHS, such as mechanical damage or automation system failures, can cause delays in baggage loading, which in turn can cause flight delays. Research by Chen et al. (2021) emphasizes that the reliability of the BHS is highly dependent on routine maintenance and rapid response to incidents.

The Terminal Inspection Unit acts as the front line in monitoring and controlling airport facilities, one of which is the BHS. According to Faizah and Widagdo (2024), the Terminal Inspection Unit is tasked with conducting routine inspections and responding quickly to reports of disruptions. The effectiveness of the Terminal Inspection Unit in handling BHS incidents depends on the speed of response, standard procedures, and the technical competence of officers. A study conducted by Lee and Park (2022) shows that airports with trained inspection units are able to minimize BHS operational downtime by up to 40%. However, the implementation of rapid response procedures at Juanda Airport Terminal 2 still needs to be studied in more depth.

Coordination between the Terminal Inspection unit, the Mechanical unit, and the Airlines is a key factor in handling disruptions to the BHS. According to Smith and Brown (2023), synergy between units can accelerate problem diagnosis and solution implementation. However, challenges such as differences in communication protocols and authority hierarchies often hinder coordination.

Previous studies have examined OTP and BHS separately, but few have linked the role of IT units in mitigating BHS disruptions to OTP. Studies by Faizah and Widagdo (2024) focus on regulatory implementation, while Aziz and Syaputra (2024) emphasize passenger satisfaction. This study attempts to fill this gap by analyzing the IT unit's rapid response procedures, inter-unit coordination, and their impact on OTP at Juanda Airport Terminal 2. Using a qualitative approach, this study aims to provide practical recommendations for improving the effectiveness of BHS disruption management.

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RESEARCH METHOD

In this study, the method I used to compile this scientific journal was a descriptive method with a qualitative approach. This study provides a clear picture of the obstacles encountered. According to Sugiyono (2020:9), qualitative research is a research method used to study natural conditions, where the researcher is the key instrument, data collection techniques are carried out using triangulation (combination), data analysis is inductive, and qualitative research results emphasize meaning rather than generalization.

According to Bogdan and Biklen in Sugiyono (2020:7), descriptive qualitative research methods involve collecting data in the form of words or images, so they do not emphasize numbers. After being analyzed, the collected data is then described so that it is easy for others to understand. This research is intended to provide an overview, describe, and define the circumstances that occurred.
The data collection techniques used were observation and interviews.

1. Observation

Observation is a method of data collection through direct observation of phenomena or behavior in the field. This technique allows researchers to observe and record what they see in real situations, without interference or changes from the researchers (Wani et al., 2024). In this study, I conducted observations at Terminal 2 of Juanda International Airport in the check-in area. During my observations at the location, I not only observed the conditions of the area but also observed the facilities that would affect passenger queues, namely the check-in counters, conveyors, baggage handling systems, and out-of-gauge baggage.

2. Interview

An interview is a data collection technique that involves direct interaction between the researcher and the respondent, where the researcher asks questions to explore in-depth information about the topic being studied (Huberman & Miles, 1992). This technique allows researchers to understand the perspectives, experiences, feelings, or opinions of respondents in more detail. Interviews are often used in qualitative research, especially when researchers need more subjective and detailed data. There are several types of interviews that can be used according to research needs (Rosyid, 2022). In this research, I will interview several parties related to the topic I have chosen, namely the Terminal Inspection unit itself, the Mechanical department, and one of the airlines operating at Terminal 2 of Juanda International Airport.

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RESULTS AND DISCUSSION

My observations at Terminal 2 of Juanda International Airport revealed that the Baggage Handling System (BHS) generally operates under the active supervision of the Terminal Inspection (TI) Unit. During peak hours, when passenger queues begin to lengthen, the check-in process continues. The Baggage Handling System (BHS) facilities also operate normally, although there are several vulnerable points, such as sensors on the conveyor belt that are prone to interference.

I also conducted in-depth interviews with three key parties, namely from the Terminal Inspection Unit (SPV Group Delta, Herwin Novarizky), the Mechanical Unit (Adi), and Singapore Airlines (Dimas Fahmawan). Representing the airlines, Mas Dimas Fahmawan (Singapore Airlines) stated that disruptions to the Baggage Handling System (BHS) have never caused significant flight delays. This is possible thanks to contingency procedures such as the use of manual baggage handling or switching to Out of Gauge (OOG) facilities. However, the impact is not immediately apparent in the form of complaints from passengers, especially frequent flyers who are members of Loyalty Airlines, which is considered a serious concern as it can affect service levels. The coordination carried out by Mas Dimas Fahmawan with the Terminal Inspection Unit is also considered highly efficient, as Dimas noted that Terminal Inspection is very responsive to any issues or disruptions occurring at airport facilities, with a response time of less than three minutes via communication groups or direct phone calls.

Meanwhile, from the Mechanical department, represented by Mas Adi, explained technically that the most common disruptions or obstacles originate from conveyor sensors that are covered with stickers or obstructed by foreign objects such as paper, cloth, and so on, and occur due to baggage handling procedures that do not meet standards, such as throwing baggage directly onto the conveyor without going through the initial stage. Mas Adi also explained that repairs for minor disruptions such as jamming can be completed in 2 to 5 minutes, while for major damage such as a torn conveyor belt, it takes approximately 2 to 3 hours. Therefore, the Mechanical Unit also has a system called SCADA (Supervisory Control and Data Acquisition) which is used for monitoring and routine checks before operational activities begin. The most common challenge faced is pressure from the airline asking about the progress of repairs, which sometimes disrupts concentration during repairs.

