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# **Journal of Business Development Strategies**

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In the first article we present, *Optimization and improvement of the goods loading process in the transportation units*, by BENÍTEZ-LÓPEZ, Guillermo, with ascription in the Instituto Tecnológico Superior de Naranjos, as next article we present, *Use of Strategic Management Accounting in the determination of costs in SMEs in the furniture sector*, by LOMELI-RODRÍGUEZ, Sandra Eva, PELEGRIN-MESA, Arístides, SÁNCHEZ-BATISTA, Antonio and TORRES-MORA, Inés Josefina, with ascription in the Universidad de Guadalajara, as next article we present, *The subcontracting of specialized services or the execution of specialized works by socially responsible companies versus labor outsourcing*, by SOTO-RIVAS, Soledad, PEREZ-AGUILAR, Esmeralda and HERNÁNDEZ-HERNÁNDEZ, María Elena, with ascription in the Tecnológico Nacional de México, Campus San Martín Texmelucan, as next article we present, *The gender gap in the human capital of the restaurant sector*, by GALVÁN-ISMAEL, María Quetzalcihuatl, GONZÁLEZ-LAZALDE, Iván, HERNÁNDEZ-CHAVARRÍA, Juana and RIVAS-BARRAZA, Anapaula, with ascription in the Tecnológico Nacional de México/ I. T. Durango and CONACyT-Tecnológico Nacional de México/I.T. Durango.

## Content

| <b>Article</b>   | <b>Page</b> |
|--|-------------|
| <b>Optimization and improvement of the goods loading process in the transportation units</b><br>BENÍTEZ-LÓPEZ, Guillermo<br><i>Instituto Tecnológico Superior de Naranjos</i>  | 1-9         |
| <b>Use of Strategic Management Accounting in the determination of costs in SMEs in the furniture sector</b><br>LOMELI-RODRÍGUEZ, Sandra Eva, PELEGRIN-MESA, Arístides, SÁNCHEZ-BATISTA, Antonio and TORRES-MORA, Inés Josefina<br><i>Universidad de Guadalajara</i>  | 10-14       |
| <b>The subcontracting of specialized services or the execution of specialized works by socially responsible companies versus labor outsourcing</b><br>SOTO-RIVAS, Soledad, PEREZ-AGUILAR, Esmeralda and HERNÁNDEZ-HERNÁNDEZ, María Elena<br><i>Tecnológico Nacional de México, Campus San Martín Texmelucan</i>  | 15-20       |
| <b>The gender gap in the human capital of the restaurant sector</b><br>GALVÁN-ISMAEL, María Quetzalcihuatl, GONZÁLEZ-LAZALDE, Iván, HERNÁNDEZ-CHAVARRÍA, Juana and RIVAS-BARRAZA, Anapaula<br><i>Tecnológico Nacional de México/ I. T. Durango</i><br><i>CONACyT-Tecnológico Nacional de México/I.T. Durango</i> | 21-30       |



**Optimization and improvement of the goods loading process in the transportation units****Optimización y mejora del proceso de carga de mercancías en las unidades de transporte**

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**Abstract**

This research work was carried out with the objective of optimizing and improving the process of loading the goods transported in a commercial company of industrial products, where it was required to diagnose the area of shipments or departures, pointing out the current problems of the company through from an Ishikawa diagram, Later the stages of the loading process were identified by taking and recording the times taken, Likewise; The items with the highest turnover and their characteristics were recorded, by reviewing historical loads, proceeding to the taking and recording of volumetric dimensions measurement in the; load units, to the packaging or boxes and wooden pallets with the support of a flexometer and the use of Hopewell Autocube 8200 (Volumetric measurements), through the use of AutoCAD some load simulations were carried out, comparing and identifying the empty spaces that They were left due to poor arrangement, managing to optimize them by increasing the amount of cargo and thus preventing the goods handled from being damaged during transport, in addition, an improvement was obtained in the completion times of the stages of the registered process under constant supervision.

**AutoCAD, Improvement, Optimization****Abstract**

Este trabajo de investigación se realizó con el objetivo de optimizar y mejorar el proceso de carga de las mercancías transportadas en una empresa comercializadora de productos industriales, donde se requirió diagnosticar el área de embarques o de salidas, señalando la problemática actual de la empresa a través de un diagrama de Ishikawa, Posteriormente se identificaron las etapas del proceso de carga tomando y registrando los tiempos realizados, Así mismo; se registraron los artículos de mayor rotación y sus características, mediante la revisión de cargas históricas, procediendo a la toma y registro de medición de dimensiones volumétricas en las; unidades de carga, a los embalajes o cajas y pallets de madera con el apoyo de un flexometro y el uso de Hopewell Autocube 8200 ( Medidas volumétricas), mediante el uso de AutoCAD se realizaron algunas simulaciones de carga, comparando e identificando los espacios vacíos que dejaban por el mal acomodo, logrando optimizarlos incrementando la cantidad de carga y evitando así que la mercancía manejada sufriera daños durante el transporte, además se obtuvo una mejora en los tiempos de realización de las etapas del proceso registrado bajo una supervisión constante.

**AutoCAD, Mejora, Optimización**

**Citation:** BENÍTEZ-LÓPEZ, Guillermo. Optimization and improvement of the goods loading process in the transportation units. *Journal of Business Development Strategies*. 2021, 7-20: 1-9

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## 1. Introduction

The optimization and improvement of current processes within supply chains are extremely necessary to speed up product deliveries on time to the final consumer, this being the most important objective in any type of company; That is why it is important to pay attention to the activities of loading goods within the transport units since it is necessary to pay special attention to the arrangement of the pallets or pallets, the type of goods, type of cargo and the route that they will carry, and so; To be able to make the most of all the capacity of the unit, in reference to the regulations and vehicle capacity, when we carry out a weak and deficient load, we would be affecting the operating cost of all those involved in the process.

A load unit must use its maximum capacity, On the other hand, the supervision of the process and a good arrangement and maneuvering of goods in the units within the units, is decisive for the personnel in charge of this process, since delivery times are speeded up and contributes to having a better distribution of the goods. Within the units. Understand the importance that this activity represents for the correct functioning of the transport of goods according to its capacity. (Guzman, GC, & Serrato, RB 2018, p.13). The proposed solution was to carry out a review of the stages of the process of loading goods to transport units to optimize and improve it.

Therefore, we proceeded to review the process and the stages involved in it in the shipping or departure area, observing that empty spaces were left when finishing it, this could cause damage to the products when being transported, a logistics process It is made up of a series of stages, which occur in a chain and depend, on the one hand, on the nature of the product itself and, on the other, on the main activity of the company. (Escudero Serrano, MJ 2019, p.3).

Considering that the capacity of the units could be used to accommodate more boxes within the unit, so we began with the taking and recording of times in the realization of this process, the products that show the highest turnover in the company and their characteristics, through a review of the historical information in the previous shipping sheets.

That is why cargo transportation services are oriented to comply with the parameters and times that current markets demand, based on operations based on Logistics that streamline processes. (Soto Correa, HA, & Rivadeneira Naranjo, NY 2019, p.3). Once these elements were established, the volumetric measurement of both internal and external load units was carried out, as well as; of the boxes and pallets used to accommodate customer orders within them, with the support of a flexometer and the Honeywell Autocube 8200 tool, which is a scanning software to obtain volumetric measurements. The current design of the analyzed products, comparing them with a redesign proposal, has a positive economic impact on the process, optimizing the cubic capacity in transport and the competitiveness of the company. Jiménez Castillo, J., et.al. (2015).

A large percentage of the areas involved in the transport of goods are an essential part of the logistics chain, these present incidents at the time of being executed, in most cases. Oleas- (Lara, CX, et.al, (2020). 6 (3), 756-773. The cost structure, reference of road freight transport and the characteristics of the different road freight service providers contribute to improving the logistical processes of companies. (Ferrer, M., Ariza, Y., et.al. (2019). The previous step when acquiring a product is supplying it until it reaches the place of distribution. This process is determined by the supply chain that is defined as a set of processes necessary to satisfy the demand from the supply of raw materials, semi-finished products, from their origin to their destination. (González, MJS 2018. p. 16).

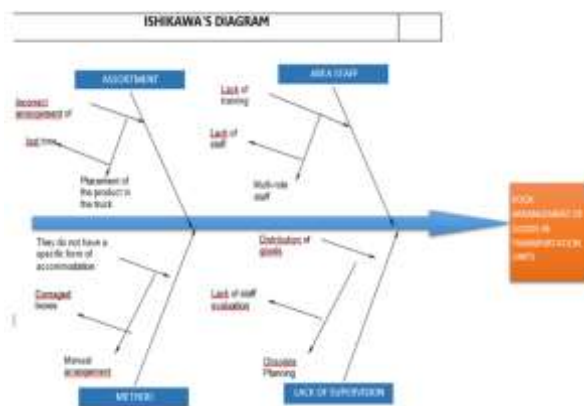
Globalization is changing the way distribution companies relate to manufacturers and this in turn demands modifications to their internal processes that relate to their customers. That is why it is essential to invest in resources that allow remote assistance, train staff with resources that allow them to communicate with their customers remotely. (Laza, CA, 2019, p. 8). The company Proveedora de Seguridad Industrial del Golfo SA de CV, dedicated to the commercialization of industrial products in its process of loading goods within the units, it is an important aspect that we must not overlook and that by not making the most of the total capacity of the unit destined for it.

It could generate unnecessary costs, so some simulations with the information collected and with the support of AutoCAD software and thus achieve a better arrangement of boxes and pallets, reducing empty spaces and increasing the load by 14% of its capacity and improving the times of completion of the stages of the process under supervision with a reduction of 21% in the time used for its realization, improving with this; customer service and company operating costs.

**2. Description of the Method**

**2.1 Diagnosis of the Departures or Departures area**

To carry out this research project it was necessary to establish a series of steps in order to reach its objective, which are detailed below: An Ishikawa diagram was applied in the identification of the problem in the area of shipments or departures of the goods, considering four aspects involved in the process of loading goods: assortment, method, staff and supervision. By identifying the causes and their impact on the company, this results in the poor arrangement of the pallets or pallets, the packaging (boxes) used in the loading units and as a consequence; the realization of a slow process, empty spaces inside the loading unit, and not counting that the personnel in charge of carrying it out is not supervised in their process and they are unaware of some important aspects such as; the volumetric measurements of the materials involved, shapes and weight of both the goods and the load units, wasting 100% of the capacity of the transport units to send the orders, as we can see in the figure one.



**Figure 1** Diagnosis of the Departures or Departures area  
Source: Self Made

**2.2. Measurement of times to carry out the preparation for the loading of goods**

In the area of shipments or departures, the way in which the personnel involved in this Process were inspected, where the times used in each of the stages that involve the process of loading the goods in the units were taken and recorded; From the preparation of orders (Picking), the authorization of the same, the palletization, the Emplayado and the arrangement of the packaging or boxes within the unit, the way of placing both the boxes on the pallets or pallets and distribute them was considered within the load units, as seen in the table one, where the times obtained for each activity are shown.

| Stage of the process             | Time to be done    |
|----------------------------------|--------------------|
| 1. Picking                       | 5 hours            |
| 2. Picking authorization         | 5 minutes          |
| 3. Palletizing                   | 20 – 30 minutes.   |
| 4. Emplayado                     | 15- 20 minutes.    |
| 1. Arrangement of goods in cargo | 50 – 60 minutes.   |
| 2. units                         |                    |
| Total Time to Perform            | 6 hours 55 minutes |

**Table 1** Record of times carried out in the Stages of the Preparation Process for the loading of goods  
Source: Self Made

These data will be necessary to make a comparison at the end of it since as we can see, the total time for the accommodation of goods without supervision in a Charging unit is 6 hours with 55 minutes estimated on average, we observe that the hours dedicated to this process is somewhat slow since it is not reviewed or verified by the company and this coupled with the ignorance of the volume dimensions of each charging unit, it can generate a bad arrangement of these and leave empty spaces on the part of the personnel who carry it out, this is one of the most common logistical problems in this type of activity.

