

Assessing Port Service Quality on Customer Satisfaction: A Study of Dar Es Salaam Seaport, Tanzania

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Abstract — This study assesses the relationship between port service quality and customer satisfaction at Dar es Salaam Seaport, Tanzania. It focuses on three key variables of service quality, namely process, resource, and outcomes. The study employs a cross-sectional research design and adopts a quantitative research approach to collect and analyze data. A total of 201 respondents, comprising Clearing and Forwarding Agents and Shipping Agents, were selected using stratified random sampling to ensure proportional representation of participants. Data were gathered through structured questionnaires consisting of closed-ended questions measured on a 5-point Likert scale to facilitate statistical analysis. It applied the ROPMIS model as the theoretical framework to analyze how each variable of port service quality contributes to customer satisfaction. Descriptive statistics and multiple regression analysis were used to analyze the data. The findings revealed that all three variables, process, resources, and outcomes, had a positive and statistically significant influence on customer satisfaction. Among the three, outcomes had the strongest effect, followed by resource and process variables. Respondents identified challenges such as outdated infrastructure, slow cargo handling processes, and inadequate communication as key issues affecting satisfaction. The study concludes that improving service quality in terms of infrastructure, operational efficiency, and service consistency is essential for enhancing customer satisfaction at the port. Further research is recommended to compare customer satisfaction across Tanzanian ports, investigate the impact of digital technologies and pricing policies on service quality, and conduct qualitative studies with port staff to better understand internal operational challenges.

Keywords — Port Service Quality, Customer Satisfaction, Process, Resource, Outcomes

I. INTRODUCTION

Ports are essential nodes in global trade, managing approximately 80% of international trade by volume and over 70% by value (UNCTAD, 2022). Globally, over 4,900 ports exist, with major ports like Shanghai processing over 47 million TEUs annually (World Bank, 2023). In Africa, ports handle about 90% of international trade; for instance, the Port of Dar es Salaam handles approximately 18 million metric tons of cargo annually and serves as a gateway for landlocked countries (TPA, 2022; Drewry, 2023). It manages about 95% of Tanzania's international trade, featuring 11 berths and handling both containerized and liquid bulk cargo (Africa Ports, 2024). Service quality in seaports significantly influences customer satisfaction. Key dimensions include logistics systems, service charges, and government regulations (Duc *et al.*, 2020). Onyemечи *et al.* (2017) highlight the positive correlation between service quality and port performance. To remain competitive, ports must invest in service quality management to align with evolving customer expectations (Nguyen & Trans, 2020). Studies on Singapore's port illustrate that operational efficiency, modern infrastructure, and technological innovations contribute to high customer satisfaction (Thai, 2016; Mabasa & Ncube, 2022).

In Africa, ports like Mombasa and Durban have improved competitiveness through enhanced customer service and infrastructure investment (Amoako & Daniels, 2020; Mabasa & Ncube, 2022). However, limited research exists on Tanzania's Dar es Salaam port regarding service quality and customer satisfaction. Challenges such as port congestion, slow cargo handling, and unresponsive customer service remain prevalent (Monyau & Bandara, 2021; Mwendapole *et al.*, 2023). This study utilizes the ROPMIS model (Thai, 2008), focusing on resources, outcomes, and process, to assess the impact of port service quality on customer satisfaction at Dar es Salaam Seaport. A more comprehensive understanding of customer perceptions is essential

to inform strategic service quality improvements and enhance the port's competitiveness in the regional maritime sector.

II. LITERATURE REVIEW

Theoretical review

ROPMIS Model

The ROPMIS Model, an acronym for Resources, Outcomes, Process, Management, Image, and Social Responsibility, serves as a comprehensive framework for evaluating service quality within maritime transport sectors, including seaports. Developed by Thai (2008), the model posits that customer satisfaction is influenced by six critical dimensions.

