



Regular Research Article

Analysis of Differences in Mooring Service Time between the Statement of Facts and Pranota: A Case Study of ITL Shipping Agency Balikpapan Branch and PT. Pelindo Balikpapan Branch

Elfira Wirza*, Cristian Jeferson Siringoringo, Riki Wanda Putra

Sea Transportation Study Program, Politeknik Pelayaran Sumatera Barat, Indonesia

*elphyra@gmail.com

Abstract: This study aims to analyze the factors that cause the difference in mooring service time between the Statement of Fact (SoF) issued by ITL Shipping Agency and the Pranota issued by PT Pelindo Balikpapan Branch. The research method employed was a qualitative method with a case study approach, with analysis conducted using fishbone diagrams to identify the gaps that emerged. The results of the study show that the main causes of time differences are seen from six aspects: *Man, Machine, Method, Measurement, Material, and Mother Nature*. This condition results in differences in the recording of mooring times, which have a direct effect on the calculation of mooring service costs and differences in bill values. This study emphasizes that improvement efforts need to be focused on improving the competence of Human Resources (HR), synchronizing the time recording system, strengthening the socialization of SOPs, optimizing document verification, and standardizing the time reference using UTC+08:00. These strategic steps are considered important to minimize time mismatches in the future and ensure the smooth and accurate process of mooring services at the Port of Balikpapan.

Keywords: *Statement of Fact (SOF), Pranota, Mooring Services*

1. Introduction

Ports are important nodes in the sea transportation system that function as a place for ships to dock, loading and unloading activities, and logistics transfer points between regions. The port became the center of the distribution of goods, cargo from the sea was unloaded and distributed to the mainland and vice versa [1]. This makes the port an important part of the logistics supply chain to ensure the smooth running of the port, every ship that docks is required to use various port services which provided by port operators while in a port to service users while in a port [2], in the port service of a port business entity [3] which is a port management operator agency provides

several services to service users, including mooring services which are services provided by port operators in the use of piers [4], Scout Services is a ship guidance service provided by Scouts to guide skippers in maneuvering ships when entering, exiting, or moving in port waters [5] and towing services be services provided by tugboat to assist vessels in maneuvering in port waters [6]. This study, it focuses more on mooring services, which are services for the use of dock facilities by ships while in port. The mooring service itself is an activity of tying the ship to the dock using a mooring rope so that the ship is in a safe position while in the port [7].

Based on the Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 72 of 2017 concerning the type,

structure, group, and mechanism for determining port service rates, mooring services are services provided to ships to use the pier so that they can stay during activities at the port. This service is charged according to the size of the ship, the type of ship, the duration of mooring, and the tariff provisions set by PT Pelabuhan Indonesia (Pelindo) as the Port Business Entity (BUP). In its implementation, the administrative process of determining mooring service tariffs is based on documents *Statement of Fact* (SoF) made by the ship agent and Pranota (bill memorandum) issued by Pelindo as the basis for official billing which is an initial document in the form of a fee notice (pre-invoice) issued by Pelindo or the port operator before becoming an official invoice and addressed to service users [8]. SOF is a document that contains records of ship activities while in port, from arrival to departure, issued by the ship agent as the basis for administration and billing of port services, signed by the agent and captain of the ship [9].

Ship mooring services constitute one of the core components of port operations, directly influencing operational efficiency and the service costs borne by port users. Accurate recording of mooring service time is therefore critical, as it serves as the primary basis for calculating port service charges reflected in billing documents. In practice, the recording of mooring time involves multiple stakeholders, including shipping agents and port authorities, which creates the potential for data discrepancies when not supported by integrated systems and standardized procedures.

This study is positioned as an evaluative case study examining the process of mooring service time recording at Balikpapan Port. The research focuses specifically on discrepancies between the Statement of Fact (SOF) prepared by the shipping agent and the Pranota document issued by PT Pelindo Balikpapan Branch. Such discrepancies not only generate administrative inconsistencies but also have direct financial implications, particularly in the calculation of mooring service charges and the potential emergence of billing disputes.