**2.3. Identification of the goods with the highest turnover in the company**

An identification of the items with the highest turnover within the company's operations was carried out in order to identify their characteristics and verify if the packaging used is correct for this, for which two types of boxes of different sizes were documented. both large, medium and small, the latter with less turnover and that were not considered for this research due to their low relevance.

As we can see in the table two, the products with the highest turnover and their characteristics were registered.

| No. | Name of Product     | Features                  |
|-----|---------------------|---------------------------|
| 1   | 3m N95 Respirator   | Disposale P / Powder.     |
| 2   | 3m Respirator       | P / Vapores Organicos S.. |
| 3   | Cartridge 3m        | 6000 Series For Steamers  |
| 4   | Girdle Vallen 2500  | Or W / Third Belt..       |
| 5   | Overol Dupont Tyvek | C / Hood And Ela.         |
| 6   | Headband Barricade  | Standard Ama              |
| 7   | Vallen 40h Boot     | Brown C / C Steel Sole.   |
| 8   | Facial Mica Vallen  | Universal Clear.          |
| 9   | Filter 3m N95       | P / Particles And Neblin. |

**Table 2** Goods with the highest turnover and their characteristics  
Source: Self Made

When questioning the personnel in charge of this Process if they knew the characteristics of the goods that were in the boxes or packaging, they argued that at they did not. For this reason, we consider it important that the personnel involved in this type of process must know the characteristics of the products they handle in order to consider the maneuvering measures that will be given to them when loading them into the unit destined for their transport.

**2.4.Measurement of the internal and external dimensions of the load units**

The types of units that the company uses to carry out the goods dispatch process are single axle trucks with a load capacity of three tons. By considering the characteristics of these units, the types of packaging used for the goods and the characteristics of these, we can have a clearer idea of a better arrangement of these, as shown in the figures two, and the table three where the type of unit, volumetric capacity, load capacity, length, width and height of the unit are recorded.



**Figura 2** Image of the external dimensions of the Load Unit  
Source: Self Made

| Load Units        | Volume Capacity | Load Capacity | length | Width  | Heigth |
|-------------------|-----------------|---------------|--------|--------|--------|
| Single Axle Truck | M3              | 3 Ton.        | 7.52 m | 2.48 m | 2.30 m |

**Table 3** External dimensions of the unit and load capacity  
Source: Self Made

As indicated in the previous point, ignorance of the type of goods that are handled in this type of maneuver can result in a bad arrangement of the boxes and cause damage to them during their transportation, as shown in the figure three.



**Figure 3** Image of unit loading with the above process  
Source: Self Made

| Load Units        | Volume Capacity | Load Capacity | length | Width  | Heigth |
|-------------------|-----------------|---------------|--------|--------|--------|
| Single Axle Truck | M3              | 3 ton.        | 7.52 m | 2.14 m | 2.13 m |

**Table 4** Internal dimensions of the unit and load capacity  
Source: Self Made

That is why the record of the internal dimensions was made considering also the volumetric capacity, load capacity, length, width and height of the units used to transport the goods as shown in the table four, and make these data known to the personnel in charge of the process, since it is very important to have knowledge of these references when loading a unit.

**2.5.Volumetric measurement of packaging (Boxes) and pallets**


It is not only necessary to know the dimensions of the load units, but also of the other elements used to load the goods, such as pallets or pallets and boxes or packaging as shown in the figure four.

The empty pallets were also registered and with load as I know show in the tables five and six for this with we support the help of a flexometer and the Honeywell 8200 software that helped us to corroborate the measurements obtained and recorded both for taking measurements of the boxes and the pallets or pallets that are used in the process of loading goods in the unit and that were also made known to the staff involved in it.



**Figure 4** Image of the measurement of the dimensions of the boxes that are handled for the orders  
*Source: Self Made*

Regarding the weight of the wooden pallets or pallets that are handled in the company, their weights range between 25 kgs, and they support loads of up to 1,500 kgs, each of them.


| Pallet Image  | Long   | Width  | Heigth |
|---|--------|--------|--------|
|  | 1.20 m | 1.07 m | 0.13 m |

**Table 5** Dimensions of the empty pallet or pallet  
*Source: Self Made*


| Pallet Image With goods   | Long   | Width  | Heigth |
|---|--------|--------|--------|
|  | 1.20 m | 1.07 m | 2.13 m |

**Table 6** Dimensions of the Pallet or Platform with goods  
*Source: Self Made*

This company, dedicated to the sale of industrial security products, as mentioned above, handles two types of packaging or boxes, one of medium size with weight approximately 100 grams, and another large size with a weight of 200 grams, registering its data with the following characteristics such as: the long, width and height, of the same to identify their accommodation within the unit, as can be seen in the tables seven and eight, the order area (Picking) is in charge of placing the various goods requested by customers and once this operation is completed they are placed on the pallets or pallets to be packed and later placed inside the loading unit with the help of small lift truck.

| Medium Box Image  | Long  | Width | Heigth |
|---|-------|-------|--------|
|  | 45 cm | 45 cm | 40 cm  |

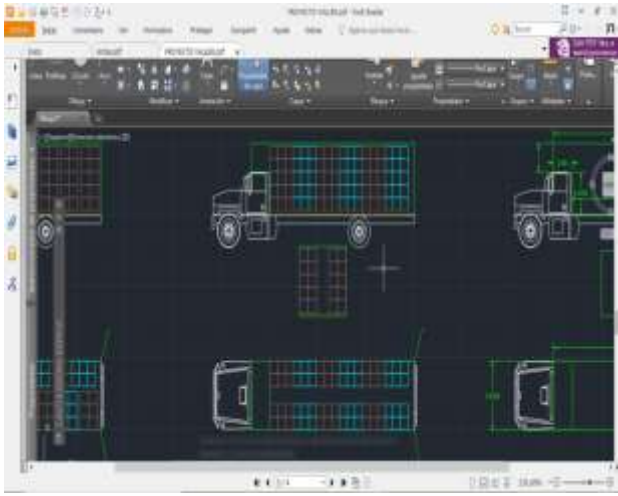
**Table 7** Medium box dimensions  
*Source: Self Made*

| Big Box Image  | Long   | Width    | Heigth |
|--|--------|----------|--------|
|  | 59 cm. | 44.5 cm. | 50 cm. |

**Table 8** Big box dimensions  
*Source: Self Made*

### 3. Results

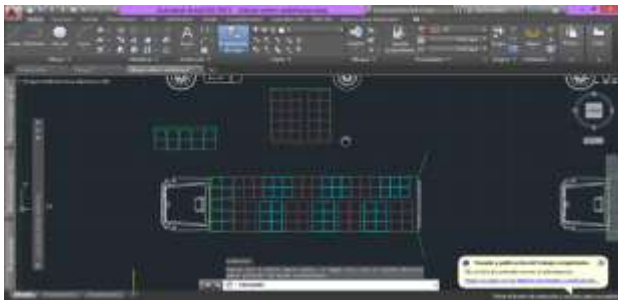
Once the information that was considered necessary to develop this research was known and registered, some simulations of the process were carried out using the AutoCAD tool, achieving graphic representations of the arrangement of pallets or pallets and the goods within the load unit, first evidencing the process that they normally carry out to later propose another type of accommodation until it manages to reduce the empty spaces that were left with the previous process as shown in the figures five and six.



**Figure 5** Simulation of normal palletizing within the unit by the personnel of the area

Source: Self Made

In this simulation we can observe the empty spaces that were left with the accommodation of the pallets or pallets in the previous loading process inside the unit. 45 cm 45 cm 40 cm for the following simulation shown in the figure six, a new rearrangement of the pallets or pallets within the unit is proposed considering the volumetric measurements obtained from the resources involved in the process.



**Figure 6** Simulation of the proposed arrangement of the palletization within the load unit

Source: Self Made

As can be seen in this graphic image, with this proposal it was possible to achieve a better arrangement of the pallets, mostly reducing the empty spaces that were left in the previous process.

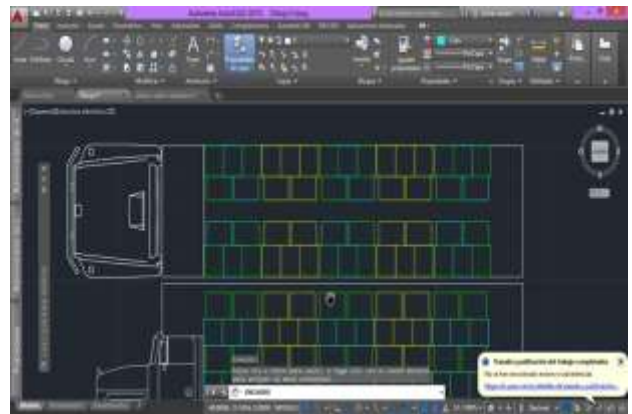
An example of inadequate arrangement of pallets or pallets with goods inside the load unit, can be seen in the following image of the figure seven, where the size of the empty spaces that remain as a result of a poor distribution in the normal process that the company staff handles are shown.



**Figure 7** Image of the normal arrangement of boxes in the company's cubing process

Source: Self Made

In a new simulation, the packaging or boxes were arranged with the goods inside the unit as shown in the figure eight.

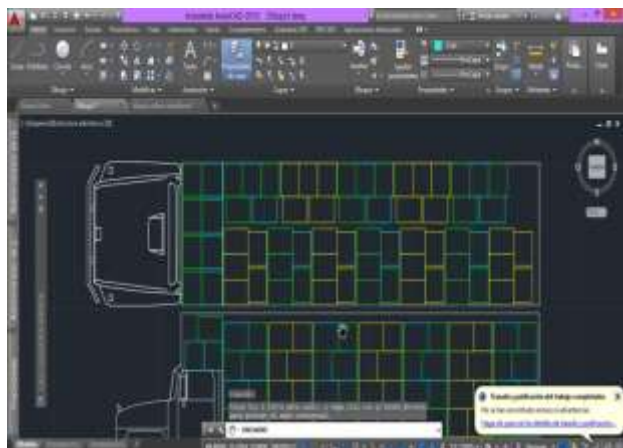


**Figure 8** Simulation of the normal arrangement of boxes by the company within the load unit

Source: Self Made

This inappropriate distribution is the result of a process being carried out without supervision by the personnel in charge of the process.

In this last simulation, shown in the image of the figure nine, a different and recommended distribution of the boxes is proposed since the reduction of empty spaces is noticeable and a greater number of these can be placed inside the unit.



**Figure 9** Simulation of the proper arrangement of boxes within the load unit

Source: Self Made

In the figure ten, we can see in the image the result obtained with the proposal of the new suggested arrangement within the load unit, achieving the reduction of empty spaces, thus achieving the introduction of a greater number of boxes, making the most of the load capacity.



