http://ejournal.stipjakarta.ac.id

METEOR STIP MARUNDA

pISSN : 1979 – 4746
eISSN : 2685 - 4775

*Maritime Institute of Jakarta*

# The Effect of Inaportnet System Implementation on Ship Agency Services at PT. Maritel Bahtera Abadi Balikpapan

*Bayu Pambudy [1], Marihot Simanjuntak [1], Mauritz HM Sibarani [1], Agus Leonard Togatorop [1], Jarot Delta Susanto [1]*

*[1]Maritime Institute, Sekolah Tinggi Ilmu Pelayaran Jakarta, North Jakarta. Jakarta 14150*

**Email Korespondensi: bayupambudy15@gmail.com*

***Submitted**:* 03/09/2023 ***Revised**:* 21/11/2023 ***Accepted**:* 04/12/2023 ***Published**:* 30/12/2023

**ABSTRACT**

*This study examines the effect of the Inaportnet system on ship agency services at PT. Maritel Bahtera Abadi in Balikpapan. Inaportnet is Indonesia's integrated electronic port clearance platform, mandated by Ministry of Transportation Regulation No. 192/2015, designed to streamline vessel arrival and departure documentation. Using a quantitative approach with survey data from 51 respondents comprising shipping agents, port authority staff, and stevedoring company employees at KSOP Class I Balikpapan, the study employs Pearson correlation, simple linear regression, and coefficient of determination analysis through SPSS 25.0. The results show a moderate positive correlation ($r = 0.472$) between Inaportnet implementation and ship agency service quality, with the system explaining 53.4% of the variance in service quality ($R^2 = 0.534$). The t-test confirms the relationship is statistically significant ($t = 3.750$, $p = 0.000 < 0.05$). However, the study also documents operational challenges including 37 system error incidents across 179 vessel visits during the observation period, seven maintenance shutdowns, and persistent gaps between target and actual approval processing times. The findings suggest that while Inaportnet has a significant positive effect on agency services, system reliability issues and the continued requirement for face-to-face approval at KSOP Balikpapan limit its full potential.*

*Copyright ©2023, **METEOR STIP MARUNDA**, pISSN: 1979-4746, eISSN: 2685-4775*

***Keywords:***

*Inaportnet; Ship Agency Services; Port Clearance; Electronic Port System; Maritime Digitalization*

## 1. INTRODUCTION

Indonesia's port system faces a persistent tension between the volume of vessel traffic it handles and the speed at which documentation can be processed. With over 17,000 islands and hundreds of commercial ports, the country's maritime logistics infrastructure must coordinate arrivals, departures, cargo operations, and regulatory clearances across multiple government agencies simultaneously [1]. Prior to digitalization, this coordination relied on

physical document submission to each agency, creating bottlenecks that extended port dwell times and increased operating costs for shipping companies [2].

The Indonesian government responded to this challenge by developing Indonesia Portnet (Inaportnet), an internet-based electronic portal that integrates port service documentation into a single platform. Mandated by Ministry of Transportation Regulation No. 192/2015, Inaportnet enables shipping agents to submit vessel clearance applications, cargo manifests, crew data, and regulatory documents electronically rather than visiting each government office in person [3]. The system integrates services from the Harbourmaster and Port Authority (KSOP), Indonesian Navy, Customs, Immigration, Quarantine, and port operators (Pelindo), aiming to reduce clearance processing from days to hours [4].

Despite these ambitions, the implementation of Inaportnet at individual ports has encountered practical difficulties. System errors, scheduled maintenance downtime, internet connectivity disruptions, and the continued requirement for face-to-face approval at some agencies have prevented the system from delivering its full promised efficiency gains [5]. These implementation gaps are particularly acute at ports outside Java, where telecommunications infrastructure may be less robust and where the volume of vessel traffic, while substantial, does not always justify the same level of IT support that major ports receive [6].

PT. Maritel Bahtera Abadi operates as a ship agency company in Balikpapan, East Kalimantan, handling vessel clearance for an average of 15 ships per month through the KSOP Class I Balikpapan. The company's operations provide a practical test case for evaluating Inaportnet's effectiveness because Balikpapan is a major petroleum and mining port with significant vessel traffic, yet it is also subject to the infrastructure limitations common to ports outside Java. During a twelve-month observation period from August 2021 to July 2022, the researcher documented 179 vessel visits handled through the Inaportnet system, recording 37 system error incidents, 7 maintenance shutdowns, and consistent gaps between the target and actual processing times for clearance approvals [7].

