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The Handling of Passenger Baggage Sweeping at the Boarding Gate: A Case Study on Batik Air at Abdulrachman Saleh Airport Malang

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Abstract

This study examines the effectiveness of baggage sweeping conducted by Batik Air at the boarding gate of Abdulrachman Saleh Airport, Malang, in response to the rising number of passengers and the growing complexity of cabin baggage management. Observations show that sweeping activities frequently trigger delays and conflicts, particularly caused by oversized items that pass through the check-in process undetected. Factors such as passengers' limited understanding of baggage regulations, restricted boarding time, insufficient staff, and limited supporting facilities exacerbate the situation. This research applies a descriptive qualitative approach, using primary data gathered through observation, interviews, and documentation, together with secondary data from airline SOPs and policies. Data were collected from February to March 2025, with source triangulation used to ensure credibility. Analysis was carried out through data reduction, data display, and conclusion drawing to identify the constraints of the sweeping process and to formulate solutions for improving effectiveness, operational efficiency, and service satisfaction. The findings reveal that baggage sweeping involves several key stages, namely baggage profiling, labeling, and re-examination using tools such as the Baggage Test Unit (BTU), along with the use of special tags. Technical and operational challenges, including the airline's internal approval system, the habit of carrying souvenir boxes, and the use of self-check-in services, require strategic solutions such as passenger education on baggage rules, additional staff, tighter supervision from the check-in stage, and the development of digital detection systems to support smooth operations and flight safety.

Keywords: *Abdulrachman Saleh Airport, Batik Air, boarding gate, flight security, baggage sweeping*

Introduction

Abdul Rachman Saleh Airport Malang is one of the main domestic airports located in Pakis District, Malang Regency, East Java, serving both commercial and military flights with two runways measuring 1,500 meters and 1,970 meters in length [1]. Passenger mobility at this airport has increased significantly, rising from 353,683 passengers in 2022 to 471,924 passengers in 2023, an increase of 33.43%, and is projected to reach 500,000 passengers by the end of 2024. As an air transportation facility, an airport is defined as a delimited area of land or water that includes buildings, installations, and equipment used for the departure and arrival of aircraft [2], as also regulated under Law of the Republic of Indonesia Number 1 of 2009 concerning Aviation [3]. The plan to upgrade Abdul Rachman Saleh Airport to international airport status has further encouraged the strengthening of security facilities, including more intensive implementation of cabin baggage sweeping [4]. This increase in passenger numbers demands better management of passenger belongings, particularly during the baggage sweeping stage at the boarding gate, which is the process of re-examining baggage that exceeds the permitted weight, size, or type of item allowed into the aircraft cabin. One of the airlines operating intensively at this airport is Batik Air, a full-service airline and subsidiary of the Lion Air Group that has obtained IATA Operational Safety Audit (IOSA) certification [5], with a frequency of approximately 28 flights per week using Airbus A320 aircraft with a capacity of 156 passengers, making cabin baggage management increasingly important to maintain flight safety and passenger comfort.

Numerous previous studies have addressed the issue of cabin baggage sweeping at various airports in Indonesia. A study at Yogyakarta International Airport found that the implementation of baggage sweeping affected Citilink Indonesia passenger satisfaction by as much as 56.1%, with a satisfaction index of 46.7% [6]. Another study at Juanda International Airport, Surabaya, found that the cabin baggage sweeping process carried out by Pelita Air had complied with the Standard Operating Procedure (SOP), although the main obstacle faced was passengers' objections regarding the security of their belongings [7]. Research on the effect of boarding time on departure schedule accuracy further confirmed that passengers' lack of discipline in carrying their belongings was the main factor causing delays and conflicts between staff and passengers [8]. Other prior studies at Kualanamu International Airport Medan, Adisutjipto Airport Yogyakarta, and I Gusti Ngurah Rai Airport Bali similarly emphasized that passengers' refusal to transfer items to checked baggage and their concerns over the security of their belongings were the main factors hindering the sweeping process [9], [10], [11], [12], [13]. Although these studies have examined the impacts and constraints of baggage sweeping across various airlines and locations, research specifically addressing the procedures and constraints of baggage sweeping by Batik Air at Abdul Rachman Saleh Airport Malang remains limited, making this study relevant in filling that gap.

