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Empirical Analysis of Service Quality on Consumer Satisfaction in Maritime Transportation

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Abstract

Maritime transportation is a crucial element of a nation's large-scale shipment system, facilitating the movement of goods both within and beyond its borders. Major port cities like Semarang, home to the Semarang Container Terminal (*Terminal Peti Kemas Semarang* or TPKS), have witnessed a surge in container traffic for imports and exports. In this study, quantitative and qualitative data were collected from 72 respondents through questionnaires, interviews, observations, literature review, and documentation. Based on empirical evidence and a research model involving multiple linear regressions, independent variables, including physical conditions, reliability, responsiveness, assurance, and empathy, individually and collectively have a significant and positive impact on customer satisfaction. Recommendations for TPKS management include enhancing service quality by providing precise services, improving professionalism, enhancing responsiveness, and ensuring clear communication to prevent unexpected costs. This research aids TPKS management in improving service quality and customer satisfaction, with a focus on key dimensions.

Keywords

Maritime transportation, TPKS, Customer satisfaction, Service quality, Container handling

1. Introduction

Maritime transportation is a vital and indispensable component of a country's large-scale shipment system, proficiently handling both outbound and inbound goods (Calatayud et al., 2017). Indonesia's strategic location, nestled between the Indian Ocean and the Pacific Ocean, as well as the continents of Asia and Australia, positions it as an irreplaceable and pivotal link between nations. The vast expanse of the ocean serves as the nation's primary asset, enabling the seamless transportation of goods. Strong inter-country and inter-province connections further underscore the essential role played by the maritime transportation system in promoting efficiency and facilitating the flow of commerce (Hummels, 2007).

Major cities with large ports like Semarang are experiencing a growing trend of increased container volumes for imports and exports. The readiness of facilities and infrastructure at the Semarang Container Terminal (*Terminal Peti Kemas Semarang* or TPKS) is expected to boost local revenue and improve Semarang's industrial landscape. Local governments have a fundamental role in managing development activities and providing services to enhance public welfare (Helmsing, 2003). A clean bureaucracy is an essential instrument for achieving efficient, effective, fair, transparent, and accountable public services (Savira & Tasrin, 2018). The management of TPKS must efficiently serve consumers for both imports and exports. Effective management of the terminal is complemented by a well-organized workforce and a clean, professional, responsive, and aspirational bureaucracy, ensuring customer satisfaction for those using TPK's services (Syafaaruddin, 2015).

The history of the establishment of TPKS is closely related to the history of Tanjung Emas Port. Tanjung Emas Port has undergone several changes in its management since 1960, including the period under the state company (*Perusahaan Negara* or PN) in 1969, the port business agency in 1969, and the state port company (*Perum Pelabuhan* or PP) in 1983. Semarang Port became part of PP III, with its headquarters in Surabaya. The construction of Phase I of Tanjung Emas Port was completed in 1985 and inaugurated by President Soeharto. The last management change occurred in 1992, dividing it into PT. (Persero) Indonesian Ports I, II, III, and IV.

Initially, container loading and unloading activities at Tanjung Emas Port were carried out in conjunction with general cargo handling under the Business Division of the Tanjung Emas Port Branch. However, after the completion of Phase II in 1997, container handling shifted to the terminal service phase managed by the Container Terminal Division of the Tanjung Emas Port Branch. With the significant growth of container transport, the Port Organization III initiated a separation, creating an independent entity for the management of the Container Terminal under the leadership of the General Manager of Semarang Container Terminal. This was an anticipatory step to meet the increasingly professional and adequate needs of container management. On the other hand, the general port management remained under the responsibility of the General Manager of Tanjung Emas Port (Djari & Adilano, 2023).