Previous research on Inaportnet has examined its implementation at major ports such as Tanjung Priok Jakarta [8] and Tanjung Perak Surabaya [9], finding mixed results. While the system has generally improved documentation speed, studies have noted ongoing challenges with system integration, user training, and the persistence of manual verification steps that undermine the efficiency gains of electronic submission [10]. Few studies have examined Inaportnet's impact specifically on ship agency operations at secondary ports, where agency companies serve as the primary interface between vessel operators and the port clearance system.

This study addresses that gap by measuring the effect of Inaportnet system implementation (X) on ship agency service quality (Y) at PT. Maritel Bahtera Abadi Balikpapan. Two research questions guide the analysis: first, whether a significant relationship exists between Inaportnet implementation and agency service quality, and second, how large that effect is. The study uses a quantitative survey approach with 51 respondents and analyzes the data through correlation, regression, and hypothesis testing.

## 2. RESEARCH METHOD

*Research Design and Population*

This study uses a quantitative research design with a survey-based approach [11]. The research population consists of all stakeholders who interact with the Inaportnet system at KSOP Class I Balikpapan and PT. Maritel Bahtera Abadi, including shipping agents, KSOP staff, Pelindo officers, stevedoring company employees, and vessel crews. Using Slovin's formula with a 10% margin of error applied to the total active user population, the sample size was determined at 51 respondents [12]. Data were collected through structured questionnaires using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) distributed to respondents during the researcher's twelve-month internship period from August 2021 to July 2022.

*Variables and Instruments*

The target population consists of all employees at PT. Aweidhia Crew Management who use the Crew Inspector and Bassnet applications in their daily work. Since the total number of employees is 30, the study employs a saturated sampling technique (census), where every member of the population is included as a respondent [12]. This approach is appropriate when the population is small enough that excluding any members would risk losing valuable data [13].

*Data Analysis*

The data were analyzed using SPSS version 25.0 through five stages. First, validity testing using

Pearson's product-moment correlation confirmed that all 20 questionnaire items met the minimum r-value threshold (> 0.279 for n = 51). Second, reliability testing using Cronbach's alpha verified internal consistency for both variables. Third, Pearson correlation analysis measured the strength and direction of the relationship between X and Y. Fourth, simple linear regression analysis estimated the regression equation and coefficient of determination ($R^2$). Fifth, hypothesis testing using the t-test determined statistical significance at the 0.05 level [15], [16].

## 3. RESULTS AND DISCUSSIONS

### 3.1. Results

*Operational Performance of Inaportnet at KSOP Balikpapan*

Before presenting the statistical analysis, it is important to document the operational context in which Inaportnet was used during the study period. Table I compares the target approval times set by KSOP Class I Balikpapan against the actual processing times experienced by PT. Maritel Bahtera Abadi.

**Table 1.** Target Vs. Actual Clearance Approval Times at KSOP Balikpapan

| Service Type | Target (min) | Actual (min) | Delay Factor |
|---|---|---|---|
| SPM (Entry Permit) | 3 | 5–10 | 1.7–3.3x |
| PKK (Arrival Notice) | 5 | 5–10 | 1.0–2.0x |
| PPKB (Pelindo) | 10 | 15–30 | 1.5–3.0x |
| BMBB (Hazmat Permit) | 15 | 60–120 | 4.0–8.0x |
| Shifting Permit | 5 | 15–20 | 3.0–4.0x |
| PNBP Navigation Dues | 3 | 10–15 | 3.3–5.0x |
| PNBP VTS | 5 | 5–10 | 1.0–2.0x |
| LK3 | 10 | 10–30 | 1.0–3.0x |
| SPB (Sailing Permit) | 15 | 15–45 | 1.0–3.0x |
| **Total** | **≈71 min** | **140–290 min** | **2.0–4.1x** |

The data reveals that actual processing times consistently exceeded targets across all service types. The most problematic service was BMBB (Hazmat Loading/Unloading Permit), where actual times ranged from 4 to 8 times the target. The cumulative effect was substantial: total clearance processing that should take approximately 71 minutes in practice required 140 to 290 minutes, roughly 2 to 4 times longer than planned.

