

ANALYSIS OF OUTGOING GENERAL CARGO HANDLING AT PT ANGKASA PURA LOGISTIK SEMARANG

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Abstract

The global growth of e-commerce has accelerated demand for fast and efficient air freight services, positioning general cargo as a critical component of modern logistics systems. However, the increasing volume of shipments frequently generates operational challenges, most notably shipment delays, which ultimately undermine service quality and distribution efficiency. This study was conducted to analyse the general cargo outgoing handling process at PT Angkasa Pura Logistik, Semarang Branch, and to identify the key inhibiting factors encountered in its execution. A descriptive qualitative methodology was employed, with data gathered through direct observation, semi-structured interviews, and documentation review. Findings reveal that the primary constraints comprise workforce shortages, documentary discrepancies in shipping documents, and a structural imbalance between cargo volume and handling capacity. On the basis of these findings, an integrated action plan was developed, clearly delineating responsibility for addressing each root cause. The implementation of this action plan is expected to enhance operational efficiency, reduce service turnaround time, and strengthen inter-unit coordination. These findings are of significant strategic value as a reference for the continuous improvement of air cargo service quality.

Keywords

General cargo, Cargo outgoing, Offload cargo, Cargo delay

INTRODUCTION

Technological advancement and globalisation have driven significant growth in the logistics sector across numerous countries, including Indonesia. Within this context, air transport has emerged as one of the principal modes capable of supporting high-speed and high-precision goods distribution. According to Malagas *et al.* (2024), approximately 35% of the total value of global trade is transported by air, despite representing only 1% of total freight volume. This figure underscores the exceptional strategic value of air logistics. In Indonesia, the rapid expansion of e-commerce has further intensified demand for fast and efficient air cargo services.

PT Angkasa Pura Logistik, Semarang Branch, plays a key role in cargo operations at Jenderal Ahmad Yani Airport, encompassing two primary processes, outgoing shipments and incoming goods. The outgoing process spanning pre-acceptance through aircraft loading — demands a high level of precision and strict adherence to internationally established procedures set by the International Air Transport Association (IATA, 2024).

Despite this, operational disruptions continue to occur, most visibly in the form of shipment delays. On average, 70 to 100 cargo units are delayed every week, reflecting suboptimal coordination of human resources, inconsistent SOP implementation, and deficiencies in document completeness. These delays may affect aircraft loading schedules, increase cargo accumulation in the warehouse, reduce service reliability, and potentially lower customer satisfaction with air cargo handling services. These impediments directly impact operational efficiency and customer satisfaction.

Anriyani (2021) identified documentary discrepancies and insufficient shipper awareness as primary drivers of operational disruption. Anggraeni and Rachmawati (2022) further argued that strengthening internal coordination and providing systematic customer education can substantially mitigate operational risk. Drljaca *et al.* (2020) emphasised the necessity of maintaining rigorous cargo handling standards, while Adawiyah (2022) recommended a risk-based mitigation approach specifically for outgoing cargo processes.

This study aims to analyse the inhibiting factors in the general cargo outgoing handling process at PT Angkasa Pura Logistik, Semarang Branch, and to formulate strategies for improving operational efficiency and effectiveness.

LITERATURE REVIEW

Operations management constitutes a critical foundation for the efficient and effective conduct of organisational activities. As defined by Saragih, operations management encompasses the systematic management of resources to produce products or services of value to customers [1]. This view is consistent with Heizer *et al.*, who argue that operations management involves designing, running, and improving systems for the production and delivery of goods and services [2]. In the logistics context, operational efficiency is fundamentally dependent on an organisation's ability to respond to demand fluctuations and the complexity of cargo flows in a timely and accurate manner.

Within the air logistics system, *general cargo* refers to standard commercial goods that do not require specialised handling, yet must nonetheless be managed with meticulous attention to procedure. The handling of air cargo — particularly general cargo — encompasses reception, temporary storage, documentation verification, and delivery to the airline. Any failure at a single stage can result in shipment delays, adversely affecting both operational performance and customer satisfaction.

Standard Operating Procedures (SOPs) serve as the principal framework for ensuring that all processes follow a defined workflow with clearly delineated responsibilities. Rahmawati and Suryana assert that effective SOP implementation can enhance efficiency and service consistency while minimising human error in operational activities [3]. In the context of outgoing cargo handling, SOPs are particularly critical for maintaining documentary discipline.

Cargo classification also plays a significant role in determining appropriate handling methods. General cargo handling differs fundamentally from special cargo, which requires specific treatment. Rizaldy and Rifni highlight that a thorough understanding of cargo classification is essential for selecting the correct handling method, auxiliary equipment, and storage arrangements [4].