TPKS is a separate branch from Tanjung Emas Port in Semarang, where all container handling affairs are managed independently by the Semarang Container Terminal management. In July 2001, Semarang Container Terminal established itself as a highly sought-after container terminal by exporters and importers, particularly in the Central Java and Yogyakarta regions. Regarding the aspects of management control systems, TPKS is categorized as the same level as Class I Branch Ports and is under the responsibility of the Board of Directors of PT. (Persero) Indonesian

Ports III. The organizational structure and work procedures in Semarang Container Terminal are determined by the Board of Directors of PT. (Persero) Indonesian Ports III in Decision Letter Number KEP.47/RP.108/P.III-2001 regarding the organizational structure and work procedures of Semarang Container Terminal. It is led by a General Manager and assisted by four managers and eight assistant managers.

Adequate and well-maintained facilities and infrastructure contribute to customer satisfaction (Astuti, 2020). Irregularities in documentation have been identified at TPKS, prompting this research to evaluate consumer satisfaction in the container loading and unloading process. It measures five key dimensions: Physicality, Reliability, Responsiveness, Assurance, and Empathy. The research aims to determine whether each of these dimensions significantly and positively influences customer satisfaction. This commitment to understanding what matters to customers in the context of container loading and unloading services and assessing the impact of these factors on their satisfaction is a central focus. Additionally, this study tests the combined influence of these five dimensions on customer satisfaction, providing a comprehensive picture of the factors contributing to customer satisfaction at TPK Semarang.

This research is expected to provide valuable insights for the management of TPKS in enhancing their service quality to meet customer expectations and satisfaction. The study has clear and structured objectives to gain an in-depth understanding of the factors influencing customer satisfaction in the container loading and unloading process at TPKS. The analysis of key dimensions, such as physicality, reliability, responsiveness, assurance, and empathy, is expected to positively impact customer satisfaction and guide service improvement strategies for TPKS.

2. Literature Review

Customer satisfaction plays a central role in the business world, given its close connection to consumer behavior (Hennig-Thurau, 2000). Customer satisfaction arises from the comparison between expectations and perceived outcomes of the product or service received (Kotler & Keller, 2007). Companies that can consistently deliver quality products or services that meet customer expectations are more likely to create customer satisfaction, which, in turn, can influence consumer behavior (Olorunniwo et al., 2006). Satisfied customers are more likely to return and use the company's products or services again and provide positive recommendations to others. Therefore, the concept of customer satisfaction remains relevant and directly impacts a company's financial performance, determined by the extent to which the company can meet its customers' expectations and needs. In other words, customer quality plays a significant role in determining the level of customer satisfaction (Caruana, 2002).

Customer satisfaction is a critical factor in the business world, as it reflects the extent to which consumers' needs, expectations, and desires are met by the products or services they receive. Kotler & Bowen, (2010) emphasize the importance of the difference between customer expectations and perceived outcomes, and companies that can consistently meet or exceed these expectations will create high levels of satisfaction. This is particularly relevant in public services, where customer satisfaction serves as an indicator of the success of the services provided. To achieve customer satisfaction, it is essential to understand the concept of service quality. Service quality can vary according to each customer's expectations, creating a need for consistency in

service delivery. Furthermore, factors such as physical evidence, reliability, responsiveness, assurance, and empathy, as described by Nasution, are key elements that can enhance service quality (Pakurár et al., 2019). These factors relate to physical evidence, equipment, employee appearance, and the company's ability to communicate with customers to provide satisfactory service. Therefore, a deep understanding of service quality and how these factors can influence customer satisfaction is crucial in meeting customer expectations and sustaining business success.

Reliability in service refers to a company's ability to fulfil promises accurately and consistently (Parasuraman et al., 1988). It encompasses performance that meets customer expectations, including aspects of timeliness, consistency, speed, as well as high accuracy in service. Reliability reflects the extent to which customers can rely on the company to fulfil the commitments that have been promised. Customer satisfaction often depends on how much a company can provide reliable service. In this context, it is essential for a company to meet the promises made to customers, provide the right service from the beginning, and ensure that the products or services provided do not suffer from damage or failure. Responsiveness is a critical aspect of service quality that involves the willingness and ability of staff and employees to provide service quickly and responsively.

