

The Importance of Logistics System in Determining Costs - A Field Study of a Group of Textile Companies in Tlemcen, Algeria

أهمية النظام اللوجستي في تحديد التكاليف - دراسة ميدانية لمجموعة شركات الغزل والنسيج في تلمسان بالجزائر

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Abstract

The logistics system depends on a series of decisions which determine the products, costumers and marketing channels selected by the company. Establishing a suitable logistics system is an important issue in every company, whereby it requests a reliable study of a descriptive and quantitative nature to achieve strategic objectives through this system, taking in consideration other factors that may affect its performance. This paper attempts to address the importance of the factors of logistics system decision-making in determining the entire logistics system cost.

Keywords: Logistics System, Logistics Decision-Making, Logistics System Cost.

ملخص

يعتمد نظام الإمداد الشامل على مجموعة من القرارات والتي تحدد قنوات المنتجات والعملاء والتسويق المستخدمة من قبل المنظمة، حيث أن إنشاء نظام لوجستي ملائم في أي منظمة يستوجب ضرورة القيام بدراسة جادة وذات طبيعة وصفية وكمية للأهداف و الغايات الاستراتيجية المرغوب تحقيقها من خلال هذا النظام، وكذلك العوامل المختلفة التي يحتمل أن تؤثر على أدائه، في هذه الورقة سيتم التطرق إلى أهمية محددات قرارات الإمداد في تحديد تكاليف نظام الإمداد الشامل.

الكلمات المفتاحية: الإمداد الشامل، قرارات الإمداد، تكاليف نظام الإمداد.

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Introduction

The logistics system is based on several activities that require coordination and integration to achieve the essential objective. The latter is represented by the quick response to the customers, the required standards and the least possible costs of products. In this context, determining the logistics network and rules underlying it depends on the logistics system decision-making.

Often the most important things a company seeks are strengthening its competitive position, increasing profits and minimizing costs. The strategy of reducing the costs depends largely on the efficiency of logistics activities performed in terms of costs as well as customer service. In other words, the logistics system can help the company expand in the market, increase its market share, increase profitability and enlarge the number of customers desiring to get their response about its products. The activities of logistics have got a specific importance, especially concerning the large size production and the growth of marketing size. This means facilitating and accelerating the response to customers in the market through the fast delivery of goods and services that are consistent with the needs and desires of costumers. These activities depend on the flow of information, packaging, transport and storage. According to that we can probe the following question: How far do the determinants of logistics decision-making affect the costs of logistics system?

To answer this problem, this paper has been divided into two sections

The first section discusses logistics decision-making.

The second section contains the field study.

In this paper we have applied both the descriptive and analytic research methodologies to determine the concepts related to the logistics system and the different decisions that belong to it. The statistical approach and the field study approach will further help shed light on the factors determining the logistics system decision-making, and their impact on the costs of this system.

Section One: Logistics Decision-Making

1.1. The Concept of Logistics

The “logistics” is considered as a connecting link between the basic management functions, on one hand it connects the suppliers with the company, on the other hand it plays the same role between the company and its customers. Meanwhile, it allows managing the internal functions which are related to the final outlook of the product starting from the raw materials arriving to the final goods. In other words, logistics system encompasses all of those integrated activities needed¹ to design, packaging, delivering...etc. that bring the products to the market and build customers’ trust and satisfaction. Businesses depend on their supply chains to provide companies with what they need to survive and thrive. Every business fits into one or more logistics and has a role to play in each of them.

The GSCM (Global Supply Chain Management) approach emphasizes both shifting, smoothing and, thus, addresses manufacturing, transportation, and inventory costs, simultaneously while trying to shorten the waiting time. In doing so, three key issues for logistics integration emerge², namely (i) the need for a system approach aimed at a higher coordination along the supply chain as well as within every stage of the chain, (ii) the emphasis on logistic variables such as logistic costs, and (iii) the importance of a uniform production flow especially when time responsiveness is a crucial performance. The Global Supply Chain Management (GSCM) approach aims at exploiting the advantages of distributed systems. Such advantages basically derive from higher flexibility associated with a larger number of options to accomplish a given task. However, to exploit such flexibility requires the ability to select the best option among all those available and this involves increased complexity in the decision-making process. Global supply chain management concerns itself with managing the financial and physical flows, in addition to, managing the relationship between the company and the suppliers of its suppliers and the costumers of the company’s customers.

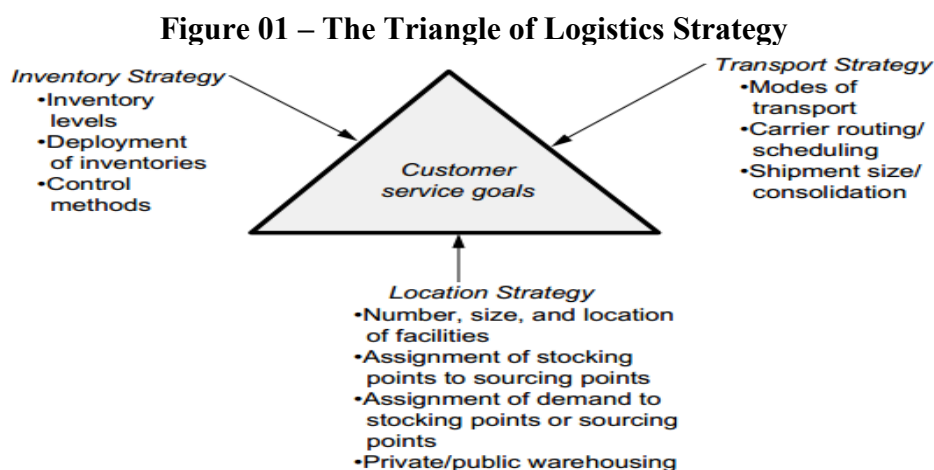
1.2. The Main Areas of Logistics Planning

Logistics or Supply Chain in a business aim to the following contributions:

- ✓ Achieve maximum customer service level
- ✓ Ensure high product quality
- ✓ Achieve minimum (possible) cost
- ✓ Be flexible in the constant market changes

Logistics management tries to have the “right product”, in the “right quantity”, at the “right place”, at the “right time” with the “right cost”.

Logistics management must balance 2 basic targets: Quality of Service & Low Cost³ based on four main levels: customer service, location, inventory decisions and decisions of transportation as is shown in figure below:



Source: Ronald H Ballou, Ibid, P 57.

Whereas, the customer service is a result of planning in the three levels⁴. It is possible to be referred to logistics management by logistic decision’s making triangle. Those levels are inter-related and must be planned as a unit because each has an impact on the system’s design. These elements are explained as follows⁵:

1.2.1. The Goals of Customer Service

The strategic planning in GSCM focuses on determining the suitable level for customer service, whereas the latter affects the supply chain management more than any other factor. Using few locations for central storage and following ineffective methods for transportation would lead to the reduction of the service quality provided to the customer.

1.2.2. