

## Administrative factors that affect customs clearance in an electronics manufacturing company in Ciudad Juárez, Chihuahua

### Factores administrativos que inciden en el despacho aduanero en una empresa maquiladora del sector electrónico en Ciudad Juárez, Chihuahua

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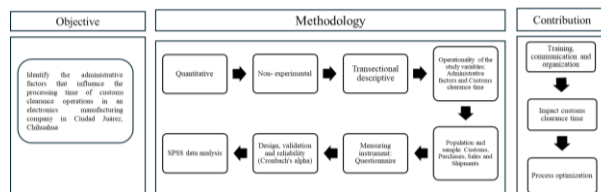
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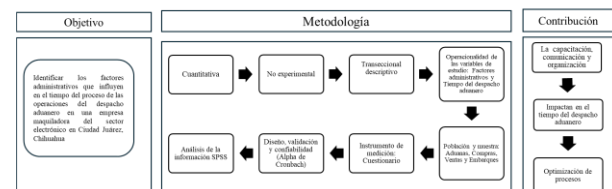
#### Abstract

The objective of this research was to identify the administrative factors influencing customs clearance operations processing time in an electronics manufacturing company in Ciudad Juárez, Chihuahua. A quantitative methodology with a non-experimental, transactional, descriptive design was used. The study population consisted of personnel from the customs, purchasing, sales, and shipping departments. Data was collected through a survey using a validated questionnaire by experts, and the instrument's reliability was verified using Cronbach's Alpha coefficient. The questionnaire was administered to 19 employees considered in the study sample. The results show that there is a dependence between customs clearance time and administrative factors: training, communication, and organization.



#### Resumen

El objetivo de esta investigación fue identificar los factores administrativos que influyen en el tiempo del proceso de las operaciones del despacho aduanero en una empresa maquiladora del sector electrónico en Ciudad Juárez, Chihuahua. Se utilizó una metodología cuantitativa, de diseño no experimental transeccional descriptivo. Se consideró como población de estudio al personal de los departamentos de aduanas, compras, ventas y embarques. Para recolectar la información se utilizó el método de encuesta, a través del diseño de un cuestionario validado por expertos, y la confiabilidad del instrumento fue comprobada a través del coeficiente Alfa de Cronbach. El cuestionario fue administrado a 19 empleados considerados en la muestra de este estudio. Los resultados obtenidos muestran que existe dependencia entre la variable tiempo del despacho aduanero y los factores administrativos: capacitación, comunicación y organización.



Customs clearance, Maquiladora, Import

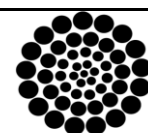
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## Introduction

Ciudad Juárez is a border city belonging to the state of Chihuahua, Mexico; due to its strategic location close to the United States of America, it attracts foreign investment through the establishment of companies belonging to the maquiladora export industry sector. These companies import raw materials and manufacture the product in Mexico and then export it to different countries, so international logistics and supply are key elements of success for these companies (Blanco, García, Avelar, Maldonado and Canales, 2015).

Maquiladora export companies depend to a large extent on supply chain processes: the supply of raw materials from suppliers, the logistics used, import processes, internal logistics systems during the production process, distribution procedures for the finished product and logistics in export processes (Sánchez and Ravelo, 2010).

According to Soín (2004) there are internal and external elements that impact the fluidity of the supply chain. In maquila companies, some of the internal factors that affect the operation of the supply chain are: logistics in the handling and movement of products and services, customer relationship management, information systems and technology used; flexibility to organisational changes, decision making and organisational factors, such as employee performance, skills and behaviour.

In terms of external factors affecting the supply chain, it is mainly the customs clearance, which is the mandatory act for all those involved in trade. However, customs clearance and all the formalities that are part of it become daunting processes (Lenin and Zamora, 2015).

Therefore, it is essential that customs and companies optimise the trade process to provide security in the markets and thus ensure the timely delivery of goods, resulting in reduced costs in international trade (Lenin and Zamora, 2015).

