

Quality and customer loyalty in the port services of Manzanillo

Calidad y lealtad del cliente en los servicios portuarios de Manzanillo

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Abstract

The customs industry, particularly within the Mexican context, plays a significant role both domestically and internationally, owing to its contribution to the global economy. With the expansion and standardization of customs clearance services, there has emerged a necessity for providers of these services to seek customer loyalty. Grounded in the principles of quality, the study examines the elements of the SERVQUAL model: tangibles, reliability, responsiveness, assurance, and empathy.

Goals:The aim of the study was to extend the SERVQUAL model by incorporating customer attitude as an additional component within the three primary dimensions for measuring service quality.

Methodology: A survey was employed to gather data from 100 customs brokerage firms through simple random sampling. Given the utilization of structural equation modeling (SEM) methodology to assess the theoretical model, Partial Least Squares (PLS) analysis technique was applied using Smart PLS 3.3.0 software. The findings indicated that the extended model had a significant impact on both customer satisfaction and loyalty within the customs facilities of Manzanillo, Colima. The coefficients of determination were 61.5% for customer satisfaction and 54% for customer loyalty, with a root mean square error of approximation (SRMR) of 0.065, confirming the model's predictive validity.

Contributions: Customs facilities should focus their strategies on addressing issues that may be impacting service quality, particularly concerning sensitivity, empathy, and reliability factors, as these have a moderate level of influence on quality determination, according to customs agencies' perceptions. Regarding the inherent limitations of online surveys and their application in specialized groups, it is crucial to expand the research to include other clients of the customs facility.

Resumen

La industria aduanera, especialmente en el contexto mexicano, desempeña un papel significativo tanto a nivel nacional como internacional, debido a su contribución a la economía global. Con la expansión y estandarización de los servicios de trámites aduaneros, ha surgido la necesidad por parte de los proveedores de estos servicios de buscar la fidelidad de sus clientes. Con base en los conceptos de calidad, el estudio examina los elementos del modelo SERVQUAL: tangibles, fiabilidad, capacidad de respuesta, seguridad y empatía.

Objetivos: El objetivo del estudio fue ampliar el modelo SERVQUAL al incluir la actitud del cliente como un componente adicional en las tres dimensiones principales para medir la calidad del servicio.

Metodología: Se utilizó una encuesta para recopilar datos de 100 empresas aduanales a través de un muestreo aleatorio simple. Dado que se empleó una metodología de modelos de ecuaciones estructurales (SEM) para evaluar el modelo teórico, se utilizó la técnica de análisis de Mínimos Cuadrados Parciales (PLS) con el software Smart PLS 3.3.0. Los resultados mostraron que el modelo ampliado tenía un impacto significativo en la satisfacción y la lealtad de los clientes en los recintos fiscalizados de Manzanillo, Colima. Los coeficientes de determinación fueron del 61.5% para la satisfacción del cliente y del 54% para la lealtad del cliente, con un error cuadrático medio de aproximación (SRMR) de 0.065, lo que confirma la predicción del modelo.

Contribución: Los recintos fiscalizados deben centrar sus estrategias en abordar los problemas que podrían estar afectando la calidad del servicio, particularmente en relación con los factores de sensibilidad, empatía y fiabilidad, ya que estos tienen un nivel moderado de influencia en la determinación de la calidad, según la percepción de las agencias aduanales. En cuanto a las limitaciones inherentes a la encuesta en línea y su aplicación en grupos especializados, es crucial ampliar la investigación a otros clientes del recinto fiscalizado.

Extend the SERVQUAL model by incorporating customer attitude as an additional component within the three primary dimensions for measuring service quality.	A survey was employed to gather data from 100 customs brokerage firms through simple random sampling. Given the utilization of structural equation modeling (SEM) methodology to assess the theoretical model, Partial Least Squares (PLS) analysis technique was applied using Smart PLS 3.3.0 software	Customs facilities should focus their strategies on addressing issues that may be impacting service quality, particularly concerning sensitivity, empathy, and reliability factors, as these have a moderate level of influence on quality determination, according to customs agencies' perceptions
Grounded in the principles of quality, the study examines the elements of the SERVQUAL model: tangibles, reliability, responsiveness, assurance, and empathy.	The findings indicated that the extended model had a significant impact on both customer satisfaction and loyalty within the customs facilities of Manzanillo, Colima.	Regarding the inherent limitations of online surveys and their application in specialized groups, it is crucial to expand the research to include other clients of the customs facility.