Then, from the perspective of Terminal Inspection, represented by Mas Herwin Novarizky as SPV Group Delta, it was explained that in handling Baggage Handling System (BHS) constraints, there are no rigid written standard procedures, but the basics held by Terminal Inspection are PM 41 of 2023, which explains everything about the procedures for achieving satisfactory LoS. The steps taken are adaptive, starting with

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receiving reports, then conducting field verification by monitoring and going directly to the location of the problem, coordinating with the Mechanical unit, and communicating with the Airline to make operational adjustments. The mechanisms relied upon by Terminal Inspection are HT channels, telephone, and WhatsApp, which so far have not experienced any problems. Given the absence of coordination issues, it can be concluded that Terminal Inspection has successfully positioned itself as a bridge connecting the airline and Mechanical departments, playing a crucial role in managing the expectations of both parties. According to Mas Herwin, disruptions to the Baggage Handling System (BHS) can affect On-Time Performance (OTP) through a domino effect: long queues slow down check-in closure, which delays baggage loading and causes flights to be late.

Based on the findings from the three perspectives above, it can be concluded that the Terminal Inspection Unit's rapid response procedure, although not formally documented, has proven effective in handling disruptions to the Baggage Handling System (BHS). This success is supported by the speed of response, flexibility of communication, and the role of Terminal Inspection as the central coordinator. The identified handling pattern begins with reporting, verification, escalation to Mechanical, and communication with Airlines. The absence of a standard protocol allows for a contextual response, but may risk inconsistency in the event of personnel changes. These findings enrich previous studies that emphasize the importance of response speed, while highlighting gaps in procedure standardization.

Coordination between units runs smoothly thanks to multiple communication channels, namely HT, telephone, and WhatsApp. This synergy minimizes miscommunication and speeds up problem solving. However, there are differences in perception regarding work pressure: Mechanical feels direct pressure from the airline, while Terminal Inspection strives to be a balancing force by managing expectations through clear communication. This shows that coordination is not only about the exchange of technical information, but also includes psychological aspects and expectation management. These findings are in line with research stating that synergy between units can accelerate problem solving, although pressure from external parties still needs to be watched out for.

The impact of Baggage Handling System (BHS) disruptions on On-Time Performance (OTP) is not considered significant, due to the existence of a multi-level mitigation system, namely quick fixes, manual route changes, conveyor diversions, or Out of Gauge (OOG). However, disruptions to the Baggage Handling System (BHS) have the potential to indirectly affect On-Time Performance (OTP) through a domino effect, namely: long queues reduce service quality, slow down the check-in process, and ultimately delay departures. This impact will be even more severe if the disruption occurs during peak hours and lasts for a long time. Thus, the reliability of the Baggage Handling System (BHS) facilities remains an indirect determinant of On-Time Performance (OTP) and also affects passenger satisfaction.

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Overall, the handling of disruptions to the Baggage Handling System (BHS) at Terminal 2 of Juanda International Airport can be described as an integrated response system that relies on speed, personal coordination, and alternative options. This success is supported by intensive communication and well-established working relationships. However, to maintain performance, steps such as the preparation of written SOPs in addition to PM 41 of 2023, crisis communication training, the development of an integrated monitoring system, and the strategic placement of spare parts are required. I hope these recommendations can strengthen the resilience and smooth operation of airport activities against Baggage Handling System (BHS) disruptions, so that not only On-Time Performance (OTP) can be maintained, but service quality can also be maintained and improved overall.

CONCLUSION

Based on the research conducted, it can be concluded that:

1. The Terminal Inspection (TI) Unit's response proved to be quick and effective in handling Baggage Handling System (BHS) disruptions at Terminal 2 of Juanda Airport, even though it was not yet supported by written standard operating procedures. The TI's role as a central coordinator successfully bridged the Mechanical and Airline Units.
2. Coordination between units ran very well through layered communication channels such as HT, telephone, and WhatsApp. However, there were differences in perception regarding work pressure, where the Mechanical Unit felt direct pressure from the Airline, while TI acted as a balancer of expectations.
3. Disruptions to the Baggage Handling System (BHS) did not directly cause significant flight delays thanks to available alternative procedures, such as the use of manual baggage handling, route diversions, or Out of Gauge (OOG) facilities.
4. The impact on On-Time Performance (OTP) is indirect through a domino effect: Baggage Handling System (BHS) disruption → long queues → late check-in closure → delayed baggage loading → potential flight delays, especially during peak hours.
5. Improvement measures are needed, such as the development of written SOPs, crisis communication training, strengthening of integrated monitoring systems, and the provision of strategic spare parts to improve the operational resilience of Juanda Airport.
6. The limitations of this study lie in its scope, which is limited to one airline and one terminal, so caution is needed when generalizing the findings. The data collected is also qualitative and based on the perceptions of respondents.
7. Suggestions for further research include comparative studies between terminals or airports, as well as quantitative approaches to measure the impact of Baggage

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Handling System (BHS) disruptions on On-Time Performance (OTP) more objectively.

Therefore, this study confirms that airport operational reliability depends not only on technology but also on synergy between units, effective communication, and well-managed response procedures.

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