The first dimension, Resources, encompasses the physical and financial assets of a port, such as infrastructure, equipment, and location advantages. Outcomes refer to the effectiveness of services provided, including key performance indicators like on-time delivery and service reliability. The Process dimension involves the efficiency and customer-friendliness of operational procedures, ensuring smooth interactions between port staff and customers. Management examines the strategic and operational oversight exercised by port authorities, with a focus on leadership and decision-making efficacy. The Image dimension relates to the port's reputation and public perception, which significantly influence customer trust and preference. Lastly, Social Responsibility considers the port's commitment to ethical practices and contributions to societal well-being.

ROPMIS Model asserts that these six dimensions collectively determine the quality of port services, thereby directly impacting customer satisfaction. Empirical studies have applied this model to assess service quality in various port contexts. For instance, Phan et al. (2021) utilized the ROPMIS framework to evaluate port service quality in Vietnam, identifying a positive correlation between service quality dimensions and customer satisfaction. Similarly, a study by Chang and Thai (2016) applied the model to Singapore's port sector, confirming that enhancements in the identified dimensions led to increased customer satisfaction.

ROPMIS Model offers a structured approach to analyzing factors affecting customer satisfaction. Through examining resource availability, service outcomes, and process efficiency components of the model this study aims to identify areas for improvement. Also, assessing the management strategies, public image, and social responsibility initiatives of the port will provide a holistic understanding of how these dimensions influence customer perceptions and satisfaction levels. Applying the ROPMIS framework in this study facilitates targeted recommendations to enhance service quality and customer satisfaction at Dar es Salaam Seaport.

Empirical Review

Resource and customer satisfaction

Phan et al. (2021), using structural equation modelling (SEM) on data from Vietnamese container ports, found that the adequacy of port infrastructure and human resources positively influenced service efficiency and reliability, thereby enhancing customer satisfaction. Similarly, Yeo et al. (2015), through factor analysis and regression modelling in Korean ports, concluded that port infrastructure, cargo handling equipment, and workforce efficiency were key determinants of service quality and customer satisfaction. In the context of Zanzibar, Ramadhan (2023) demonstrated that financial resources, skilled labour, and modern infrastructure significantly improved the implementation and performance of seaport development projects, offering insights applicable to Tanzanian seaports due to their shared regional context. Chang and Thai (2016), in a study on Taiwanese ports using SEM, emphasized the importance of advanced security infrastructure and trained personnel in building customer trust and satisfaction through enhanced service reliability. Additionally, Mireles (2020), through econometric regression analysis in Mexican seaports, revealed that infrastructure quality, operational efficiency, and workforce competence are foundational to achieving high service quality and customer satisfaction.

Process and customer satisfaction

Mwendapole and Jin (2021), using a mixed-methods approach, identified that inefficiencies in logistics, cargo handling, and customs clearance negatively affect customer satisfaction. However, their study did not describe which specific processes most significantly contribute to satisfaction among distinct stakeholder groups. Expanding on this, Mwendapole et al. (2023), through a SERVQUAL-based quantitative study, confirmed that dimensions such as timeliness, communication, and operational responsiveness are critical to service quality.

However, the study did not explore the underlying causes of service inefficiencies, thus leaving a gap in understanding how these inefficiencies affect satisfaction at a granular level. Stephen (2024) employed performance metrics and surveys to analyze operational efficiency at the Dar es Salaam Port Terminal. The findings revealed that cargo handling speed, staff responsiveness, and infrastructure adequacy significantly influenced customer satisfaction. Still, the study did not comprehensively address how these factors vary across stakeholder roles or service categories. In an earlier study, Masangya (2008) identified systemic constraints such as inadequate equipment and limited ICT adoption as barriers to service efficiency. Despite finding high satisfaction in safety and employee conduct, the study primarily relied on descriptive statistics and did not delve into the interrelationships between service efficiency and satisfaction dimensions.

Outcomes and customer satisfaction

Thai (2016), through structural equation modeling (SEM) in Singapore's seaport context, found that modern infrastructure, skilled labor, and responsive operations significantly improved service outcomes, which in turn enhanced customer satisfaction. Similarly, Le et al. (2020), in a study of Vietnamese ports, demonstrated that timely cargo handling and effective communication as part of service outcomes positively affected customer satisfaction. Both studies emphasize the mediating role of efficient service delivery, though they were conducted in Asian port environments, which may differ significantly from Tanzanian operational realities. Basir et al. (2015) analyzed marine transportation services and concluded that high-quality service outcomes, customer-centric orientation, and competitive pricing directly influenced both customer satisfaction and loyalty. While informative, this study focused on marine transportation more broadly and not specifically on seaport operations. Kusumawati and Sri Rahayu (2020) further expanded the understanding by linking experience quality, including service efficiency and interpersonal interactions to increased customer satisfaction and loyalty. However, their findings, grounded in a different service and cultural context, may not fully translate to Tanzanian seaport operations. Likewise, Hirata (2019) affirmed the importance of reliability, speed, and efficiency in container liner shipping, reinforcing the broader applicability of these service outcome variables to customer satisfaction.

Conceptual Framework

The conceptual framework of this study proposed port service quality (outcomes, process, and resource) as independent variables and customer satisfaction as the dependent variable. This study selected Resources, Outcomes, and Process from the ROPMIS model to assess port service quality (PSQ) on customer satisfaction at the Dar es Salaam Seaport due to their direct relevance to operational efficiency, practical applicability, and empirical support. The findings from previous research demonstrate that using selected variables of the ROPMIS model rather than all six can still effectively measure port service quality (PSQ) on customer satisfaction.

For instance, Farahani (2019) examined five out of the six dimensions, excluding social responsibility, and found that these selected variables significantly influenced customer satisfaction at Dar es Salaam Port. This supports the argument that analyzing only a subset of the ROPMIS model can yield meaningful understandings. Similarly, Jasmin (2011) applied the ROPMIS framework to Sabah Port, Malaysia, but focused only on port users' experience, demonstrating that different variables can be emphasized based on the study's context. Also, Mermertaş (2024) investigated service quality at Mersin International Port, selecting only Reputation, Social Responsibility, and Management, showing that not all six variables were necessary to assess service quality effectively.