This study further references the outgoing general cargo handling workflow, which encompasses pre-acceptance, acceptance, storage, and delivery to the ramp area. Each stage must conform to prevailing standards and regulations to ensure shipment safety and timeliness.

From a regulatory perspective, the Indonesian Government has issued Ministerial Regulation No. PM 53 of 2017, governing the security of cargo, mail, and the supply chain. This regulation affirms the importance of security, speed, and accuracy throughout all stages of air cargo handling [5].

International guidelines also serve as an important reference for air cargo operations. The *Airport Handling Manual (AHM)*, published by IATA, provides a globally recognised standard for the technical and administrative handling of cargo at airports [6]. The integration of national regulation and international guidelines is essential to ensure that cargo handling practices meet global standards and support the long-term reliability of air logistics services.

METHODS

This study employs a descriptive qualitative approach, aimed at providing an in-depth understanding of the outgoing general cargo handling process at PT Angkasa Pura Logistik, Semarang Branch. This methodological choice was made because it allows for a contextual and nuanced account of field conditions, particularly in relation to operational constraints such as shipment delays, which are intimately connected to procedural dynamics and inter-divisional coordination. The study was conducted at Jenderal Ahmad Yani Airport, Semarang — a major air distribution hub in Central Java characterised by high general cargo volumes and operationally complex characteristics.

Data were collected through three principal techniques: direct observation of operational sites, semi-structured interviews with personnel directly involved in cargo handling — including the SBU Supervisor, acceptance officers, and EMPU operational staff — and documentation review of archival records and cargo delay reports for the period January to March 2024. Observation was used to identify operational workflows and real-world constraints, while interviews served to capture perceptions, experiences, and applied cargo handling practices within the company. Documentation was employed as corroborating evidence to verify the alignment between written procedures and actual implementation.

Data analysis was conducted using the interactive analysis model of Miles and Huberman, comprising three principal stages: data reduction, data presentation, and conclusion drawing. Data reduction involved selecting relevant information from interview transcripts and observational records; the data were then presented in narrative and diagrammatic form to facilitate interpretation. Preliminary conclusions were subsequently drawn regarding recurring problem patterns and potential solutions. Throughout this process, source triangulation was applied to strengthen analytical validity by cross-checking data from interviews, observations, and internal company documents (Miles & Huberman, 1994).

As part of the problem-solving process, the study also produced an action plan as an implementable set of recommendations grounded in the primary field findings. This action plan was systematically structured to designate responsible parties, propose solutions, and estimate implementation timelines for each identified root cause. The action plan represents the principal deliverable of this research and is intended to serve as a practical operational improvement guide for company management.