The two documents, namely *the Statement of Fact* (SoF) and the Pranota must have data

suitability, both in terms of the docking time, dock position, ship size (*Gross Tonnage*), type of ship, dollar price in accordance with the current exchange rate, and the duration of use of the mooring facility. However, in reality, in the field, there is often a difference in the mooring service time between the notes on the *agent's Statement of Fact* and the Pranota issued by Pelindo.

The case that occurred at the Balikpapan coal terminal pier owned by PT. Pelindo Balikpapan Branch, especially the ships that are agent by the ITL Shipping Agency agent, found a difference the time recording of mooring services which causes time differences and has an impact on costs where the difference lies between the documents prepared by the agent, namely SOF, and the official document of Pelindo, namely Pranota. The difference can have various impacts, such as differences in financial data, delays in the bill verification process, and potential misunderstandings between agents and ports in the settlement of payment administration [10]. This problem is important to study because it is directly related to financial administration, service efficiency, and transparency of the relationship between service users (ship agents) and service providers (Pelindo). This problem shows that there is a gap that needs to be researched, namely the implementation of time recording standards among the various parties involved.

Previous studies have addressed port service performance and vessel operational efficiency; however, research that specifically evaluates inconsistencies in mooring time recording across official operational documents remains limited. This gap highlights the need for a systematic assessment of the factors contributing to time-recording discrepancies under actual operational conditions. Accordingly, this study seeks to provide an in-depth evaluation of the root causes of these differences within the context of daily port operations.

An evaluative case study approach was employed by examining the time-recording process through field observations, semi-structured interviews, and document analysis. To systematically identify the sources of

discrepancies, the study applies a Fishbone diagram using the 6M framework (Man, Machine, Method, Measurement, Material, and Mother Nature). This framework enables the classification and assessment of causal factors based on their relative influence on time-recording variations.

Based on this background, the objectives of this study are threefold: (1) to identify the form and magnitude of mooring time discrepancies between the Statement of Fact and Pranota documents; (2) to analyze the causal factors of

these discrepancies using the 6M Fishbone approach; and (3) to evaluate the implementation of Standard Operating Procedures (SOPs) and the governance of mooring time-recording practices. The findings are expected to provide practical contributions toward improving the accuracy and reliability of mooring time documentation and to serve as a reference for stakeholders in enhancing port service management and operational accountability.

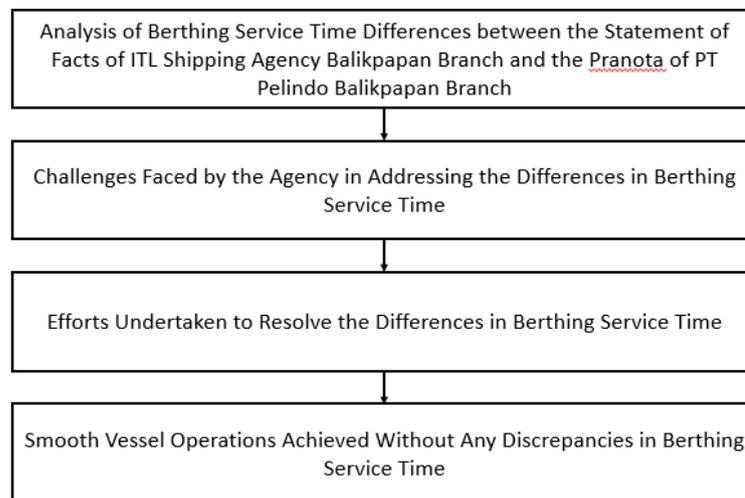


Figure 1. Conceptual Framework

This framework serves as a *research map* that explains how a phenomenon is understood, what factors affect it, and the direction of analysis that the researcher will carry out [11]. The conceptual framework presented shows that the difference in mooring service time between the *Statement of Fact* (SOF) prepared by ITL Shipping Agency Balikpapan Branch and Pranota issued by PT Pelindo Balikpapan Branch originated from various operational obstacles faced by agents in the time recording process. The role of the agent itself is to provide services to the agent ship and carry out all administrative and operational activities while the ship is in port [12]. The implementation of these measures allows the recording process to run more accurately, uniformly, and transparently. The alignment of time recording not only improves the efficiency of port services but also strengthens the credibility and accountability of the administrative process between shipping

agents and port managers [13].

