

Improvement of hotel “Las Cuevas” warehouse logistics

Ms.C. Ernesto González Cabrera

Industrial Engineering Department, Universidad Central “Marta Abreu” de Las Villas, Cuba

DrC. Roberto Cespón Castro

Industrial Engineering Department, Universidad Central “Marta Abreu” de Las Villas, Cuba

Prof. Dr.-Ing. Dr. h.c. Prof. h.c. Norge Isaias Coello Machado

Mechanical Engineering Department, Universidad Central “Marta Abreu” de Las Villas, Cuba

Prof. h. c. Dr.-Ing. Dr. h. c. (UCLV) Elke Glistau

Institute of Logistics and Material Handling Systems, Otto von Guericke University Magdeburg, Germany

DOI: <http://dx.doi.org/10.25673/85939>

Abstract

This research is carried out in the hotel "Las Cuevas", located less than 400 meters from the historic centre of the municipality of Trinidad, Sancti Spiritus, with the objective of applying a procedure that allows the analysis and improvement of the logistics of warehouses in the hotel. For this purpose, information collection and analysis techniques are used, such as: bibliographic review, document review, consultation with specialists, direct observation, interviews, application of a checklist, among others, which make possible the veracity and accuracy of the results of the study. Logistics in general plays an important role in the world and national panorama at present, since it has been established in recent years as a new way of approaching business management, having become a competitive tool within the development strategies of companies. The application of the selected procedure, which includes a general characterization of the hotel, a general characterization of the warehouse under study and a diagnosis of its current situation, concludes with an analysis of the problems detected and improvement proposals to achieve the improvement of logistics in the beverage and liquor warehouse so that it can be certified at the current level or higher.

1. Introduction

The COVID-19 pandemic caused an unprecedented level of disruption in the global hotel industry. The combination of local confinements and travel

restrictions resulted in the temporary closure of many hotels or operations at a small fraction of their available capacity.

While by mid-2021, some hotels have begun operating, many destinations maintain their borders completely closed to international tourism. Although, during the final months of this year, and mainly, throughout 2022, the development of corporate operations that respond to the unique economic cycle propitiated by COVID-19 is expected, with the objective of overcoming the crisis and reaching stability. In recent days, Cuba has shown a considerable decrease in the number of confirmed cases of COVID-19, as well as a tendency to control the pandemic. In addition to being guaranteed the coverage of vaccines to immunize the entire population, a controlled and staggered reopening of the national borders is expected, for which the 10 international airports of the national territory are ready to operate and are already preparing their hotels to receive visitors from other countries, all under strict sanitary control measures.

In this scenario, logistics plays an important role since it has been established in recent years as a new way of approaching business management, having become a competitive tool within the development strategies of companies. Authors such as: [1],[2],[3] state that the supply chain today includes from the design and administration of all the activities necessary for the acquisition of resources and their channelling for transformation to final distribution or delivery. This in turn is interrelated with aspects of quality,

customer loyalty, timely presence in the market, sales momentum, operating costs, foreign trade, and the design and redesign of the product or service itself. The appropriate management of information is useful for managers to make effective management decisions and reduce the ecological impact of supply chains, as reaffirmed by [4] and [5].

Business logistics makes it possible to carry out the organization of the company through a set of means and methods that provide a certain order to the processes related to the supply, production and marketing of goods. Among the processes covered by business logistics are distribution, transportation and warehousing. It serves as a link between the production phase and the market phase, which, although they are quite distant in space and time, can be connected thanks to business logistics [6]. The techniques used for this connection focus on the tasks of resource planning and management, whose function is to increase and control efficiency from production to sale to the customer, in order to satisfy the needs of consumers at the lowest possible cost [7].

Currently the world is entering the fourth industrial revolution, which is named by several authors as digital revolution or Industry 4.0, where the role of digitization and computer interconnectivity within industries is prioritized. The term "Industry 4.0" was first used in a high-tech strategy project of the German government. It is based on software nomenclature and is used as a synonym for the fourth industrial revolution. The basic concepts of Industry 4.0 ensure the availability of relevant information in real time by networking all elements involved in value creation, the ability to derive optimal value-adding processes from information and data at any time and the realization of an integrated value-adding process information [8]. According to the authors [9], [10], [11] the use of cyber-physical systems (CPS) best describes Industry 4.0. This means the integration of computing, networking and actual physical systems, which provide the basis for new business models and business solutions. In the CS field, the term Logistics 4.0 is used. The above authors define it as the management of the flow of people, and materials between an origin and the point of consumption to meet customer requirements, using the benefits of IT and automation. Relevant Logistics 4.0 technologies are: identification, mobile communication, localization, electronic data interchange, data analysis methods, and data analysis processing [12]. This includes transportation, warehouses and the management of raw materials and finished productions. The Hotel Cubanacán "Las Cuevas" is a three-star city hotel that accommodates most of the transit tourists visiting the city of Trinidad. It offers

laundry services, snack bar and swimming pool, bar, buffet and specialized restaurant, it has the "Discoteca Ayala" in the cave with the same name that distinguishes it from the other facilities of the pole.