**Figure 10** Image with the correct arrangement of the cubic capacity in the load unit

Source: Self Made

It was previously mentioned that by using the positioning simulations in AutoCAD, it was possible to achieve a better distribution of the pallets or pallets and the packaging or boxes used by the company for this process.

In the Table nine, the load capacity of the unit, its measurements and a comparison of the number of packages or boxes loaded inside the unit and the increase achieved with the proposed new distribution are shown.

| Load Unit         | Volume Capacity | Load Capacity | Length | Width  | Height | Loaded Boxes (Before) | Loaded Boxes (Today) |
|-------------------|-----------------|---------------|--------|--------|--------|-----------------------|----------------------|
| Camión De Un Eje. | M3              | 3 Ton.        | 7.52 M | 2.14 m | 2.13 m | 600                   | 682                  |

**Table 9** Comparison of the load capacity used in the unit

Source: Self Made

As we can see, the load capacity with the previous process was 600 units and with the new distribution it increased to 680 boxes, managing to place 82 more inside the unit. This represents 14% more load taking advantage of the total capacity of the unit.

And finally, the measurement and recording of times was carried out again in the stages of the process of loading the goods to the unit, with the suggestion that the process be carried out under supervision to corroborate whether or not there were improvements in the realization of this. . Applying the suggested recommendations, the following data was obtained, which is shown in the Table ten.

| Stages of Process.                     | Time to Be Done    |
|--|--------------------|
| 1. Picking                             | 5 hours            |
| 2. Picking authorization               | 5 minutes          |
| 3. Palletizing                         | 20 – 30 minutes.   |
| 4. Empleado                            | 15- 20 minutes.    |
| 1. Arrangement of goods in cargo units | 50 – 60 minutes    |
| Total Time Spend                       | 6 hours 55 minutes |

**Table 10** Record of times carried out in the Stages of the Preparation Process for the loading of goods

Source: Self Made

Once these data were obtained and recorded, they were compared with results obtained in the times recorded in the preparation stages for loading without supervision in the Table one, and those achieved with the supervision suggested in the table ten, and the results are shown in the following Table eleven.

| Stages of the process                            | Previous Time Registered | Current Time Recorded |
|--|--------------------------|-----------------------|
| Picking  | 5 hours                  | 4 hours               |
| Picking authorization.                           | 5 minutes                | 5 minutes             |
| Palletizing.                                     | 30 minutes               | 15 minutes            |
| Empleado.  | 20 minutes               | 10 minutes            |
| Arrangement of merchandise METRI in cargo units. | 1 hour                   | 45 minutes            |
| Total Time Spent                                 | 6 hours 55 minutes       | 5 hours 15 minutes.   |
| Time difference Obtained                         | 1 hora con 40 minutos    |                       |

**Table 11** Comparison of Times Taken in the stages of preparation for loading goods

Source: Self Made

In this final comparison of the times recorded for the completion of the process stages involved in the loading of goods in the units with and without supervision, it was possible to realize that from the stage of order preparation to the loading of these in the units cargo, the personnel in charge, were more agile when carrying it out; achieving an optimization of times of 1 hour 40 minutes with respect to those registered at the beginning of our investigation.

#### 4. Thanks

We are grateful to the company Proveedora de Seguridad Industrial del Golfo SA de CV from Tampico, Tamaulipas, for the facilities granted to carry out this study within its facilities and to the Instituto Tecnológico Superior de Naranjos for the support and facilities provided.

#### 5. Conclusions

This research work highlights improvements made to the stages of a process loading goods from the shipping area or departures to the units for transport and that; In addition, this process was carried out without constant supervision, generating some negative effects such as leaving empty spaces within the units, risking the safety of the products during the transfer, thus impacting productivity, making it difficult to achieve the objectives established in the company. Nevertheless;

This demands constant improvement, optimization and updating of processes, to achieve highly the from positive and with great benefits for the company, offering better customer service as well as operating costs, for this case study, it was possible to improve with the support of simulations in AutoCAD, the loading of the goods in the unit, by taking and recording of times in each stage of the process, knowing the specific characteristics of the merchandise, its volumetric measurements, involving the personnel in charge of carrying it out, managing to increase the load capacity of the unit by 14% from 600 to 682 boxes of merchandise, by means of a rearrangement of these, while in the recording of the times occupied in carrying out the stages of the process executed with supervision, an optimization of this was obtained in 1 hour and 40 minutes (21% less), with respect to the time carried out habitually.

Although in this study, all the information used was useful, applying it to a specific process and taking into account the stages involved, in subsequent studies the characteristics of each company should be considered, although there is common information in them; since not all handle the same processes with the same similarity, so that this contributes to continuous improvement, optimizations, and adjusting the loading maneuvers that they carry out.

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## Use of Strategic Management Accounting in the determination of costs in SMEs in the furniture sector

### Uso de la Contabilidad de Gestión Estratégica en la determinación de costos en PYMES del sector mueblero

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#### Abstract

Determining cost in industry of all sizes represents a starting point for determining your desired returns. For this reason, the precise calculation matters greatly to the administration of any economic entity. We are currently facing the so-called knowledge era and where changes are looming permanent, so the colloquially called traditional accounting systems must be reinforced with innovative techniques. The objective of this research work is to propose to Small and Medium-sized companies (PYMES) dedicated to the manufacture of furniture an innovative tool with which the cost is determined starting from a hybrid counting system, a traditional system strengthened with a technique of Strategic management. The Cost Management System proposed by this research is based on the conclusion found in the theoretical framework that a system is not something isolated, but is formed as a gear of techniques, procedures and techniques; according to the needs of the companies under study. To carry out the present research work, a diagnostic analysis of the furniture SMEs was carried out, where information was obtained regarding the characteristics for the determination, measurement, analysis and cost management of these companies. According to the result of said analysis, the system proposal is presented, which is in the validation process for its dissemination and, where appropriate, commercialization, prior to its registration. If the SMEs dedicated to the manufacture of furniture have a system according to their characteristics, it will be possible to determine with certainty indicators that are essential for making strategic decisions that infer in the improvement of the administration of the SMEs under study.

Cost in SMEs, furniture SMEs, Strategic management

#### Resumen

La determinación del costo en la industria de todos los tamaños representa un punto de partida para la determinación de sus rendimientos deseados. Por tal razón el cálculo preciso importa en gran manera a la administración de todo ente económico. Actualmente nos estamos enfrentando a la denominada era del conocimiento y donde los cambios se vislumbran permanentes por lo que los sistemas contables llamados coloquialmente tradicionales deben ser reforzados con técnicas innovadoras. El objetivo del presente trabajo de investigación es proponer a las empresas Pequeñas y Medianas (PYMES) dedicadas a la fabricación del mueble una herramienta innovadora con la que se determine el costo partiendo de un sistema de contos híbrido, un sistema tradicional fortalecido con un técnica de Gestión estratégica. El Sistema de Gestión de Costos que propone la presente investigación se funda en la conclusión encontrada en el marco teórico respecto a que un sistema no es algo aislado, sino que se conforma como un engranaje de técnicas, procedimientos y técnicas; de acuerdo con las necesidades de las empresas objeto de estudio. Para llevar a cabo el presente trabajo de investigación se realizó un análisis diagnóstico de las PYMES muebleras donde se obtuvo información respecto a las características para la determinación medición, análisis y gestión de costos de estas empresas. De acuerdo con el resultado de dicho análisis se presenta la propuesta del sistema, misma que se encuentra en proceso de validación para su difusión y en su caso comercialización, previo a su registro. Si las PYMES dedicadas a la fabricación de muebles cuentan con un sistema acorde a sus características será posible determinar con certeza indicadores que son indispensables para la toma de decisiones estratégicas que infieran en la mejora de la administración de las PYMES objeto de estudio.

Costos en PYMES, PYMES muebleras, Gestión Estratégica

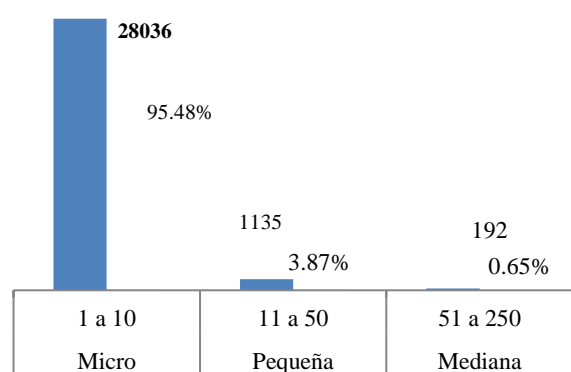
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## Introducción

In Mexico, 98% of the manufacturing industries dedicated to the manufacture of furniture are SMEs (Small and Medium Enterprises) according to the National Statistical Directory of Economic Units (DENUE) of the National Institute of Statistics and Geography (INEGI), of these, 95.48% are micro, 3.87% small and only 0.65% medium based on the number of workers they employ.



**Graphic 1** Furniture SMEs in Mexico  
*Fountain: DENUE (2021)*

In Mexico, Strategic Management Accounting acquires greater relevance due to the changes that affect Accounting in all its forms; fiscal, financial and management. Facts generated by tax reforms that have an impact on the financial and administrative or management situation of any organization. Regarding strategic management accounting fully related to the internal control of organizations in which it is included Cost accounting primary base for decision making, as indicated (Arredondo, 2015) "Cost Accounting supports Accounting Financial and Administrative Accounting to give you information on costs and expenses for decision making".

In the same way (Valeria & Soto, 2017) points out that cost indicators are used for the control, evaluation, planning and development of information systems for organizations. Interesting work has been done on management accounting in SMEs, such as the article Mite Albán, (2018), which points out: the adoption of management accounting strategies according to the literature review decreases in a business segment known as SMEs, in a lapse of almost fifty years, of analysis of articles related to the social sciences in Scopus and the Web of Science, 4827.

Only 13 concerned accounting, costs, and management in small businesses. Another publication, (Baigorria, 2018) states: despite the benefits of Accounting, SMEs use it only in order to comply legal and tax requirements, becoming an expense without benefits. SMEs are family businesses, with little professional development, with administrations little interested in giving an adequate use to this set of tools. This lack of interest has meant an obstacle in the speed and precision of transcendental decisions, that undoubtedly, can contribute to improving managerial performance. (Peña, 2005).

We find ourselves with two major challenges, on the one hand, despite the need for accurate information to decide, ignorance and in other cases, the costs that can generate tools designed for large companies, have limited the development of strategic management accounting in SMEs. In another order, scientists have focused their efforts on control and decision-making of large companies, and the SME segment, cannot afford that result. That is why this scientific work seeks focus on the use of a strategic management technique according to SMEs dedicated to the manufacture of wooden furniture.

## 1. Background

In the current era we are living, the use of technology, the internet and the maturation of globalization to which many have intensified authors have called generation 3.0, we can observe relevant changes in this regard in all areas and do not say in the prosecutor, economic and financial companies worldwide. In addition to this, the competition between global peers, the management of information current electronics and new forms of marketing. Aspects that Management Accounting can not remain alien.

With this, Accounting can be considered as a Techno-science, defined by Echeverria (2005) as a way of practicing the science and technology that emerged in the 80s in the US (United States of America) and that extends to other countries. Techno-science coexists with conventional science and technology since each scientific discovery has a conditioned state for the need for social development and at the same time its impact on Society.

