Article **Journal-Labor and Demographic economic**
December 2022 Vol.6 No.11 9-14

Proposal of a logistics model for a furniture manufacturing company in the municipality of Nacajuca, Tabasco, Mexico

Propuesta de un modelo logístico de una empresa manufacturera de mobiliario, en el municipio de Nacajuca, Tabasco, México

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DOI: 10.35429/JLDE.2022.11.6.9.14 Received July 30, 2022; Accepted December 15, 2022

Abstract

It is a fact that strategic logistics helps an organization to understand, evaluate, control, optimize and develop operations with an integral approach, taking into account all the factors that influence both internally and externally the system, in order to increase competitive advantages, attracting and retaining customers and generating an increase in the economic benefits obtained from the marketing and production of goods and services, through the interaction of the activities of physical distribution, supply of raw materials, information management, response times, inventory level control, study of demand, customer service, etc. Therefore, in this work we intend to carry out a study in the business context with the objective of measuring the level of efficiency and effectiveness of its current logistics, by means of an instrument that allows visualizing the organization in an integral way, to later analyze and interpret the results and propose solutions, improvement projects or systems that improve the results obtained in the diagnosis.

Strategic logistics, Factors, Integral approach

Resumen

Es un hecho que la logística estratégica, ayuda a una organización a comprender, evaluar, controlar, optimizar y desarrollar operaciones con un enfoque integral, tomando en cuenta todos los factores que influyen tanto de manera interna como de manera externa en el sistema, con la finalidad de aumentar las ventajas competitivas, captando y reteniendo clientes y generando un incremento en los beneficios económicos obtenidos por la comercialización y producción de los bienes y servicios, mediante la interacción de las actividades de distribución física, aprovisionamiento de materias primas, manejo de información, tiempos de respuesta, control del nivel de inventarios, estudio de la demanda, servicio al cliente, etc. Por lo que en el presente trabajo se pretenden realizar un estudio en el contexto empresarial con el objetivo de medir el nivel de eficiencia y eficacia de su logística actual, mediante un instrumento que permita visualizar a la organización de manera integral, para posteriormente analizar e interpretar los resultados y proponer soluciones, proyectos de mejora o sistemas que mejoren los resultados obtenidos en el diagnóstico.

Logistica estratégica, Factores, Enfoque integral

Citation: DE LEÓN-DE LOS SANTOS, Brissa Roxana, MOREJÓN-SÁNCHEZ, Juana María, ELISEO-DANTÉS, Hortensia and GARCÍA-REYES, David Antonio. Proposal of a logistics model for a furniture manufacturing company in the municipality of Nacajuca, Tabasco, Mexico. Journal-Labor and Demographic economic. 2022. 6-11: 9-14

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Introduction

For the purposes of the study, a furniture manufacturing company located in the municipality of Nacajuca, Tabasco is taken. Tabasco company with more than 30 years of experience in the architectural furniture manufacturing industry.

The organization to be studied belongs to the SMEs (as 99.8% of the establishments in Mexico according to the economic census conducted by INEGI in 2019) so it is interesting and attractive to conduct the present study, since its current logistics processes are not formally established or developed, which prevents projects from being carried out efficiently.

The following is the organization chart of the furniture company, which has 7 main areas or departments, after which the activities that are commonly performed in them are briefly described:

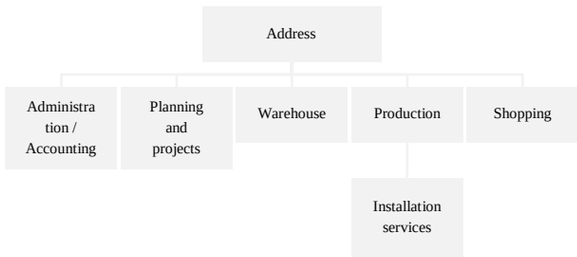

Figure 1 Organization chart of the furniture manufacturing company
Source: Author's perception

- Management: Activities that encompass all the rest of the organization, such as: Establishing company goals, exercising leadership, improving communication.

- Administration / Accounting: Functions such as resource planning (material, human and computer), organization, representation, accounting accountability.

- Planning and projects: Its main activity is to plan the activities to be carried out to carry out a project effectively. Planning labor, material and time required.

- Warehouse: Activities of reception, control, conservation, custody and dispatch of goods and products.

- Production: All activities for the manufacture of furniture, wood processing, assembling, varnishing, packaging, etc.

- Purchasing: Supplier analysis, purchase request, receipt of materials and supplies.

- Installation services: Product (furniture) installation activities.

Measurement of the organization

After knowing the main structure and the actors that make it up, the study starts by measuring the organization, where the current state of the organization is known, and thus, have a solid base from which to start and identify the key points that need help to significantly improve it.

In the present work a tool is designed to evaluate the current logistic state, this measurement instrument will allow to detect strategic points of which to pay more attention in order to subsequently propose improvement alternatives.

The instrument will be answered based on the Likert Scale, with the objective of evaluating the opinion and attitudes of the actors.