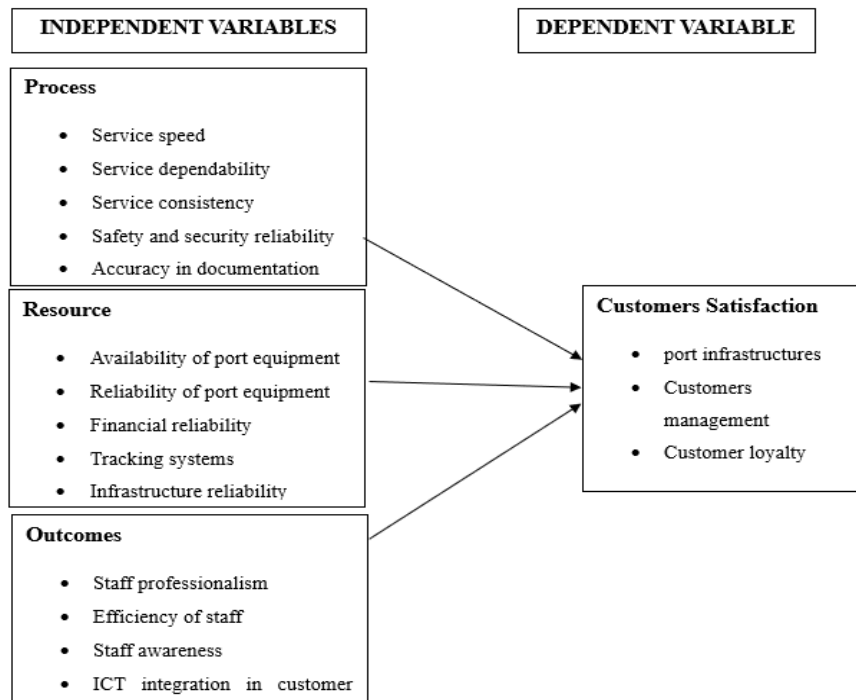


Figure 1: Conceptual framework of the study

Source: researcher 2025

III.METHOD

This study adopted a positivist research philosophy, which is grounded in the belief that knowledge is derived from objective, observable, and measurable phenomena. Positivism facilitates the use of quantitative methods to test hypotheses and draw conclusions based on empirical evidence (Saunders & Thornhill, 2019). The choice of this philosophy aligns with the study's aim to scientifically evaluate the relationship between port service quality and customer satisfaction using measurable data (Iovino & Tsitsianis, 2020). Accordingly, a deductive research approach was employed. The study utilized a survey strategy, which provided a structured and standardized means of collecting data from a large population, enhancing reliability and applicability. This method was instrumental in capturing quantifiable information on customer satisfaction across various dimensions of service quality at the Dar es Salaam Seaport (Bryman, 2016). A cross-sectional research design supported this strategy by allowing data to be collected at a single point in time, thereby facilitating the identification of patterns and relationships without manipulating variables (Cresswell, 2013). This design was particularly suitable for analyzing the relationship between service quality and customer satisfaction within a real-time operational context.

The research was conducted at Dar es Salaam Seaport, the largest port in Tanzania and a central hub for international trade. The target population consisted of 1,184 licensed Clearing and Forwarding Agents and Shipping Agents, as reported by TASAC (2023). These stakeholders were selected for their direct engagement with port services, making their insights critical to the assessment. A stratified random sampling method was employed to ensure proportional representation of each group, followed by simple random sampling within each stratum. This combination of probability-based sampling techniques ensured a representative and unbiased selection of participants, thereby improving the generalizability and accuracy of the findings (Saunders et al., 2019). To determine an appropriate sample size from the target population of 1,184 individuals, a Yamane's formula (1967) was used

$$n = \frac{N}{1 + Ne^2}$$

Where:

n = sample size

N = population size (1,184)

e = margin of error (0.05 for 95% confidence level)

Primary data were collected through structured questionnaires based on a 5-point Likert scale, chosen for its ability to capture respondent opinions clearly while minimizing reasoning difficulty. The questionnaire was designed to ensure clarity, consistency, and ease of response, thereby enhancing data reliability. It was organized into sections addressing key variables such as resources, service outcomes, process efficiency, and overall customer satisfaction. This method enabled standardized responses, making the data appropriate for statistical analysis. The IBM SPSS software version 27 was used in this study to analyze the quantitative data, and the descriptive analysis method was used. Multiple regression analysis was employed to examine whether there was a positive or negative relationship between the dependent and independent variables. The study model was described as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where,

Y = Customer Satisfaction

X_1 = Resource

X_2 = Outcomes

X_3 = Process

ε = Error term

$\beta_0, \beta_1, \beta_2$ and β_3 these are corresponding coefficients

IV. RESULT AND DISCUSSION

A. Result

Process and customer satisfaction

This was the first objective of this research, which intended to examine how the execution of port services influences customer satisfaction at Dar es Salaam Seaport. The researcher aimed to determine whether port staff demonstrate professional behaviour, respond promptly to customer inquiries, understand customer needs, and whether ICT tools are effectively used in handling customer service processes. The responses of the respondents in relation to these aspects are presented hereunder. As stated earlier, in the first question, the respondents were asked whether the port staff demonstrate professional attitude and behaviour in delivering services. The analysis showed that (16.4%) of the respondents strongly agreed, (26.9%) agreed, (16.4%) were neutral, (24.4%) disagreed, and (15.9%) strongly disagreed with the statement. In another question, the respondents were asked whether port staff respond promptly to customer inquiries and requests. The analysis revealed that (14.4%) of the respondents strongly agreed, (29.9%) agreed, (16.4%) were neutral, (25.9%) disagreed, and (13.4%) strongly disagreed. Furthermore, respondents were asked whether the port staff understand customer needs. The findings showed that (14.4%) strongly agreed, (29.4%) agreed, (19.4%) were neutral, (20.9%) disagreed, and (15.9%) strongly disagreed. Lastly, the respondents were asked if ICT is effectively used in handling customer service activities. The results indicated that (21.9%) of the respondents strongly agreed, (26.9%) agreed, (15.9%) were neutral, (15.9%) disagreed, and (16.9%) strongly disagreed. These results suggest that while a percentage of respondents acknowledge positive aspects of service delivery, there remain significant areas requiring improvement to ensure consistent customer satisfaction at Dar es Salaam Seaport.

