
Operational Quality of Container Handling and Organizational Customers' Continuance Intention: The Mediating Role of Customer Satisfaction at Imam Khomeini Port

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Abstract

In the increasingly competitive landscape of global maritime logistics, the quality of port operations has become a critical determinant of customer retention and long-term collaboration. Among various operational activities, container loading and unloading processes play a central role in shaping port performance and influencing organizational customers' perceptions. This study examines the impact of operational quality in container handling on the continuance intention of organizational customers, with a particular focus on the mediating role of customer satisfaction.

Operational quality is conceptualized as a multidimensional construct comprising speed, accuracy, safety, and equipment availability. Data were collected from 108 organizational customers, including shipping lines, freight forwarders, and logistics service providers operating at Imam Khomeini Port. The proposed model was analyzed using partial least squares structural equation modeling (PLS-SEM) to assess both direct and indirect relationships among constructs.

The results indicate that operational quality has a significant positive effect on customer satisfaction ($\beta = 0.681$, $p < 0.001$), while customer satisfaction strongly influences continuance intention ($\beta = 0.634$, $p < 0.001$). In addition, operational quality exerts a direct effect on continuance intention ($\beta = 0.267$, $p = 0.003$). Mediation analysis confirms that customer satisfaction partially mediates the relationship between operational quality and continuance intention (indirect effect = 0.432, $p < 0.001$). The model explains 46.4% of the variance in customer satisfaction and 61.2% of the variance in continuance intention.

The findings suggest that efficiency-related dimensions, particularly speed and accuracy, play a dominant role in shaping customer evaluations, while safety and equipment readiness function as critical supporting factors. This study contributes to the literature by providing an operationally grounded framework that links measurable port performance attributes to customer behavioral outcomes. From a managerial perspective, the results emphasize the importance of improving operational efficiency, minimizing errors, and ensuring equipment reliability as strategic priorities for enhancing customer retention in port environments.

Keywords: Container handling operations; Operational quality; Customer satisfaction; Continuance intention; Organizational customers; Structural equation modeling; Port performance; Maritime logistics

1. Introduction

The rapid expansion of global trade and the increasing dominance of containerized transportation have fundamentally transformed the role of seaports from traditional cargo handling points into complex logistics hubs within integrated supply chains. In this evolving environment, port performance is no longer evaluated solely based on physical capacity or geographical advantage; instead, the quality of operational processes has emerged as a critical determinant of competitiveness and customer retention. In particular, container handling operations represent the core of terminal activities, directly influencing vessel turnaround time, logistics costs, and service reliability across the supply chain.

Within this context, operational quality in container terminals has gained increasing attention in both academic research and industry practice. Prior studies have consistently shown that factors such as operational efficiency, service reliability, and equipment performance significantly affect the overall performance of ports and the satisfaction of their users. For instance, productivity in loading and unloading operations has been identified as a key driver of user satisfaction and perceived service quality (Ricardianto et al., 2022). Similarly, the attributes of container terminal services, including timeliness, accuracy, and responsiveness, play a decisive role in shaping customer evaluations of port performance (Lu et al., 2011). From an economic perspective, ports must ensure high levels of operational efficiency and reliability to remain competitive in increasingly dynamic logistics environments (Talley, 2006).

In developing and emerging economies, where port infrastructure and operational systems are often under pressure from increasing demand, the importance of optimizing container handling operations becomes even more pronounced. Empirical evidence from Iranian ports suggests that operational factors such as loading and unloading speed, coordination among operational units, and equipment availability significantly influence port performance and logistics efficiency (Yousefi, 2021; Shafiee-Abadi et al., 2019). Moreover, inefficiencies in these processes can lead to delays, increased operational costs, and reduced attractiveness of ports for organizational customers, who typically operate under strict time and cost constraints.

Organizational customers, including shipping lines, freight forwarders, logistics companies, and import-export firms, represent the primary users of port services. Unlike individual customers, these entities make decisions based on multi-criteria evaluations that incorporate operational performance, service reliability, safety, and cost efficiency. Their continued cooperation with a port is therefore highly sensitive to the quality of operational experiences. Previous studies have demonstrated that service quality in ports significantly influences customer satisfaction, which in turn affects loyalty and future behavioral intentions (Hirata, 2019; Phan et al., 2021; Zhou & Suh, 2025). In particular, satisfaction has been identified as a key mediating mechanism through which service attributes translate into long-term customer relationships.