A poorly managed baggage sweeping procedure can have systemic impacts, ranging from flight delays and conflicts between staff and passengers to a decline in customer satisfaction toward the airline. Based on preliminary observations conducted by the author at the boarding gate of Abdul Rachman Saleh Airport Malang from February 4 to March 31, 2025, it was found that passengers using self-check-in services often failed to report their belongings to check-in counter staff and were reluctant to have their baggage swept when its volume or size did not comply with regulations, triggering disputes between staff and passengers and slowing down the boarding process. This condition was compounded by limited boarding time, an insufficient number of staff, and a lack of supporting equipment in the field. Therefore, this study aims to determine the baggage sweeping procedure applied by Batik Air, identify the constraints faced by staff, and formulate solutions to improve the effectiveness and efficiency of baggage sweeping implementation at the airport's boarding gate, so that the results of this study are expected to make a real contribution to improving national air transportation service procedures.

Research Method

This study employs a descriptive qualitative approach to describe and understand in depth the implementation of baggage sweeping at the boarding gate of Batik Air based on the direct experience of staff in the field, with the researcher serving as the main instrument [14]. The research was conducted at the boarding gate of Abdul Rachman Saleh Airport Malang, the actual location where baggage sweeping is carried out, over the period of February to March 2025.

The data used consist of primary data, namely the results of direct observation and in-depth interviews with three informants experienced in handling baggage sweeping as well as secondary data in the form of Standard Operating Procedures (SOPs), airline baggage policies, and relevant prior research. Data collection techniques were carried out in three ways: direct observation of the interaction between staff and passengers during the sweeping process, structured interviews with one supervisor and two passenger-service (pasasi) staff, and documentation in the form of photographs of activities and baggage tags used in the field.

The collected data were analyzed using a qualitative analysis model consisting of three stages: data reduction, to summarize and focus on significant aspects; data display, to organize information so that conclusions can be drawn; and conclusion drawing, based on evidence obtained during the data collection stage [15]. Data validity was tested through two types of triangulation: source triangulation, by comparing interview results between the supervisor and passenger service staff, and technique

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triangulation, by checking the consistency of observation data against interview results. The overall research flow, from problem formulation to solution formulation, is illustrated in the conceptual framework shown in Figure 1.

Informants were selected purposively, that is, by choosing individuals directly involved in and experienced with baggage sweeping at the boarding gate, so that the information obtained genuinely reflected field conditions. The three informants consisted of one supervisor with the authority to make decisions in unforeseen situations and two passenger service staff who interact directly with passengers on a daily basis. Interviews were conducted face to face using a previously prepared structured interview guide, while observations were conducted through passive participant observation, in which the researcher observed sweeping activities without directly participating in the staff's duties, in order to maintain the objectivity of the data obtained.

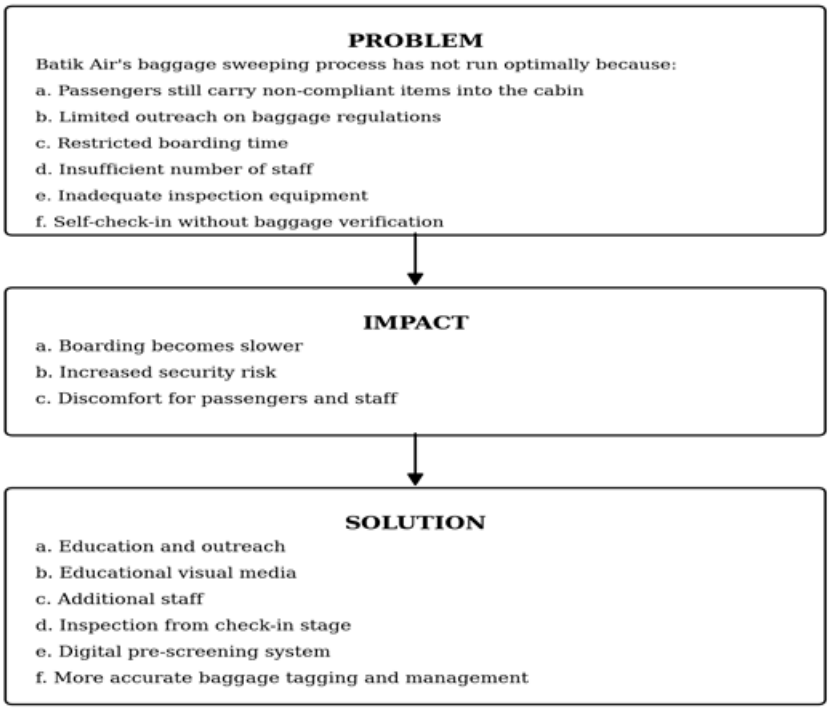

Figure 1. Conceptual Framework of the Research

Results and Discussion

Research data were obtained through observation and interviews with three informants at the passenger-service (boarding gate) unit of Abdul Rachman Saleh Airport Malang, which operates under the management of PT Avia Citra Dirgantara. Observations were conducted throughout the baggage sweeping process, while interviews were conducted with the informants described in Table 1.

Table 1. Description of Informants

No	Informant Code	Position
1	Informant 1 (H)	Supervisor
2	Informant 2 (L)	Passenger Service Staff
3	Informant 2 (A)	Passenger Service Staff

Field observations revealed four main findings. First, conflicts between passengers and staff frequently occurred during sweeping, particularly when passengers carried boxes of souvenirs that had to be transferred to checked baggage. Second, staff continued to sweep items exceeding the cabin

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size limit, using either a Baggage Test Unit (BTU) or manual measurement, before directing such items to be placed in checked baggage. Third, items resulting from the sweeping process were given a limited release tag to indicate that the item was not permitted into the cabin. Fourth, no additional staff were assigned when passenger volume increased, so that on-site personnel capacity was not proportional to the number of passengers requiring handling, potentially reducing service efficiency.

Characteristics of the Airport and Batik Air's Operations

The boarding gate is a strategic area at the airport that functions as both a waiting area and the final filter before passengers board the aircraft [16]. Before entering this area, passengers are required to go through the check-in process and obtain a boarding pass containing the passenger's name, flight route, departure date, boarding time, gate number, and seat number as valid proof that the passenger is registered on the flight [17]. As the primary subject of air transportation, passengers are entitled to services grounded in the principles of efficiency, respect for human rights, and non-discrimination [18].

In the context of air travel, baggage is categorized into checked baggage, stored in the aircraft's cargo hold; cabin baggage, carried directly by passengers into the cabin with a weight limit 7 kilograms; and unchecked baggage, personal items carried for use during the flight [19]. Batik Air, as a full-service airline operating a modern fleet including the Airbus A320 and Boeing 737-800/900ER, enforces strict cabin baggage policies, including a prohibition on storing power banks in the overhead cabin compartment (hat rack), as part of its commitment to global safety standards audited through the IATA Operational Safety Audit [5].

Baggage Sweeping Procedure

Observation and interview results indicate that Batik Air's baggage sweeping procedure at the boarding gate of Abdul Rachman Saleh Airport Malang begins with baggage profiling, that is, identifying the characteristics and ownership of each passenger's baggage, followed by confirmation of the passenger's final destination, and the attachment of a tag to the baggage containing route and seat number information. Batik Air's regulations limit cabin baggage to a maximum weight of 7 kilograms and dimensions not exceeding 40 x 30 x 20 centimeters. Items that do not meet these requirements are re-examined either manually or using a Baggage Test Unit (BTU), and are then given a special tag: a limited release tag for baggage redirected to checked baggage, a fragile tag for fragile items, and a transit tag for baggage belonging to passengers with connecting flights.

The use of these tags is part of a baggage management system that functions as terminal operational security, aimed at preventing violations of size, weight, and prohibited item limits, such as excess liquids, sharp objects, and high-capacity electronic devices [20]. As stated by the informants, all boarding gate staff are involved in the sweeping process, including staff who also serve as announcers, and when baggage belonging to a passenger with a connecting flight on a different airline is found, the baggage is tagged according to the first destination of the flight sequence. Staff also coordinate directly with passengers to explain baggage regulations and assist the sweeping process so that it runs smoothly and in accordance with the Standard Operating Procedure (SOP) established by both the airline and the ground handling provider.

Constraints Faced by Staff in Baggage Sweeping

As part of the airport security system aimed at preventing dangerous items from entering the aircraft cabin [21], the implementation of baggage sweeping at the boarding gate of Abdul Rachman Saleh Airport Malang is not free from a number of technical and social constraints. The first constraint is limited time, given that the boarding process lasts a maximum of 20 minutes, while the inspection of each passenger requires 1 to 3 minutes, requiring staff to work quickly without disrupting the departure schedule. The second constraint is the insufficient number of staff at the boarding gate,

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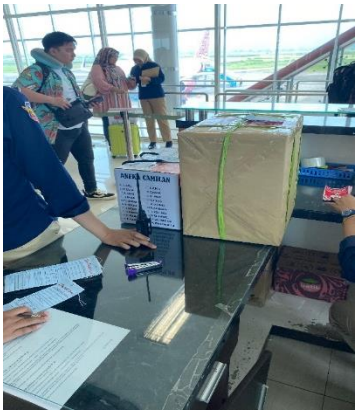
which does not increase even when passenger volume rises during peak hours, so that personnel capacity is not proportional to the number of passengers requiring handling. Third, limited supporting equipment such as the Baggage Test Unit further hampers the objective measurement of baggage dimensions, compounded by a boarding gate layout that is not spacious enough to accommodate inspection activities.



Figures 2 and 3. Baggage Sweeping Results

Other constraints stems from passenger-related factors, namely a lack of understanding regarding cabin baggage regulations, diverse passenger requests, and the reluctance of some passengers to undergo baggage inspections particularly those carrying boxes of Malang specialties or plants without the appropriate documentation, as shown in Figures 2 and 3. Complexity has increased further along with plans to upgrade the status of Abdul Rachman Saleh Airport to an international airport, including runway extension and the strengthening of security services [1], [4]. Internal airline systems are also a constraint, as sweeping baggage for passengers with connecting flights on different airlines requires additional approval from the airline concerned. In addition, self-check-in services cause passengers' belongings to go unverified from the outset of departure, meaning that sweeping can only be carried out in the final minutes before boarding, risking delays and conflicts between staff and passengers. When suspicious items are found, staff detain the item, report it to the supervisor or Aviation Security (Avsec), and conduct re-screening if necessary.

To further clarify the variation in constraints faced in the field, Table 3 summarizes the main constraints and proposed improvements conveyed by each informant based on the interview results.

Table 2. Summary of Constraints and Proposed Improvements by Informant

Informant Code	Main Constraint Reported	Proposed Improvement
Informant 1 (H)	A boarding gate layout that is not spacious enough, and passengers who persistently refuse to have their baggage swept using various arguments.	Additional personnel and automated measuring tools (BTU); improved coordination between the ground handling provider and the airline.
Informant 2 (L)	Baggage belonging to passengers with connecting flights on different airlines requires additional approval; passengers lack understanding of baggage regulations.	Early education through the airline's application; additional scanning equipment; increased staff numbers during peak hours.
Informant 2 (A)	Insufficient number of staff at the boarding gate; souvenir boxes typical of Malang are often refused for sweeping.	Improved staff work scheduling; stricter inspection and security questioning starting from the check-in process.