One of the main objectives of the facility in recent times has been to obtain the categorization of a four-star hotel. However, some weaknesses are found, primarily in the area of assurance. Its warehouse was categorized in 2019 with the first technical level, which is not satisfactory for its aspirations, as this is the lowest of the categories. As of today, there are also serious supply problems, mainly in the area of beverages and liquors. There are also several points regarding the overcrowding of merchandise, mainly because the warehouse is designed to keep the necessary products only for the hotel; but as it is currently catalogued as a Hotel Complex, it is established as a central warehouse that supplies the five hotels of the complex. All this is presented as the problematic situation of the present investigation. In view of the above, the scientific problem of the research is: How to contribute to the improvement of logistics in the beverage and liquor warehouse of the hotel "Las Cuevas" so that it can be certified at the current level or at a higher level?

In order to solve the scientific problem, the following hypothesis is proposed as a research hypothesis: If a structured procedure for warehouse logistics is applied, which considers international good practices, current Cuban legislation, national experiences in this field and the particularities of the beverage and liquor warehouse of the hotel "Las Cuevas", it will be possible through its subsequent application the continuous improvement of the same and the achievement of higher levels of certification. The general objective is defined as: To apply a procedure that allows the analysis and improvement of the warehouse logistics in the hotel "Las Cuevas".

In order to achieve the general objective, the following specific objectives are established:

1. To carry out a thorough bibliographic review, which will provide all the theoretical bases and fundamental applications related to the subject of the research.
2. To apply a procedure that allows the continuous improvement of storage logistics and the achievement of higher levels of certification of the beverage warehouse of "Las Cuevas" hotel.

2. Methods or experimental part:

There are several procedures that allow an adequate diagnosis of warehouse logistics for its subsequent improvement. These procedures contain seven work steps. Their operating logic is similar to the Deming Cycle, where the first five stages correspond to "Plan", the sixth stage to "Do", the control step to "Verify" and "Act" overlaps with all the first five work steps or part of them once a complete cycle is completed. From this point of view, it can be stated that the cyclical nature of the procedure allows it to be conceptualized as a continuous improvement tool. The procedure proposed by [13], taking only the first three stages and adapting it to the conditions of the hotel's beverage and liquor store, will be used for this research.

The procedure is shown in Figure 1 and contains four phases, each of them with working steps. From this point of view, it can be asserted that the cyclical character given to the procedure allows conceptualizing it as a continuous improvement tool. The importance of control at each step of the procedure should be emphasized to ensure its correct implementation. The author considers that it should be applied on a quarterly basis, although it should also be done when there are modifications in the products considered or when the facility undergoes any type of change. The following is a brief explanation of the procedure for a better understanding:

2.1. General characterization of the entity

This is the first step or work stage and it is important to have a general knowledge of the

organization. For this it is necessary to describe a whole set of aspects such as: corporate purpose, mission, vision, services, staff and its completeness, organizational management structure, strategic analysis of the organization.

2.2. General characterization of the warehouse

It is important to characterize the target warehouse in order to focus the research on a certain area or locale and to define important aspects such as: warehouse layout, storage technology (classification, storage means, transport equipment, warehouse areas, load flow, functional procedures, storage forms, location and localization of products in the warehouse) and the characterization of the technical state of the equipment.

2.3. Diagnosis of the warehouse

This step or work stage is the core of the warehouse diagnosis and covers the study of the physical installation and its management, preferably qualitatively and quantitatively. The aspects to be analysed are: space utilization, warehouse organization, reception and dispatch of goods, planning and control, documentation, conservation and protection and safety standards.

2.4. Analysis and proposed solutions

Once the problems have been identified, a set of measures aimed at eliminating or minimizing the problems detected must be proposed. For the implementation of the corrective measures, the conditions of the warehouse must be considered, where possible solutions tend to increase economic results and customer service.