Reviewing the theoretical framework in this regard we can divide the development of accounting into stages or periods for a better analysis, the empirical period, the classical or methodical and the scientific. In the empirical beginning with the emergence of sedentary peoples who had the need to account for family assets, then followed by the Babylonian and Egyptian empires (ancient) in which there was already to be control of taxes of oppressed people and other resources, then come the Greeks and the Roman Empire where it already began with the control of money and capital accounts. In the empirical period it could be said that it was by the Middle Ages then, there were isolated procedures.

Already in the classical period it begins with the systematized use of the double game and begins the great development of science between the sixteenth and seventeenth century with the theorists Colon, Copernicus, Galileo, Newton and Pacciolo. French, Lombarda, Tuscany, personalist and Bosta schools emerge. It is followed by the scientific period in which the development of capitalism in its upper phase, manifested in the concentration of capital and the development of large industry elevated the role of accounting to management science and to some dispute with other economic sciences over the object of research.

## 2. Costs and Accounting of Strategic Management

The main objective of financial accounting is to be oriented to the third user of accounting information, call it the treasury, banks, investors, etc. which can be nourished, from the accounting information that arises from a balance sheet, of a series of data for decision making. But this information suffers from a great drawback, it is relative to the past, which in a sense disqualifies it from making decisions regarding the future.

What every entity seeks with the use of accounting is to provide timely, truthful and reliable information oriented to decision making. For this reason, the use of Strategic Management Accounting is essential. Cost accounting is an essential tool for the decision-making of economic entities of all sizes, not undermining the SMEs.

For this work we will refer to Strategic Cost Management (CGE). In traditional cost accounting simply the cost is determined with the use of a system, either by processes or by orders, depending on the characteristics of the economic entity in question. By making use of strategic tools we would find strategic cost management which will focus on the use of traditional accounting incorporating the strategic issue within the scope of costs, which is already novel.

Management accounting has distinguished itself by adopting a strategic character that has been reflected in the current systems, instruments and models it encompasses. Such are the cases of activity based costing (ABC); local information systems (LS); the balanced scorecard (BSC); activity management (AM); activity-based management (ABM); life cycle costing (LCC); and target costing (TC), among others. (Martinez y Blanco, 2017)

The great strength of SCM is that it addresses each link in the value chain, strategic positioning and cost drivers, taking into account external cost-incurring events such as environmental costs, logistics costs, balanced scorecard (BSC) and quality costs.



**Figure 1** Strategic Cost Management (SCM)

Source: Own elaboration

As can be seen in Illustration 1 to locate the techniques that strengthen traditional accounting with novel and useful strategies for cost calculation and management, we can call them guidelines for managing cost strategically.

### 3. Costs for SMEs

A diagnostic study was applied to 100% of the companies dedicated to the manufacture of wood furniture in Ocotlán Jalisco, Mexico; registered as members of AFAMO (Asociación de Fabricantes de Muebles de Ocotlán A.C.) as of the date of the research. Of the 262 furniture industries that INEGI claims exist in Ocotlán only seventy are members of AFAMO. This industrial zone was determined as the universe of study because it is considered the capital of furniture, one of the most influential nationally in this branch. (Lomeli, 2018). Most SMEs have deficiencies in their cost information systems. As a result, the information used for decision-making lacks the required relevance, reliability and timeliness. Hence the importance of proposing an integral methodology that modifies this process and makes it possible to determine product costs, providing greater competitive advantages at a global level.

Most SME entrepreneurs determine the cost of their product in order to have a basis for setting (or negotiating) the selling price and, in addition, they calculate their business results as the difference between their revenues and total costs. Unfortunately, today these entrepreneurs spend more time increasing their production than analyzing costs, when an improvement in productivity would allow them to simultaneously manufacture more and reduce costs. It is common to find technical or conceptual errors in cost reports: misclassifications, duplicated information, simplistic or unrealistic projections, among others. Based on the results found, a traditional costing system is proposed with the use of a strategic management technique to facilitate costing for SMEs engaged in furniture manufacturing.

### 4. Costing System using CEMs

The Cost Management System proposed in this research is based on the conclusion found in the framework according to the needs of the companies under study. The characteristics of the furniture SMEs are very clear, they determine their costs empirically, so by proposing this system they will have a basis for the determination of the cost starting with the determination of the sales price, as the basis of the cost.

First of all, it is extremely important to know the business (characteristics of the product and/or service, production and/or provision processes, to know the market where it operates, including sales and distribution channels).

To know the existing information circuits: what information is currently available, who produces it, who its recipients are, the information gaps for new purposes, in other words, the flow of costs. A survey of the different operational circuits and, depending on the particular case, it could be divided into different objectives. Once the objective has been defined, for example production: a map should be drawn up with the different production activities (they could be cost centers) that consume resources and where the linkage of the activities can be observed.

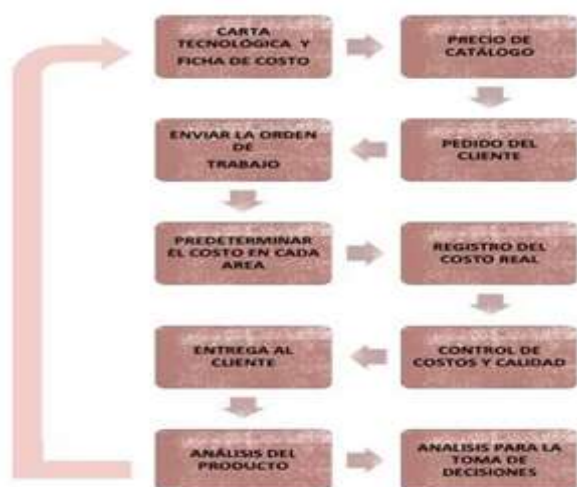
The aforementioned mapping of activities is a very important tool to be able to follow up, measure efficiency, set standards to be met and consequently make improvements in the different processes.

Due to their nature and mode of operation, small and medium-sized companies have very peculiar characteristics that are a function of their size, operations and the accumulation of costs, making the use of an Order-Based Costing System interesting and pertinent. The author assumes the criterion that for the Mexican context, the use of this type of system in SMEs is inserted within the current purposes for these companies to achieve the goals and strategies foreseen.

In these entities, prices are calculated based on cost recovery and a certain profit margin; however, why not use market-based pricing systems, also known as Genka Kikaku, Target Cost or Objective Cost? In these systems, starting from a price accepted by the market, the company subtracts the desired profit margin, obtaining the cost by difference. This thinking is the one that adapts to the small and medium-sized companies that are the basis of this research. In view of this scenario, the proposal of the "Complete Cost System by Production Orders or Orders using the Objective Costing Management Technique" (SCPO) arises, which is proposed according to the characteristics of the case study companies, an innovative idea that breaks with previous paradigms.

The system runs in nine stages, the proposed procedure is similar to the classic systems and therefore it is not complex but it does require to be detailed. And by including the target cost in the model, the traditional perspective is changed by the Japanese philosophy of customer orientation, to consider that the selling price is determined by the market and in this way it is the customer who conditions the maximum cost to be incurred, which will be achieved with teamwork by joining all efforts to achieve planning and cost reduction. For this, it is considered that there must be a change of mentality in the whole organization, forming a proactive group that allows them to be oriented towards their permanence in the market and consequently their growth and development in all the senses in which the company operates. The system is in the process of validation, which has shown its efficiency by running correctly and the pertinent adjustments are being made according to the results.

The product of this research will be a very useful tool for the companies under study, and it will be possible to extend it to other types of companies with similar characteristics.



**Figure 2** Logical-Methodological Schema

Source: Own Elaboration

## Conclusions

The diagnostic study provided the basis for the problem and affirmed that the furniture SMEs did not have a strategic cost management model. The integration of a CEM tool helps to determine the necessary production volumes and to determine the most suitable mix of items to be produced.

The implementation of an Order-Based Costing System with a CEM approach in small and medium-sized enterprises (SMEs) in Mexico is a disruptive technology that will enable these entities to perform analysis, make decisions and propose increasingly competitive prices.

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## The subcontracting of specialized services or the execution of specialized works by socially responsible companies versus labor outsourcing

### La subcontratación de servicios especializados o de ejecución de obras especializadas por parte de las empresas socialmente responsables versus el outsourcing laboral

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#### Abstract

Socially responsible companies are economic entities that know their tax obligations, serving them correctly and in a timely manner. The prohibition of outsourcing as established in art. 12 of the LFT and the permission of specialized services or execution of specialized works of art. 13 of the LFT is the link by which a company that provides specialized services must act ethically against the third parties involved. The prohibition of outsourcing has been a step forward in the face of the relaxation in terms of contributions and contributions related to subordinate work relationships. However, it is necessary to thoroughly review if this intention is carried out in accordance with current legislation and procedures regarding the contracting of specialized services by the different regulatory bodies such as the Secretary of Labor and Social Security, among others. Objectives.- Identify the opportunity to be a socially responsible company in the face of specialization services or execution of specialized works versus the prohibition of outsourcing. Methodology. - Analysis of current legislation on outsourcingbjjetivos

**Socially responsible companies, Labor outsourcing, Specialized services**

#### Resumen

Las empresas socialmente responsables son las entidades económicas que conocen sus obligaciones fiscales atendíendolas de forma correcta y oportuna. La prohibición del outsourcing como lo establece el art. 12 de la LFT y la permisión de los servicios especializados o ejecución de obras especializadas del art. 13 de la LFT es el vínculo por el cual una empresa que presta servicios especializados debe actuar de forma ética frente a los terceros involucrados. La prohibición del outsourcing ha sido un paso adelante frente al relajamiento en materia de contribuciones y aportaciones relacionadas a las relaciones de trabajo subordinado. Sin embargo hay que revisar de forma exhaustiva si esta intención se lleva a cabo de acuerdo a las legislaciones y procedimientos actuales en materia de contratación de servicios especializados por parte de las diferentes instancias reguladoras como lo son la Secretaria del Trabajo y Previsión Social, entre otras. Objetivos.- Identificar la oportunidad de ser una empresa socialmente responsable frente a los servicios de especialización o ejecución de obras especializadas versus la prohibición del outsourcing. Metodología. - Análisis de la legislación actual en materia de outsourcing

**Empresa Socialmente responsable, Outsourcing laboral, Servicios especializados**

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## Introduction

Outsourcing is a subject of debate since businessmen, from a profit perspective, will try to delegate responsibilities to the contractor company, which is why this debate must be addressed by specialists in administrative and fiscal matters. The ethical consideration regarding the way of hiring, recruiting and managing human resources is a point of theoretical and procedural discussion. In other words, the maintenance of workers' labor rights is one of the goals of a socially responsible company. The reforms approved in April 2021 in relation to the regulation of outsourcing should be considered within the short and long term financial strategies.

### 1. Background

As Silva (2010) refers, the term outsourcing is not a concept that emerges from the field of law. It is an interdisciplinary term whose main characteristic is that outsourcing exists when a company hires another company to perform activities related to the services provided by the first. What are these services or activities? In the first place to the production of a good or a service, to be related to the main activity developed by the first company being able to be of temporary or permanent way.

Since it is an Anglo-Saxon term, Romero (2003) in Silva (2010) relates it to the term outsourcing and Garcia (1999) in Silva (2010) refers to its characteristic of subcontracting.