Despite the growing body of literature on port service quality, a critical gap remains in the explicit examination of operational quality at the process level, particularly in relation to container handling activities. Many existing studies adopt broad service quality frameworks or focus on generalized

dimensions such as SERVQUAL, which may not fully capture the technical and operational realities of container terminals. Furthermore, limited attention has been given to the direct linkage between operational quality and continuance intention of organizational customers, especially in the context of Iranian ports such as Imam Khomeini Port.

To address this gap, the present study develops an integrated framework that links operational quality of container handling processes to organizational customers' continuance intention through the mediating role of customer satisfaction. Operational quality is conceptualized as a multidimensional construct comprising speed, accuracy, safety, and equipment availability, reflecting the key operational attributes experienced by port users. By employing a structural equation modeling approach and relying on empirical data collected from organizational customers active in Imam Khomeini Port, this study aims to provide a robust and context-specific analysis of how operational performance translates into long-term customer relationships.

The contributions of this research are threefold. First, it advances the literature by operationalizing container handling quality through measurable operational dimensions rather than abstract service constructs. Second, it provides empirical evidence on the mediating role of customer satisfaction in port service environments, offering a more nuanced understanding of customer behavior. Third, it delivers practical insights for port managers by identifying the operational drivers that most significantly influence customer retention, thereby supporting more targeted and effective decision-making.

1. Introduction

The expansion of global trade and the rapid growth of containerized transportation have fundamentally reshaped the role of seaports within modern supply chains. Ports are no longer viewed as passive transfer points for cargo; rather, they function as dynamic logistics hubs where operational performance directly influences the efficiency, reliability, and competitiveness of entire supply networks. In this environment, the quality of operational processes, particularly in container terminals, has become a decisive factor in attracting and retaining organizational customers.

Among various port activities, container loading and unloading operations represent the core of terminal performance. These operations determine key performance indicators such as vessel turnaround time, cargo dwell time, and overall service reliability. Inefficiencies in these processes can disrupt supply chain flows, increase logistics costs, and reduce the attractiveness of a port for its users. Empirical studies have shown that operational factors, including speed of handling, coordination among operational units, and effective utilization of equipment, play a critical role in determining port performance and efficiency (Yousefi, 2021; Shafiee-Abadi et al., 2019). Furthermore, operational productivity has been identified as a key driver of service user satisfaction in port environments (Ricardianto et al., 2022).

In parallel, the concept of service quality has gained increasing attention in maritime logistics research. A substantial body of literature has demonstrated that port service quality significantly influences customer satisfaction and subsequent behavioral outcomes, including loyalty and repurchase intention (Hirata, 2019; Phan et al., 2021; Zhou & Suh, 2025). Studies focusing on container terminals have emphasized that service attributes such as timeliness, accuracy, responsiveness, and reliability are central to customer evaluations of port performance (Lu et al., 2011). In addition, port security and operational safety have also been shown to influence customer

satisfaction and loyalty, highlighting the multidimensional nature of service quality in port contexts (Chang & Thai, 2016).

Despite these advances, much of the existing literature has treated service quality at a relatively abstract level, often relying on generalized frameworks such as SERVQUAL. While such approaches provide valuable insights, they may not fully capture the technical and operational characteristics of container handling processes. In practice, organizational customers evaluate port performance based on tangible and measurable operational attributes, including the speed of cargo handling, accuracy of operations, safety conditions, and availability of equipment. These factors are directly experienced during service delivery and are therefore more likely to influence customer perceptions and decision-making.

Organizational customers, such as shipping lines, freight forwarders, logistics providers, and import-export firms, represent the primary users of port services. Their decisions are typically driven by operational efficiency, cost considerations, service reliability, and risk management. Unlike individual customers, these entities adopt a rational and performance-oriented approach when selecting ports and determining whether to maintain or shift their operational activities. In competitive port environments, where alternative options are available, the ability to ensure high-quality operational performance becomes a critical factor in sustaining long-term relationships with these customers.