Efficiency in the customs processes of maquila companies is a fundamental factor in their operation, which is why it is important for them to have various strategies and tools that allow them to optimise their customs activities and achieve a more fluid and agile international trade.

Customs clearance is composed of the set of formalities and actions that are carried out at the time of entry and exit of goods from one country to another, through the different types of traffic, land, rail, sea and air. Customs regimes play a fundamental role in the customs law, generating the process of operations before customs, complying with the transmission of the corresponding information through an electronic customs system (Cámara de Diputados del H. Congreso de la Unión, 2024).

An administrative process is made up of activities, sequenced, repetitive and connected to each other in a systematised manner, the correct execution of which has the same purpose. In the work environment, processes have always existed as the most natural way to organise work, however, in order to correctly identify the correct steps to follow according to the process to be carried out, it is necessary to delimit the limits based on their function, assign responsibilities and identify the elements and interactions to make a successful process possible.

Nowadays, the task of producing efficiently while avoiding delays in the delivery of the finished product has become essential for companies that wish to remain in a competitive commercial market linked to elementary factors for survival, such as quick responses, quality and delivery times are paramount. Thus, business processes have become a crucial factor for manufacturing companies seeking to cope with international trade (Arango, Campuzano, and Zapata, 2015).

Internally, organisations have been influenced by several factors, which have resulted in providing time and resources for new work routines, which are based on teamwork, cooperation and observation; to achieve this, it is necessary to invest in the necessary tools to help accomplish these tasks, such as the application of new technologies, constant training and coaching of employees, and investing in knowledge.

Training and communication become key tools for the functioning of the operations and activities of the maquila industries (Beltrán and Cabiativa, 2008).

Based on the above, we proceeded with the analysis of the customs clearance process of a maquiladora company in the electronics sector located in Ciudad Juárez, Chihuahua.

Customs operations in the maquiladora company considered in this research project tend to be affected by the speed and fluidity of customs clearance processes, causing stoppages in operations, delays in the delivery of finished products, increased costs due to overtime and reprimands to customs personnel due to the slow crossing of some goods.

The clearance times present delays in each daily export and import operation to be carried out, which causes fewer commercial operations per day, increases the wait for the arrival of raw materials and customer dissatisfaction due to late deliveries.

The general objective of this research was to identify the administrative factors that influence the process time of customs clearance operations in the maquiladora industry of the electronics sector in Ciudad Juárez, Chihuahua.

The identification of the administrative factors that influence the process time of customs clearance operations will allow companies to optimise their processes by eliminating bottlenecks, strengthening weak points and reducing the time of operations, which will allow them to increase their productivity and efficiency.

## Methodology

The nature of the research was quantitative, non-experimental, descriptive, cross-sectional design.

The study was conducted in the following functional areas of the company: customs, purchasing, sales and shipping, of a manufacturing company belonging to the maquiladora sector, in Ciudad Juárez, Chihuahua. The study population consisted of 19 employees belonging to the aforementioned areas (table 1).

## Box 1

**Table 1**

Staff by areas participating in the study

Department	Employees
Customs	4
Sales	3
Purchasing	7
Shipments	5
Total	19

Source: Own elaboration

The sample was obtained according to the population involved and the formula for finite populations was used, generating a result of 18.75 people. To collect the information, the survey method was used, through the design of a questionnaire, validating the content of the research instrument through the technique of expert judgement in the areas involved (Galicia, Balderrama and Navarro, 2017). According to table 2, it integrates the elements of coherence, clarity and impartiality of the instrument, suggesting the adjustment of some questions which were identified and improved for validation.

## Box 2

**Table 2**

Expert validation

Expert	Coherence		Clarity		Impartiality	
	YES	NO	YES	NO	YES	NO
1	X		X			X
2	X		X		X	X
3	X		X			X
4		X	X		X	
5	X		X			X

Source: Own elaboration

The validity of the questionnaire was tested under Cronbach's Alpha coefficient which is a tool that takes values between 0 and 1. The closer to 1, the greater the veracity of the instrument used (Darren & Mallery, 2003).