For Ruiz in Pérez and Olguin (2021) outsourcing has etymologically two roots out (out) and source (source or supply), to which is added the ending ing, connotation that implies that something is being done, that is:

External supply, that is, a supply of goods or services that comes from outside the company itself, being a business reengineering strategy that leads to a different way of doing better business (Perez and Olguin, 2021).

Therefore, when talking about reengineering strategies, the decisions of top management of the companies are immersed and with it the convenience of analyzing the feasibility from a corporate social responsibility perspective.

On the other hand, if we address international competitiveness against other countries, the issue of outsourcing also represents a debate, since, as Ruiz (2019) points out, outsourcing can also be seen as a commercial technique in the international arena, where the preponderant role played by Free Trade Agreements in this regard becomes evident.

At the onset of neoliberalism in different regions of the world, profit was prioritized over workers' rights. The vertiginous installation of outsourcing in regions that aspire to competitiveness without questioning ethical purposes.

Ruiz (2019) in analyzing the factors that favor the maintenance of outsourcing identifies that outsourcing markets have grown at a faster pace than the industrial sector as a whole. First, throughout the 1960s and 1970s, the main area of competition was price competition, where companies only sought to achieve economies of scale and thus promote growth and expand their market shares. From the 1980s onwards, competition ceased to be based solely on price, but also, and above all, on product quality or characteristics. Companies are focusing on upstream activities, such as R&D, marketing and product design, and downstream activities, such as sales and promotion.

Another factor that has made outsourcing flourish is the creation and diffusion of highly efficient and flexible production techniques and methods based on robotics and integrated production technologies (Ruiz, 2019). As Ruiz (2019) refers, the entry of automation of production processes was one of the causes for the promotion of outsourcing in Mexico, as it was intended to decrease direct costs to labor without the revision of labor obligations. The application of robotics in transformation processes was characterized by the hiring of fewer personnel in the production processes, as well as a process of specialized training in the handling of machinery.

This raises the question of whether labor subcontracting necessarily translates into precarious labor relations. To answer this question, it is essential to understand what is meant by precarious work.



Precarious" jobs have the following attributes: a) uncertainty as to the continuity of work; b) less worker control over working conditions; c) wages or pace of work; d) greater lack of protection against social coverage; e) discriminatory practices; f) arbitrary dismissals or inadequate working conditions; g) remunerations associated with poverty and; h) insecure social insertion (Bensusán, 2007). These disadvantages in terms of workers' rights (precarious conditions) must be translated into benefits for companies. The objective of this type of practices is not only the search for greater specialization, but also the generalized interest in replacing directly hired labor in order to reduce costs, avoid unions and gain flexibility in the management of labor relations, especially when there are contracts or collective bargaining agreements with a high regulatory profile (Bensusán, 2007). Thus, we find ourselves in an equation where the formula for reducing workers' rights will inevitably give us some administrative advantages for companies, mainly within the framework of profits.

For researcher Graciela Bensusán, labor subcontracting does not necessarily lead to precariousness in itself, although it increases, at least substantially, the risk of falling into it. Therefore, it should deserve not only an ad hoc legal regulation but also special attention within the labor policy, considering workers enrolled in these practices as a particularly vulnerable group (Bensusán, 2007). However, it should be pointed out that this precariousness is what Mexico is currently trying to lead us to. Currently, as the LFT stands, it does not allow the state of defenselessness of the worker in the face of possible attempts at labor fraud through the improper use of subcontracting or outsourcing, since it recognizes these types of companies providing or facilitating workers as employers and, therefore, gives them joint and several liability along with the company receiving these services.

The participation of tax policies on the part of the federation is a measure of containment of business intentions, not only national but also international, with respect to the labor strategies allowed in Mexico. Thus, in the face of debates on economic, political and social issues, important reforms are approved that prohibit outsourcing but allow the contracting of specialized services.

In the face of this action, it is questioned which are the main acts of the companies for which they contract specialized services that do not correspond to the main line of business of the contracting company. It is appropriate to highlight concepts of tax culture, since for a company to be considered socially responsible it must be linked to its tax rights and obligations.

Robles (2013) refers that the tax culture is the set of values, beliefs and attitudes of a certain social group with respect to taxation and the observance of the laws that govern the conduct manifested in the permanent compliance of tax duties based on reason, trust, affirmation of the values of personal ethics, respect for the law, civic responsibility and social solidarity.

For PRODECON (2013) identifies that the tax culture is a set of knowledge, beliefs, values and attitudes, individual and collective, held by the participants of the national tax system, regarding taxation and observance of the laws governing the conduct manifested in the permanent compliance of tax duties based on reason, trust, affirmation of personal ethics values, respect for the law, citizen responsibility and social solidarity of tax payers.

Garza (2003) identifies tax culture as the set of values that are manifested in the permanent fulfillment of tax duties based on reason, trust and the affirmation of the values of personal ethics, respect for the law, responsibility and social solidarity of taxpayers, providing the foundations for the transformation of erroneous perceptions within society.

## **2. Methodology**

A theoretical approach is presented in order to understand the importance of the actions taken by a socially responsible company with respect to its tax obligations as well as labor legislation. The study was derived from the analysis of the legal proposals for the prohibition of outsourcing personnel.

The research stage is still in the exploratory phase of the motives that propitiated the hiring of specialized services versus the outsourcing of personnel. Emphasizing the employer and joint and several obligations when contracting a specialized service.

As part of the methodology, a hermeneutic study of the legislations related to the prohibition of personnel outsourcing was carried out in order to later, in another research stage, conduct an empirical study with the commercial business sector in the region of San Martín Texmelucan Puebla. Socially responsible companies will be entities in solidarity with the rights of workers, concerned and engaged in enforcing labor rights won historically. The current stage of prohibition of outsourcing of personnel is intended to vindicate these rights.

In public administrations prior to that of President López Obrador, actions such as outsourcing were allowed without due control of tax and labor obligations, allowing this labor strategy to be considered successful in terms of flexibilization and relaxation of tax obligations on the part of the contracting company. Likewise, a legal search of the legislations involved in the regulation of the contracting of specialized services was carried out, as well as the reforms approved in April 2021, relating the results with categories of analysis such as tax culture, socially responsible company, labor rights, among others.

### 3. Results of the study

As results of the study of the reforms promoted and approved by the current federal administration, the following points stand out:

- The decree is published on April 23, 2021, which reforms, adds and repeals several legislations such as: The Federal Labor Law, the Social Security Law, the Law of the National Workers' Housing Fund Institute, the Federal Tax Code, the Value Added Tax Law, the Federal Law of Workers in the Service of the State, Regulatory Law of Section B) of Article 123 of the Constitution, Regulatory Law of Section XIII Bis of Section B, of Article 123 of the Political Constitution of the United Mexican States, in matters of Labor Outsourcing.

- The subcontracting of personnel for the benefit of the institutions referred to in Article 1 of this Law is prohibited. Only the subcontracting of specialized services or the execution of specialized works will be allowed, provided that the contractor is registered in the public registry referred to in Article 15 of the Federal Labor Law.

- As amended in April 2021, Article 12 of the Federal Labor Law refers to the prohibition of subcontracting of personnel. The concept of subcontracting according to such article is understood as when an individual or legal entity provides or makes available its own workers for the benefit of another. The same article also states that employment agencies or intermediaries that intervene in the personnel hiring process may participate in the recruitment, selection, training and qualification, among others. They will not be considered employers, since this character is held by the person who benefits from the services.

- Although Article 12 of the current LFT prohibits subcontracting, Article 13 of the LFT allows the subcontracting of specialized services or the execution of specialized works that are not part of the corporate purpose or the main economic activity of the beneficiary of such services, provided that the contractor is registered in the public registry referred to in Article 15 of this Law.

- The main requirement in the subcontracting of specialized services or execution of specialized works is the formalization of a written contract in which the object of the services to be provided or the works to be executed is indicated, as well as the approximate number of workers that will participate in the performance of such contract, as established in Article 14 of the LFT.

- The Ministry of Labor and Social Welfare must be the entity before which individuals or legal entities must register in a registry of companies that provide subcontracting services in specialized works as referred to in Article 15 of the LFT, renewing the registration every three years.

- Complementary or shared services or works between companies of the same corporate group. They will be considered specialized, as long as they are not part of the corporate purpose or predominant economic activity of the company receiving such services.

- Registration of individuals or legal entities that provide outsourcing services. They must have the corresponding registration before the Ministry of Labor and Social Welfare and must renew their registration every three years. In order to obtain the registration, they must prove that they are up to date with their tax and social security obligations.

- Joint and several liability. Joint and several liability will be established between the individual or legal entity that subcontracts services or specialized works and the individual or legal entity that subcontracts or provides such services, for the failure of the latter to comply with its labor and social security obligations with respect to its employees.

- Reporting of information. Individuals or legal entities that provide specialized services or specialized works are obliged to comply with the reporting requirements before the labor, social security and housing authorities on a quarterly basis.

- Employer substitution. The assets of the company or establishment must be transferred to the substitute employer, with the exception of the companies that carry out the transfer of the workers to the beneficiary within 90 calendar days from the entry into force of the Decree. In any case, the labor rights, including seniority, generated by the effect of the employment relationship must be recognized.

- Profit sharing. It will have a maximum limit of three months of the employee's salary or the average of the participation received in the last three years; the amount that is more favorable to the employee will be applied.

- Financial penalties. Individuals or legal entities that agree to subcontract personnel services in violation of the provisions of this reform, may be subject to various economic sanctions, in accordance with the applicable laws.

- Tax effects. Payments or considerations made for the subcontracting of personnel to carry out activities related to the corporate purpose and the main economic activity of the contractor will not be deductible or creditable. Neither will tax effects of deduction or crediting be given to the services in which personnel is provided or placed at the disposal of the contractor, when any of the following cases occur:

- When the workers that the contractor provides or places at the disposal of the contracting party, originally have been workers of the latter and have been transferred to the contractor, through any legal figure, and.

- When the workers provided or made available by the contractor cover the main activities of the contractor.

- For the purposes of the first paragraph of this article, payments or considerations for the subcontracting of specialized services or the execution of specialized works, which are not part of the corporate purpose or the predominant economic activity of the beneficiary thereof, may be deducted or credited for tax purposes, provided that the contractor has the registration referred to in Article 15 of the Federal Labor Law and complies with the other requirements established for such purpose in the Income Tax Law and in the Value Added Tax Law, respectively.

- Simulation. The use of simulated schemes for the rendering of specialized services or the execution of specialized works or the subcontracting of personnel will be considered as tax fraud in terms of the Federal Tax Code and the Federal Criminal Code.

- Effective date. The day after its publication in the Official Gazette of the Federation, in the case of labor and social security reforms. Within 30 calendar days following the entry into force of this Decree, the Ministry of Labor and Social Welfare must issue general provisions on the list of subcontracting companies. Regarding the reforms to the tax laws, on August 1, 2021. In the case of workers in the service of the Mexican State in fiscal year 2022.

- As of the date of entry into force of this Decree, individuals or legal entities that provide subcontracting services must obtain the registration before the Ministry of Labor and Social Welfare provided for in Article 15 of the Federal Labor Law, within 90 calendar days, counted as of the publication of the general provisions referred to in Article 15, sixth paragraph, of said Law.