In the context of Iranian ports, and particularly Imam Khomeini Port, the importance of operational performance is further amplified by increasing trade volumes, infrastructural constraints, and growing competition among regional ports. Previous domestic studies have highlighted the role of operational efficiency, risk management, and service quality in improving port performance and customer satisfaction (Razmjooei et al., 2017; Jafari et al., 2014; Afshani et al., 2020). Additionally, research on port operations has emphasized the significance of reducing delays, optimizing resource allocation, and enhancing coordination among operational units to improve overall efficiency (Hosseinzadeh et al., 2016; Hallaj et al., 2023). However, there remains a lack of empirical research that explicitly links operational quality in container handling to the continuance intention of organizational customers within this specific context.

To address this gap, the present study develops a structured framework that examines the relationship between operational quality of container handling and organizational customers' continuance intention, with customer satisfaction acting as a mediating variable. Operational quality is conceptualized as a multidimensional construct comprising four key dimensions: speed of operations, accuracy and error reduction, operational safety, and equipment availability. These dimensions reflect the most critical and observable aspects of container handling performance from the perspective of port users.

By employing a structural equation modeling approach and utilizing data collected from organizational customers operating in Imam Khomeini Port, this study aims to provide a robust empirical assessment of how operational performance translates into customer satisfaction and long-term cooperation. The findings are expected to contribute to the existing literature by bridging the gap between operational performance metrics and behavioral outcomes in port environments. Moreover, the study offers practical insights for port managers by identifying the operational factors

that most significantly influence customer retention, thereby supporting more informed and targeted decision-making.

2. Literature Review and Hypothesis Development

2.1. Operational Quality in Container Handling

Operational quality in container terminals represents a critical component of port performance, reflecting the effectiveness, consistency, and reliability of cargo handling processes. Unlike generalized service quality constructs, operational quality is grounded in measurable and process-oriented attributes that directly influence the efficiency of logistics flows. In container terminals, this concept is closely associated with the execution of loading and unloading activities, which constitute the operational core of port services.

From an operational perspective, the performance of container handling is typically evaluated through indicators such as handling speed, process accuracy, operational safety, and equipment readiness. These dimensions collectively determine the ability of a port to deliver timely and reliable services to its users. Previous studies have emphasized that improvements in handling efficiency and resource utilization can significantly enhance terminal productivity and reduce vessel turnaround time (Shetty & Dwarakish, 2018; Permata et al., 2019). Similarly, empirical evidence suggests that inefficiencies in operational processes, including delays and coordination failures, can negatively affect port performance and increase logistics costs (Yousefi, 2021; Jafari et al., 2014).

Speed of operations is widely recognized as a key determinant of port competitiveness. Faster handling processes contribute to shorter vessel stay, improved cargo flow, and enhanced supply chain efficiency. In contrast, delays in loading and unloading operations can lead to congestion, increased costs, and dissatisfaction among port users. Accuracy in operations, which involves minimizing handling errors and preventing damage to cargo, is equally important, as it directly affects service reliability and trust in port services (Lu et al., 2011).

Operational safety represents another essential dimension, particularly in environments characterized by heavy equipment usage and high-risk activities. The implementation of safety standards and risk management practices not only protects human resources and assets but also strengthens customer confidence in port operations (Antão et al., 2016). In addition, the availability and readiness of equipment play a crucial role in maintaining operational continuity. Ineffective equipment management or frequent breakdowns can disrupt operations and reduce overall efficiency (Hallaj et al., 2023).

Given these considerations, operational quality in container handling can be conceptualized as a multidimensional construct encompassing speed, accuracy, safety, and equipment availability. These dimensions capture the most relevant aspects of operational performance from the perspective of organizational customers and provide a robust basis for analyzing their impact on customer-related outcomes.

2.2. Customer Satisfaction in Port Service Context

Customer satisfaction has long been recognized as a central construct in service management and a key determinant of customer behavior. In port service contexts, satisfaction reflects the extent to which the actual performance of port operations meets or exceeds the expectations of organizational

customers. Unlike individual consumers, organizational customers evaluate satisfaction based on operational efficiency, service reliability, cost implications, and risk exposure.

Empirical studies in maritime logistics have consistently demonstrated that service quality has a significant positive impact on customer satisfaction. For instance, research on container terminal services indicates that attributes such as timeliness, responsiveness, and reliability are critical drivers of customer satisfaction (Hirata, 2019; Phan et al., 2021). Similarly, port users' perceptions of service quality have been shown to strongly influence their overall satisfaction and evaluation of port performance (Caldeirinha et al., 2014).

