

Analysis of manufacturing companies in Ciudad Juárez that are currently certified

Análisis de las empresas manufactureras de Ciudad Juárez que actualmente están certificadas

NAVARRO-ENRÍQUEZ, Laura†*, HOLTZEIMER-ÁLVAREZ, Ángeles, RIVERA-MOJICA, Denisse and TOVAR-VÁSQUEZ, Amado

Universidad Tecnológica Paso del Norte, Industrial Processes, Mexico.

ID 1st Author: *Laura, Navarro-Enríquez* / ORC ID: 0000-0001-6969-7529, CVU CONACYT ID: 775111

ID 1st Co-author: *Ángeles, Holtzeimer-Álvarez* / ORC ID: 0000-0003-0463-4038, CVU CONACYT ID: 1701809

ID 2nd Co-author: *Denisse, Rivera-Mojica* / ORC ID: 0000-0003-4382-2197, CVU CONACYT ID: 214879

ID 3rd Co-author: *Amado, Tovar-Vásquez* / ORC ID: 0000-0002-7734-0631, CVU CONACYT ID: 775112

DOI: 10.35429/JAF.2021.22.8.23.30

Received January 25, 2021; Accepted June 30, 2021

Abstract

The lack of specific information on the internet and in other media with reference to currently certified companies, which is intended to create a database of companies that are certified and those that are not ISO 9000 certified, show them the benefits, as well as give them the opportunity to know the advantages of being certified in ISO 9000 and if they are interested to present a proposal for a quality management system. And even generate a link with Índex de Juárez to share this information with this institution to give extra value to this research. The research approach is mixed with the combination of the quantitative and qualitative approach, for the first phase of this research a field investigation of the background of companies that are currently certified and which are the certifying companies as well as the preparation of a standard questionnaire for other entities and Ciudad Juárez that will be applied throughout this study to collect relevant data and present the number of companies that have their ISO 9001 certification, if they are interested in being certified and which ones are not certified.

ISO 9001 Certification, Analysis, Quality of companies (SGC), Manufacturing companies

Resumen

La falta de información concreta en internet y en otros medios con referencia a las empresas certificadas actualmente, con lo cual se pretende crear una base de datos de empresas que están certificadas y las que no están certificadas en ISO 9000 mostrarles los beneficios, así como darles la oportunidad de conocer las ventajas de estar certificado en ISO 9000 y si están interesadas presentarles una propuesta de un sistema de gestión de calidad. E incluso generar un vínculo con Índex de Juárez para compartir esta información con esta institución para darle un valor extra a esta investigación. El enfoque de la investigación es mixto con la combinación del enfoque cuantitativo y cualitativo, para la primer fase de esta investigación se realizara una investigación de campo de los antecedentes de empresas que están certificadas actualmente y cuáles son las empresas certificadoras así como la elaboración de un cuestionario estándar para otras entidades y Ciudad Juárez que estará aplicándose a lo largo de este estudio para recabar datos relevantes y presentar la cantidad de empresas que cuentan con su certificación ISO 9001, si están interesados en certificarse y cuales no están certificadas.

Certificación ISO 9001, Análisis, Calidad de las empresas (SGC), Empresas manufactureras

Citation: NAVARRO-ENRÍQUEZ, Laura, HOLTZEIMER-ÁLVAREZ, Ángeles, RIVERA-MOJICA, Denisse and TOVAR-VÁSQUEZ, Amado. Analysis of manufacturing companies in Ciudad Juárez that are currently certified. Journal of Administration and Finance. 2021. 8-23:23-30.

* Correspondence to Author (Email: laura.navarro@utpn.edu.mx)

† Researcher contributing first author.

Introduction

This research work is focused on generating a Geo-socio-economic diagnosis in Ciudad Juárez and the relationship to the manufacturing companies that are currently certified, since there is no simple registry where information on these companies can be found, as well as their certifying houses. Motivating those who are not certified to seek their certification, presenting the benefits and advantages of being certified to the ISO 9001 standard with the possibility that our educational institutions could advise them in the future in the implementation of a QMS. Currently, it is not possible to find a metric to measure quality in companies, therefore, it would be important to have a benchmark such as, in your case, all those companies that are certified. The interest in quality in Mexico is demonstrated by the growing number of companies that have achieved ISO quality recognition. (Show% hard data from INEGI for our entities). Although the certification of ISO standards it is understood that it should be an initial step towards other Total quality strategies. (Meegan and Taylor, 1997)

Therefore, this study focuses its attention on the following topics of interest in relation to quality, ISO 9001 certification and certifying companies, for which we will only focus solely on the collection of data and application of the survey for documentary purposes for In a second stage, analyze the results and obtain statistical data, which will not be included in this article for the moment, since this project is still being worked on until its completion next year.