Table 1: Process and customer satisfaction

Statement	1(%)	2(%)	3(%)	4(%)	5(%)
The staff in the port always demonstrate professional attitude and behavior in meeting client requirements.	15.9	24.4	16.4	26.9	16.4
The staff in the port consistently respond promptly to enquiries and requests.	13.4	25.9	16.4	29.9	14.4
The staff in the port consistently demonstrate a clear understanding of client needs and requirements	15.9	20.9	19.4	29.4	14.4
The level of ICT applications in customer service at the port is comprehensive.	16.9	15.9	18.4	26.9	21.9

1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree

Resources and customer satisfaction

The second objective of this study was to assess the quality of port superstructure in supporting operational needs at the Dar es Salaam Port. Respondents were asked about the availability, modernity, and functionality of port equipment and facilities, service efficiency, shipment tracking capabilities, and the state of physical

infrastructure. The findings reflect moderate satisfaction with the current superstructure conditions, with a majority expressing agreement to some extent on most aspects. 27.9% agreed and 18.9% strongly agreed that the port had available equipment and facilities to meet operational needs, while 20.9% remained neutral. For the statement regarding modern and functional equipment, 30.8% agreed and 13.9% strongly agreed, whereas 26.4% disagreed. On service quality, 32.3% agreed and 20.9% strongly agreed, while 13.9% strongly disagreed. Regarding shipment tracking capability, 33.8% agreed and 22.4% strongly agreed, showing relatively high satisfaction. Lastly, 27.4% agreed and 19.4% strongly agreed that the port has well-developed physical infrastructure. These results suggest that while there is reasonable satisfaction with the port superstructure, further improvements are necessary to enhance overall operational performance.

Table 2: Resources and customer satisfaction

Statement	1(%)	2(%)	3(%)	4(%)	5(%)
The port had available equipment and facilities to meet the required operational needs.	11.4	20.9	20.9	27.9	18.9
The port has equipment and facilities that are up-to-date and consistently function properly.	12.4	26.4	16.4	30.8	13.9
The port provides high-quality and efficient services.	13.9	20.4	12.4	32.3	20.9
The port has a highly effective shipment track and trace capability.	13.4	21.9	8.5	33.8	22.4
The port has well-developed physical infrastructure	13.9	22.4	16.9	27.4	19.4

1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree

Outcomes and customer satisfaction

This was the third objective of this research, which intended to assess how outcomes-related indicators of port service quality influence customer satisfaction at Dar es Salaam Seaport. The researcher wanted to determine whether actual service delivery results, such as timeliness of service completion, accuracy of documentation, reliability of cargo handling, and service effectiveness, have a direct impact on how customers perceive the port's services. The aim was to examine whether satisfactory service outcomes contribute to an enhanced customer experience and a higher level of satisfaction. The responses of the respondents in relation to these questions are presented hereunder.

In the first question, respondents were asked if the port provides fast service. The analysis showed that (13.4%) of the respondents strongly disagreed, (23.4%) disagreed, (20.4%) were neutral, (24.9%) agreed, and (17.9%) strongly agreed. In another question, respondents were asked if the port provides service in a reliable manner. The analysis revealed that (19.4%) of the respondents strongly disagreed, (15.9%) disagreed, (13.9%) were neutral, (29.9%) agreed, and (20.9%) strongly agreed. Respondents were also asked if the port provides services in a consistent manner. The analysis showed that (13.4%) strongly disagreed, (21.9%) disagreed, (15.9%) were neutral, (27.9%) agreed, and (20.9%) strongly agreed. This implies that while many users acknowledge service consistency, improvements are still necessary to achieve uniform satisfaction.

On the aspect of safety and security for ships and shipments, the analysis indicated that (13.4%) strongly disagreed, (21.9%) disagreed, (14.4%) were neutral, (31.8%) agreed, and (18.4%) strongly agreed. This shows that the port's safety measures are fairly well regarded, though not unanimously accepted by all respondents.