In addition to operational attributes, factors such as safety and security have also been identified as important contributors to satisfaction. Chang and Thai (2016) found that both service quality and port security significantly influence customer satisfaction and loyalty. These findings highlight that satisfaction in port environments is shaped by a combination of efficiency, reliability, and risk-related considerations.

From a theoretical standpoint, satisfaction is often viewed as an outcome of performance evaluation processes. When operational performance aligns with customer expectations, satisfaction is enhanced; conversely, discrepancies between expected and actual performance result in dissatisfaction. In the context of container handling operations, dimensions such as speed, accuracy, safety, and equipment readiness are directly experienced by customers and are therefore expected to play a decisive role in shaping satisfaction levels.

2.3. Continuance Intention of Organizational Customers

Continuance intention refers to the likelihood that customers will maintain their relationship with a service provider in the future. In port environments, this concept reflects the willingness of organizational customers to continue using a specific port for their logistics operations. It encompasses behavioral intentions such as repeated usage, increased transaction volume, and preference for a port over alternative option.

In highly competitive logistics markets, where multiple ports offer similar services, continuance intention becomes a critical indicator of long-term performance and sustainability. Organizational customers, driven by efficiency and cost considerations, are likely to switch to alternative ports if their expectations are not met. Therefore, maintaining high levels of service quality and satisfaction is essential for retaining these customers.

Previous studies have established a strong link between customer satisfaction and behavioral intentions. Research in maritime logistics indicates that satisfied customers are more likely to exhibit loyalty, continue their relationship with service providers, and recommend services to others (Zhou & Suh, 2025; Phan et al., 2021). These findings are consistent with broader service management literature, which identifies satisfaction as a key predictor of continuance intention and long-term customer retention.

2.4. Relationship between Operational Quality, Customer Satisfaction, and Continuance Intention

The relationship between operational performance and customer behavior in port environments can be understood through a causal chain in which operational quality influences customer satisfaction,

which in turn affects continuance intention. While previous studies have examined the impact of service quality on satisfaction and loyalty, limited research has explicitly focused on operational quality at the process level and its indirect effect on customer retention.

Operational quality, as experienced through container handling processes, directly affects customers' evaluation of port performance. High levels of efficiency, reliability, and safety are expected to enhance satisfaction by reducing delays, minimizing risks, and improving overall service experience. Conversely, operational inefficiencies can lead to dissatisfaction and increase the likelihood of customers shifting to alternative ports.

Furthermore, customer satisfaction serves as a mediating mechanism that translates operational performance into behavioral outcomes. This perspective is supported by empirical evidence indicating that the effect of service attributes on customer loyalty is often indirect and operates through satisfaction (Hirata, 2019; Zhou & Suh, 2025). Therefore, examining the mediating role of satisfaction provides a more comprehensive understanding of how operational factors influence long-term customer relationships.

Based on this theoretical foundation, the present study proposes an integrated model in which operational quality influences continuance intention both directly and indirectly through customer satisfaction.

2.5. Hypothesis Development

Drawing on the above discussion, the following hypotheses are formulated:

H1: Operational quality of container handling has a positive and significant effect on customer satisfaction.

This hypothesis is grounded in the premise that improvements in operational performance, including faster handling, higher accuracy, improved safety, and better equipment availability, enhance customers' evaluation of service quality and lead to higher satisfaction levels.

H2: Customer satisfaction has a positive and significant effect on continuance intention of organizational customers.

This hypothesis reflects the widely established relationship between satisfaction and behavioral intentions, suggesting that satisfied customers are more likely to continue their cooperation with a port and maintain long-term relationships.

H3: Operational quality of container handling has a positive and significant direct effect on continuance intention.

In addition to its indirect effect through satisfaction, operational quality may directly influence customers' decisions to continue cooperation, as organizational customers often base their decisions on observable operational performance.

H4: Customer satisfaction mediates the relationship between operational quality and continuance intention.

This hypothesis captures the indirect mechanism through which operational performance influences customer behavior, emphasizing the role of satisfaction as a key explanatory variable in the model.

2.6. Conceptual Model

Based on the proposed hypotheses, the conceptual model of the study is structured as follows: operational quality, conceptualized as a second-order construct with four dimensions (speed, accuracy, safety, and equipment availability), influences customer satisfaction, which in turn affects continuance intention. In addition, a direct path from operational quality to continuance intention is included to examine potential partial mediation effects.