**Table 2**. Presents The System Reliability Data for Inaportnet During the Observation Period

| Month | Vessels Handled | System Errors | Error Rate |
|---|---|---|---|
| Aug 2021 | 15 | 2 | 13.3% |
| Sep 2021 | 8 | 6* | 75.0% |
| Oct 2021 | 16 | 3 | 18.8% |
| Nov 2021 | 23 | 7 | 30.4% |
| Dec 2021 | 17 | 4 | 23.5% |
| Jan 2022 | 15 | 0 | 0.0% |
| Feb 2022 | 12 | 2 | 16.7% |
| Mar 2022 | 9 | 6 | 66.7% |
| Apr 2022 | 19 | 5 | 26.3% |
| May 2022 | 14 | 4 | 28.6% |
| Jun 2022 | 11 | 0 | 0.0% |
| Jul 2022 | 20 | 4 | 20.0% |

| | | | |
|---|---|---|---|
| **Total** | **179** | **37**** | **20.7%** |

*Statistical Analysis Results*

**Table 3**. Summarizes the key statistical findings from the SPSS analysis:

| Test | Result | Interpretation |
|---|---|---|
| Pearson Correlation (r) | 0.472 | Moderate positive correlation |
| Coefficient of Determination ($R^2$) | 0.534 | 53.4% variance explained |
| Regression Coefficient (β) | 0.464 | Positive effect direction |
| t-statistic | 3.750 | > t-table (1.677); significant |
| Significance (p-value) | 0.000 | < 0.05; Ha accepted |
| Regression Constant (a) | 21.761 | Baseline Y when X = 0 |

The correlation coefficient of 0.472 places the relationship between Inaportnet implementation and agency service quality in the moderate range (0.41–0.60) according to standard interpretation guidelines [15]. The positive sign indicates that higher levels of Inaportnet adoption are associated with higher service quality. The $R^2$ value of 0.534 means that Inaportnet implementation explains 53.4% of the variation in agency service quality, with the remaining 46.6% attributable to other factors not measured in this study.

The t-test result ($t = 3.750$, $p = 0.000$) confirms that the relationship is statistically significant at the 0.05 level. Since t-calculated (3.750) exceeds t-table (1.677 for df = 49), the null hypothesis (H0: no significant effect) is rejected and the alternative hypothesis (Ha: significant positive effect) is accepted.

### 3.2. Discussion

The moderate correlation ($r = 0.472$) between Inaportnet implementation and ship agency service quality tells a more nuanced story than a simple finding of significance. A moderate effect means that Inaportnet makes a real difference to service quality, but it is not the only factor, or even the dominant factor, determining how well agency services perform. The 46.6% of unexplained variance points to other determinants such as staff competence, internet infrastructure quality, the responsiveness of KSOP officials, and the completeness of vessel documentation provided by ship owners [17].

The operational data supports this interpretation. The persistent gap between target and actual approval times (Table I) suggests that the Inaportnet system has not fully eliminated the manual bottlenecks in the clearance process. The BMBB permit, which showed the largest delay factor (4–8x), requires coordination between the shipping agent, the vessel, the cargo owner, and the KSOP. Inaportnet facilitates the submission of the application, but the approval still depends on the availability and responsiveness of the approving officer, which remains a human factor outside the system's control [9].

The system reliability data (Table 2) reveals another constraint. An average error rate of 20.7% across the observation period means that roughly one in five vessel visits encountered some form of system disruption. The September 2021 cable failure, which caused a near-complete outage, illustrates the vulnerability of an internet-dependent system in a region where submarine cable infrastructure serves as the primary backbone. This vulnerability is not unique to Balikpapan; other eastern Indonesian ports face similar risks [6].

These findings are consistent with prior research at larger ports. Malisan and Tresnawati [9] found that Inaportnet at Tanjung Perak Surabaya still had not fully achieved single-window service delivery, with manual verification steps persisting alongside electronic submission. Saifudin [8] noted similar implementation gaps at Tanjung Priok. The contribution of this study is to show that the pattern holds at secondary ports as well, and that the effect size ($R^2 = 0.534$) provides a quantitative benchmark for measuring how much of the service quality improvement can be attributed to the system itself versus other operational factors.