2. Materials and Methods

2.1. Research Design and Approach

This study employed a qualitative research method using an evaluative case study approach. The primary objective was to examine and assess the mooring service time-recording process and to identify the underlying causes of discrepancies between the Statement of Facts (SOF) and Pranota documents. Rather than comparing numerical differences, the study aimed to understand the procedural, organizational, and operational factors contributing to inconsistencies in time documentation.

A case study design was selected because the investigation focused on a specific operational setting and institutional context, namely the interaction between the shipping

agency and port authority in Balikpapan. This design allows an in-depth exploration of real-world practices, administrative workflows, and decision-making processes that cannot be fully captured through quantitative measurement alone. By concentrating on a bounded system within an actual port environment, the research was able to analyze how formal procedures are implemented in practice and how deviations may occur during routine mooring operations.

The evaluative nature of the study emphasizes assessing the effectiveness and reliability of the existing recording system against operational realities. Through direct observation, interviews, and document analysis, the research sought to construct a detailed explanation of how discrepancies emerge, whether due to human factors, procedural gaps, communication delays, or measurement practices. This approach enabled a comprehensive understanding of the dynamics influencing time-recording accuracy within the daily operational framework of Balikpapan Port.

2.2. Study Site and Research Object

The study was conducted at Balikpapan Port, Indonesia, one of the major commercial ports in East Kalimantan that handles various types of vessel traffic, including general cargo, bulk carriers, and offshore-support vessels. As an active port with continuous mooring and unmooring operations, Balikpapan Port provides a dynamic operational environment in which administrative recording practices directly affect service billing, operational efficiency, and stakeholder coordination. This setting makes it a relevant and representative case for examining discrepancies in mooring service documentation.

The research objective focused specifically on the mooring service time-recording process as documented in two official records: (1) the Statement of Facts (SOF), prepared by the shipping agent as an operational report of vessel activities, and (2) the Pranota document issued by PT Pelindo Balikpapan Branch as the formal basis for service calculation and billing. These two documents record key operational timestamps, including the commencement and completion of mooring activities, which form

the basis for determining service duration and associated charges.

The analysis centered on identifying and evaluating discrepancies between the recorded times in these two documents. By examining how and when these records are generated, verified, and finalized, the study aimed to understand the procedural and operational dynamics influencing time accuracy. Thus, the SOF and Pranota documents functioned not merely as administrative records but as analytical instruments for assessing transparency, coordination, and reliability within the port's mooring service system.

2.3. Data Collection Techniques

Data was collected using multiple techniques to ensure comprehensive analysis and methodological triangulation. Non-participant direct observations were conducted during vessel mooring and unmooring operations, with particular attention given to recording the actual timestamps of key events such as "First Line" and "Casted Off." These observations aimed to capture real operational conditions and identify discrepancies between real-time activities and the times documented in official records.

In addition, semi-structured interviews were carried out with four key informants directly involved in the mooring service process, including operational staff of the shipping agency, administrative personnel, and relevant port officers. The interview protocol was developed based on the Fishbone 6M framework (Man, Machine, Method, Measurement, Material, and Mother Nature) to systematically explore potential factors contributing to time-recording discrepancies. Furthermore, documentary analysis was performed by reviewing relevant records such as Statements of Facts (SOF), Pranota mooring service documents, Standard Operating Procedures (SOPs), and related administrative reports. These documents were used to verify, compare, and substantiate findings obtained from observations and interviews, thereby strengthening the reliability of the study.

2.4. Data Analysis

Data were analyzed qualitatively through three stages: data reduction, data display, and conclusion drawing. Collected information was organized, coded, and categorized to identify patterns related to time-recording discrepancies. To systematically determine the root causes, a Fishbone diagram based on the 6M framework was applied. Each factor was assessed according to its frequency of occurrence and its relative impact on time discrepancies. This procedure enabled the prioritization of dominant and supporting factors and provided a structured basis for causal evaluation.

2.4. Validity and Trustworthiness

Data validity and trustworthiness were ensured through methodological and source triangulation. Findings from observations, interviews, and document analysis were compared to confirm consistency and reliability. Additionally, cross-verification among informants was conducted to validate interpretations and reduce potential. These procedures enhanced the credibility, dependability, and confirmability of the study findings.

3. Results

3.1. Mooring Service Time Discrepancies between SOF and Pranota

Based on direct observations and a comparative analysis of the Statement of Fact (SOF) and Pranota mooring service documents, discrepancies were identified in the recorded mooring service times. Differences were consistently observed in both the vessel berthing initiation time ("First Line") and the completion time ("Casted Off"). Overall, the average discrepancy in recorded mooring time ranged between approximately ± 30 –60 minutes per vessel, with a minimum difference of about 15 minutes and a maximum exceeding 90 minutes. These variations directly affected the calculated mooring service duration, which serves as the basis for determining port service charges.

3.2. Quantitative Indicators of Time Discrepancy

Data processing results indicate that the discrepancies in recorded times resulted in differences in total berthing duration as stated in the billing documents. Variations in service duration subsequently led to increases or decreases in the calculated mooring service charges borne by port users. Although the time differences may appear relatively small on an individual basis, their cumulative effect had a measurable impact on overall vessel operational costs. These findings demonstrate that even minor inconsistencies in time recording can generate significant financial implications.

3.3. Root Cause Analysis Using the 6M Fishbone Framework

The contributing factors to mooring time discrepancies were analyzed using a Fishbone diagram based on the 6M framework: Man, Machine, Method, Measurement, Material, and Mother Nature. Factors were prioritized according to their frequency of occurrence and relative impact observed during fieldwork.

- Man (Human Resources)

The Man factor was identified as the dominant contributor to time discrepancies. Findings revealed differences in personnel's understanding regarding the definition of berthing start and completion times, as well as inaccuracies and inconsistencies in operational time recording.

- Method (Work Procedures)

The Method factor represented the second most significant cause. Differences in time-recording procedures between shipping agents and port authorities were observed, along with inconsistent implementation of Standard Operating Procedures (SOPs).

- Measurement (Time Reference and Synchronization)

The Measurement factor involved the use of non-uniform time references, including differences in time zones and unsynchronized clocks, which contributed to recording inconsistencies.

- Machine (Equipment and Systems)

The Machine factor is related to the continued reliance on manual or semi-manual recording

systems, increasing the likelihood of human error during data entry and documentation.

- Material (Supporting Documents)

The Material factor included incomplete or delayed submission of supporting documents, which affected the accuracy and timeliness of the mooring time recording.

- Mother Nature (Environmental Conditions)
Environmental conditions, such as weather and sea currents, were identified as minor supporting factors that could influence actual breathing and unberthing times but were not consistently associated with documentation discrepancies.