Lastly, respondents were asked if the port provides error-free invoices and related documents. The analysis showed that (13.9%) strongly disagreed, (21.4%) disagreed, (15.9%) were neutral, (28.9%) agreed, and (19.9%) strongly agreed. This reflects moderate satisfaction with administrative accuracy, although some customers still report issues. Overall, the findings indicate that while many respondents are satisfied with service outcomes mostly in reliability, safety, and documentation accuracy, there remains a significant percentage who perceive inadequacies, highlighting the need for continuous operational improvements at Dar es Salaam Seaport.

Table 3: Outcomes and customer satisfaction

Statements	1(%)	2(%)	3(%)	4(%)	5(%)
The port provides fast service	13.4	23.4	20.4	24.9	17.9
The port that provides service in a reliable manner	19.4	15.9	13.9	29.9	20.9
The port provide service in a consistent manner	13.4	21.9	15.9	27.9	20.9
The port ensures safety and security for ships and shipments.	13.4	21.9	14.4	31.8	18.4
The port that error- free invoice and related documents	13.9	21.4	15.9	28.9	19.9

1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree

Modal Summary

The model summary in Table 4 shows a strong positive relationship between process-related, resource-related, and outcomes-related service quality factors and customer satisfaction at Dar es Salaam Seaport. With an R^2 of 0.505, about 50.5% of the variation in customer satisfaction is explained by these factors. The adjusted R^2 of 0.498 confirms the model's robustness, while an R value of 0.711 shows a substantial correlation. The standard error of 0.71560 indicates reasonable prediction accuracy, confirming that these service quality dimensions are significant determinants of customer satisfaction in port operations.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.711 ^a	.505	.498	.71560

Analysis of variance (ANOVA)

The ANOVA results in Table 5 confirm that the regression model is statistically significant in explaining variations in customer satisfaction at Dar es Salaam Seaport. The F-value of 67.054 with a p-value of 0.000 ($p < 0.05$) indicates that process-related, resource-related, and outcomes-related factors significantly predict customer satisfaction. The total sum of squares (203.891), comprising regression (103.011) and residual (100.879) components, shows that a substantial portion of the variability in customer satisfaction is explained by the model.

Table 5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	103.011	3	34.337	67.054	.000 ^b
	Residual	100.879	197	.512		
	Total	203.891	200			

Coefficients

The results in the coefficients Table 4 provide important insights into the individual effects of each independent variable resources-related, outcomes-related, and process-on customer satisfaction, based on the multiple regression model:

$$\text{Customer Satisfaction} = -0.411 + 0.389(\text{Resources}) + 0.464(\text{Outcomes}) + 0.265(\text{Process})$$

The constant (intercept) is -0.411, which is not statistically significant ($p = 0.127$), indicating that in the absence of all predictors, the model's estimate of customer satisfaction is not different from zero in a meaningful way.

The resources-related service quality variable has an unstandardized coefficient (B) of 0.389, with a p-value of 0.000, suggesting a positive and statistically significant effect on customer satisfaction. This implies that for every one-unit increase in the resources-related quality score, customer satisfaction increases by 0.389 units, holding other factors constant.

The outcomes-related service quality variable has the highest coefficient ($B = 0.464$) and standardized coefficient (Beta = 0.508), with a highly significant p-value of 0.000. This indicates that outcomes-related quality has the strongest positive influence on customer satisfaction among the three predictors.

The process-related service quality also shows a positive and significant relationship, with a coefficient of 0.265 and p-value of 0.000, indicating that improvements in service delivery processes contribute meaningfully to enhancing customer satisfaction.

All independent variables significantly and positively influence customer satisfaction, with outcomes-related service quality exerting the strongest effect, followed by resources-related, and then process-related service quality. These results highlight the importance of focusing on reliable service outcomes, adequate resources, and efficient processes to enhance customer satisfaction at Dar es Salaam Seaport.