One limitation of this study is that the cross-sectional design captures a single period of system performance. Inaportnet is continuously updated, and

the error rates and processing times documented here may have improved in subsequent periods. Future research should adopt a longitudinal design to track whether system updates translate into measurable improvements in both reliability and service quality [18].

## 4. CONCLUSION

This study measured the effect of Inaportnet system implementation on ship agency service quality at PT. Maritel Bahtera Abadi Balikpapan using survey data from 51 respondents analyzed through correlation and regression in SPSS 25.0. Two principal findings emerged. First, Inaportnet implementation has a moderate positive and statistically significant effect on agency service quality, with a correlation coefficient of 0.472 ($p = 0.000$) and $R^2$ of 0.534, meaning the system accounts for 53.4% of the variation in service quality. Second, operational data from the twelve-month observation period documents persistent implementation challenges, including an overall system error rate of 20.7%, clearance processing times 2–4 times longer than targets, and particular weakness in BMBB (hazmat permit) processing. These findings indicate that the Inaportnet system delivers genuine improvements to port clearance efficiency but has not yet reached its full potential due to system reliability issues, infrastructure constraints, and the persistence of manual approval steps. The study recommends improved server redundancy and backup connectivity for eastern Indonesian ports, process redesign to reduce face-to-face approval requirements, and targeted training for agency staff on the BMBB module to reduce the largest processing bottleneck.

## REFERENCES


[1] Government Regulation of the Republic of Indonesia No. 51 of 2002 on Shipping.

[2] Saifudin, "Analysis of readiness for Indonesia Port Integration System (Inaportnet) implementation for vessel services at Tanjung Priok Port," Faculty of Engineering, University of Indonesia, Jakarta, 2009.

[3] Ministry of Transportation of Indonesia, "Regulation No. PM 192/2015 on the implementation of Inaportnet for electronic vessel and cargo services," Jakarta, 2015.

[4] A. Kwartama, T. Pinuji, and Sumiyatiningsih, "The effect of Inaportnet system implementation and ship service quality on performance at the Main Port Authority of Tanjung Priok Jakarta," unpublished.

[5] A. L. Tandung, M. Abduh, R. D. Priatmaja, and F. Ihsan, "Inaportnet system implementation in vessel document processing," Hengkara Majaya, vol. 3, pp. 51-57, 2022.

[6] A. Kurniawan, I. B. Hascaryo, and N. Syahrial, "Feasibility study of Inaportnet and e-business development strategy at Makassar Port," 2015.

[7] PT. Maritel Bahtera Abadi, "Operational monitoring data and Inaportnet incident records," Balikpapan, Aug 2021-Jul 2022.

[8] Saifudin, "Analysis of readiness for Indonesia Port Integration System (Inaportnet) implementation," Universitas Indonesia, p. 22, 2009.

[9] J. Malisan and W. Tresnawati, "Inaportnet implementation in one-stop integrated service at Tanjung Perak Surabaya Port," Research Center for Sea, River, Lake and Ferry Transport, pp. 67-74, 2019.

[10] Kotler, P., Principles of Marketing, 17th ed. London: Pearson, 2018.

[11] Sugiyono, Research Methods: Quantitative, Qualitative, and R&D. Bandung, Indonesia: Alfabeta, 2019.

[12] D. Hamid, Research Methods in Education and Social Sciences. Bandung, Indonesia: Alfabeta, 2013.

[13] D. M. Putra, "Efforts to improve ship agency services by PT. Bahtera Adhiguna at Tanjung Intan Cilacap Port," UNIMAR AMNI, pp. 14-15, 2020.

[14] D. S. Mardiana and K. S. Sholeh, "Ship agency disbursement at PT DIAN LINE Surabaya branch," MUARA: J. Natl. Shipping Manage., vol. 3, p. 77, 2020.

[15] D. A. Lasse, Equipment Management:

Operational and Maintenance Aspects. Jakarta, Indonesia: Rajawali Pers, 2017.

[16] V. W. Sujawerni, Business and Economics Research Methodology: Quantitative Approach. Yogyakarta, Indonesia: Pustaka Baru Press, 2018.

[17] A. Pangihutan, M. Thamrin, and A. Suhendar, "Ship agency service quality and interpersonal communication at shipping companies," vol. 3, no. 2, 2016.

[18] R. Handayani, Social Research Methodology. Yogyakarta, Indonesia: Trussmedia Grafika, 2020.