#### 4. Conclusions

Outsourcing is a term coined at the end of the 1980s for the subcontracting of information systems. Its origin is Anglo-Saxon, being composed of the words Out (which means outside, outside) and source (which means source, resource, origin), so that from the business point of view it means that certain activities of the company will be developed outside. This term is coined in an incipient entrance to globalization and labor flexibilization. The reforms proposed and accepted in the XXI century in Mexican territory is the opportunity to act as companies in a responsible and solidary way from a perspective of conviction to seek a social and community improvement.

Although the conventional and timely term of outsourcing means acquiring resources for the internal operation or part of it through external sources, the acquisition through outsourcing of non-core functions in companies is a practice that must be questioned by decision makers, since it also implies tax penalties. The deductibility of such expenditures will not proceed if the reforms in the matter of specialized outsourcing are not attended. Therefore, we must move away from relating outsourcing as a profitable business model since it implies additional costs in terms of taxation.

#### 5. Recommendations or proposals to help solve the problem

It is recommended to promote a contributive culture in the contracting companies to conform social values that allow a legal observance with an ethical perspective putting as an end the labor rights of the workers as well as of the company as a participant in the development of the regions.

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## The gender gap in the human capital of the restaurant sector

### La brecha de género en el capital humano del sector restaurantero

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#### Abstract

The purpose of this paper is to analyze the gender gap in the performance of activities and capacities in the manager position in micro and small restaurant companies in the city of Victoria, Durango. The Portela Human Capital Index (PHCI) and performance measurement were determined considering the labor competence standards CONOCER EC0422. The construct was validated through the Cronbach's alpha coefficient and the correlation of the performance indicators with those of human capital was sought; hypothesis tests were performed with non-parametric statistics searching for the behavior sample of men vs women. Results show demographic and performance characteristics; statistically they do not show significant differences between genders, although they show that men obtained the manager position at a younger age than women, even if having less experience. The proportion of women who must have a bachelor's degree to be considered for the position, compared to men, is higher. Finally, job performance is higher in workers who have a higher level of human capital, specifically in understanding and managing laws and regulations.

**Gender gap, Job performance, Human Capital**

#### Resumen

El propósito del trabajo fue analizar la brecha de género en el desempeño de las actividades y capacidades del puesto de gerente en las empresas micro y pequeñas restauranteras de la ciudad de Victoria de Durango. Se determinaron el Índice de Capital Humano de Portela (ICHP) y medición del desempeño, considerando las normas de competencia laboral CONOCER EC0422. Se validó el constructo a través del coeficiente alfa de Cronbach y se buscó la correlación de los indicadores de desempeño con los de capital humano; se hicieron pruebas de hipótesis con estadística no paramétrica buscando el comportamiento de la muestra de hombres vs mujeres. Los resultados muestran las características demográficas como de desempeño, estadísticamente no muestran diferencias significativas entre género, aunque se puede apreciar en los estadísticos como el hombre accede al puesto de gerente a una edad menor que la mujer, aun teniendo menos experiencia. La proporción de mujeres que deben tener estudios de licenciatura para ser consideradas en el puesto, en el caso del hombre esta proporción es menor. Finalmente, el desempeño laboral es mayor en aquellos trabajadores que tienen un nivel de capital humano más alto, específicamente en la comprensión y la gestión de las leyes y normas.

**Brecha de género, Desempeño laboral, Capital Humano**

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## Introduction

Eliminating the gender gap is a priority objective for development. Strengthening the participation of women, with full intervention under equal conditions in the decision-making of organizations, should be viewed as a decisive factor for development and progress. The United Nations Development Programme shows that countries with higher Human Development Index have higher levels of Gender Empowerment Index, this could mean that gender equality can be accompanied by a higher level of society development (UN, 2018).

According to data offered by the National Survey of Occupation and Employment 2005-2009 of the National Institute of Statistics and Geography (Instituto Nacional de Estadística y Geografía - INEGI), the participation of women in the workplace is lower than that of men: 35 out of 100 women contribute to the production of goods and services while 70 out of 100 men have a paid job, which shows that the gap between women from men is still in effect (Instituto de la Mujer Duranguense, 2010). Gender inequality continues to be a problem even today, Opportunities for women in decision-making positions maintain a trend towards the male gender.

Therefore, strengthening the participation of women in managerial positions of companies represents a challenge for society and institutions. Derived from this, a key factor to strengthen equity is the training of intellectual capital of organizations through the development of skills and job competencies in its staff. In the case of the Restaurant Industry, the National System of Competences, of the National Council for Standardization and Certification of Labor Competencies, of the Ministry of Public Education, (CONOCER, 2019) seeks to adapt working conditions for human capital through abilities, skills and attitudes of people, which are acquired at work over time; providing certifications to increase the productivity of organizations and an improved performance of service providers, as well as user satisfaction (Norma Mexicana NMX-R-025-SCFI-2015). Companies must identify what are the skills required by the activities they develop to meet the needs of its customers; therefore, the improvement of individual and collective capacities should be stimulated to improve labor competencies.

In this sense, certifications are an endorsement that allows greater competitiveness in the market, since they are a procedure that guarantees that the product or service offered meets a standard or requirements that support its quality. A certification offers credibility, reliability on the activities, processes, and methodology, it is an added value to the service offered; it allows to distinguish from its competitors, it's an investment of time and resources that benefits the organization by giving recognition to the skills of its human capital, becoming a competitive advantage.

The purpose of this study was to analyze the gender gap that exists in the performance of activities and capacities of men and women who occupy the position of manager in the economic activity of the service sector in the city of Victoria, Durango; specifically, in companies dedicated to the preparation of food and alcoholic and non-alcoholic beverages; for this purpose, the Portela Human Capital Index (PHCI)(Arrazola, María; Hevia, 2003) and the performance measurement established in the labor competence standards CONOCER EC0422 were used.

The central hypothesis is established as to whether the working conditions of performance and knowledge are the same among those who occupy the position of manager between the female and male genders, and to determine from a gender perspective the fundamental differences in the performance of managers, without including salary aspects as this is considered a sensitive variable.

This article consists of five sections; the first section describes the competence standards EC0422 "Management of people in organizations" of the CONOCER Standards used as a basis for the analysis of the manager's competencies and performance. The second section summarizes the importance of the sector studied in the state and in the municipality of Durango. The third section concerns the description of the method used to carry out the study, where the determination of the sample size, the information gathering instruments and the instrument validation are highlighted. The fourth section is related to the results and descriptive analysis of human capital and performance level in the job from a gender perspective.

In the fifth section, the inferential analysis of performance levels is carried out by applying Pearson's correlation coefficient and a nonparametric statistical hypothesis test to determine the differences between male and female samples of performance levels alongside demographic variables such as: age group, schooling group, and the PHCI, among others. The results are diverse in gender gap and in performance of managers in food and beverage preparation service companies in the city of Victoria, Durango.

### **Competence Standards EC0422**

The labor competence regulations list the actions that the worker must follow in terms of performance criteria, that is, the expected practices in that specific activity, the fields of application shown through the evidences of fundamental knowledge such as performance methods and principles, and circumstantial knowledge for decision-making adapted to various situations, in addition to the orientation of the evaluation in which the way it will be evaluated is detailed, as well as the evidence obtained for said evaluation (Schwartzman Kaplan, 2000).

The standard of competence for managers is EC0422 "Management of people in organizations", this standard is divided into four elements that make up the competence standards: establish the terms of the individual / collective employment relationship; pay payroll, benefits, and compensation; implement the labor regulations of the organization at the federal and local level; and manage the termination of the employment relationship. In each of these elements, the evaluation criteria are products that the competent person obtains, knowledge that the person must possess to be competent, the responses to emergent situations and attitudes, habits, and values shown.

The level of knowledge achieved must be shown by understanding article 123 of the Political Constitution of the United Mexican States in sections A and B, the content of the Federal Labor Law regarding claims, strike sites and disabilities, that which concerns the related authorities for the fulfillment of individual and collective labor relations (Secretary of Labor and Social Welfare, Federal Attorney's Office for the Defense of Labour, Federal Conciliation and Arbitration Board).

Local Conciliation and Arbitration Board), concept of union relationship, scope and limitations based on the type of collective bargaining agreement, concept, definition and elements of the collective wage and contractual contract and regulations of Federal Employers' Relations (general description of the type of laws, law of the Institute of the National Fund for Workers' Housing [INFONAVIT], the Institute of Social Security and Services for State Workers [ISSSTE], the Pension Saving System [SAR] and the Mexican Institute of Social Security [IMSS]), knowledge of payroll in terms of the concept, elements and process, structure, laws and applicable regulations and knowledge regarding the internal normativity of the internal regulations and collective contract; Likewise, the standard assesses the level of performance in terms of: incident management, payroll calculation process, representation of the organization before the Federal Conciliation and Arbitration Board (JFCA), application of the exit protocol in all cases (death, resignation and dismissal) and in obtaining the various elaborated products, such as:

Safety and hygiene regulations, internal regulations, integrated individual contract, integrated collective contract, integrated special contract, processed payroll, monthly and annual report of the information required for tax and employer obligations, administrative withdrawal form, checklist of exit protocols, settlement, settlement format and exit interview or survey format. For the manager to be competent according to the standard; attitudes, habits and values regarding responsibility, cooperation, order and kindness are also measured. Regarding emergent situations, this refers to extreme circumstances that the manager must face in the labor relationship with his workers, human resource management and representation in the JFCA when physical and verbal aggressions are triggered (CONOCER, 2021).

### **Importance of the sector in the state and municipality of Durango, Dgo**

The restaurant sector is part of the 72nd classification, corresponding to temporary accommodation and food and beverage preparation services of the Automated Census Information System (SAIC) of the National Institute of Statistics and Geography (INEGI).

At the national level, as of 2018, 637,124 economic units were registered (UE); In Durango, the registered economic units were 56,236, which represents 8.8% of the national total. In relation to 2014 there was an increase of 765 UE in Durango, which means a growth of 6% (INEGI, 2019).

In the state of Durango, Total Gross Production (TGP) as of 2018 was of 5,008.18 million pesos; In the case of investment, it was 70.6 million pesos. Regarding the employed personnel, 26,886 people were employed in this sector during 2018.

The results of the INEGI, for 2018, show that most of the companies in the restaurant sector installed in Durango where micro (with up to 10 employees), 8, 216 companies join this stratum. Small-sized companies follow with 276 units, and only 14 companies are medium and large with up to 250 employees. At the municipal level, the municipality with the most presence in the restaurant sector is the state capital, Durango, with 25,204 economic units, the city of Lerdo follows with 3,537 companies; Santiago Papasquiario and Guadalupe Victoria are next, with 1,861 and 1,682 respectively. These five municipalities cover 76.2% of the economic units of the restaurant sector in the state of Durango.

### Description of the methodology

The considered universal population were 98 micro and small companies in the city of Victoria, Durango which met the characteristic in their functional structure of having at least a manager, a chef, and a cook. This article only shows the results of the analysis carried out in the manager position. To determine the sample size, the formula for finite populations was applied considering a confidence level of 95% and a sampling error of 0.07, with which a sample size of 65 companies was obtained.

$$n = \frac{k^2 N p q}{e^2 (N-1) + k^2 p q} \quad (1)$$

Where:

n= is the size of the population sample

N= is the size of the total population

$\Sigma$ = population standard deviation

z= confidence level

e= sampling error limit

p= expected proportion

k= confidence level constant

The sampling frame was designed from the data produced by the search carried out in the National Statistical Directory of Economic Units (DENUE, INEGI) selecting companies, probabilistically, for which a list of random numbers was generated using Office Excel v.16 software and choosing 65 numbers according to the list of the sampling frame going to the indicated establishment, in case the company was not found or refused to participate in the study, the next one was considered according to the random selection list created. It's worth mentioning that the information was collected at the end of 2020 and the beginning of 2021, therefore, due to the current pandemic situation, many of the establishments faced closure situations.