This entails a swift response to customer needs and requests, as well as providing clear information and actions that benefit the customers (Line et al., 2020). Responsiveness reflects the extent to which a company cares about its customers and how much it endeavors to assist customers in resolving their problems or requests. This caring aspect plays a vital role in enhancing customer satisfaction, as when a company demonstrates that they care about their customers, customers tend to feel valued and well-served. Responsiveness is a key element in creating a positive customer experience and enhancing their satisfaction levels with the service provided by the company (Stein & Ramaseshan, 2016). Empathy is an individual's ability to sense the feelings and emotions of others and the ability to understand and imagine themselves in someone else's situation. This includes sympathy, attention, and the ability to sense another person's personal world genuinely and sensitively. Empathy involves the capacity to put oneself in the shoes of another and truly understand their emotions and experiences.

In the context of customer service, empathy is highly important because it reflects the ability of the staff and the company to understand the specific needs and desires of customers (Clark et al., 2013). When a company shows empathy toward its customers, they tend to feel valued and well-listened to. This can help enhance customer satisfaction levels and build better relationships between customers and the company. Empathy is one of the key elements that create good service quality. In the context of container loading and unloading, the process involves a series of activities, including preparing, lifting, landing, and releasing goods to or from the ship. There are various ways to perform container loading and unloading, including using ship's cranes, quay-side cranes, or vehicles like lorries to load and unload containers. Moreover, various equipment is used in the container loading and unloading process, such as gantry cranes, rubber-tired yard gantry cranes, rail-mounted yard gantry cranes, straddle carriers, head trucks, and chassis, top loaders, forklifts, and side loaders. All these pieces of equipment serve to facilitate and expedite the container loading and unloading process at container ports. A solid understanding of this equipment and processes is crucial to ensure efficiency and safety in container loading and unloading operations.

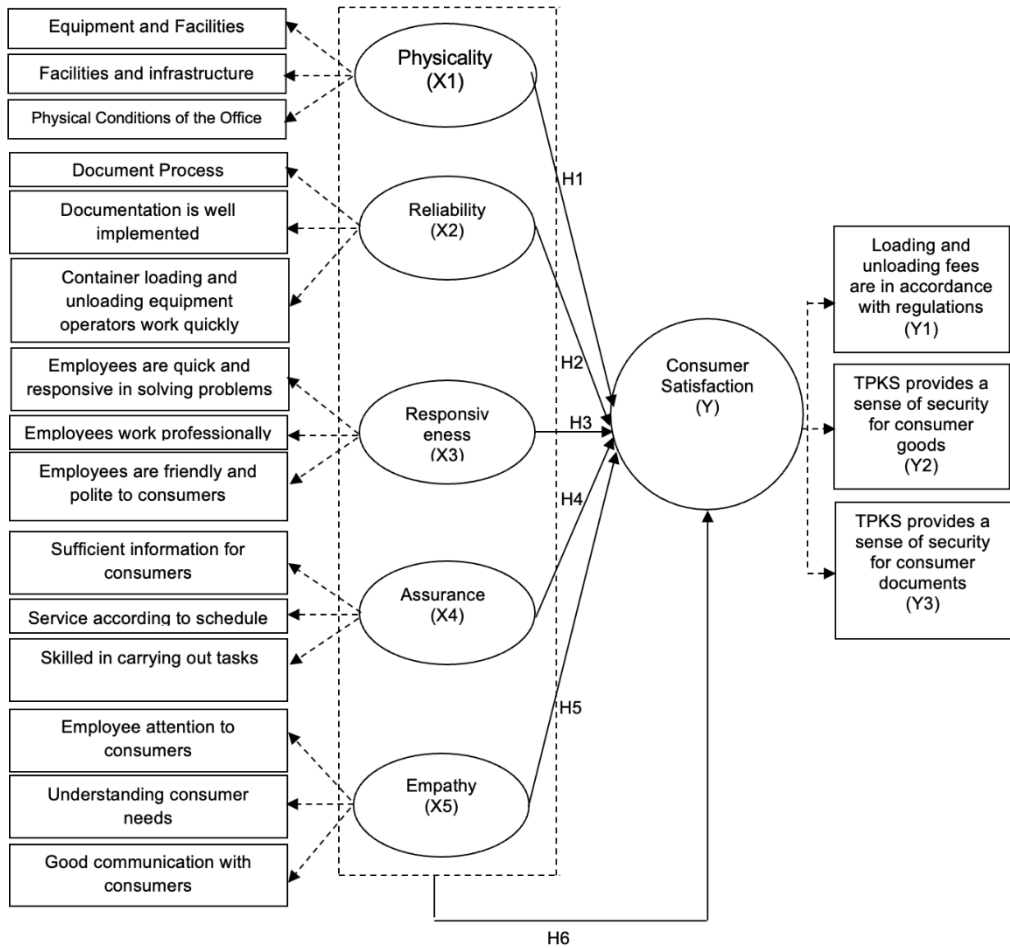


Figure 1. Research Framework

H1. Physicality has a positive and significant influence on consumer satisfaction

H2. Reliability has a positive and significant effect on consumer satisfaction.

H3. Responsiveness has a positive and significant effect on consumer satisfaction

H4. Assurance has a positive and significant effect on consumer satisfaction

H5. Empathy has a positive and significant effect on consumer satisfaction

H6. Physicality, reliability, responsiveness, assurance, and empathy simultaneously have a positive and significant effect on consumer satisfaction

3. Research methods

The population for this study comprises users of TPKS, including import, export, and local transactions, who have been involved in these activities over the last three months from April to June 2023. The sample size used in this study was determined to be 72 respondents to facilitate

the research process. Regarding the data types, two main categories are identified: qualitative and quantitative data. Qualitative data involves information that is categorized and described, often in the form of textual descriptions. On the other hand, quantitative data comprises numerical measurements that can be statistically analyzed. In this study, the measurement of variables was conducted using a Likert Scale, which is a widely accepted method for assessing specific social phenomena, such as attitudes, opinions, and perceptions. Respondents' qualitative responses were transformed into quantitative data, and each item on the instrument was scored on a scale of 1 to 5, representing varying degrees of agreement or disagreement.

The data collection methods employed in this research encompass questionnaires, interviews, direct observations, a comprehensive review of existing literature, and documentation. Questionnaires were systematically distributed to 72 respondents. Interviews were conducted formally with both TPKS employees and container owners. Direct observations were utilized to gather real-time data on container loading and unloading activities at TPKS. The literature review involved consulting a wide range of books, articles from relevant journals, internet resources, and other publications to provide the theoretical foundation for the study. Additionally, documentation was used as a method to gather data from documents available in libraries or at the research site.

4. Results and Discussion

The validity test is a crucial step in this research to ensure that the measurement tool used can measure the concept of phenomena or events that correspond to the variable under investigation. The construct validity of all concepts used in this research has been tested. The results of this validity test measure the extent to which the measured concept aligns with the variable under investigation and is relevant in the research context. High validity will ensure that the measurement tool genuinely measures what should be measured, and the findings of this research can be relied upon.