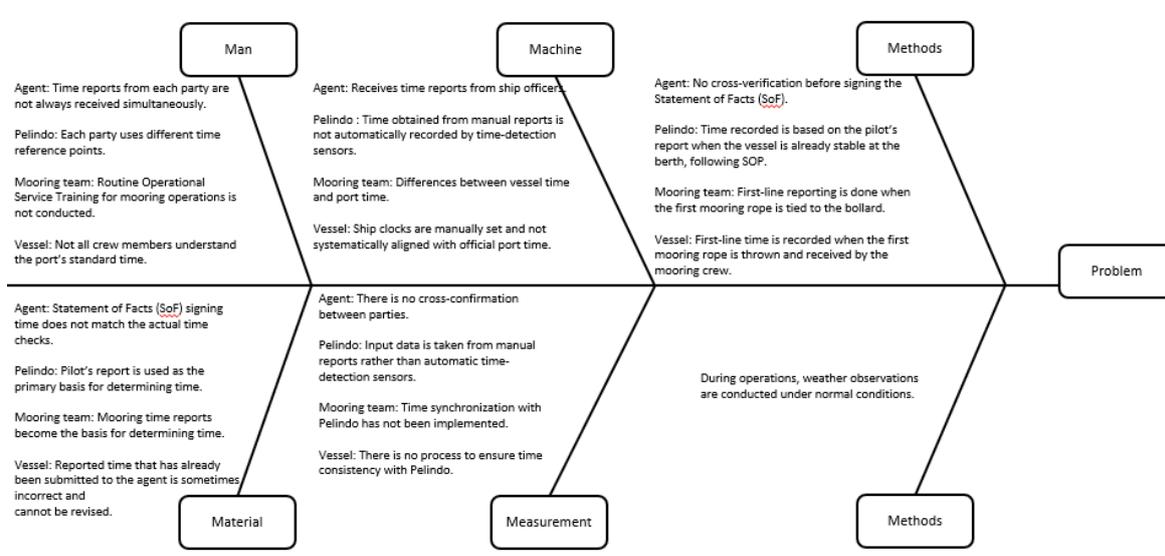


Figure 2. Fishbone Diagram

3.4. Separation of Findings and Interpretation

All findings presented in this section are based solely on factual evidence derived from observations, interviews, and document analysis. Interpretations, causal relationships, and broader implications for governance, procedural compliance, and mooring service management are discussed separately in the Discussion section.

Based on the results of the analysis using the *Fishbone Diagram*, it can be concluded that the main problem studied (*Problem*) is not caused by a single factor, but is the result of the interaction of several causative factors that come from six main aspects, namely *Man, Machine, Methods, Material, Measurement, and Mother Nature*.

In this section, the researcher tested the data's validity by triangulating the data. In data triangulation, the researcher uses source triangulation, a technique to check the validity of data by comparing and checking the consistency of information obtained from different data sources [14]. Researchers use the source triangulation technique because it can

very well describe and prove how valid a result of observations and interviews is [15]

The researcher concluded that the difference in mooring service time was not caused by technical or environmental factors, but by procedural aspects, the difference in recording reference time between parties and ships, and agents who have not fully implemented the Standard Operating Procedures. Therefore, the data used in this study is declared valid and synchronous with the results of observations, interviews, and documentation conducted by the author. In the Man aspect, the difference in the recording reference point between ships, agents, mooring officers, and guides causes a time difference from the beginning of the process. On the Machine aspect, the use of personal clocks, manual clocks on board, and unsynchronized Pelindo server time magnifies data inconsistencies.

The Method aspect was found in the form of no cross-verification before the document was issued, as well as the lack of implementation of SOPs by agents and service

users. In the Measurement aspect, even though all parties use the same time zone (WITA), the difference in time source causes the recording results to be inconsistent. Furthermore, in the Material aspect, the SOF and Pranota documents are available in full, but not through the integration and joint checking process, so that differences still arise until the final stage. The Mother Nature aspect does not affect the

recording process, because the weather conditions and the pier are stable and are not a factor causing the time difference.

The comparative analysis between the Statement of Fact (SOF) prepared by ITL Shipping Agency and the Pranota issued by PT Pelindo Balikpapan Branch demonstrates measurable discrepancies in recorded mooring service time.

Tabel 1. Time Calculation

No	Information	Date		Total Difference Time
		SOF	Pranota	
1.	First Line	15/11/2024 06:00	15/11/2024 04:57	1 Hours 3 Minutes
2.	Casted Off	15/11/2024 23:36	16/11/2024 00:03	27 Minutes
Total Berthing Time		17 Hours 36 Minutes	19 Hours 6 Minutes	1 Hours 30 Minutes

Empirical findings indicate measurable discrepancies in the recorded mooring service times between the Statement of Facts (SOF) and the Pranota documents. The difference in the recorded "First Line" timestamp reached 1 hour and 3 minutes, while the "Casted Off" timestamp differed by 27 minutes. Consequently, the total berthing duration documented in the SOF was 17 hours and 36 minutes, whereas the Pranota recorded 19 hours and 6 minutes, resulting in a cumulative discrepancy of 1 hour and 30 minutes (90 minutes) for a single vessel call. Based on the observed operational timestamps, the average

discrepancy ranged between 45 and 60 minutes per activity, with variations spanning from 27 to 63 minutes. This pattern suggests a systematic variation rather than incidental recording error. Such differences directly influenced the calculation of chargeable mooring duration and led to inconsistencies in service billing. The underlying causes of these discrepancies were subsequently analyzed using the Fishbone (6M) framework, and each contributing factor was assessed based on its frequency of occurrence and operational impact as identified through interviews, document analysis, and field observations.