The designed measurement instrument obtained a reliability of 0.923 in the Cronbach's Alpha range, which is an excellent acceptance criterion according to table 3.

**Box 3****Table 3**  
Cronbach's Alpha Reliability

Cronbach's Alpha	No. of Items	No. of participants
.923	16	19

*Source: Own elaboration*

The questionnaire consisted of 16 questions, distributed in 3 dimensions corresponding to the study variables. For the answers to each question, a Likert scale was used with values from lowest to highest, where 1 has a scale of never and 5 is very frequently. The questionnaire was physically administered to the 19 employees considered in the sample of this study.

The operationalisation of variables is a process of separation and observation of the variable into its components, which allows it to be measured (Morán & Alvarado, 2010). Accordingly, Table 4 is presented, in which the components of the selected variables are developed.

**Box 4****Table 4**  
Variables and dimensions

Variable	Dimension	Ítems
Independent: Administrative factors	Training Communication Organisation	1, 8, 9, 16, 2, 7, 10, 15, 3, 6, 11, 14,
Dependent: Customs clearance time	Import time	4, 5, 12, 13

*Source: Own elaboration*

In addition, a checklist was designed to record the activities and times in minutes of the operations carried out in the customs, purchasing, sales and shipping areas of the company studied.

The information collected was analysed using SPSS statistical software.

**Results**

The results obtained for the objective of this research are presented below.

**Objective**

To identify the administrative factors that influence the process time of customs clearance operations in a maquiladora company in the electronics sector in Ciudad Juárez, Chihuahua.

**Hypothesis**

Ho: Administrative factors do not influence the time of the customs clearance process in the maquiladora industry of the electronics sector in Ciudad Juárez, Chihuahua.

Ha: Administrative factors do influence the time of the customs clearance process in the maquiladora industry of the electronics sector in Ciudad Juárez, Chihuahua.

The analysis of the information collected, carried out using Chi-square and contingency tables, identified the following as the main administrative factors that influence the processing time of customs clearance operations: training, communication, and organisation.

The results for each of the factors identified are presented below.

**Training**

Table 5 presents the result of the Chi-Square test to identify whether there is a dependence between customs clearance time and training.

**Box 5****Table 5**  
Chi-square test training dimension

Value	df	Asvmp Sig (2-sided)
Pearson Chi-Square	15.354	3
es Likelihood Ratio	19.585	3
Linear-by-Linear Association	11.558	1
N of Valid Cases	19	

*Source: Own elaboration*

The relationship is dictated by Pearson's correlation coefficient ( $\rho$ ), and according to the result obtained, there is indeed a dependence between the training dimension and the customs clearance time variable, since the  $\chi^2$  as shown in table 3 with a value of 15.354 is greater than the critical value of 7.815 and a p-value = 0.002.



Training in companies seeks to ensure that employees obtain and develop the skills necessary for the position they hold. It is deeply rooted in the organisation's systems, the lack of which can affect the daily operations of the maquiladora, so it must provide teaching, learning and tools that allow the skills of employees to flow and thus achieve the intended goals of the position (Parra and Rodriguez, 2015).

### Communication

Table 6 shows the result of the Chi-Square test to identify whether there is dependence between the variable customs clearance time and the communication dimension. When calculating the Chi-Square test, according to the result obtained, it was determined that there is dependence between the variable customs clearance time and the communication dimension, since the  $\chi^2$  calculated in Table 17 with a value of 12.436 is greater than the critical value of 7.815 and a p-value = 0.002.

### Box 6

**Table 6**

Chi-square test communication dimension

	Value	df	Asymp Sig (2-sided)
Pearson Chi-Square	12.436	2	.002
es Likelihood Ratio	15.856	2	.000
Linear-by-Linear	9.659	1	.002
Association			
N of Valid Cases	19		

*Source: Own elaboration*

The result obtained coincides with De Castro (2014), with regard to the continuous affectation in the internal operations of the companies due to the lack of communication.