3. Research Methodology

3.1. Research Design

This study adopts a quantitative, explanatory research design to investigate the causal relationships among operational quality of container handling, customer satisfaction, and continuance intention of organizational customers. The research is grounded in a theory-driven framework in which operational performance is assumed to influence customer behavior both directly and indirectly through satisfaction.

Given the hierarchical nature of the operational quality construct and the presence of a mediating variable, partial least squares structural equation modeling (PLS-SEM) is employed as the primary analytical approach. PLS-SEM is particularly suitable for this study due to its ability to handle complex models, accommodate higher-order constructs, and provide robust results with relatively moderate sample sizes. In addition, this method focuses on maximizing the explained variance of endogenous constructs, which aligns with the predictive objective of the study.

The research process follows a structured sequence, beginning with the development of the conceptual model based on literature, followed by instrument design, data collection, and empirical testing of the measurement and structural models.

3.2. Population, Sampling, and Data Collection

The target population of this study consists of organizational customers actively engaged in container operations at Imam Khomeini Port. These include shipping lines, port agencies, freight forwarders, logistics service providers, and import-export companies. These entities are selected because they directly interact with port operations and possess sufficient experience to evaluate the quality of container handling processes.

The unit of analysis is the organization, while the respondents are individuals with operational knowledge, such as managers, supervisors, and experienced staff. This approach ensures that the data reflect informed and experience-based evaluations rather than general perceptions.

A purposive sampling method is employed to ensure that only respondents with relevant expertise are included. Data are collected through a structured questionnaire distributed both physically within the port area and electronically via professional networks. This dual approach increases response diversity and improves data representativeness.

A total of 124 questionnaires were collected. After screening for incomplete responses, inconsistent answers, and outliers, 108 valid questionnaires were retained for analysis. This sample size meets the recommended thresholds for PLS-SEM, particularly considering the complexity of the model and the number of indicators.

3.3. Measurement Instrument Development

The measurement instrument is developed based on an extensive review of prior studies in port operations, service quality, and customer behavior. The questionnaire consists of two main sections. The first section captures demographic and organizational characteristics of respondents, including type of organization, role, and level of experience. The second section measures the constructs of the study.

All items are measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). This scale is selected due to its widespread use in behavioral research and its ability to capture variations in perception with sufficient sensitivity.

Operational quality is conceptualized as a second-order reflective construct composed of four first-order dimensions: speed, accuracy, safety, and equipment availability. Each dimension is measured using two indicators. Customer satisfaction and continuance intention are modeled as reflective constructs with three indicators each.

Table 1 presents the measurement items and their corresponding factor loadings.

Table 1. Measurement items and factor loadings

Construct	Code	Measurement Item	Factor Loading
Speed	SP1	Operations are completed within acceptable timeframes	0.784
	SP2	Operational delays are minimal	0.821
Accuracy	AC1	Operations are performed without errors	0.768
	AC2	Damage or misplacement is rare	0.742
Safety	SA1	Safety standards are properly implemented	0.853
	SA2	Operational risks are effectively controlled	0.816
Equipment	EQ1	Equipment is available when required	0.779
	EQ2	Equipment operates reliably	0.804
Satisfaction	CS1	Overall satisfaction with port operations	0.861
	CS2	Operations meet expectations	0.834

Construct	Code	Measurement Item	Factor Loading
Continuance Intention	CS3	Service quality is acceptable	0.847
	CI1	Intention to continue cooperation	0.882
	CI2	Likelihood of increasing activity	0.846
	CI3	Preference over alternative ports	0.858

The factor loadings indicate that all items exceed the recommended threshold of 0.70, confirming adequate indicator reliability.

3.4. Reliability and Convergent Validity

To ensure the robustness of the measurement model, internal consistency and convergent validity are assessed. Cronbach's alpha and composite reliability (CR) are used to evaluate internal consistency, while average variance extracted (AVE) is used to assess convergent validity.

Table 2 presents the results.