Table 2. Root Cause Identification

Factor (6M)	Description	Weight (%)	Role
Man	Inconsistent recording practices, lack of SOP compliance, and different interpretations of time points	45%	Main cause
Method	SOP is not standardized and not verified immediately after the operation	25%	Main supporting cause
Machine	Manual/timepiece differences, absence of an integrated system	12%	Supporting
Measurement	No single UTC reference, unsynchronized clocks	10%	Supporting
Material	Weak supervision and coordination	6%	Supporting
Mother Nature	Weather/traffic effects	2%	Minor

The Man (human resource) factor was identified as the most dominant contributor, accounting for nearly half of the total causal weight.

4. Discussion

Field findings indicate that SOP for time recording exists but is not consistently implemented. Inconsistencies often occur when SOPs are not adequately internalized by operational implementers, there is weak supervision, and routine-based work practices dominate over formal procedures. In the operational recording of port and ship services, previous research confirmed that the accuracy of time recording on SOF and derivative documents such as Pranota is very important in determining the reliability of cost calculations, service claims, and operational transparency [16]. Inconsistent time recording is often caused by the absence of direct supervision standards for SOP compliance, the absence of an integrated or digital recording system, and low awareness of officers regarding the legal and financial implications of operational documents.

Besides that, compliance level is estimated at moderate low (approximately 50–60%). Compliance was deemed suboptimal due to the presence of recording practices that did not fully adhere to the SOP, such as inaccurate recording times, discrepancies in time data between documents, and retrospective recording based on memory or estimates. This situation indicates that the SOP serves primarily as an administrative guideline, while in daily implementation, there are still deviations from established standards. This moderate to low level of compliance has the potential to reduce the reliability of the Pranota and SOF as official documents, increase the risk of discrepancies in cost calculations, and open up the possibility of audit findings and operational disputes. Therefore, this situation indicates the need to strengthen the implementation of SOPs through increased supervision, affirmation of responsibilities, and regular compliance evaluations to ensure accurate, consistent, and accountable recording of Pranota and SOF.

Furthermore, recording responsibilities divided among the ship crew (initial time), the

agent (SOF documentation), and the Pelindo officer (pranota issuance). Based on the results of the operational implementation evaluation, there was a lack of proper and structured coordination regarding the division of responsibilities for recording operational times and events between the parties involved: the ship's crew as the initial timekeepers of activities, the ship's agent as the preparer and documenter of the Statement of Facts (SOF), and Pelindo officers as the issuers of the Pranota. In practice, the division of roles and responsibilities for recording has not been clearly outlined and uniformly understood by all parties. The ship's crew records the initial time of operational activities, but this data is not always conveyed completely, promptly, and verified to the agent. The agent then prepares the SOF based on the information received, which in some cases is still partial or requires further clarification. Meanwhile, Pelindo officers issue the Pranota based on the SOF and available operational data, although the quality and consistency of the underlying data are not fully guaranteed. This lack of coordination leads to discrepancies in the time and chronology of activities between the ship's crew records, the SOF prepared by the agent, and the Pranota issued by Pelindo. This condition shows that there is no effective coordination mechanism, such as a standard communication flow, data handover point, and cross-party verification process, before documents are used as a basis for calculation and billing. The impact of this suboptimal coordination is a decline in the reliability of Pranota and SOF, an increased risk of calculation errors, delays in document issuance, and the potential for operational disputes and audit findings. Therefore, this situation demonstrates the need to clarify the division of record-keeping responsibilities, strengthen cross-party coordination, and establish an integrated verification mechanism to ensure accurate, consistent, and accountable Pranota and SOF recording.