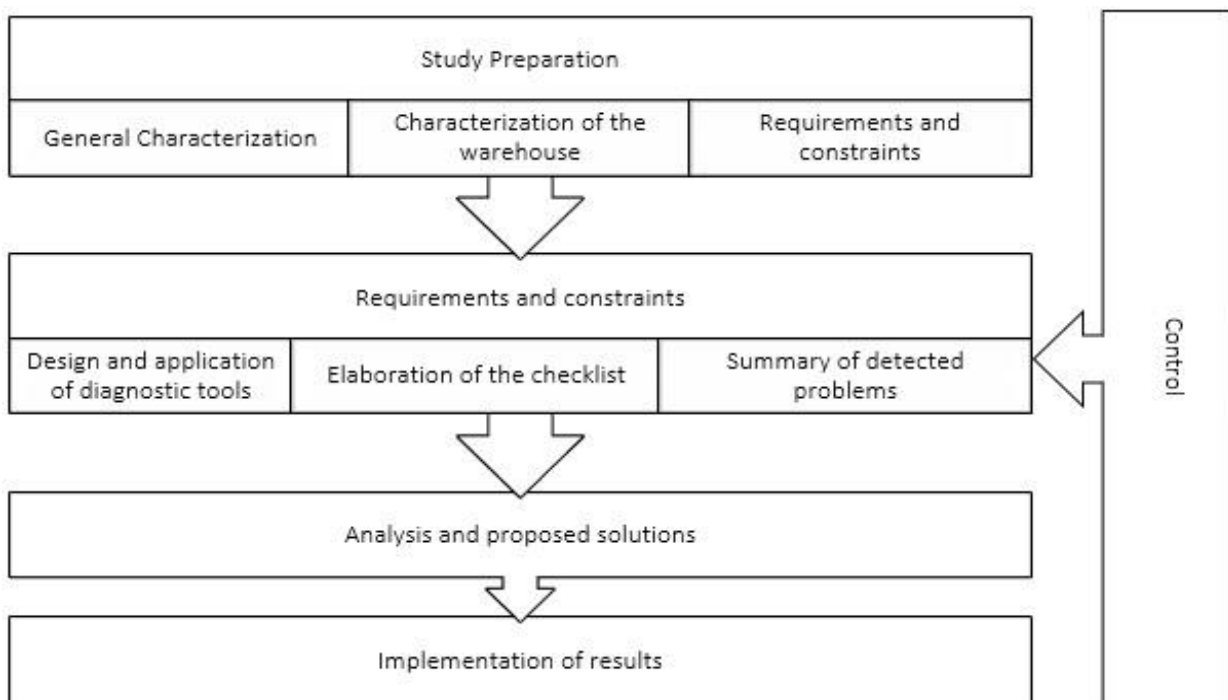


Figure 1: Methodology

2.5. Implementation of results

At this stage, the implementation of the technological reorganization design of the warehouse is proposed for a trial period of three months. The logistics manager will systematically bring together those responsible for applying each measure and verify compliance with the implementation plan. If any corrective action requires staff training, this manager will coordinate with the training area and the participation of the factory's top management.

2.6. Control

The last step of the procedure is a control loop that allows rectifying any deviation detected during the three-month period of operation of the warehouse or of some of the intermediate stages of the procedure. The checklist and indicators proposed in the diagnostic stage are used again to verify whether the problems have been mitigated or eliminated and whether the indicators meet the requirements of resolution 47/2020 Warehouse logistics regulations for entities operating in the national economy. If this does not occur, return to the corresponding work step of the procedure and repeat the rest of the procedure.

3. Results and Discussion

The Table 1 shows a summary of the checklist applied and the application of the checklist in the beverage and liquor warehouse, which revealed the following problems in the different aspects evaluated in the warehouse:

Table 1: Warehouse checklist. First level of categorization. Source: Own elaboration

Aspects to be evaluated	Maximum rating to be obtained	Warehouse rating
Construction condition	10	10
Organization of the warehouse	30	23
Planning and control	15	13
Warehouse documentation	10	7
Standards of conservation and pest control	10	9
Protection, Safety and health of workers	15	13
Product Contamination	10	7
Total	100	82

The following deficiencies were found in the different aspects:

3.1. Warehouse organization

This aspect includes deficiencies such as: the aisles and access doors to the warehouse are not free of products or objects that obstruct or hinder the passage of handling equipment and personnel, due to the problems of overcrowding in the warehouse, so it is sometimes necessary to place goods in the aisles, which also leads to the existence of blocked products in the warehouse. In addition, there is no procedure to reduce handling, nor are the loading schemes for each product defined, and the warehouse does not have a defined area for the repair and maintenance of the unitizing equipment.

3.2. Planning and control

Compatibility between stored products is not guaranteed, also due to overcrowding, since due to lack of space, products are sometimes placed in other areas that are not the right ones.