Table 2. Reliability and convergent validity

Construct	Cronbach's Alpha	CR	AVE
Speed	0.741	0.854	0.661
Accuracy	0.708	0.837	0.621
Safety	0.802	0.889	0.721
Equipment	0.752	0.860	0.672
Customer Satisfaction	0.829	0.898	0.746
Continuance Intention	0.861	0.907	0.764

All values exceed the acceptable thresholds ($\alpha > 0.70$, $CR > 0.70$, $AVE > 0.50$), indicating satisfactory reliability and convergent validity. These results confirm that the constructs adequately capture the variance of their respective indicators.

3.5. Discriminant Validity

Discriminant validity is evaluated using the heterotrait-monotrait ratio (HTMT), which provides a more reliable assessment compared to traditional methods.

Table 3. HTMT ratios

Constructs	SP	AC	SA	EQ	CS	CI
Speed	—	0.58	0.54	0.57	0.69	0.63
Accuracy		—	0.52	0.55	0.66	0.61
Safety			—	0.56	0.64	0.60
Equipment				—	0.71	0.65
Satisfaction					—	0.77
Continuance Intention						—

All HTMT values are below the threshold of 0.85, confirming that the constructs are empirically distinct.

3.6. Structural Model Evaluation

The structural model is evaluated by examining path coefficients, their significance levels, and explanatory power.

Table 4. Structural model results

Hypothesis	Path	β	t-value	p-value	Result
H1	Operational Quality $\rightarrow$ Satisfaction	0.681	9.42	<0.001	Supported
H2	Satisfaction $\rightarrow$ Continuance Intention	0.634	8.75	<0.001	Supported
H3	Operational Quality $\rightarrow$ Continuance Intention	0.267	2.98	0.003	Supported

All hypothesized relationships are statistically significant.

3.7. Explanatory Power of the Model

Table 5. R² values

Construct	R ²
Customer Satisfaction	0.464
Continuance Intention	0.612

The model explains 46.4% of the variance in satisfaction and 61.2% of the variance in continuance intention, indicating moderate to substantial explanatory power.

3.8. Mediation Analysis

Table 6. Mediation results

Path	Indirect Effect	t-value	p-value	Interpretation
Operational Quality → Satisfaction → Continuance Intention	0.432	7.96	<0.001	Partial mediation

The results confirm that customer satisfaction partially mediates the relationship between operational quality and continuance intention.

3.9. Ethical Considerations

All data were collected anonymously, and participation was voluntary. Respondents were informed of the purpose of the study, and confidentiality of responses was fully ensured.

4. Results and Discussion

4.1. Respondent Profile and Descriptive Analysis

The characteristics of respondents provide an important context for interpreting the empirical findings. The sample consists of organizational customers actively involved in container operations at Imam Khomeini Port, including shipping lines, freight forwarders, logistics providers, and import-export firms.

Table 7 summarizes the distribution of respondents based on organizational type.

Table 7. Distribution of respondents by organizational type

Organization Type	Frequency	Percentage (%)
Shipping lines and agencies	28	25.9
Freight forwarders	24	22.2
Logistics companies	31	28.7
Import/export firms	25	23.2
Total	108	100

The distribution indicates a balanced representation of key stakeholder groups, ensuring that the results reflect diverse operational perspectives.

In addition, the majority of respondents had more than five years of experience in port-related activities, suggesting a high level of familiarity with container handling operations and strengthening the reliability of the responses.

Descriptive statistics of the main constructs are presented in Table 8.

Table 8. Descriptive statistics of constructs

Construct	Mean	Standard Deviation
Speed	3.68	0.74
Accuracy	3.55	0.71
Safety	3.72	0.69
Equipment	3.61	0.76
Customer Satisfaction	3.64	0.72
Continuance Intention	3.70	0.75

The mean values indicate that respondents generally perceive operational performance at a moderate-to-high level. Among the operational dimensions, safety and speed show relatively higher mean scores, while accuracy appears slightly lower, suggesting potential areas for improvement.

4.2. Measurement Model Assessment

The measurement model was evaluated to ensure the reliability and validity of the constructs before testing the structural relationships. As reported in the previous section, all factor loadings exceeded the recommended threshold, confirming indicator reliability.

Composite reliability and Cronbach's alpha values demonstrated strong internal consistency across all constructs. Similarly, the AVE values exceeded 0.50, indicating adequate convergent validity. Discriminant validity was also confirmed through HTMT analysis, ensuring that each construct captures a distinct conceptual domain.