### Organisation

When performing the Chi-squared test to identify whether there is dependence between the customs clearance variable and the organisation dimension, according to the data collected, the result obtained showed that there is dependence. Table 7 shows that the  $\chi^2$  had a value of 15.308, higher than the critical value of 5.991 and a p-value of 0.000.

### Box 7

**Table 7**

Chi-square test organisational dimension

	Value	df	Asymp Sig (2-sided)
Pearson Chi-Square	15.308	2	.000
es Likelihood Ratio	19.362	2	.000
Linear-by-Linear	12.117	1	.000
Association			
N of Valid Cases	19		

*Source: Own elaboration*

According to the results obtained, there is dependence between the customs clearance time variable and the administrative factors: training, communication and organisation, therefore, Ho: Administrative factors do not influence the customs clearance process time in the maquiladora industry of the electronics sector in Ciudad Juárez, Chihuahua with a significance level of 0.05 is rejected.

### Conclusions

The optimisation of the activities involved in the customs clearance of local companies is a matter of great concern. This operation plays a crucial role, as this process allows the legal entry or exit of goods through customs, complying with the regulations and standards determined.

The internal operations between the departments of a maquiladora company require an effective analysis to identify areas of opportunity and improvement, in order to reduce the time of the internal process. The present study identified different organisational factors influencing the process and time mentioned above, within which several elements were detected and sized in three categories, training, organisation and communication.

A DAT 2024 measurement instrument was developed with a total of 16 questions with which the perception and ideals of the different departments involved in clearance, customs, purchasing, sales and shipping were evaluated. The questions were sized as independent variables of the three categories mentioned above, and the time of customs clearance was integrated as a dependent variable.

The instrument was analysed with the statistical programme SPSS 21 for Windows; the results were measured with the Chi-square statistical test, which was used to determine if there is significant dependence between the administrative factors, training, organisation and communication and the time of the internal customs clearance process of the maquiladora company.

The results obtained for the training variable, the  $\chi^2$  calculated with a value of 15.354 was higher than the critical value of 7.815 and a p-value = 0.00. On the other hand, the result obtained for the communication variable, the  $\chi^2$  calculated with a value of 12.436 was higher than the critical value of 7.815 and a p-value = 0.002.

Finally, the result obtained for the organisation variable calculated with a value of 15.308 was higher than the critical value of 5.991 and a p-value = 0.000.

According to the above results, following up on the hypotheses stated, the null hypothesis was rejected, which states: Administrative factors do not influence the time of the customs clearance process in the maquiladora industry of the electronics sector in Ciudad Juárez, Chihuahua with a significance level of 0.05.

The data obtained allow us to establish an improvement plan in the different departments in which the proposal to measure the times of each operation will be generated, to establish the necessary improvements and changes and to determine statistically whether the improvements implemented will generate a significant change in the time of the customs clearance process in the maquiladora industry of the electronics sector in Ciudad Juárez, Chihuahua.

The product obtained once the changes, improvements and the measurement of departmental process times have been implemented will generate another data analysis and statistical tests to determine whether the recommendations and approach generated in this study will improve the time efficiency of customs clearance in the maquiladora industry of the electronics sector in Ciudad Juárez, Chihuahua.

## Declarations

### Conflict of interest

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

### Authors' contribution

*Castro Ramírez, Vianey Iliana*: Contributed the idea of the research project, the approach, methodology, data collection and analysis, results and conclusions.

*Portillo Castillo, Víctor Manuel*: Contributed to the research approach, methodology, results and conclusions.

*Mejía Hernández, Marisela*: Contributed to the research approach and methodology.

### Availability of data and materials

The data obtained and the instruments used for the collection of information in this research are available upon request to the authors.

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This research was carried out without funding from any institution or body.

### Abbreviations

DAT Customs clearance time

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