Table 6: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.411	.268		-1.531	.127
	Resources	.389	.062	.313	6.240	.000
	Outcomes	.464	.048	.508	9.688	.000
	Process	.265	.055	.252	4.794	.000

B. Discussions

Process-and customer satisfaction

The findings of this study indicated that process-has a positive and statistically significant effect on customer satisfaction at Dar es Salaam Seaport, with a standardized regression coefficient of $\beta = 0.265$ and $p < 0.001$. This suggests that improvements in service processes such as staff responsiveness, professionalism, ICT application, and service timeliness enhance customer satisfaction. These results were aligned with existing literature that emphasizes the role of operational processes in shaping user perceptions of port service quality.

Mwendapole and Jin (2021) found that process efficiency in cargo handling, customs clearance, and general port operations significantly affects customer satisfaction at Dar es Salaam Seaport. They noted that operational delays and infrastructure limitations negatively impact the customer satisfactions, emphasizing the need for efficiency in procedural flows.

Mwendapole et al. (2023) applied the SERVQUAL model to compare service quality in major African ports and confirmed that process variables such as responsiveness, reliability, and empathy significantly influence customer satisfaction. Dar es Salaam Seaport was reported to face notable delays and operational inefficiencies, findings that align with this study's results. This study offers a more targeted analysis of how these service process inefficiencies directly relate to satisfaction within the specific context of Dar es Salaam's port users.

Stephen (2024) further confirmed the importance of service process efficiency by highlighting that the speed of cargo handling, responsiveness of staff, and infrastructure capacity are key determinants of customer satisfaction at the port terminal. He identified port congestion and delays as major challenges, findings which support this study's results and demonstrate that customer satisfaction is sensitive to process execution quality.

Similarly, Masangya (2008) emphasized that inefficiencies such as inadequate equipment and limited ICT usage lead to slower service delivery, while customers were more satisfied with security and employee cooperation. His study recommended investment in ICT and staff motivation, which aligns with this study's findings on improving staff responsiveness and professional conduct as part of process-related quality.

The study contributes to the literature by confirming that efficient service processes, including responsive staff behavior and effective use of technology, was a significant role in improving customer satisfaction. These findings highlight the need for targeted reforms in port service processes mostly in reducing delays, improving communication, and increasing ICT adoption to enhance the customer satisfactions at Dar es Salaam Seaport.

Resource-and customer satisfaction

The findings of this study showed that resource-significantly influences customer satisfaction at Dar es Salaam Seaport. Regression results showed that the resource-related variable had a positive and statistically significant effect on customer satisfaction ($\beta = 0.389$, $p < 0.001$), indicating that the availability and suitability of port infrastructure, equipment, and related resources helps in shaping users' satisfaction levels. This aligns with previous empirical literature, which has consistently highlighted the importance of resource quality in port service delivery.

Phan et al. (2021) found that in Vietnamese container ports, resource availability include infrastructure, equipment, and human resources was a key determinant of customer satisfaction by improving service efficiency and reliability. Although the context differs geographically, the consistency of results suggests that resource quality is universally significant to port performance. Similarly, Yeo et al. (2015), in their study of Korean container ports, reported that infrastructure and cargo handling equipment substantially contributed to customer satisfaction by enhancing operational efficiency. Both studies emphasize the global relevance of resource-related factors, despite contextual differences in regulatory environments and infrastructure development.

Ramadhan (2023), who studied seaport development projects in Zanzibar, provided findings that are more contextually comparable to this study. His study revealed that financial resources, skilled labor, and modern infrastructure significantly affected the success of port operations. These findings support this study's results and confirm the importance of investing in resource development within Tanzanian seaports to meet customer satisfactions.

Similarly, Chang and Thai (2016) emphasized the role of advanced infrastructure and trained personnel in strengthening service reliability and customer trust in Taiwanese ports. Although the study was conducted in East Asia, its findings highlight the broader applicability of resource-related service quality to customer satisfaction, supporting the significance of reliable, well-managed port resources.

Mireles (2020), in his study of Mexican seaports, found that resource elements such as port infrastructure and workforce quality contributed significantly to service quality and satisfaction, emphasizing that regardless of the regional context, resource availability is central to service performance outcomes.