El objetivo del estudio fue ampliar el modelo SERVQUAL al incluir la actitud del cliente como un componente adicional en las tres dimensiones principales para medir la calidad del servicio.	Se utilizó una encuesta para recopilar datos de 100 empresas aduanales a través de un muestreo aleatorio simple. Dado que se empleó una metodología de modelos de ecuaciones estructurales (SEM) para evaluar el modelo teórico, se utilizó la técnica de análisis de Mínimos Cuadrados Parciales (PLS) con el software Smart PLS 3.3.0	Los recintos fiscalizados deben centrar sus estrategias en abordar los problemas que podrían estar afectando la calidad del servicio, particularmente en relación con los factores de sensibilidad, empatía y fiabilidad, ya que estos tienen un nivel moderado de influencia en la determinación de la calidad, según la percepción de las agencias aduanales
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SERVQUAL, Facebook pages, digital engagement

SERVQUAL, recintos fiscalizados, Engagement digital

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Introduction

The efficiency of public services has driven the implementation of new quality management mechanisms and systems. This has had a significant impact on trade facilitation and the efficient delivery of foreign trade services. At the same time, quality management has maintained and even improved collection levels, ensuring effective control over imports and exports (Reyes et al., 2021). This has led to important changes in the control and tax collection functions.

Recent research has shown that Mexico is moving towards more effective, transparent and competitive customs management (Zamora & Reyes, 2022; Molina-Porras, Morelos-Gómez, & Marrugo-Arnedo, 2017; Juárez & Conde, 2015). However, studies on their modernisation have been oriented towards describing activities considering customs functions individually, without a comprehensive approach to adapt efficiency models.

Although the greatest advances in customs modernisation in Mexico have been observed at Manzanillo customs, this progress has consolidated customs and the port as one of the most important in container handling, with connectivity to numerous ports around the world.

It should be noted that, as a gateway between Asia and North America, the port is fundamental for cargo movement and a key logistics point to serve a growing market.

Therefore, this study sought to identify the factors that influence the quality of service in bonded warehouses through customer perceptions, in order to identify areas for improvement, take action and make decisions that will benefit and improve performance, as well as enhance the commercial position of customs.

This study was carried out in the bonded warehouses of the port of Manzanillo, Colima, Mexico, due to its national relevance and its position as the third port with the largest containerised cargo movement in Latin America and the Caribbean.

The paper addresses the lack of information on Customs modernisation, with the intention of improving their control activities (Reyes et al., 2022), suggesting a direct relationship between trade facilitation and quality of service through indicators at the national level.

Given this context, the main objective was to analyse the quality of service provided by the bonded warehouses in this port, using the Servqual method, and to propose improvement actions.

Literature review

The service industry, both in Latin America in general and in Mexico in particular, is of utmost importance nowadays, both nationally and internationally, due to its contribution to the world economy. The expansion and standardisation of the supply of customs services has generated the need for suppliers to seek customer loyalty, as pointed out by Meraz Ruiz et al. (2023). Consequently, companies have become aware of the diversity of customer segments, as well as the different needs that each one has, which cannot be satisfied by a single company.

As a result of the standardisation of processes, services and amenities, quality assessment systems have emerged based on the fulfilment of certain criteria in a list of offerings considered as minimum for certain levels in the service industry.

Thus, service entities have realised that only by offering exceptional service quality, as Pérez-Cruz et al. (2023) point out, can they achieve customer satisfaction. In this sense, they seek to obtain an efficiency that could be considered as the fundamental basis for their growth and consolidation in the market in which they operate. Within this framework, service quality in these organisations involves guiding customers to meet their needs and facilitating the fulfilment of their individual expectations. It also highlights the importance of providing high quality and personalised attention. Silva-Treviño et al. (2021) emphasise that the provision of high quality services is one of the most important and difficult tasks facing any service organisation.

Furthermore, they point out that maintaining consistent provision of high quality service is a considerable challenge, as all consumers have experienced instances of poor service. This reflects the general perception that services are inherently complicated and challenging in terms of standardisation and quality.

This has led the public sector to prioritise its efforts to continuously improve service quality. Pérez-Cruz (2020) points out that both public and private institutions providing services face economic pressures and capital shortages, which pose the challenge of satisfying their customers without costly reforms. One way to keep track of service quality is through quantitative methods of evaluation.

As a result, a number of studies have been conducted that seek strategies to improve services in public organisations. The methodologies used to measure public service quality have been diverse. In a study by Pérez-Cruz & Pinto-Pérez, (2021) the SERVQUAL model adapted to public transport services was used, measuring the perceptions associated with this public service. Similarly, Meraz et al. (2023) have demonstrated the relevance of using service quality models to evaluate emotions associated with innovation and reference groups in user satisfaction, which translates into the purchase intention of the service offered.