Source: Primary data from interviews

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The Role of Aviation Security and Daily Operational Oversight

Identification of suspicious items during the sweeping process is carried out through physical inspection of the item, direct confirmation with the passenger, and coordination with Aviation Security (Avsec) and the Security Check Point (SCP), which have already inspected passengers' belongings at the security screening area. Boarding gate staff apply security questioning in accordance with the SOP as an additional step to ensure that no prohibited items pass through into the cabin, in line with the threat-prevention principles mandated by ICAO Annex 17 [22]. Beyond baggage inspection, daily operational oversight at the boarding gate also includes a morning briefing for all staff to align on task division, as well as identity (ID card) checks for passengers prior to boarding as part of the identification and security procedure before departure. Consistency in carrying out these stages is an important factor supporting the effectiveness of baggage sweeping in the field, alongside the improvements to human resources and equipment discussed previously.

Solutions to Improve the Effectiveness and Efficiency of Baggage Sweeping

The application of strict cabin baggage policies together with effective sweeping implementation contributes to increased customer satisfaction, which, according to service quality management theory, directly affects the airline's image and the passenger's travel experience [22]. In line with this, paid baggage policies and checked baggage restrictions need to be communicated clearly to passengers to avoid misunderstandings during the sweeping process [23]. Based on the findings of this study, several strategic solutions can be proposed: (1) increasing passenger education and outreach regarding cabin baggage regulations, particularly for self-check-in users, through ticket confirmation emails, educational videos in the waiting area, and direct announcements during check-in; (2) increasing the number of staff at the boarding gate to speed up inspection and reduce queues, accompanied by improved work scheduling during peak hours; (3) tightening baggage inspection from the check-in counter area so that non-compliant items can be redirected to checked baggage earlier; and (4) developing a digital pre-screening system capable of automatically detecting baggage non-compliance and notifying both passengers and staff, so that boarding time can be used more optimally.

Comparison with Previous Studies

To further clarify the position of this study's findings relative to similar previous research, Table 2 presents a comparison of the focus and main findings between this study and nine prior studies on cabin baggage sweeping across various airlines and airports in Indonesia.

Table 3. Comparison with Previous Studies

No	Researcher (Year)	Location / Airline	Focus and Main Findings
1	Saputri dan Ariebowo (2023)	Yogyakarta International Airport / Citilink Indonesia	Baggage sweeping affected passenger satisfaction by up to 56.1%, with a satisfaction index of 46.7%.
2	Andre dan Rahimudin (2024)	Juanda Airport, Surabaya / Pelita Air	Sweeping procedures complied with the SOP; the main constraint was passengers' objections regarding the security of their belongings.
3	Saputra dan Masyi'ah (2024	Rahadi Oesman Airport, Ketapang / Wings Air	Passengers' lack of discipline in carrying belongings was the main cause of delays.
4	Nurice (2019)	Kualanamu Airport, Medan / Citilink Indonesia	Baggage sweeping is essential for maintaining security, comfort, and flight safety.

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5	Maisarah (2019)	Adisutjipto Airport, Yogyakarta / Garuda Indonesia	Sweeping service significantly affected passenger satisfaction by 58%.
6	Purba (2020)	Adisutjipto Airport, Yogyakarta / Citilink Indonesia	Technical and social constraints: lack of understanding and passenger objections.
7	Mardliyyah (2021)	I Gusti Ngurah Rai Airport, Bali / Garuda Indonesia	Passengers' refusal to transfer items to checked baggage was the main obstacle.
8	Disastra (2022)	Juanda Airport, Surabaya / Citilink Indonesia	SOP-compliant sweeping is important for safety despite added cost to passengers.
9	This study (2025)	Abdul Rachman Saleh Airport, Malang / Batik Air	Reveals specific constraints related to the airline's internal system (connecting flights) and self-check-in services that have not been widely addressed in previous research.