Requirements necessary to obtain an ISO 9000 certificate

What companies must adopt these standards?

The systems apply to any type of business organization, from transnational to medium and small, internal consumption and mainly companies dedicated to export. Standards can be adopted by the public sector and / or the private sector.

Requirements in ISO 9001

The requirements in ISO 9001 are as follows: Managerial responsibility, a quality system, contract review, design control, document control, customer-supplied products, process control, inspection, control of non-conforming products, actions corrective and preventive, handling, storage, packaging, control of records, audits, training, statistical techniques. These are specified in the ISO 9001 standard. (Espinoza, 1999)

ISO 9001 certification companies

Some of these associations are EFAC (European Federation of Association of Bodies Certification), the IQNet (International Certification Network) and the PEFC (Program for the Endorsement of Forest Certification Schemes). As indicated by the IEC 17021 standard, the objective of the certification is to generate confidence in all parties about the QMS meets the specified requirements (Álvarez, 2015)

Certified companies in Mexico

Quality	Standard	Total Percentage
NMX-CC-9001-IMNC-2000/ISO 9001:2000	84	4.92%
NMX-CC-9001-IMNC-2008/ ISO 9001:2008	1442	84.48%
NMX-CC-SAA-19011-IMNC-2002/ISO 19011:2002	3	0.18%
NMX-F-CC-22000-NORMEX-IMNC-2007/ISO 22000:2005	14	.82%
NMX-SAA-14001-IMNC-2004/ISO 14001-2004	116	6.8%
NMX-SAST-001-IMNC-2008	46	2.69%
NMX-TT-006:1996 IMNC	2	0.12%

Table 1 Certified companies in Mexico
Source: SE (Secretaría de Economía, 2012)

Benefits of companies certified in ISO 9001

Some benefits, both direct and indirect, are the following: Improvement in the management of the organization since at this point it requires full participation of the management team, increased productivity, satisfied customers, motivated staff since the standard requires that the organization know their functions and responsibilities within it, improves the image since a certification is an excellent presentation letter for the company. A study carried out a few years ago at UCLA (University of California) revealed that companies certified in ISO 9001 had achieved superior financial performance compared to other companies that did not have this certification. Implementing a QMS is not a cost but an investment that is reflected in its processes and its results. (López, 2016)

Method description

Ciudad Juárez is a city in Mexico with a total population of 1,512,450 (Population Census. INEGI, 2020) which is located in the north of the country, in the state of Chihuahua, on the banks of the Rio Bravo is located in the central table of the region Northern Mexico, in the state of Chihuahua, between the states of Sonora, Sinaloa, Durango and Coahuila, borders the United States border.

List of industries by activity

SCIAN 2007 is divided into 20 activity sectors at the most general level, 94 subsectors, 304 branches, 617 underlines and, at its most detailed level, into 1049 activity classes. It is important to bear in mind that when businesses carry out more than one activity, they are classified by the most relevant. This catalog includes 459 companies of which 411 are manufacturers and 48 are non-manufacturers. (IMIP, 2014). For this research we will only consider the following sectors: Electronics, Automotive, Medicine, Food, Chemical, Petrochemical, Textile, Wood Industry and others due to the industry that exists in our entity.

Searching in Dengue (2018) it was found that from 31 to 250 employees there are 239 manufacturing companies in Ciudad Juárez considering the category of small or medium companies, it was also investigated of 250 employees or more there are 215 manufacturing companies in Ciudad Juárez.

According to the Official Mexican Standard for Industrial Parks NMX-R-046-SCFI-2011 they are classified as Industrial Warehouse, Industrial Park, Industrial Lot, Industrial Complex, Industrial Zone. (IMP)

Various authors have studied the contribution of ICT to strengthen KM in organizations, small and medium-sized enterprises (SMEs), as well as the main factors that influence its adoption and dissemination, such as the economic environment and the particular characteristics of the company (Quijano, 2021).

Analysis from the method

The research was carried out from a qualitative methodological approach, since it is required through interviews with personnel who work directly in the maquiladora industries and SMEs and the type of study that was carried out is descriptive, Fidias, argues that this type of research consists of "the characterization of a fact, phenomenon, individual or group, in order to establish its structure or behavior. (Montaño B, 2021 & Fidias, 2012)

This research work is focused on generating a Geo-socio-economic diagnosis in Ciudad Juárez in relation to the manufacturing companies that are currently certified, since there is no simple registry where information on these companies can be found, as well as their certifying houses. Motivating those who are not certified to seek their certification, presenting the benefits and advantages of being certified to the ISO 9001 standard with the possibility that our educational institutions could advise them in the future in the implementation of a QMS. At present it is not possible to find a metric to measure quality in companies, therefore, it would be important to have a benchmark such as all those companies that are certified. The interest in quality in Mexico is demonstrated by the growing number of companies that have achieved Iso quality recognition. (Show % hard data from INEGI for our entities).

To carry out this project we rely on the information provided by the 2020 population census to search for information on geo-statistical areas, as well as the National Statistical Directory of economic units (Denue), List of companies of the Paso del Norte Technological University that They currently have an agreement by the linking department, in addition it is intended to seek sources and support from the National Council of the Maquiladora and Export Manufacturing Industry (Índex), Georeferenced Catalog-directory of parks, industrial zones and industries of Ciudad Juárez, Chihuahua . It is worth mentioning that the Official Mexican Standard for Industrial Parks makes a division (Industrial warehouse, industrial park, Industrial lot, Industrial complex, Industrial zone) which is important to take into consideration when collecting the information and classifying it. It is also necessary to know the geographic location of the industries since they are divided into 7 sectors (North West, Central West, South West, North East, Central East, South East, South East East) so which this has to be a priority on the part of both academic bodies to delimit the area of study. The manufacturing industry in Ciudad Juárez Chihuahua is divided into parks and industrial zones that are subdivided into sector, name and area. There are a total of 33 industrial parks, 298 manufacturing industries and 44,000 small and medium-sized companies according to table 2 and the INEGI digital maps in figure 1 and 2.

In total, the municipality of Ciudad Juárez has a total of 397 maquiladoras. (Inegi, 2020)

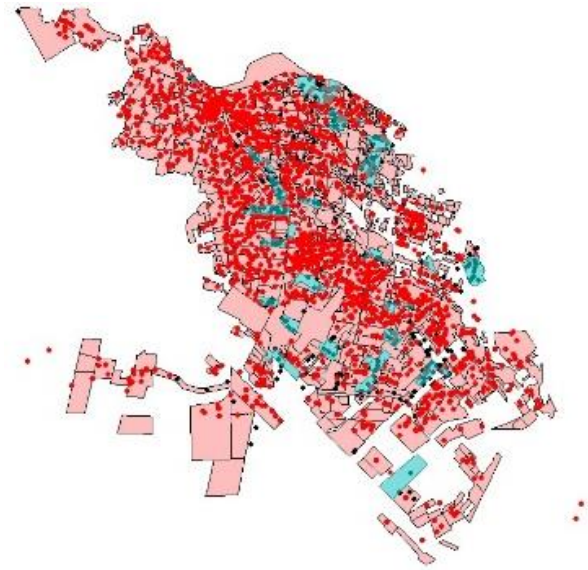


Figure 1 Map of all maquiladoras and Pymes
Source: Campos J, Digital Maps of Mexico INEGI

The points marked in red in figure 1 are the Pymes, the ones marked in green are the maquiladora companies.