For the analysis of the level of competencies achieved by the managers of the companies under study, the Competency Standard CONOCER EC0422 was considered, establishing the manager's perception regarding the *performance of the workers* he/she directs, his/her employment relationship regarding knowledge of regulations and employment contracts, *the management of labor regulations* subject to the *management of incidents, wages and salaries* and Federal Conciliation and Arbitration Board, *employment relationship* in terms of protocols for dismissals, departures, layoffs, death, liquidation and exit surveys, supervision of work, areas and clients, knowledge of labor laws (Constitution, Federal Labor Law, collective relations, unions, *contracts and employer regulations*, payroll management and tax laws and *regulation management*, Internal Regulation of Work, fires, training, working conditions and safety and hygiene), for which a questionnaire that consisted of four sections was designed: in the first one, demographic data such as gender, age and number of workers in the company and information for the calculation of the PHCI (years of schooling and years of experience) were collected; subsequent sections were designed in response of a five-entry Likert scale (always, almost always, sometimes, almost never and never); the second section is related to the activities carried out in the workplace; the third section is related to the knowledge maintained according to their perception; and the fourth section is related to their attitude, habits and values.



The performance analysis variables were classified into eight indicators: *'perception of worker performance by manager'* where the perception of the manager in relation to the range of delivery and performance of the workers within the company they run is analyzed; *'knowledge of labor relations'* which includes knowledge of the safety and hygiene regulations for the variables, of the internal regulations drawn up, of the integrated individual contract, of the integrated collective contract and the integrated special contract; *'knowledge of labor regulation management'* which contains the incident management variables, salary and compensation management, and representation of the company before the JFCA; *'management of the employment relationship'* which integrates the application of exit protocols in all cases and elaborates the discharge forms, checklists, delivery of elaborated settlement forms, and carries out the exit interviews or survey formats; *'management of work supervision'* in correspondence to the variables regarding pre-service meetings with the personnel under their charge, to monitor the conditions of the room where food and beverage service are provided, to report needs for the conditioning of facilities, to verify the operation equipment and processes, supervise the activities assigned to personnel, verify the garbage area, verify the assembly of the beverage service area, serve diner during their stay, supervise prepared food and beverages, monitor diner attention, verify food and beverage service orders, verify consumer bills;

*'knowledge of labor laws and regulations'* corresponding to the variable knowledge of article 123 of the Political Constitution of the United Mexican States, of the content of the Federal Labor Law in terms of lawsuits, strike calls and disabilities, of the authorities related to the fulfillment of individual and collective labor relations (STPS, PFDT, JFCA y JLCA), of the concept of union relationship, scope and limitations based on the type of collective contract agreement, of the concept and elements of the collective wage and contractual agreement and the regulations of federal employer relations; *'payroll management and tax laws'* subject to knowledge of concepts and elements of the types of payroll, the payroll process interfaces, concept and structure of the payroll audit process.

Of the Federal Tax Regulations of the Federal Tax Code, of the Federal and Local Tax Regulations regarding payroll tax and the concepts and application of internal regulations; *'Work standards management'*, under the variables and knowledge of the Federal Labor Law (incentives, commissions, penalties, compensation and retirements), of the elements to attend a general inspection of working conditions, training, safety and hygiene by the STPS and internal regulations. It was determined through the mean of the indicators that the overall performance level of the Standard CONOCER EC0422.

The validation and consistency of the instrument with which the information was collected on those variables contained in some of the indicators was carried through Cronbach's alpha coefficient. Considering the group of variables according to their indicator, Table 1 shows the results with an average of 0.857, which is considered by various authors as a good level of reliability.

| Indicator                                 | Cronbach's alpha coefficient |
|---|------------------------------|
| Knowledge of labor relations              | 0.796                        |
| Management of the employment relationship | 0.839                        |
| Work supervision management               | 0.826                        |
| Knowledge of labor laws and regulations   | 0.870                        |
| Payroll management and tax laws           | 0.921                        |
| Management of work standards              | 0.893                        |

**Table 1** Cronbach's alpha coefficient of each indicator  
Source: Own Elaboration

The sample was grouped into female and male managers to determine the statistical differences presented in relation to some demographic variables, PHCI and performance indicators. The Pearson correlation coefficient was determined with the performance indicators, the software used was SPSS V25. for nonparametric statistics in hypothesis tests applying the Kruskal Wallis test and the Minitab V.19 software for the Mann Whitney tests.

**Results of gender descriptive analysis, human capital index and level of performance**

Managers were studied from a gender perspective to determine the gender gap in performance within the managerial level in this economic activity, finding that the age is very similar between the two genders with an average of 37 years for women and 33 years for men, with a standard deviation of 11 years for women and 10 for men. Regarding years of schooling, it was found that both men and women have truncated undergraduate level studies on average with a standard deviation of three years. In relation to the years of experience in the development of this activity, it's lower for men compared to women; the average years of experience for men is that of 7.37 and for women is 8.07. Table 2 shows the mean and standard deviation of the manager's age, years of study and years of experience for men and women.

|     | Manager's age |       | Years of study |      | Years of experience |      |
|-----|---------------|-------|----------------|------|---------------------|------|
|     | $\bar{x}$     | s     | $\bar{x}$      | s    | $\bar{x}$           | s    |
| W*  | 37.37         | 11.73 | 14.50          | 3.13 | 8.07                | 8.53 |
| M** | 32.89         | 10.04 | 14.86          | 3.14 | 7.37                | 7.49 |

\*Women, \*\*Men

**Table 2** Comparative descriptive statistics women and men age of the manager, years of study and years of experience

Source: Own Elaboration

Regarding the number of employees that men and women manage, it's also very similar with a small difference, the average number of employees for women is 14.73 and for men is 13.6, the PHCI (formula 2 in annexes) is similar for both men (14.37) and women (14.32). Table 3 shows the mean and standard deviation of the number of employees and the PHCI.

|     | Number of employees |       | PHCI      |      |
|-----|---------------------|-------|-----------|------|
|     | $\bar{x}$           | s     | $\bar{x}$ | s    |
| W*  | 14.73               | 11.25 | 14.32     | 3.64 |
| M** | 13.6                | 8.25  | 14.37     | 3.75 |

\*Women, \*\*Men

**Table 3** Comparative descriptive statistics for men and women number of employees and PHCI

Source: Own Elaboration

Table 4 shows the level of education by gender, where it can be observed that the proportion of managers with a truncated high school or lower level is higher in women.

It also highlights that more than twice the percentage of men occupy the position with truncated undergraduate level studies. Regarding managers with a bachelor's degree, women occupy the position 1.5 times higher. The total of managers of both genders who have postgraduate studies only reaches 7.7 percent. It's also observed that for 63% of men, truncated undergraduate studies or lower was enough to hold position of manager, while these same schooling characteristics are only shown by 50% of women in the same position. In other words, for a woman to be able to have the position of manager, she requires a bachelor's degree or a postgraduate, with only 37% of men completing this level of studies.

| Level of education          | Women |      | Men |      | Total |      |
|-----------------------------|-------|------|-----|------|-------|------|
|                             | F*    | %    | F*  | %    | F*    | %    |
| Truncated secondary         |       |      | 1   | 2.9  | 1     | 1.5  |
| Secondary                   | 4     | 13.3 |     |      | 4     | 6.2  |
| Truncated baccalaureate     | 1     | 3.3  | 2   | 5.7  | 3     | 4.6  |
| Baccalaureate               | 5     | 16.7 | 6   | 17.1 | 11    | 16.9 |
| Truncated Bachelor's degree | 5     | 16.7 | 13  | 37.1 | 18    | 27.7 |
| Bachelor's degree           | 13    | 43.3 | 10  | 28.6 | 23    | 35.4 |
| Postgraduate                | 2     | 6.7  | 3   | 8.6  | 5     | 7.7  |

\* Frequency

**Table 4** Level of education for the manager position

Source: Own Elaboration

**Results of the inferential analysis of performance levels and in relation to demographic variables and PHCI**

To define the level of relationship between the variables analyzed in the manager's performance level, the Pearson's correlation coefficient statistical test was applied using the classification established by Hernández Sampieri (2014): very weak positive correlation when the parameter of  $0.10 > 0.25$  is found, weak at  $0.25 > 0.50$ , medium at  $0.50 > 0.75$ , considerable at  $0.75 > 0.90$ , very strong at  $0.90 > 1.00$  and perfect at 1.00. The positive correlation shows a directly proportional relationship. The results show a very weak positive correlation for the case of 'perception of worker performance' by manager in relation to 'employment relationship management' with a relationship of 24.5%.

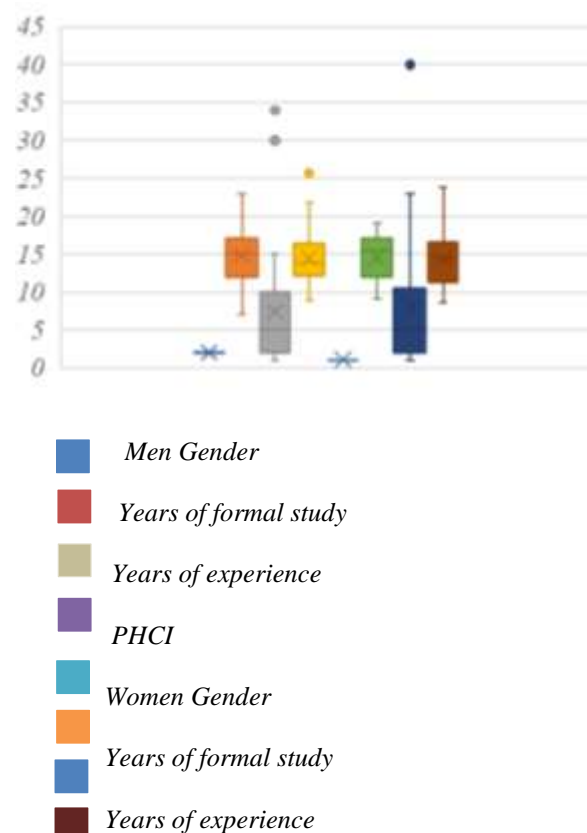
A weak positive correlation was shown in the same indicator in relation to 'knowledge of labor laws and regulations', 'payroll management and tax laws' and 'management of work standards' with 37.9%, 32.0% and 30.4% respectively. In contrast, 'knowledge of labor relations' presents a mean positive correlation with 'knowledge of laws and regulations' at a 56.1% and with 'management of work standards' of 56.9%. The relationship shown between 'knowledge of labor laws and regulations' with 'payroll management and tax laws' and 'management of work standards' with a considerable correlation coefficient of 0.831 and 0.795 respectively, also stands out. 'Payroll management and tax laws' maintains a considerable positive relationship with 'work standards management' at 88.3%. Table 5 contained in the annexes shows the indicators the relationship with respect to the correlation coefficient.