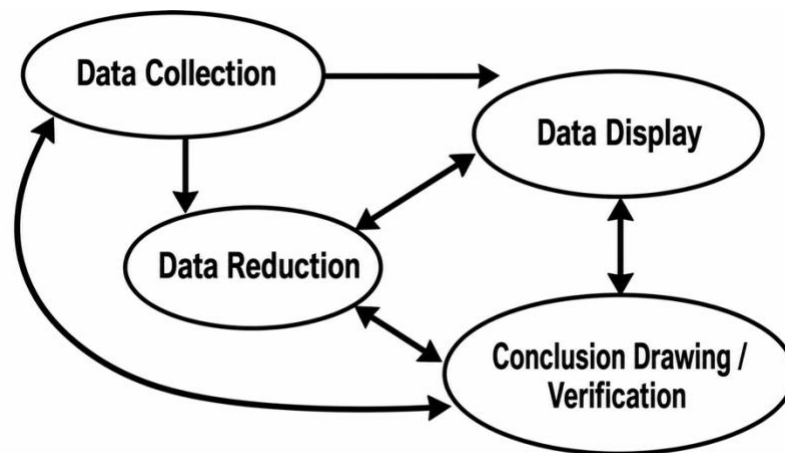


Figure 1. Data Analysis Technique

RESULT AND DISCUSSION

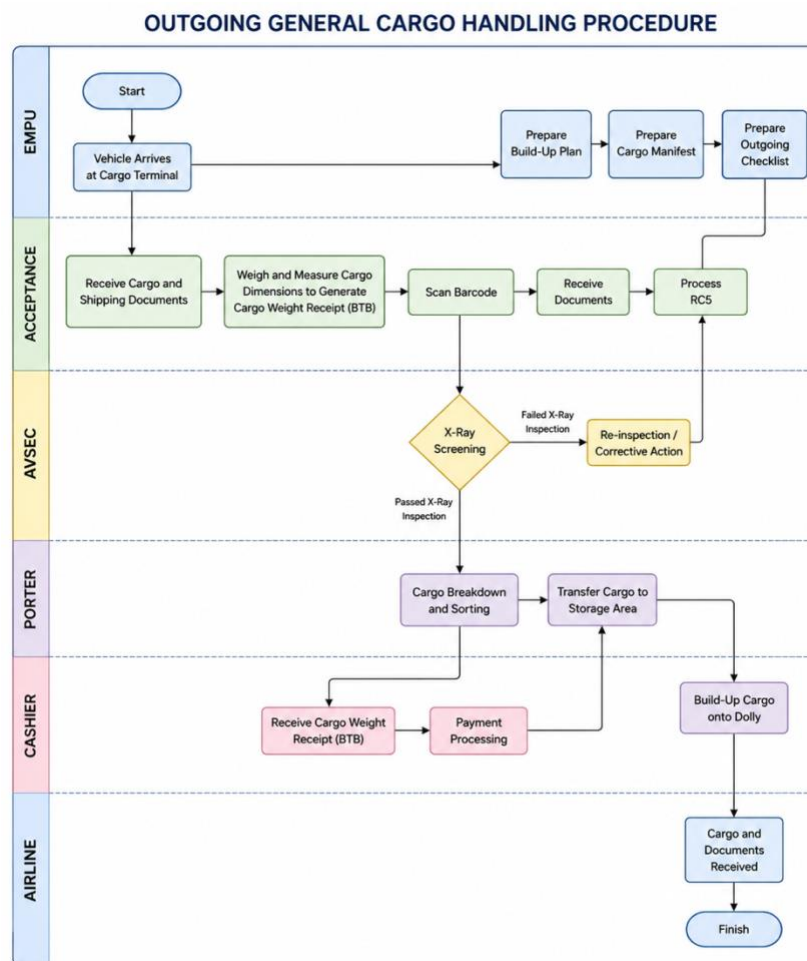
The outgoing general cargo handling process constitutes a systematic sequence of operations commencing with the receipt of goods from freight forwarders and concluding with

the loading of cargo onto the aircraft. These factors are interrelated because limited personnel slow down document verification and cargo movement, while documentary discrepancies and limited X-ray capacity create additional queues that ultimately delay manifest preparation and aircraft loading. This procedure reflects cross-unit integration involving EMPU staff, acceptance officers, AVSEC personnel, porters, cashiers, and airline representatives. Each stage performs a critical function in ensuring the smooth operation, safety, and punctuality of cargo deliveries.

Operationally, this workflow adheres to the standard procedures established by PT Angkasa Pura Logistik and incorporates international guidelines from the International Air Transport Association (IATA), particularly with respect to security protocols and documentary compliance. A thorough understanding of the sequential stages is essential for identifying critical control points that may introduce constraints, such as shipment delays.

The flowchart below provides a detailed illustration of each stage in the outgoing general cargo handling procedure at PT Angkasa Pura Logistik, Semarang Branch.

Figure 2. Outgoing General Cargo Handling Procedure Flowchart



Source: Researcher's Data Processing, 2025

The outgoing general cargo handling procedure is designed to ensure the uninterrupted flow of goods to the aircraft while simultaneously guaranteeing the security and completeness of the accompanying documentation. However, the procedural complexity inherent in engaging multiple operational units creates a significant risk of delay if any stage is not managed optimally.

The process begins with the arrival of freight forwarder vehicles at the cargo terminal, followed by the handover of documents and goods to the acceptance officer for inspection, weighing, and the generation of the Cargo Weight Receipt (Bukti Timbang Barang/BTB). Documents are then forwarded to the cashier for administrative settlement. A discrepancy between documentation and the physical cargo constitutes a common obstacle at this stage.