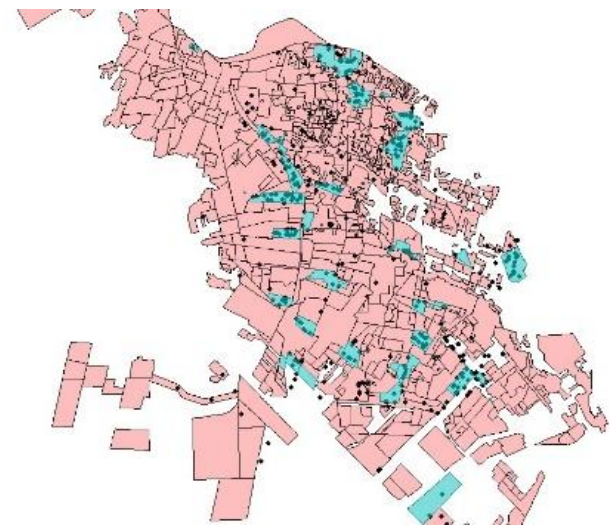


Figure 2 Map of Ciudad Juárez of all sectors where there are maquiladoras
Source: Campos J, Digital Maps of Mexico INEGI

Those that are marked in fig. 2 in green are the sectors where maquiladoras are located.

List of Industrial Parks and Industrial Zones	Number of maquiladoras in the area
Intermex South Park	4
Intermex East Park	2
South Towers Park	1
Nuevo Zaragoza Park	2
Salvarcar Park	7
Satelite Park	1
Independencia Park	5
El Mirador Park	1
El Marques Park	1
Juarez Industrial Center	3
Magnaplex Industrial Park	2
Aero Juarez Ii Park	1
Omega 17 Park	17
Eje Juan Gabriel Industrial Park	2
Ramón Rivera Industrial Zone	8
Aztecas Industrial Park	12
Fernández Industrial Park	9
Aeropuerto Industrial Park	2
Industrial City	8
J. Bermudez Park	2
Las Fuentes Industrial Park	1
Total	397

Table 2 List of Parks and Industrial Zones in Ciudad Juárez

Source: INEGI_DENUE 02032021

ID	Name of Economic Unit	Company name	Name of human settlement	Municipality	Basic geo-statistical area
152210	ABARROTES Y COSTURAS CARRETES		SIMONA BARBARA	Juarez	4116
156249	GROCERIES AND BAKERY		AMPL PLUTARCO ELIAS CALLES	Juarez	4141
174041	ABARROTES Y PANADERIA MORALES		RIBERAS DEL BRAVO	Juarez	7729
211902	ABARROTES Y FORTALEZA RUBI		FELIPE ANGELES	Juarez	2961
629147	AGROINDUSTRIAL LIDERLAC	AGROINDUSTRIAL LIDERLAC SA DE CV	PUENTE ALTO	Juarez	294A
52785	AGUA ALASKA	AL TEC PURIFICACION SA DE CV	PROGRESISTA	Juarez	3476
3097146	AGUA MACULADA DE JUAREZ		GRANJAS DEL DESIERTO	Juarez	8408

Table 3 List of Pymes in Ciudad Juárez

Name of between	Outer number or kilometer	Type of human settlement human settlement	Name of human settlement
Road 2	2706	Colonia	Simona Barbara
Maria viuda de romero	4728	Colonia	Ampl Plutarco Elias Calles
Philippine islands	83	Subdivision	Riberas Del Bravo
Rivera del moro	6812	Colonia	Felipe Angeles
Reynosa	10405	Colonia	Puente Alto
None	754	Colonia	Progresista
Bouche		Colonia	Granjas Del Desierto
None	2703	Colonia	Americas
Tomas alva edison	3310	Subdivision	Infonavit Parques Industriales
Donato azures	6780	Subdivision	La Cuesta Ii
Tecnologico		Subdivision	Parajes De San Juan
Montecolon	5525	Subdivision	La Cuesta Ii
Caucasus mountain range	232	Section	Samalayuca
Ignacio allende	6005	Colonia	Partido Las Fuentes
None	1961	Commercial zone	Plaza San Andres
Reserva del valle	0	Subdivision	Misiones Del Real
Paseo de compositores	1223	Subdivision	Heroes De Mexico

The table above shows the list of manufacturing companies called SMEs, which are in total 2167 companies, according to (Inegi, 2020) INEGI_DENUE_11032021

The ISO variable is a dichotomous variable that can only take 1/0 values to define mutually exclusive options, whether or not the ISO 9000 quality certificate is available.

Among the Universities interested in participating in the project, they must determine the data analysis, collect information and interpret the results with some related statistical method that can give us important results for the investigation.

The most common way to obtain information is through open interviews where researchers generally analyze patterns in the observations during the data collection phase.