Table 1. Validity Test Results

| No | Variable | . R count | . R table | Confirmation |
|----|----------------------------------|-----------|-----------|--------------|
| 1. | Physicality (x ₁) | | | |
| | X _{1.1} | 0.756 | 0.232 | Valid |
| | X _{1.2} | 0.883 | 0.232 | Valid |
| | X _{1.3} | 0.726 | 0.232 | Valid |
| 2. | Reliability (x ₂) | | | |
| | X _{2.1} | 0.682 | 0.232 | Valid |
| | X _{2.2} | 0.826 | 0.232 | Valid |
| | X _{2.3} | 0.774 | 0.232 | Valid |
| 3. | Responsiveness (x ₃) | | | |
| | X _{3.1} | 0.782 | 0.232 | Valid |
| | X _{3.2} | 0.738 | 0.232 | Valid |
| | X _{3.3} | 0.791 | 0.232 | Valid |
| 4. | Assurance (x ₄) | | | |
| | X _{4.1} | 0.920 | 0.232 | Valid |
| | X _{4.2} | 0.656 | 0.232 | Valid |
| | X _{4.3} | 0.937 | 0.232 | Valid |

| No | Variable | . R count | . R table | Confirmation |
|----|---------------------------|-----------|-----------|--------------|
| 5. | Empty (x ₅) | | | |
| | X _{5.1} | 0.690 | 0.232 | Valid |
| | X _{5.2} | 0.731 | 0.232 | Valid |
| | X _{5.3} | 0.848 | 0.232 | Valid |
| 6. | Consumer satisfaction (y) | | | |
| | Y _{1.1} | 0.795 | 0.232 | Valid |
| | Y _{1.2} | 0.808 | 0.232 | Valid |
| | Y _{1.3} | 0.651 | 0.232 | Valid |

Based on Table 1, it can be explained that all research indicators used to measure variables have a correlation coefficient that is greater than table ($r_{table} n = 72$ is 0.232). Detection of multicollinearity can be explained by the VIF and Tolerance values from the regression test results, guidelines for a regression model that is free of multicollinearity.

Table 2. Reliability Test Results

| Variable | Alpha Coefficient | Confirmation |
|----------------------------------|-------------------|--------------|
| Physicality (X ₁) | 0.293 | 3.413 |
| Reliability (X ₂) | 0.393 | 2.547 |
| Responsiveness (X ₃) | 0.339 | 2.949 |
| Assurance (X ₄) | 0.563 | 1.776 |
| Empathy (X ₅) | 0.553 | 1.808 |

Table 2 reveals that each research variable has a substantial Alpha coefficient, exceeding 0.6. Consequently, it can be concluded that all the concepts used to measure the variables in the questionnaire are reliable, and statistical testing can proceed.

Table 3. Regression Test Results

| Variable | Regression coefficient | t count | Sig | Confirmation |
|-------------------|------------------------|---------|-------|--------------|
| Constant | -0.579 | | | |
| Physique | 0.304 | 3.789 | 0.000 | significant |
| Reliability | 0.159 | 2.280 | 0.026 | significant |
| Responsiveness | 0.236 | 2.941 | 0.005 | significant |
| Assurance | 0.225 | 3.962 | 0.000 | significant |
| Empathy | 0.132 | 2.040 | 0.045 | significant |
| R | 0.923 | | | |
| R square | 0.852 | | | |
| F count | 76.133 | | | |
| Significance of F | 0.000 | | | |

Table 4. Simultaneous test testing

| ANOVA ^b | | | | | |
|------------------------------|----------------|----|-------------|--------|-------------------|
| Model | Sum of Squares | Df | Mean Square | F | Sig |
| Regression | 140.146 | 5 | 28.029 | 76.133 | .000 ^a |
| Residual | 24.299 | 66 | .368 | | |
| Total | 164.444 | 71 | | | |
| <i>a. Dependent variable</i> | | | | | |
| <i>b. Predictors</i> | | | | | |

Based on primary data and the results of multiple linear regression model processing using the statistical tool SPSS Ver. 16.0, the calculations below were obtained:

$$Y = -0,579 + 0,304.X_1 + 0,159.X_2 + 0,236.X_3 + 0,225.X_4 + 0,132.X_5 + \mu$$

From the equation, it can be explained that the presence of independent variables influences the dependent variable. This assumption holds for several variables, including physicality, reliability, responsiveness, assurance, and empathy towards the satisfaction of container loading and unloading service consumers. Partial and simultaneous statistical testing carried out supports the hypotheses presented in this research. The variables, both individually and collectively (simultaneously), have a positive and significant impact on customer satisfaction. These findings are in line with previous research demonstrating the influence of these variables on customer satisfaction.