As shown in Table 3, the findings of this study reinforce previous research indicating that the effectiveness of baggage sweeping is strongly influenced by the level of passenger understanding and staff resource readiness [9], [10]. However, unlike previous studies that focused more on quantitative passenger satisfaction perceptions [6], [10] or general technical and social constraints [11], [12], [13], this study found that internal airline system factors related to connecting flights and self-check-in services constitute a specific constraint that has not been widely revealed in prior studies conducted in different airline and location contexts. Differences in operational context, such as passengers' habit of carrying region-specific souvenir boxes, also represent a distinctive characteristic of the Abdul Rachman Saleh Airport Malang case that is not commonly found in previous studies.

Theoretical and Practical Implications

Theoretically, the findings of this study enrich the study of ground handling management, particularly regarding cabin baggage handling, by showing that the effectiveness of baggage sweeping is determined not only by compliance with the SOP but also by the interaction between human factors, internal airline systems, and the operational characteristics of the local airport. This broadens the understanding of service quality management theory [23], which emphasizes that customer satisfaction in the aviation service industry is also influenced by the consistent application of security procedures at critical points such as the boarding gate.

Practically, the results of this study can serve as a consideration for Batik Air and the management of Abdul Rachman Saleh Airport Malang in designing cabin baggage handling policies that are more adaptive to local passenger characteristics, such as the habit of carrying souvenirs in large boxes. Implementation of the proposed solutions, such as early passenger education and the development of a digital pre-screening system, has the potential to reduce sweeping duration per passenger, lower the risk of flight delays, and decrease the potential for conflict between staff and passengers in the field, thereby supporting the airport's plan to upgrade to international status.

Conclusion

Baggage sweeping is an essential part of efforts to maintain the safety, security, and comfort of passengers during flights. Batik Air's baggage sweeping procedure at the boarding gate of Abdul Rachman Saleh Airport Malang includes baggage profiling, tagging using limited release tags, fragile tags, and transit tags, as well as re-examination using a Baggage Test Unit or manual methods. Its

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implementation still faces constraints, including limited boarding time, an insufficient number of staff, limited inspection equipment, passengers' lack of understanding of cabin baggage regulations, the habit of carrying souvenir boxes, internal airline systems related to connecting flights, and self-check-in services that leave passengers' belongings unverified from the outset of departure.

Based on these findings, several recommendations are proposed. First, for Batik Air, it is recommended to conduct routine evaluations of the baggage sweeping procedure, increase the number of staff and inspection aids such as the Baggage Test Unit, and implement a digital pre-screening system to accelerate the early identification of violations. Second, for boarding gate staff, regular training is recommended in technical inspection aspects, communication skills, and conflict management, given that direct interaction with passengers has the potential to affect the airline's service image. Third, for passengers, it is recommended to be more proactive in understanding and complying with cabin baggage regulations, particularly for self-check-in users, so that the baggage verification process can proceed in accordance with the applicable procedure. Further research is recommended to quantitatively examine the effectiveness of implementing such a digital detection system, in order to provide stronger empirical evidence for airlines and airport management in designing more optimal cabin baggage handling policies.

This study has limitations that should be considered when interpreting its results. The limited number of informants, three in total, and the two-month observation period mean that the findings of this study cannot yet be fully generalized across the entire operational period or to other airlines operating at Abdul Rachman Saleh Airport Malang. In addition, the descriptive qualitative approach used emphasizes an in-depth understanding of the phenomenon at a single location, so further research using broader data coverage and a quantitative approach is needed to test the generalizability of these findings in different airport and airline contexts.

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