The most used technique is online surveys in google forms as it brings great benefits in reducing time and money.

This type of form you can choose from a lot of question options from a test to drop-down lists with a numerical scale.

The responses to your surveys are collected automatically and in an orderly manner in Forms, with graphs and data of the responses in real time, as well as you can examine your data in spreadsheets.

Survey of quality management system for manufacturing companies

1. How long has your company been operating in Mexico?
a) 1 to 3 years b) 3 to 5 years c) 5 to 10 years d) more than 10 years

2. How many personnel does your company have?
a) 1 to 50 b) 50 to 100 c) 100 to 300 d) 300 to 500 e) 500 to 1000 f) 1000 or more.

3. What is your company's line of business?
a) Electronics b) Automotive c) Medical d) Food e) Medical and Chemical f) Petrochemical g) Textile h) Wood industry I) Other

4. Do you have a quality management system?
YES NO

5. Is your company certified under ISO 9001?
IF NOT WHICH VERSION: _____

6. Which version of the standard do you have?

7. Would you be interested in certification?

8. Can you provide name and contact e-mail address?
Name: _____
E-mail address: _____

9. In which State and City is your company located?

10. Do you have certification in any other standard? (Indicate which one)

Figure 3 Quality management system survey for manufacturing companies
Source: Own elaboration, (2021)

Results

The objective of the Certification system is to facilitate national and international trade, allow better identification of products and that they comply with certain requirements of the ISO 9001: 2015 standard, as well as for consumers to be sure that the product you purchase is safe and has the specific quality of the product. The ISO 9001 certification must give confidence about the quality management system to the consumer, customer and suppliers.

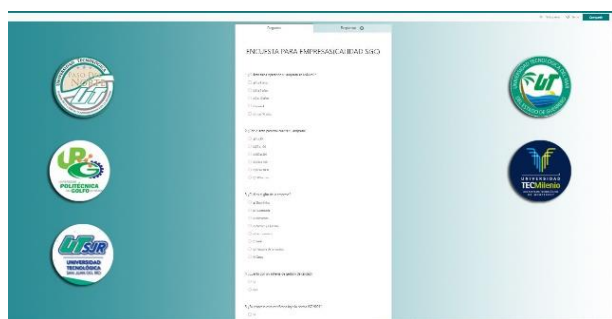
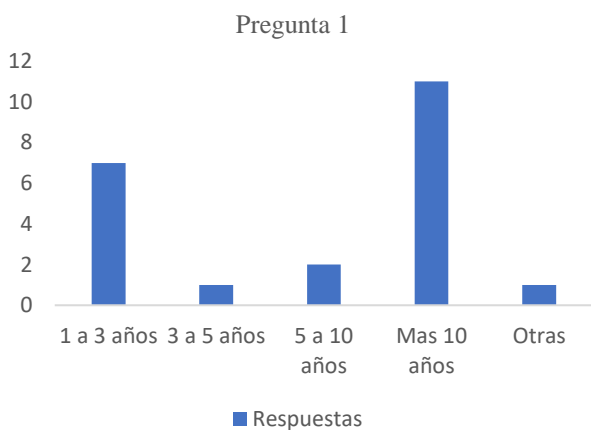


Figure 4 Survey proposed in online google forms to be applied to manufacturing companies
 Source: Own elaboration, (2021)

Results analysis

1. How long has your company operating in Mexico?

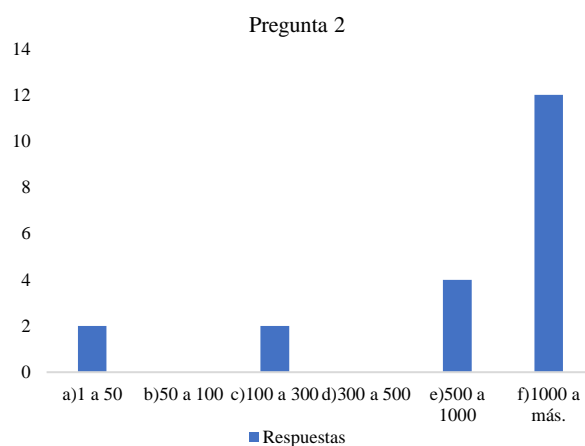
Time (years)	Answers
a) 1 to 3 years	7
b) 3 to 5 years	1
c) 5 to 10 years	2
d) More than 10 years	11
Others	1