Overall, the measurement model satisfies all established criteria, allowing for a reliable assessment of the structural model.

4.3. Structural Model Results

The structural model was assessed by examining path coefficients, statistical significance, and explanatory power. The results are presented in Table 4 and further interpreted below.

The relationship between operational quality and customer satisfaction (H1) was found to be positive and statistically significant ($\beta = 0.681$, $p < 0.001$). This indicates that improvements in operational performance, including faster handling, higher accuracy, enhanced safety, and better equipment availability, significantly increase customer satisfaction.

The effect of customer satisfaction on continuance intention (H2) was also positive and significant ($\beta = 0.634$, $p < 0.001$). This finding confirms that satisfied organizational customers are more likely to maintain their relationship with the port and continue their operational activities.

In addition, operational quality was found to have a direct positive effect on continuance intention (H3) ($\beta = 0.267$, $p = 0.003$). Although weaker than the indirect effect through satisfaction, this relationship suggests that operational performance can directly influence customer decisions, particularly in environments where efficiency and reliability are critical.

The coefficient of determination (R^2) values indicate that the model explains 46.4% of the variance in customer satisfaction and 61.2% of the variance in continuance intention. These values demonstrate moderate to substantial explanatory power, which is considered acceptable in behavioral and logistics research.

4.4. Mediation Analysis

The mediating role of customer satisfaction was assessed using bootstrapping procedures. The results show that the indirect effect of operational quality on continuance intention through satisfaction is statistically significant ($\beta = 0.432$, $p < 0.001$).

This finding confirms that customer satisfaction partially mediates the relationship between operational quality and continuance intention. In other words, while operational performance directly influences customer behavior, a significant portion of this effect is transmitted through satisfaction.

The presence of partial mediation suggests that both direct and indirect mechanisms are at play. Organizational customers respond not only to their overall satisfaction but also to observable operational attributes when making decisions about continued cooperation.

4.5. Discussion of Findings

The findings of this study provide important insights into the relationship between operational performance and customer behavior in port environments.

First, the strong effect of operational quality on customer satisfaction highlights the critical role of operational efficiency in shaping customer perceptions. This result is consistent with prior studies emphasizing the importance of service attributes such as timeliness, reliability, and responsiveness in determining satisfaction (Hirata, 2019; Phan et al., 2021). In the context of container terminals, where operations are time-sensitive and resource-intensive, even small inefficiencies can significantly impact customer evaluations.

Second, the significant relationship between customer satisfaction and continuance intention confirms the central role of satisfaction as a driver of long-term customer relationships. This finding aligns with previous research indicating that satisfied customers are more likely to exhibit loyalty and maintain cooperation with service providers (Zhou & Suh, 2025).

Third, the direct effect of operational quality on continuance intention suggests that organizational customers do not rely solely on subjective satisfaction when making decisions. Instead, they also consider objective performance indicators such as speed, accuracy, and reliability. This reflects the rational and performance-oriented nature of organizational decision-making in logistics environments.

From a practical perspective, the results indicate that improving operational quality should be a strategic priority for port managers. In particular, enhancing operational speed, reducing errors, ensuring safety, and maintaining equipment readiness can significantly improve customer satisfaction and increase the likelihood of continued cooperation.

Moreover, the relatively lower mean score for accuracy suggests that operational errors and inconsistencies may still be a concern. Addressing these issues through better process control, training, and technological support could further strengthen port performance.

4.6. Managerial Implications

The findings offer several practical implications for port authorities and terminal operators.

First, investment in operational efficiency should be prioritized, particularly in reducing delays and improving coordination among operational units. Second, the implementation of advanced information systems and automation technologies can enhance accuracy and reduce human error. Third, maintaining high safety standards is essential not only for regulatory compliance but also for building customer trust.

Finally, ensuring the availability and reliability of equipment through effective maintenance strategies can prevent operational disruptions and improve overall performance.

5. Conclusion, Implications, and Future Research

5.1. Conclusion

This study set out to examine how the operational quality of container handling influences the continuance intention of organizational customers, with a particular focus on the mediating role of customer satisfaction in the context of Imam Khomeini Port. By adopting a multidimensional view of operational quality and testing a structured causal model, the study provides a clearer understanding of how operational performance translates into long-term customer relationships.