3.3. Documentation in the warehouse

There are no procedures for receiving, storage and dispatch. In practice, the personnel in charge know how to proceed, but the procedures are not designed as such.

3.4. Storage and pest control standards

Despite complying with the fumigation program established for the warehouse and products, rodents are occasionally present.

3.5. Product Contamination

There is currently no cross-contamination in the warehouse and there are strategies to prevent it, but there is no structured procedure in place. For the analysis of the deficiencies detected in the warehouse, they are grouped into five fundamental problems, considering their similarity:

- *Overcrowding of goods*

The aisles and access doors to the warehouse are not free of products or objects that obstruct or hinder the passage of handling equipment and personnel.

Blocked products are observed in the warehouse. Compatibility between stored products is not guaranteed.

- *Absence of written procedures*

There are no procedures to reduce handling.

There are no procedures for reception, storage and dispatch.

There are no procedures to avoid cross contamination.

- *Impossibility of a repair area for unitarizing media.*

There are no constructive facilities to define an area for the repair of unitarized media.

- Presence of vectors

Despite the existence of a fumigation and pest control program, there are still rodents in the warehouse.

- Absence of loading schemes

There are no loading diagrams for each product. Subsequently, a Pareto diagram is made (see Figure 2), where after weighing all the problems, it is found that the main problem affecting the beverage and liquor warehouse is the overcrowding of merchandise, for which a Cause Effect diagram is made (see Figure 3).

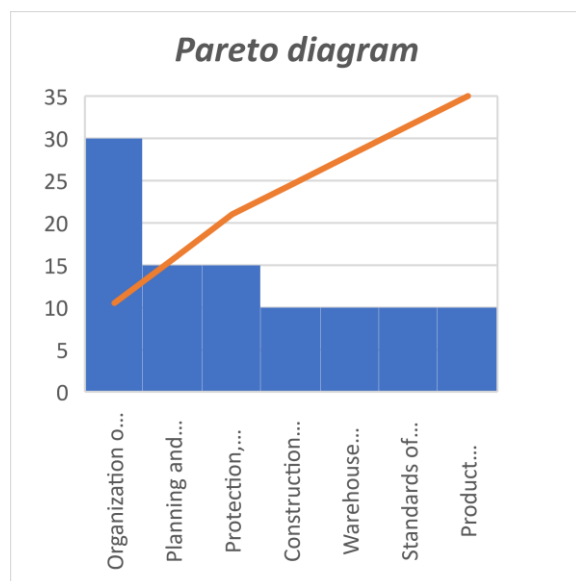


Figure 2: Pareto Diagram

Once the fundamental causes of the overcrowding of merchandise in the warehouse have been analysed in the Ishikawa diagram, a series of

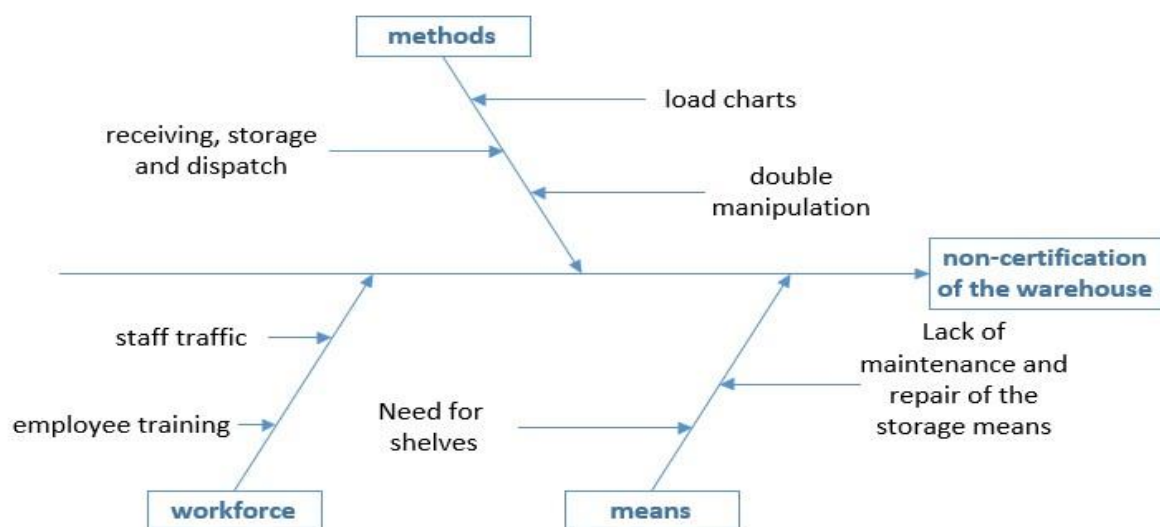


Figure 3: Cause Effect Diagram

measures are proposed in order to attenuate or eradicate the overcrowding:

- Search for a place with the appropriate constructive characteristics to establish it as the central warehouse of the hotel complex and that it works only for the insurance of the hotel "Las Cuevas", so that each unit of the complex carries its logistic management independently.
- Organize the warehouse by substituting some direct pallets for shelves to place the merchandise without secondary packaging, whenever possible, in order to optimize the space used.
- Keep a strict control of the rotation of products in the warehouse so that there are no idle or expired products.
- Train workers on the issue of merchandise overcrowding and how to proceed to reduce it.
- The top management, together with the assurance personnel, should establish and record all the procedures that are currently absent, such as: a procedure to reduce handling, procedures for the reception, storage and dispatch of merchandise, as well as establishing the loading schemes for each product.

It is also proposed to analyse and solve the other deficiencies detected in the study in the short term, which does not require significant resources.

4. Conclusion:

1. The procedure used, contains methods and instructions for the categorization of the warehouse, as well as qualitative and quantitative tools valid for the object of study, varying only small details and consequently improvements are proposed to the deficiencies detected.
2. There are several deficiencies that affect the logistics management of the warehouse, highlighting the absence of written procedures and that the most important problem to be solved with the highest priority is the overcrowding of goods, for which several measures are proposed.
3. Many of the problems identified are soluble in the short term and do not require significant resources. In addition, their detection and subsequent solution is important to maintain the current level of certification and work to achieve certification at a higher level, with the current regulations.

5. References

- [1] Acevedo-Suárez, J.A.; Gomez Acosta, M. I. (2010): La logística moderna en la empresa., ed. Varela, F.. <https://scholar.google.es/scholar/Acevedo-Suárez/Gómez-Acosta/La-logística-moderna-en-la-empresa/>
- [2] Calzado-Girón, D. (2020): La gestión logística de almacenes en el desarrollo de los operadores logísticos. Ciencias Holguín, p. 26.
- [3] Maruri-Avidal, C.; Torres-Rivera, A. D. (2019): Gestión de la sustentabilidad en las cadenas de suministro: Un acercamiento desde la teoría. Red Internacinal de Investigadores en Competividad, 13: p. 18.
- [4] Valencia-Granados, J.A. (2019): Metodología de diagnóstico logístico de almacenes y centros de distribución. Realidad y Reflexión, p. 49.
- [5] Lao-León, Y. O., Pérez-Pravia, M. C.; Moreno-Perdomo, L. Y. (2018): Perfeccionamiento de la gestión de almacenamiento en empresas comercializadoras. Caso: EMSUME Holguín. Universidad de Holguín: Tercer taller de gestión empresarial e intercambio de experiencias, 2015.
- [6] Cespón Castro, R.; Orellana Amador, M. A. (2003): Manual para estudiantes de la especialidad de Ingeniería Industrial. Tegucigalpa: Universidad Tecnológica Centroamericana de Honduras.
- [7] Logistics, Supply Chain Management.(2016) www-retos.en.supply.chain.
- [8] Glistau, E.; Coello Machado, N. I. (2018): Logistics concepts and Logistics 4.0, In: Advanced logistic systems - Miskolc: Univ., Bd. 12., pp. 37-46
- [9] Hardai, I.; Illés, B.; Bányai, À. (2019):. Efficiency Improvement of Manufacturing and Logistic Processes in Industry 4.0. Environment. in 12th International Doctoral Students Whorkshop on Logistics. Magdeburg, pp. 65-70
- [10] Agárdi, A.; Kovács, L.; Bányai, T. (2019): Optimization of Complex Vehicle Routing Problems. in 12th International Doctoral Students Whorkshop on Logistics. Magdeburg, pp. 107-112
- [11] Pavlenko, V., Morozova, O.; Pavlenko, T. (2019): Data Mining Thecnology as a tool for enhancing the efficiency of Logistic activity of the Enterprise. in 12th International Doctoral Students Whorkshop on Logistics. Magdeburg, pp. 41-46
- [12] Glistau, E.; Coello Machado, N. I. (2019): Logistics 4.0 - basics, ideas and useful methods. In: MultiScience - XXXIII. microCAD International Multidisciplinary Scientific Conference - Miskolc: University of Miskolc, Hungary, 7 pp.
- [13] González Cabrera, E., et al., Certification of the warehouse in Rum Factory, in 14th International Doctoral Students Workshop on Logistics 2021, Institut für Logistik und Materialflusstechnik an der Otto-von-Guericke-Universität Magdeburg: Magdeburg, pp. 47-54