Thus, this study applies the SERVPERF scale, together with statistical confirmation of a theoretical model, to understand the key dimensions that influence the perception of service quality, which impacts on customer loyalty for port services in Manzanillo. It is observed that, although there is abundant literature in Spanish on the adaptation of models linking quality and loyalty, especially in the service sector, there is a lack of attention to the port and international logistics segment, which tends to focus more on customs agencies and peripheral foreign trade services.

Previous studies in this field have neglected to perform confirmatory statistical analyses, such as structural equation modelling, and in particular, analyses based on Bootstrap resampling.

Although the SERVQUAL model has been widely used in Ibero-American research on quality in the service sector, recent critiques have pointed out important flaws in terms of the validation of its constructs and its ability to explain variation (Vidrio-Barón, Rebolledo-Mendoza, & Galindo-Salvador, 2020).

As a result, adaptations and new sector-specific models have been suggested, including SERVPERF for services in general (Ramos, Mogollón, Santur, & Cherre, 2020), SERVQHOS for quality assessment of health services (Numpaque-Pacabaque & Rocha-Buelvas, 2016), E-S-QUAL and E-REC-QUAL for digital services (Leyton-Johns, Ahumada, & Mora, 2020) and HISTOQUAL for historical heritage and cultural services (Frochot & Hughes, 2000).

However, loyalty prediction has been assessed using three items, which offer higher predictive accuracy than direct behavioural analysis. Studying how service quality and customer loyalty influence service quality helps to understand the impact of these items on the likelihood that port service customers will maintain their consumption patterns. This raises a research question as to what is the direct and indirect influence of port service quality on the loyalty of Mexican consumers, specifically in the Manzanillo bonded warehousing environment?

It is observed that the preference of many researchers is to use the SERVQUAL model, according to Leyton-Johns (2020), adapting it with certain variations and adjustments due to its generic nature, which facilitates its application to a wide range of services such as restaurants, hotels, museums, historical heritage, digital services, among others.

Thus, to measure the implementation of the strategies, service quality indicators were analysed based on the SERVQUAL model, which measures five dimensions: Tangibility (T), Reliability (F), Responsiveness (CR), Security (S) and Empathy (E).

For Gutiérrez et al. (2021) these five elements for measuring service quality are understood as follows:

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- Tangibles (T): encompasses physical appearance, facilities, such as infrastructure, equipment and materials, and staff presentation.
- Reliability (F): is defined as the ability to deliver the promised service in a reliable and meticulous manner, ensuring that the organisation meets its commitments in terms of delivery, service provision, problem resolution and pricing.

Responsiveness (RC): refers to the willingness to assist users and provide a fast and efficient service. It involves attentiveness and speed in handling requests, responding to customer questions and complaints, and resolving problems.

Assurance (S): represents the knowledge and courtesy of employees, as well as their ability to generate credibility and trust.

Empathy (E): related to the degree of personalised attention that companies provide to their customers, which should be manifested through personalised service or service tailored to the customer's preferences.

For its part, the conceptualisation of loyalty has undergone an evolution since its first application emanating from the psychology of consumption proposed by Guest (1944). Guest described it as the tendency to repurchase and considered it to be the essence of brand loyalty.

Over time, this notion has broadened and diversified, adopting both behavioural and attitudinal perspectives. More detailed dimensions such as atmospheric elements, service landscape, place attractiveness and word-of-mouth recommendation have been introduced, and the importance of service quality in promoting loyalty has been demonstrated with revisit intentions indicated by Santarriaga and Soto (2020). The Customer Loyalty model developed by Sanza et al. (2013) analyses cognitive, affective, conative and trust factors. More recent research underlines the growing impact of service quality on loyalty and highlights the connection between service quality in the hotel sector and customer satisfaction and loyalty, as well as its influence on profitability (Pelayo-Maciel & Ortiz-Villavelazquez, 2019).

Furthermore, service quality is recognised as a precursor to loyal attitude repurchase, with word-of-mouth recommendation and repurchase as key outcomes of this process (Santarriaga-Pineda, Mercado-González, & Soto-Ramírez, 2023).

Hypotheses

Thus, the following research hypotheses were established:

H1: Tangibility directly influences the quality of port services.

H2: Reliability directly influences the quality of port services.

H3: Responsiveness directly influences the quality of port services.

H4: Safety directly influences the quality of port services.