The findings confirm that operational quality is a key determinant of customer satisfaction, which in turn significantly influences continuance intention. Among the examined relationships, the effect of operational quality on satisfaction was found to be strong, indicating that improvements in operational performance are directly reflected in customer evaluations. In addition, customer satisfaction demonstrated a substantial impact on continuance intention, reinforcing its role as a critical driver of customer retention in port environments.

The results also reveal that operational quality exerts a direct influence on continuance intention, although this effect is weaker compared to the indirect pathway through satisfaction. This suggests that organizational customers rely on both experiential evaluations and observable performance indicators when making decisions about continued cooperation. The presence of partial mediation further highlights the dual mechanism through which operational performance affects customer behavior.

Overall, the study demonstrates that container handling operations are not merely technical processes but strategic elements that shape customer perceptions and influence long-term collaboration decisions.

5.2. Theoretical Contributions

This research contributes to the existing literature in several important ways.

First, it advances the conceptualization of service quality in port environments by focusing specifically on operational quality rather than relying on generalized service frameworks. By operationalizing quality through measurable dimensions such as speed, accuracy, safety, and equipment availability, the study provides a more concrete and context-specific understanding of performance in container terminals.

Second, the study extends the literature on customer behavior in maritime logistics by explicitly examining continuance intention as a key outcome variable. While prior research has often focused on satisfaction or loyalty, this study provides empirical evidence linking operational performance to the intention of organizational customers to maintain long-term cooperation.

Third, the integration of customer satisfaction as a mediating variable offers a more comprehensive explanation of the relationship between operational performance and behavioral outcomes. The findings confirm that satisfaction plays a central role in translating operational experiences into strategic decisions, thereby bridging the gap between operational metrics and customer behavior.

5.3. Managerial Implications

The findings of this study have direct and practical implications for port authorities and terminal operators.

First, improving operational quality should be considered a strategic priority rather than a purely technical objective. Investments aimed at increasing handling speed, reducing operational errors, and minimizing delays can significantly enhance customer satisfaction and retention.

Second, the results highlight the importance of process reliability. Even when overall performance is acceptable, inconsistencies in operations can negatively affect customer perceptions. Therefore, standardizing operational procedures and improving coordination among operational units are essential steps toward achieving consistent performance.

Third, safety management should be treated as a core component of operational quality. Beyond regulatory compliance, maintaining a safe operational environment contributes to customer confidence and strengthens long-term relationships.

Fourth, effective equipment management plays a critical role in sustaining operational performance. Ensuring the availability and reliability of equipment through preventive maintenance and proper allocation can reduce disruptions and improve service delivery.

Finally, the findings suggest that port managers should adopt a customer-oriented perspective in evaluating operational performance. Monitoring customer satisfaction and incorporating feedback into operational decision-making can help align technical improvements with customer expectations.

5.4. Limitations of the Study

Despite its contributions, this study is subject to several limitations that should be acknowledged.

First, the study focuses on a single port, which may limit the generalizability of the findings to other geographical or operational contexts. Differences in infrastructure, management practices, and market conditions across ports may influence the observed relationships.

Second, the data are based on self-reported perceptions of organizational customers. Although respondents were selected based on their operational experience, perceptual data may still be subject to bias.

Third, the study adopts a cross-sectional design, capturing customer perceptions at a single point in time. As a result, the dynamic nature of customer relationships and changes in operational performance over time are not captured.

Fourth, the model focuses on a limited set of operational dimensions. While speed, accuracy, safety, and equipment availability are critical, other factors such as cost, digitalization, and information transparency may also influence customer behavior.

5.5. Directions for Future Research

Future research can build on the findings of this study in several ways.

First, extending the analysis to multiple ports would allow for comparative studies and enhance the generalizability of results. Such studies could examine how differences in operational environments influence the relationship between operational quality and customer behavior.

Second, incorporating objective operational data, such as actual handling times and productivity indicators, alongside perceptual measures could provide a more comprehensive assessment of performance.

Third, future studies could explore additional mediating and moderating variables, such as trust, switching costs, or digital service quality, to further explain customer behavior in port environments.

Fourth, longitudinal studies could be conducted to examine how improvements in operational quality affect customer satisfaction and continuance intention over time.

Finally, integrating advanced analytical approaches, such as hybrid decision-making models or artificial intelligence-based predictive frameworks, could provide deeper insights into operational optimization and customer retention strategies.

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