Moreover, no mandatory joint verification or cross-checking mechanism. In practice, the crew's recorded time and chronology of activities are used by agents as the basis for preparing the SOF, which then serves as a

reference for Pelindo officers when issuing the Pranota. However, there is no formal obligation to jointly verify the accuracy of the time data, sequence of events, or completeness of the information before the SOF is finalized and the Pranota is issued. As a result, potential recording errors, differences in time interpretation, and data discrepancies between documents go undetected early. The impact of the lack of a joint verification mechanism is the decreased reliability of the Pranota and SOF as official documents, the increased risk of cost miscalculations, delays in document corrections, and the potential for operational disputes and audit findings. This situation indicates that the internal control function in the recording process is not functioning adequately. Therefore, it is necessary to establish a mandatory joint verification mechanism, including cross-checking of time data between relevant parties, establishing formal approval stages before documents are finalized, and integrating the verification mechanism into the SOP for recording Pranota and SOF to ensure the documentation process is more accurate, consistent, and accountable.

This fragmented responsibility structure resulted in inconsistent data entry and delayed reconciliation. The results indicate that time discrepancies are primarily attributable to procedural non-compliance rather than technical or environmental constraints. The dominance of the Man and Method factors confirms that the problem originates from behavioral and organizational weaknesses, including inconsistent interpretation of recording standards and limited operational coordination. Although previous studies emphasize manual recording limitations as the primary source of error, the present findings demonstrate that technology alone is insufficient. Even under manual systems, consistent SOP enforcement and synchronized time references could significantly reduce variability. Therefore, the root issue lies in governance and procedural discipline rather than the absence of digital tools.

The absence of immediate post-operation verification further amplifies discrepancies. Without real-time confirmation between agents

and port officers, each party records time independently, leading to cumulative divergence. This explains the observed discrepancy range of 27–63 minutes and the total difference of 90 minutes per call. Such variation directly affects billing fairness, operational transparency, and stakeholder trust. From a managerial perspective, the findings suggest that improvement efforts should prioritize high-impact and low-cost interventions. Strengthening human competency, enforcing SOP compliance, and establishing shared time standards are likely to yield greater benefits than capital-intensive technological upgrades alone.

System weaknesses were identified in four aspects:

- Lack of a unified time reference (UTC not enforced)
- No mandatory joint validation procedure
- Unclear accountability between the ship, agent, and port operator
- Absence of supervisory control or audit trail

Addressing these structural gaps would improve the reliability of operational data and reduce administrative disputes. Overall, the study confirms that mooring time accuracy is a managerial control issue, and enhancing procedural consistency and coordination constitutes the most effective strategy for minimizing discrepancies and improving port service performance.

5. Conclusions

Based on a systematic analysis of the causal factors, operational impacts, and corrective measures, this study identifies that discrepancies in mooring service time primarily originate from procedural and administrative deficiencies rather than environmental or technical constraints. Specifically, three dominant causes were observed: (1) inconsistent implementation of Standard Operating Procedures (SOPs) in time recording by vessel crews and agents, (2) the use of different time references between the Statement of Fact (SOF) and the pranota documents, and (3) the absence of immediate post-operation verification of recorded times.

These inconsistencies directly contribute to mismatched service duration calculations, which subsequently affect the accuracy of billing and create financial discrepancies between stakeholders.

Field observations indicate that environmental conditions, including weather and port traffic, did not significantly influence recording delays during the study period. Therefore, the problem is predominantly managerial and systemic in nature, highlighting weaknesses in coordination, documentation practices, and time standardization mechanisms. This finding suggests that improving procedural compliance and documentation control would yield greater effectiveness than technical or infrastructural interventions.

In response to these findings, corrective actions were prioritized based on urgency, feasibility, and direct alignment with the identified root causes. The highest priority involves the establishment of a standardized time reference (UTC+08.00) to be uniformly applied across all operational and administrative documents. The second priority consists of implementing mandatory real-time verification and joint confirmation of recorded times by agents, mooring officers, and port authorities immediately after mooring activities. The third priority includes strengthening SOP dissemination and periodic training programs to enhance personnel competency and procedural compliance. Finally, the adoption of an integrated digital time-logging system is recommended to reduce manual recording errors and improve data synchronization among stakeholders.

These measures are practical, low-cost, and directly implementable within the existing organizational framework. Their systematic application is expected to minimize time discrepancies, enhance billing accuracy, and improve the transparency and operational efficiency of mooring services at Balikpapan Port. The study thus provides evidence-based managerial recommendations that can be replicated in similar port service contexts to improve service reliability and administrative accountability.

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