H5: Empathy directly influences the quality of port services.

H6: The quality of port services directly influences the loyalty of port customers.

In this sense, figure 1 below sets out the independent and dependent variables and their relationship with the research hypotheses.

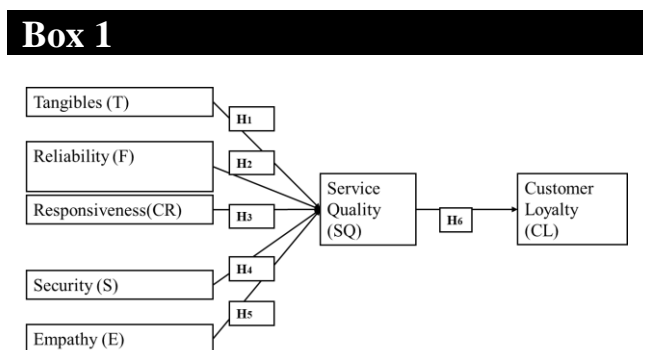


Figure 1

Research hypotheses

Source: own elaboration based on Gutiérrez, et. al. (2021)

Methodology

The study focused on the city of Manzanillo, Colima, Mexico. A self-developed questionnaire was designed, consisting of 22 items aimed at assessing the perception of service quality.

As a first step, the consistency between the theoretical design and the results was evaluated (Hair Jr et al., 2021). This consistency was determined using the goodness-of-fit index known as the standardised root mean square residual (SRMR). The SRMR analysis yielded a value of 0.068, thus confirming the goodness of fit of the model and validating the relevance of the results obtained according to Nande et al., (2022).

Subsequently, convergence validity was performed. The values are detailed in table 1 below.

Box 2

Table 1
Reliability and validity values

Constructs	α	CC	AVE	VIF
T	0.82	0.89	0.95	1.36
F	0.78	0.80	0.81	1.36
CR	0.83	0.86	80.59	1.36
S	0.76	0.79	0.81	1.36
E	0.81	0.84	0.86	1.36
CS	0.80	0.83	0.86	1.36
LC	0.89	0.91	0.95	1.36

Note: α = Cronbach's Alpha; CC= reliability coefficient, AVE=average variance extracted and VIF= variance inflation factor.

T=tangibles; F=reliability; CR=responsiveness; S=safety; E=empathy; CS=quality of service; LC=customer loyalty.

Source: own elaboration based on Smart PLS.

The table above shows the composite reliability (CC) values, which were above 0.70 and the average variance extraction (AVE) above 0.5 - indicating that the model has the construct validity established by Hair et. al. (2021). The second criteria were also confirmed by observing that the AVE exceeded the squares of the correlations between the constructs, and by verifying that each indicator shared a greater proportion of variance with its respective latent construct rather than a different one (Hair, et al., 2021).

Finally, the presence of multicollinearity was ruled out by assessing the variance inflation factor (VIF), whose values obtained exceeded the value of 1 and were less than 3 (Ringle, Wende, & Becker, 2015).

Hypothesis testing

The data presented in the second table shows the concurrent validity of the study. Next, a two-tailed bootstrapping method was run with 5,000 iterations, covering the t-values for the six proposed hypothesised relationships. These relationships proved to be statistically significant at 0.01 and 0.05 significance levels, as indicated in the table below.

Box 3

Table 2
Hypothesis testing results

Hypothesis	β	t	P	Decision
H ₁ T > CS	0.07	7.49	0.00***	Confirmed
H ₂ F > CS	0.06	2.23	0.07	<i>Rejected</i>
H ₃ CR > CS	1.78	2.13	0.95	<i>Rejected</i>
H ₄ S > CS	0.06	4.27	0.00***	Confirmed
H ₅ E > CS	0.05	2.66	0.06	<i>Rejected</i>
H ₆ CS > LC	0.88	2.55	0.04*	Confirmed

Note: β = Standard deviation; t= t-statistic, P= p-value. *** significant at 0.001, ** significant at 0.01 and * significant at 0.05.

Source: own elaboration based on Smart PLS.

Source: own elaboration based on Smart PLS.

The re-sampling assessment revealed that tangible elements and security stand out for their relevance to service quality in port facilities. It was also found that these service quality factors indirectly influence customer loyalty.

The aspects of sensitivity, reliability and empathy are in the moderate range, according to the generally specified validity criteria (Nande, Reyes, & Pérez, 2022).

Conclusions

One way of analysing the quality of service offered by audit facilities involves, initially, identifying the elements that facilitate its measurement through an understanding of the crucial customer-provider relationship developed during this process. Subsequently, it is important to recognise that the evaluation of these services by users represents an essential competitive element, significantly influencing the profitability and strategic position of customs in the long term.