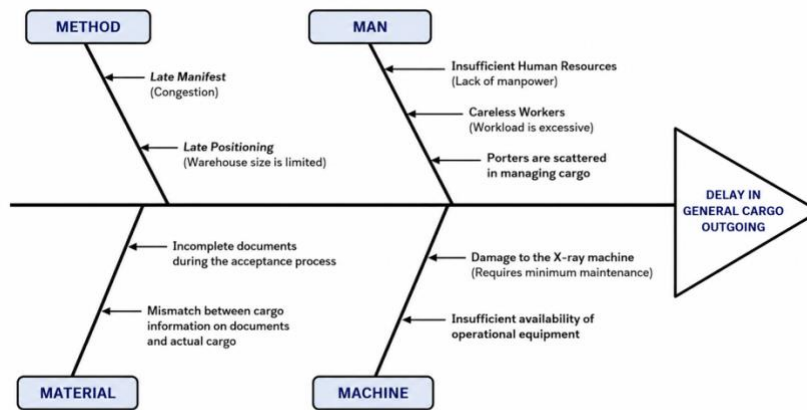
Subsequently, the goods undergo AVSEC inspection via X-ray scanner. Items that pass security screening are transferred to the storage area; those that fail are subject to re-examination. Constraints such as an insufficient number of X-ray machines frequently cause queuing and consequent delays. In the following stage, porters relocate the goods into build-up trolleys for transfer to the ramp. Disorganised cargo placement and the limited dimensions of the warehouse further impede the workflow. Meanwhile, operational staff prepare flight documentation including the manifest, build-up plan, and outgoing checklist. One of the most operationally significant constraints at this phase is the late issuance of the manifest (*late manifest*), which has a direct and immediate impact on aircraft loading schedules.

Finally, upon transfer of documents to the airline representative, goods are loaded and the shipment process is deemed complete. Each of the stages described above, when not adequately supported by inter-unit coordination, adequate facilities, and procedural discipline, constitutes a potential critical failure point leading to delay. Accordingly, a thorough understanding of this process flow is indispensable as the foundation for the formulation of sustainable improvement strategies in air cargo management.

Notwithstanding the systematic design of the handling procedure, a range of constraints continues to cause shipment delays in practice. These problems materialise at virtually every stage, from initial acceptance through to final loading. Based on field observations and interviews, delays in outgoing general cargo shipments are primarily attributable to documentary discrepancies, insufficient numbers of operational personnel, limited inspection equipment (particularly X-ray machines), and technical difficulties in the preparation of flight documents such as the *late manifest*. Additionally, suboptimal warehouse organisation and insufficient supervisory presence further exacerbate operational bottlenecks during peak shipment periods. These conditions do not merely disrupt the effectiveness of the distribution workflow; they also carry direct implications for customer satisfaction and the overall reputation of cargo services. It is therefore imperative that the root causes be systematically analysed and that targeted improvement strategies be developed to enhance the efficiency and punctuality of outgoing general cargo shipments at PT Angkasa Pura Logistik, Semarang Branch.

To provide a more structured identification of the causal factors underlying shipment delays, a fishbone (Ishikawa) diagram analysis was conducted. This tool visualises the root causes of the problem according to key operational categories, thereby serving as the analytical basis for formulating precise and targeted improvement strategies. The fishbone diagram pertaining to the analysis of cargo delay causes is presented below.

Figure 3. Fishbone Diagram Causes of Outgoing General Cargo Delay



Source: Researcher's Data Processing, 2025

The fishbone analysis reveals that delays in outgoing general cargo shipments are not attributable to a single isolated factor, but rather represent the cumulative effect of multiple interconnected systemic weaknesses: procedural inefficiencies, a shortage of adequately trained personnel, limited supporting facilities, and deficient inter-unit coordination. This finding indicates that the problem is structural in nature and demands an improvement approach that is not merely technical, but also managerial in scope.

Consequently, the development of a comprehensive action plan constitutes an indispensable strategic step. The action plan is not merely intended to provide targeted solutions for individual root causes; it also serves as an evaluative instrument that guides the improvement process in a gradual and sustainable manner. By clearly designating responsible parties, setting implementation deadlines, and establishing measurable success indicators, the action plan is expected to substantially reduce the incidence of delays. Beyond this, the successful execution of the action plan will serve as a gauge of the organisation's adaptive capacity in responding to operational dynamics and the increasingly complex demands of modern logistics services.

Table 1. Action Plan: Outgoing General Cargo Handling

No	Root Cause	Proposed Solution	Action Plan		
			SBU Supervisor	Acceptance Office	EMPU Operational Staff
1	Insufficient workforce	Increase staffing numbers, particularly during peak periods such as holiday seasons and e-commerce promotional events	P	S	P
2	Disorganised cargo placement by porters	Implement strict supervisory oversight during operational hours	P	S	S
3	Low staff diligence and attention to detail	Strengthen a culture of professional discipline to raise workplace standards	P	S	K
4	Inadequate preventive maintenance of X-ray machines	Establish a preventive maintenance schedule and deploy a dedicated stand-by technician in the operational area	S	S	P
5	Insufficient availability of operational equipment (e.g. pallets, hand pallet jacks)	Procure additional operational equipment and implement equitable distribution across all departmental units	P	S	P
6	Late positioning due to constrained warehouse dimensions	Redesign the warehouse layout to optimise space utilisation	P	S	P
7	<i>Late manifest caused by X-ray rejection and cargo breakdown</i>	Strengthen coordination, particularly with freight forwarder customers as the first point of contact	K	P	S
8	Incomplete documentation during the acceptance process	Implement pre-entry document verification before cargo enters the terminal, and designate a dedicated document verification officer	S	P	S
9	Discrepancy between declared cargo	Establish a Regulated Agent (RA) function responsible	K	K	P

	description actual cargo	and	for conducting pre-shipment security inspections prior to air transportation			
KET : P (<i>Primary Responsibility</i>) , S (<i>Secondary Responsibility</i>), K (<i>Communication</i>)						