The findings of this study are further supported by the ROPMIS model, which identifies resource input as foundational to operational efficiency and customer outcomes in port management information systems. According to this model, without adequate resource inputs, service delivery processes and customer satisfaction levels are likely to decline.

The findings from both this study and other literature demonstrates that resource-was a fundamental determinant of customer satisfaction. The results highlight the need for Tanzanian ports, especially Dar es Salaam Seaport, to enhance infrastructure, modernize equipment, and invest in human resources to ensure consistent and reliable service delivery that meets user satisfactions.

Outcomes-and customer satisfactions

The findings of the study revealed that outcomes-had the most significant and positive effect on customer satisfaction at Dar es Salaam Seaport. Regression analysis showed that the outcomes variable had the highest standardized coefficient ($\beta = 0.464$, $p < 0.001$), indicating that improvements in service outcomes strongly enhance the satisfaction of port users. This result aligns with previous empirical studies conducted in other global contexts.

For instance, Thai (2016), in a study on Singapore's seaports, found that service outcomes, including operational reliability, responsiveness, and efficiency, significantly contributed to customer satisfaction. Although Singapore has a highly developed port infrastructure, the principle remains applicable in Dar es Salaam, suggesting that efficient and reliable outcomes are universally valued by port users. Similarly, Le et al. (2020) in the Vietnamese port context demonstrated that timely cargo handling and effective service communication, as outcome variables, had a positive influence on customer satisfaction. This supports this study's findings and highlights the role of reliable logistics performance in improving service perceptions.

Furthermore, Basir et al. (2015) emphasized that service outcomes such as high quality, customer-oriented approaches, and competitive pricing significantly influence both satisfaction and loyalty in marine transport services. These findings support the idea that positive outcomes directly shape how users evaluate and continue using port services.

Kusumawati and Sri Rahayu (2020) also found that experience quality reflected in service efficiency, personalized service, and quality interaction positively affected satisfaction and loyalty. This finding aligns to those from Dar es Salaam, where outcome quality, such as timely and accurate service, directly affect customer satisfactions. Similarly, Hirata (2019) confirmed that in container liner shipping, service outcomes like reliability and speed are essential predictors of customer satisfaction, supporting the significance of delivering consistent and dependable services.

VI. CONCLUSIONS

The study reveals that despite efforts to enhance service quality at Dar es Salaam Seaport, customer satisfaction remains moderately low due to determined challenges in service delivery, including delays, limited staff responsiveness, outdated equipment, and inconsistent outcomes. While process-related, resource-related, and outcomes-related factors significantly influence satisfaction, their full potential is hindered by operational inefficiencies and resource constraints. Addressing these issues requires comprehensive reforms in efficiency, infrastructure investment, technological integration, and operational principles, supported by policy measures ensuring accountability and performance monitoring. Without such interventions, the port risks falling short of international standards and regional competitiveness.

Limitations and Recommendations for Future Research

Based on the limitations of this study, further research is recommended to compare customer satisfaction across different Tanzanian ports, such as Tanga and Mtwara, explore the impact of digital technologies on service quality, and examine the effect of pricing policies on customer satisfaction. Additionally, qualitative studies involving interviews with port staff and stakeholders may provide a deeper understanding of internal operational challenges.

ACKNOWLEDGMENT

I would like to express my sincere gratitude to my supervisor, Dr. Mary Mashoke (PhD), for her helpful guidance, encouragement, and positive feedback throughout the entire research process. Her expertise and support have been instrumental in shaping the quality and direction of this study.

I also extend my honest appreciation to my co-supervisor, Mr. Strimius Kahangwa, for his continuous support, understanding suggestions, and commitment in assisting me throughout the research journey. His contributions greatly enhanced the clarity and depth of my work.

Furthermore, I wish to thank the respondents, particularly the Clearing and Forwarding Agents and Shipping Agents at Dar es Salaam Seaport, for their willingness to participate in this study and for providing essential data that made this research possible.

Lastly, I am grateful to the National Institute of Transport for providing the academic environment and resources necessary for completing this research project.

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