During this study, the factors influencing the perception of the service quality of bonded warehouses from the perspective of customs representatives were determined.

It was identified that the aspects directly linked to service quality were tangibles and security. Indirectly, they also had an impact on customer loyalty. This coincides with the goals of customs modernisation plans and the legal guidelines for customs facilities as outlined in the existing literature (Reyes et al., *Gestión aduanera y su modernización: un análisis con ecuaciones estructurales en la aduana Lázaro Cárdenas, México*, 2022).

One explanation for security is the growing importance of security in Mexican customs, where significant investments are made in (tangible) infrastructure. This includes the modernisation of buildings for commercial operations, improvements in the road system and general infrastructure, all aimed at facilitating trade as an essential function of modern customs. The latter directly impacts on the handling of an increasing volume of cross-border trade cargo as noted by (Reyes et al., 2021; Cruz, 2015).

In particular, at Manzanillo customs, the modernisation plan has sought to improve efficiency and productivity in the logistics chain at national and international level, which resulted in an increase in the capacity of the entity through the expansion of physical, transport, technological and security infrastructure.

Likewise, the security element is established in the customs law that involves the operators of port facilities to observe the established norms in terms of control, surveillance and security of the facilities.

With regard to areas of opportunity, it was found that sensitivity, reliability and empathy are elements that port authorities need to address. Given that these factors are not perceived by customs agents as being associated with the quality of service. It is recommended to develop knowledge transfer strategies with higher education institutions to address the main points of customer dissatisfaction as pointed out by (Pérez-Cruz, 2020). Such transfer should be oriented especially to time efficiency and speed of service, as well as the confidence transmitted by the staff, the speed of their response and their personal presentation.

Finally, for future research, it is suggested to keep the focus on port services to assess whether the categories of responsiveness, reliability and empathy directly affect service quality and customer loyalty. Considering that the study tool emerged from an adapted version of the SERVQUAL model, applicable to services in certain industries, it is crucial to monitor the high-quality expectations associated with this service sector. Similarly, it is important to observe how the lack of quality is perceived in service establishments peripheral to the port, such as carriers, operators, processors among others, which offer basic foreign trade services and which can influence the overall standardised port service experience.

Declarations

Conflict of interest

The authors declare that they have no conflict of interest. They have no known competing financial interests or personal relationships that might have appeared to influence the article reported in this paper.

Article

Authors' contribution

Reyes-Real, Oscar Bernardo: Introduction, Literature review, methodology and conclusions, *Osegueda-Rodríguez, Rubí:* Introduction, Literature review, methodology and conclusions, *Amezcu-Vivaz, José de Jesús:* Literature review, methodology and conclusions.

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All data obtained in this research are available.

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Abbreviations

AVE - Average Variance Extraction
 CC - Composite Reliability
 CR - Responsiveness
 CS - Quality of Service
 E - Empathy
 F - Reliability
 LC - Customer Loyalty
 S - Security
 T - Tangibles
 VIF - Variance Inflation Factor.

References**Antecedents**

Guest (1944) - Propuesta inicial sobre la lealtad de marca en la psicología del consumo.

Pérez-Cruz & Pinto-Pérez (2021) - Utilizado en un estudio sobre la calidad del servicio público en el transporte.

Basic

Pérez-Cruz et al. (2023) - Destaca la importancia de ofrecer un servicio de calidad excepcional para alcanzar la satisfacción del cliente.

Silva-Treviño et al. (2021) - Enfatiza la importancia de la prestación de servicios de alta calidad.

Sanza et al. (2013) - Desarrolla un modelo de lealtad del cliente analizando factores cognitivos, afectivos, conativos y de confianza.

Pelayo-Maciél & Ortiz-Villavelazquez (2019) - Destaca la conexión entre la calidad del servicio en el sector hotelero y la satisfacción y lealtad del cliente.

Santarriaga y Soto (2020) - Mencionado en relación con la importancia de la calidad del servicio en la promoción de la lealtad.

Santarriaga-Pineda, Mercado-González, & Soto-Ramírez (2023) - Se refiere a la recompra y la recomendación boca a boca como resultados clave.

Support

Meraz et al. (2023) - Demuestra la pertinencia del uso de modelos de calidad del servicio en la satisfacción de los usuarios.

Discussions

Gutiérrez et al. (2021) - Mencionado en relación con la elaboración de hipótesis de investigación y variables independientes y dependientes.