Graphic 1 Question 1
 Source: Own elaboration, (2021)

2. How many staff does your company have?

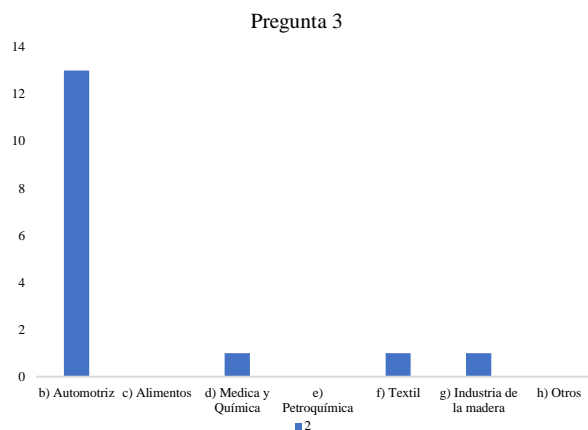
Personal quantity	Answers
a) 1 to 50	2
b) 50 to 100	0
c) 100 to 300	2
d) 300 to 500	0
e) 500 to 1000	4
f) More than 1000 years.	12



Graphic 2 Question 2
 Source: Own elaboration, (2021)

3. What is the business of the company?

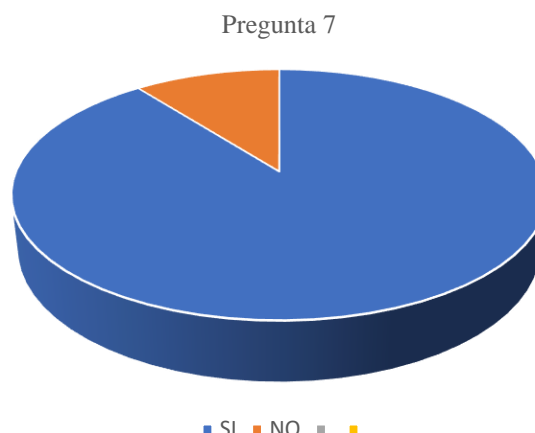
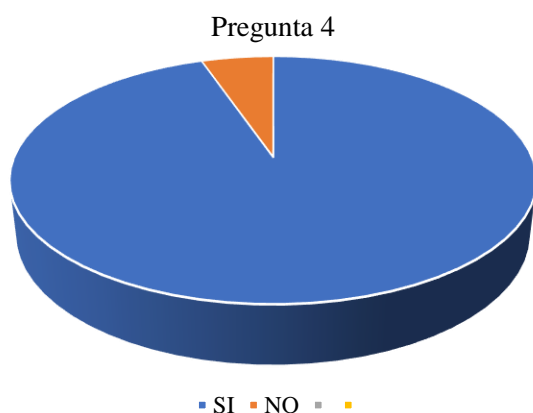
a) Electronics	2
b) Automotive	13
c) Food	0
d) Medical and Chemical	1
e) Petrochemical	0
f) Textil	1
g) Wood industry	1
h) Others	1



Graphic 3 Question 3
 Source: Own elaboration, (2021)

4. Do you have a quality management system?

Yes	18
No	1

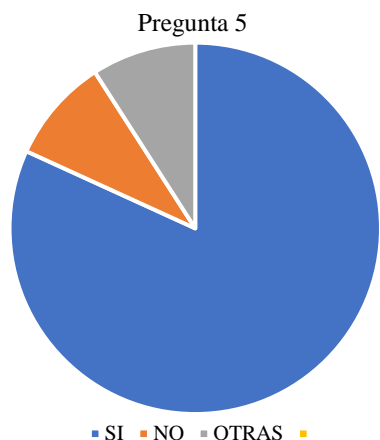


Graphic 4 Question 4
Source: Own elaboration, (2021)

Graphic 6 Question 7
Source: Own elaboration, (2021)

5. Is your company certified under the ISO 9001 standard?

Yes	18
No	2
Others	2



Graphic 5 Question 5
Source: Own elaboration, (2021)

6. What version do you have of the standard?

ID	Answers
1	9001-2015
2	I don't remember
3	I don't really know
4	9001:2018
5	2015
6	9000
7	Satisfy the customer in time and order
8	The recent