Measurement instrument

The following instrument will be answered based on the Likert scale, taking into account that:

1 = Never
2 = Almost never
3 = Sometimes
4 = Almost always
5 = Always

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Survey to evaluate the logistics of the before						
N°	Questions	1	2	3	4	5
Top management						
1	How often do you hold meetings with other departments?					
2	Do departments wait for orders from top management before performing an activity?					
3	Are the links and relationships between departments clear and communicated?					
Administration and accounting						
4	Is the name and objectives of the project made known to senior management?					
5	How often are staff trained?					
6	Before starting a new project, is the accounting for the past period up to date?					
Planning and projects						
7	Is a master production plan carried out?					
8	Is software used to assist in project control?					
9	Are product designs accepted by customers from the start?					
Warehouse						
10	Are there any intelligent systems for product storage, such as ABC, FIFO, LIFO, etc.?					
11	Are personnel trained on the proper storage of chemicals?					
12	Is the most suitable space for the material to be placed in the warehouse created before the material is put into the warehouse?					
Production						
13	Before starting any project, are specifications such as project objective, delivery date, target audience, etc. communicated to them?					
14	Are tasks divided and assigned to personnel prior to the start of production?					
15	Is the material and machinery available just prior to the start of production operations?					
Installation services						
16	Are measurements taken, dimensions of the area where the installation will take place?					
17	Were adequate drawings provided for proper installation?					
18	Does the material or product arrive at the site in good condition?					
Purchasing						
19	Is the purchase order well executed?					
20	At least 2 supplier alternatives are available					
21	The purchasing manager has full autonomy over the orders.					
Total						
Percentage						

Table 1 Measuring instrument (Logistics before)
Source: Author's perception

Survey to evaluate the logistics of the during						
N°	Questions	1	2	3	4	5
Top management						
1	How often is production monitored when it is in process?					
2	Do you consider that the working day is used correctly?					
3	How often are meetings held with representatives from each area during the implementation of a project?					
Administration and accounting						
4	How well are resources optimized? Be they material, human and/or IT?					
5	Are purchases invoiced and debts paid in a timely manner?					
6	How well do you coordinate actions between departments?					
Planning and projects						
7	Is the project controlled by means of IT tools?					
8	Are design modifications made during project execution?					
9	The daily progress target is met.					
Warehouse						
10	The correct material handling device is used.					
11	Inventory is updated as products enter the warehouse.					
12	The requested material is distributed to production with sufficient time in advance.					
Production						
13	Are there any manufacturing systems that help create quality products such as Kanban, TPM, Lean Manufacturing, six sigma?					
14	They perform quality inspection during the processing of their products.					
15	They follow the production plan previously outlined.					
Installation services						
16	There are problems in the installation due to poor measurement of the furniture.					
17	The material and tools necessary for the installation are provided.					
18	How often an inspector's installation is monitored.					
Purchasing						
19	How much traceability do you have on the purchase?					
20	Is the time to receive the purchase adequate?					
21	A control is kept to determine when it is correct to make the purchase of materials					
Total						
Percentage						

Table 2 Measuring instrument (Logistics during)
Source: Author's perception

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Survey to evaluate the logistics of the after						
N°	Questions	1	2	3	4	5
Top Management						
1	How often are meetings held with other departments or areas to recognize the efforts of employees after the completion of a project?					
2	The project is completed on schedule					
3	Does the organization perform process feedback to make known possible points of improvement?					
Administration And Accounting						
4	How likely is it that there are resources in excess of what was projected or forecast?					
5	The accounting at the end of the period is complied with in due time and form.					
6	Feedback and communication of possible improvements and processes carried out					
Planning And Projects						
7	Feedback and improvement of the planning process is provided after each project					
8	Is the project on schedule?					
Cenalma						
9	Material is requested to the purchasing area in advance.					
10	Do you feed back to improve the storage process?					
11	New alternatives for material handling devices are analyzed.					
Production						
12	Is the product or project delivered on time?					
13	There is feedback to improve manufacturing processes.					
14	Final quality inspection is performed.					
Installation Services						
15	The service was obtained according to the calendar and schedule that was established.					
16	A customer survey is conducted to evaluate the service and its quality.					
17	It provides feedback to improve installation service processes.					
Purchasing						
18	The packaging used completes purchases in an efficient manner.					
19	Purchases are confirmed upon delivery to the plant.					
20	Do you have inventory control and purchase history?					
Total						
Percentage						

Table 3 Measuring instrument (Logistics after)
Source: Author's perception

Description of the measurement procedure

Knowing that the objective of applying the instrument is to evaluate the company's current logistics, the procedure followed to achieve it is explained below:

1. Questions are formulated for each stage of logistics, taking into account that there are 3, logistics before, during and after.

2. 3 questions were asked to evaluate the before, 3 for the during and 3 for the after, this for each of the departments or areas of the company.