Statistical testing for the physicality variable (X1) yields a t-value of 3.789, indicating a positive and significant influence on customer satisfaction. The physicality variable stands out as the most significant factor among the five variables, drawing attention and affecting customer satisfaction. Empirical data support the evidence that the physicality variable is the second most influential factor in customer satisfaction, corroborating previous research by Aimesheva (2016).

Testing for the reliability variable (X2) results in a t-value of 2.280, signifying a positive and significant influence on customer satisfaction. Reliability is the second most influential variable among the five studied, capturing attention and impacting customer satisfaction. Empirical data support the notion that reliability is the fourth most influential factor in customer satisfaction. This is in line with previous research by Barusman (2019), which emphasizes that reliability serves as a foundational element in ensuring customer contentment. When a business consistently delivers dependable products or services, it builds trust, reduces uncertainty, and fosters a consistent and positive customer experience. This, in turn, leads to increased customer satisfaction, enhances loyalty, and contributes to a positive reputation.

Statistical analysis of the responsiveness variable (X3) reveals a t-value of 2.941, indicating a positive and significant impact on customer satisfaction. Responsiveness is the third most influential variable among the five, garnering attention and influencing customer satisfaction. Data from previous studies (Meesala & Paul, 2018) further support the assertion that responsiveness is an influential factor in customer satisfaction. Examination of the assurance variable (X4) produces a t-value of 3.962, showing a positive and significant impact on customer satisfaction. It is the most influential factor among the five variables, positively and significantly

affecting customer satisfaction. This implies that assurance significantly influences customer satisfaction (Hung et al., 2019).

The influence of the empathy variable (X5) on customer satisfaction is the fifth most influential factor. Satisfactory service standards, meticulous documentation, and straightforward service procedures determine the extent of customer satisfaction. If all five research variables are handled well, customer satisfaction can be achieved. Previous research (Hwang & Kim, 2018) indicates a positive and significant influence of empathy on customer satisfaction. Meanwhile, the coefficient of determination (R²) shows an R-square value of 0.852, meaning that 85.2% of customer satisfaction is influenced by the variable's physicality, reliability, responsiveness, assurance, and empathy. The remaining 14.8% of customer satisfaction is affected by other variables.

5. Conclusion

Physicality, reliability, responsiveness, assurance, and empathy have a positive and significant effect on consumer satisfaction in container loading and unloading services at TPKS. The analysis results show that these aspects play a vital role in creating a positive experience for consumers who use container loading and unloading services at TPKS. Additionally, when considered collectively, these variables also simultaneously exhibit a positive and significant influence on consumer satisfaction. The coefficient of determination (R²) of 0.852 indicates that 85.2% of the variation in consumer satisfaction with container loading and unloading can be explained by the variables examined in this study. This suggests that the mentioned factors make a substantial contribution to shaping consumer satisfaction. However, approximately 14.8% of other variations in consumer satisfaction remain unexplained by these factors, which may be attributed to unexamined variables. Therefore, the research results provide a robust understanding of the factors influencing consumer satisfaction in container loading and unloading services, and managerial recommendations can be focused on improving service quality through these variables.

Based on the conclusions drawn from this research, certain recommendations are put forward. To achieve optimal results for container loading and unloading services, it is advised that TPKS provides services with precision as promised. Moreover, it is recommended that the Container Terminal enhances its professionalism in assisting and providing responsive, consumer-oriented services by delivering clear information to prevent unexpected costs.

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