Among the proposed actions, pre-entry document verification, additional workforce during peak periods, and preventive maintenance of X-ray machines should be prioritized because these issues directly affect the speed of cargo acceptance, security screening, and manifest preparation.

In order to enhance the effectiveness and efficiency of outgoing general cargo handling, a comprehensive action plan has been developed that engages three key roles, which structurally and functionally represent all relevant operational units: the *Strategic Business Unit (SBU) Supervisor*, the *Acceptance Officer* at the Cargo Terminal, and the *EMPU (Ekspedisi Muatan Pesawat Udara) Operational Staff*.

First, the SBU Supervisor functions as the principal authority in strategic decision-making and cross-unit coordination. Key responsibilities include monitoring overall operational workflow, evaluating service performance, and overseeing the follow-up of operational constraints. In the action plan, the SBU Supervisor serves as the primary liaison between managerial policy and field-level implementation, ensuring that procedures conform to established standards and corporate performance targets.

Second, the Acceptance Officer holds direct responsibility for the second stage of the shipment process within the cargo terminal, namely document verification, physical inspection of goods, and validation of shipping requirements. In the context of the action plan, the acceptance officer serves as the primary control point for preventing data errors, documentary discrepancies, and system input delays. By reinforcing the acceptance function as a filter before goods are moved to the storage area, the potential for bottlenecks at subsequent stages can be substantially reduced.

Third, the EMPU Operational Staff bear responsibility for the initial operational stage, as they interact directly with customers and are responsible for preparing all documents required for cargo processing. In the action plan, EMPU staff are tasked with optimising loading turnaround times, monitoring flight schedules, and adjusting cargo assignments to available capacity. Preventive action against potential delays constitutes their primary focus, including strengthening coordination with airlines and managing cargo prioritisation.

By engaging all three roles, the entire process chain — from planning and initial inspection through to aircraft loading — is comprehensively and continuously represented. Each unit possesses an interconnected locus of responsibility, forming a unified operational system capable of responding rapidly and effectively to operational constraints. The three-tiered accountability

structure of SBU Supervisor, Acceptance Officer, and EMPU Operational Staff therefore constitutes a sufficient and strategically sound set of key elements for the optimal execution of the outgoing general cargo handling action plan.

CONCLUSION

This study concludes that the outgoing general cargo handling process at PT Angkasa Pura Logistik, Semarang Branch, has been implemented in a systematic and procedurally compliant manner; however, it continues to face a number of operational constraints that adversely affect process efficiency. The principal findings are as follows:

1. Outgoing general cargo handling is executed through a structured sequence of stages, commencing with goods reception at the EMPU, followed by packaging inspection, document preparation (PTI and SMU), distribution to the cargo terminal, X-ray security screening, and handover of goods to the airline. This entire sequence involves multiple internal stakeholders, including EMPU staff, acceptance officers, porters, AVSEC personnel, and airline representatives. Procedural compliance constitutes a critical element in ensuring shipment security and timeliness.
2. The primary impediment to the outgoing cargo handling process is shipment delay. Delays are principally caused by a shortage of operational personnel, insufficient staff diligence during handling, the late issuance of the flight manifest (*late manifest*), and limited supporting infrastructure notably the availability of only a single X-ray machine for security screening. Furthermore, restricted warehouse space, improper cargo placement by porters, and discrepancies between documentation and physical cargo collectively contribute to delays in the distribution process.
3. In response to these challenges, a range of solutions has been proposed. These include workforce augmentation, the establishment of a routine maintenance schedule for operational equipment, warehouse layout redesign, competency enhancement through regular training, and the implementation of pre-entry document verification.
4. The theoretical implications of these findings underscore the importance of applying logistics management principles grounded in efficiency, risk mitigation, and inter-unit synergy. A structured collaborative approach among cargo operators, airlines, and airport authorities constitutes the essential foundation for developing an adaptive logistics system capable of meeting the evolving demands of operational environment.

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