3. The instrument containing the questions analyzed and posed is integrated.

4. It is applied to the representatives of each area or department, which are 7 (Management, administration and accounting, planning and projects, warehouse, production, installation services and purchasing).

5. The responses are analyzed by means of Microsoft Forms, and then plotted in Microsoft Excel.

Results

After applying the survey to the representatives of each of the 7 areas and/or departments of the company, the answers are analyzed by means of Microsoft Excel software and the following results are obtained.

Graph 1 Percentages obtained after the instrument (Logistics of the before)
Source: Author's perception

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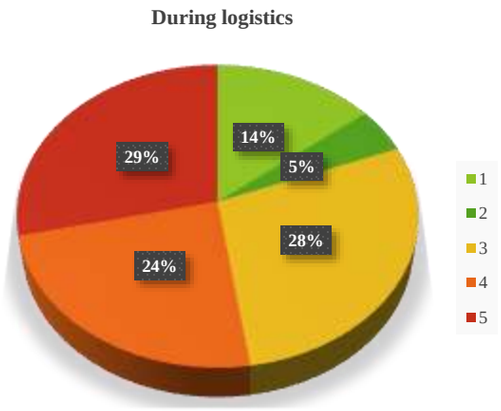
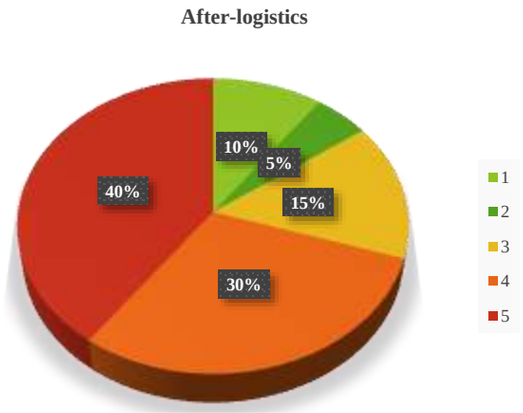


Graph 2 Percentages obtained after the instrument (Logistics during)
Source: Author's perception



Graph 3 Percentages obtained after the instrument (after-logistics)
Source: Author's perception

Improvement proposal

The improvement proposals in the logistic aspect help to put in context what is intended to be achieved with it, giving rise to the improvement, which is why it is one of the most important parts when proposing.

For this reason, in order to improve the logistics applied to the company studied, the PDCA continuous improvement model was implemented.

Finally, once the current situation of the company has been evaluated, and the strategic points where it can be improved have been analyzed, a logistics improvement model is proposed in which the main objective is to create an integral, united logistics, where the synergy in the work can be noticed, in this way the biggest problem of the company, which is the lack of communication, could be reduced.

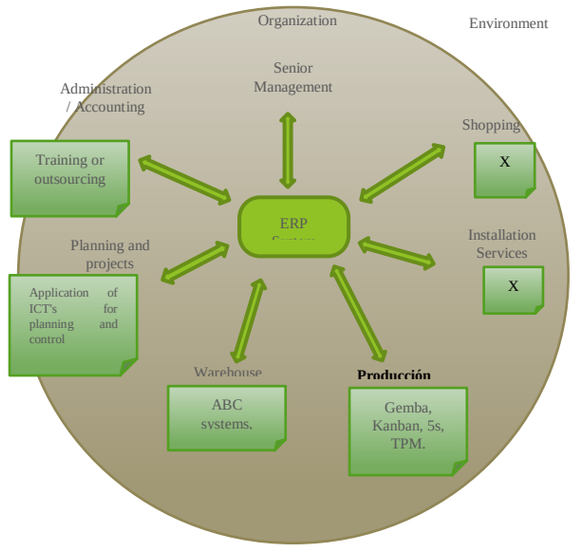


Figure 2 Proposed model for the improvement of integral logistics
Source: Author's perception

The model shows the new logistics system, which has a system) as a pillar for effective communication, addressing the main problem of the organization (lack of communication), since it is an Enterprise Resource Planning (ERP) system, a business software that allows a company to manage the efficient and effective use of resources (materials, human resources, finances, etc.), by providing a comprehensive and total solution to corporate information processing needs.

It should also be noted that ERP differs from other information technology systems because its implementations include technological, operational, administrative, strategic and organizational components.

Among the most important attributes is its ability to automate and integrate business processes within the company, share common data and practices across the enterprise, and produce and access information in a real-time environment.

Conclusions

We can highlight what we consider to be the key points of the work.

1. Whenever we seek to improve something, in any field, we must first verify that it is measurable.

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2. There are multiple ways to evaluate the state of logistics in a company, the development of the questionnaire is one of the easiest to perform, however, it must be very precise when formulating the questions, so that the data obtained are as close to reality as possible.

3. The use of data processing tools such as Microsoft Excel and Microsoft Forms greatly streamlines the process of developing a project.

4. Improving logistics can be a complicated task if you do not have a good working team in your organization.

5. The implementation of Lean Manufacturing tools such as the 9s program, Kanban system, Gemba and others would greatly help the improvement process.

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ISSN-On line: 2524-2067