Likewise, the correlation coefficient was used to determine the relationship of the manager's PHCI level with the years of experience and with the years of study, finding that the correlation for both the years of experience and the years of schooling shows an average positive relationship of 51.6% and 71.7%, respectively.

The correlation of the performance indicators in relation to the PHCI was also calculated finding that 'knowledge of labor relations', 'knowledge of labor laws and regulations' and 'management of work standards' maintain a weak positive correlation of 0.371, 0.265 and 0.246, respectively. By determining that years of schooling maintain a higher coefficient relationship with the PHCI the relationship of years of schooling with each of the indicators related to the manager's performance was calculated finding that 'knowledge of management of the labor norm', 'management of the employment relationship' maintain a weak positive relationship with a coefficient of 0.316 and 0.274 respectively with the manager's years of schooling. The relationship between the manager's years of schooling and the manager's level of performance was also determined according to the EC0422 standard, finding a similar result (weak positive correlation) of 0.256.

For inferential analysis between performance levels and demographic and PHCI variables, hypothesis tests were applied using non-parametric statistics with the Kruskal Wallis test to determine the gender gap in the manager position, finding that within the distribution of the eight indicators analyzed relative to the performance, no statistically significant differences were found between men and women.

The demographic characteristics of the managers in the restaurants of the city of Victoria, Durango was also determined by applying the hypothesis test under the same test, finding that the number of workers they manage, the age of the manager, the manager's years of schooling, their years of experience and the PHCI do not show statistically significant differences between the capacities and performances of women who occupy the position of managers with respect to their male colleagues. As can be seen in graph 1, the box plots show the dispersion by gender for different demographic variables.



**Graph 1** Gender gap in years of schooling, years of experience and PHCI of managers

Source: Own Elaboration

The indicators related to the level of performance of the managers were analyzed in relation to the PHCI group, manager's group of years of schooling manager's age group, and company size categories applying the Kruskal Wallis hypothesis test. If the alternative hypothesis was accepted, the Mann Whitney test was applied with a confidence level of 95% using the test of one population different from another. A population is  $>$  or  $<$  to another to determine group differences.

In the case of the PHCI, its results were grouped into four categories: level 1 Low (PHCI  $<$  10), level 2 Medium (10  $>$  PHCI  $<$  15), level 3 Medium High (15  $>$  PHCI  $<$  20) and level 4 High (PHCI  $>$  20). When applying the hypothesis test, it was determined that the distribution of knowledge of labor relations is not the same between the PHCI group categories with a significance level of 0.021. The Mann Whitney analysis was applied to determine differences comparing two groups, finding that level 1 group is less than level 3 group, level 1 group is lower than level 4 group, and level 2 group is lower than the level 4 group with a significance level of 0.032, 0.005 and 0.007 respectively, with which it can be observed that the PHCI of the level 4 group in the knowledge of the regulations concerning labor relations is higher than in other groups.

For the years of schooling, the results were categorized into five groups starting from group 3 to 7; truncated secondary studies (less than 9 years), finished secondary (9 years of study) and truncated baccalaureate (10 and 11 years) were joined in group 3 because the elements of truncated and finished secondary were few, which made separate analysis impossible; group 4 finished baccalaureate (12 years); group 5 truncated undergraduate level (13 to 15 years); group 6 completed bachelor's degree (16 to 17 years); and group 7 postgraduate studies with more than 18 years of schooling. When applying the hypothesis test regarding the distribution of the performance level indicators, it was found that for the case of *'payroll management and tax laws'* and *'management of work standards'* different results are shown with a significance level of 0.024 and 0.013 respectively, therefore, the Mann Whitney test is applied, resulting in differences for *'payroll management and tax laws'* in group 4 as it was lower than group 5 and group 6 with a significance level of 0.011 and 0.005 respectively.

The above indicates that *'payroll management'* and *'knowledge of tax laws'* in the completed baccalaureate group (group 4) had lower results than those for truncated bachelor's degree (group 5) and completed (group 6). Referring to *'work standards management'* the null hypothesis was rejected with a significance level of 0.013, when applying the test to determine differences by groups, group 4 was found to be lower than group 6 and group 7 with a significance level of 0.012 and 0.008, that means that *'work standards management'* of the completed baccalaureate group showed a lower response scale than truncated bachelor's degree and postgraduate.

Performance indicators were averaged by applying the Mann Whitney test to all groups, finding that group 4 statistically showed a lower level of performance than group 6 with 0.072. It should not be forgotten that the questionnaires consider the perception of the managers regarding their own competencies and carried out (performances) activities with answers of always, almost always, sometimes, almost never and never, so it can be deduced that since coursing baccalaureate, managers become aware of their level of knowledge and activities established in the Standard CONOCER EC0422 in the aforementioned indicators.

The age of the manager was also evaluated with respect to the distribution of each of the performance indicators resulting in *'knowledge of management of the labor norm'* to be different with a significance level of 0.010, so the following relative test was applied to the age groups, group 1 contains managers  $<$  30 years, group 2 from ages 31 to 40, group 3 from ages 41 to 50 and group 4 from ages 51 to 60 or more years of age. The results showed that group 1 is lower than group 2 and higher than group 3 with a significance level of 0.012 and 0.020 respectively, group 2 is higher than group 3 with a significance level of 0.001 and group 3 lower than group 4 with a significance level of 0.011.

The size of the company was another group considered in the hypothesis tests in relation to performance indicators, as already mentioned, the study observed micro and small companies, resulting in the acceptance of the alternative hypothesis for the *'management of labor regulations and management of payroll and tax laws'* with a significance level of 0.038 and 0.036 respectively.

When applying the test of differences by company size, it was shown that in these two indicators micro companies have lower performance results than small companies with a significance level of 0.032 and 0.008, respectively. Therefore, it can be assumed that the managers of micro companies recognize the lack of knowledge of management of labor regulations and management of payroll and tax laws.

**Annexes**

| Correlation classification                    | Indicator                                   | Indicator                                 | Correlation coefficient |
|---|---|---|-------------------------|
| Very weak positive correlation<br>0.10 > 0.25 |   | Labor relationship management             | 0.245                   |
|   |   | Knowledge of labor laws and regulations   | 0.379                   |
| Weak positive correlation<br>0.25 > 0.50      | Perception of worker performance by manager | Payroll management and tax laws           | 0.320                   |
|   |   | Management of work standards              | 0.304                   |
|   |   | Knowledge of labor regulation management  | 0.399                   |
| Weak positive correlation<br>0.25 > 0.50      | Knowledge of labor relations                | Work supervision management               | 0.373                   |
|   |   | Payroll management and tax laws           | 0.445                   |
| Mean positive correlation<br>0.50 > 0.75      |   | Knowledge of labor laws and regulations   | 0.561                   |
|   |   | Management of work standards              | 0.569                   |
| Weak positive correlation<br>0.25 > 0.50      | Knowledge of labor regulation management    | Management of the employment relationship | 0.396                   |
|   |   | Work supervision management               | 0.461                   |
|   |   | Knowledge of labor regulation management  | 0.461                   |
|   |   | Management of work standards              | 0.457                   |
|   |   | Knowledge of labor laws and regulations   | 0.520                   |
| Mean positive correlation<br>0.50 > 0.75      |   |   |                         |
| Weak positive                                 | Management of the                           | Work supervision management               | 0.498                   |

|  |   |   |       |
|--|---|---|-------|
| correlation<br>0.25 > 0.50                       | employment relationship                 | Knowledge of labor laws and regulations | 0.457 |
|  |   | Payroll management and tax laws         | 0.457 |
|  |   | Management of work standards            | 0.498 |
| Weak positive correlation<br>0.25 > 0.50         | Work supervision management             | Knowledge of labor laws and regulations | 0.310 |
|  |   | Payroll management and tax laws         | 0.368 |
|  |   | Management of work standards            | 0.394 |
| Considerable positive correlation<br>0.75 > 0.90 | Knowledge of labor laws and regulations | Payroll management and tax laws         | 0.831 |
|  |   | Gestión de normas de trabajo            | 0.795 |
| Considerable positive correlation<br>0.75 > 0.90 | Payroll management and tax laws         | Management of work standards            | 0.883 |

**Table 5** Pearson correlation performance indicators  
Source: Own Elaboration

The calculation of the PHCI is carried out through equation (2) which makes it possible to equate the experience acquired over the years with the level of studies that the people subject to analysis have (Portela, 2001).

$$CHPi = MEDU \times \left( 0.5 + \frac{e^{\frac{(EDUi - MEDU)}{(DTEdu)}}}{1 + e^{\frac{(EDUi - MEDU)}{(DTEdu)}}} \right) \times \left( 0.5 + \frac{e^{\frac{(EXPEi - MEXPE)}{(DTEXPE)}}}{1 + e^{\frac{(EXPEi - MEXPE)}{(DTEXPE)}}} \right) \tag{2}$$

Where:

- MEDU = Average educational level of the agricultural population
- EDUi = Educational level of the i-th individual
- DTEdu = Standard deviation of said educational level
- EXPEi = Work experience of the i-th individual
- MEXPE = Average experience of the agricultural population
- DTEXPE = Standard deviation of said work experience

**Acknowledgment**

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**Conclusions**

At present, there is still a gender gap in most managerial-level positions, therein lies the importance of this study to understand this phenomenon and to create policies to improve this situation. Research shows that both demographic and performance characteristics statistically do not show significant differences between the restaurants lead by women and men, and although statistically they are not different, it can be seen that on average, men access the position of manager at an age five years younger than women, even when having less work experience.

This means that, in order to reach the management level, women not only need to have the same level of human capital and performance as a man, in addition, they need to have more time of professional work to be recognized for the position. This shortens the working lives of women in managerial positions and therefore their access to better salaries and benefits than their male counterparts. It is also concluded that to occupy the position of manager, truncated undergraduate level studies or lower are enough for men, while for a woman in the manager position a completed bachelor's degree or postgraduate studies is needed. It's clear that job performance is higher in workers who have a higher level of human capital, specifically in understanding and managing laws and regulations that frame a better performance of organizations. The study shows that larger companies allow them to have a higher level of human capital.

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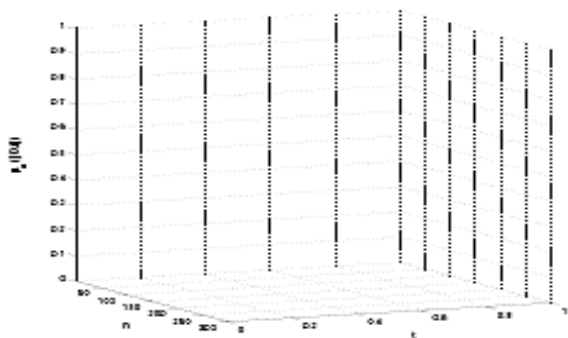
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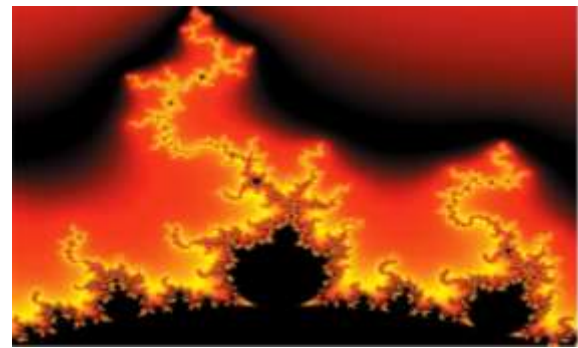
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