7. Would you be interested in getting certified?

Yes	17
No	2

8. Could you provide name and contact-email?

ID	Answers
1	LEAR VICTORIA abdielfeliperamirez7@gmail.com 6563481430
2	José Alfredo Pavía Rodríguez 1986paviafredy@gmail.com
3	I no longer work there
4	Luis Daniel Luevanos Salazar 18030334@utpn.edu.mx, dhanlvns13@gmail.com
5	jesus.ismael.pillado@outlook.com
6	1503185c@utpn.edu.mx
7	María Abigail lindo morales abigaillindo538@gmail.com
8	ulisesrojas48@gmail.com ulises marines
9	Enrique sanchezenrique593@gmail.com

9. In what State and City is your company located?

ID	Answers
1	CD Juárez
2	Cd. Juárez Chihuahua
3	Cd, Juárez Chihuahua
4	En ciudad Juárez Chihuahua
5	Cd Juárez Chihuahua
6	Cd, Juárez Chihuahua
7	CD Juárez Chihuahua
8	CD Juárez, Bermúdez park
9	Cd Juárez Chihuahua
10	Cd Juárez

10. Are you certified in any other standard? (Say which)

ISO 14,000

Acknowledgments

I thank the Paso del Norte Technological University for the opportunity to publish this article. To my career director Ángeles Holtzeimer Álvarez, Lic. Javier Omar Campos González, Eng. Tovar Vásquez Amado, Eng. Rivera Mojica Denisse, for the support they provided for the preparation of this article.

Conclusion

The objective of the Certification system is to facilitate national and international trade, allow better identification of products and that they comply with certain requirements of the ISO 9001: 2015 standard, as well as for consumers to be sure that the product you purchase is safe and has the specific quality of the product. The ISO 9001 certification must give confidence about the quality management system to the consumer, customer and suppliers.

References

Álvarez, Roger (2015). *Hacia la Sostenibilidad-Towards Sustainability*, No 278. *Business Success Magazine*. CEGESTI. Recovered from: http://www.cegesti.org/exitoempresarial/publicaciones/publicacion_278_260115_es.pdf

Arias Fidias. (2012). *The Research Project*. Editorial Episteme C.A. Caracas Venezuela

Campos González, Javier Omar (INEGI). *Synthesis of geographic information of the state of Chihuahua*.

Campos González, Javier Omar(INEGI,2020). *National Statistical Directory of Economic Units. List of companies in the Manufacturing sector in Ciudad Juárez*.

Digital Maps of Mexico INEGI app software.

Espinoza, Rebeca (1999). *Standards for Product Quality Management and Environmental Management*. San José, C.R: IICA. ISBN: 92-9039-433 1

GlobalSTD certification (2019), retrieved from: web: <http://www.globalstd.com>

INEGI, 1984. *Topographic Chart 1: 50,000*.

INEGI, 2010. *SCINCE* (System for consulting census information).

Municipal Research and Planning Institute (IMIP), 2014. *Georeferenced Catalog-Directory of Parks, Industrial Zones and Industries in Ciudad Juárez*.

López, Paloma (2016). *ISO 9001: 2015 news*. Spain: FC Editorial Fundación Confemetal.ISBN: 97884166671007.

Meegan, S. T. y Taylor, W.A(1997): *Factors influencing a successful transition from ISO 9000 to TQM. The influence of understanding and motivation*, *International Journal of Quality & Reliability Management*, vol 14, núm. 2, pp. 100-117.

Montaño, B., & Jenire, R. (2021). *Analysis of the performance of human talent based on the training process in the Company JVSEIMEC Ingeniería CIA. LTDA from 2015 to 2016* (Doctoral dissertation, Ecuador-PUCESE – Master's Degree in Human Talent Management).

Quijano García, R. A., & Magaña Medina, D. E. (2021). *Psychometric properties of the scale: perception about information and communication technologies for knowledge management*. *PAAKAT: magazine of technology and society*, 11 (20).

SE (Secretary of Economy, 2012). *Certified Companies in Management Systems*. Recovered from: Thomas, Cynthia (2004). *History of World Quality*. Puebla: Lupus Inquisitor. ISBN: 968-7507-98-5.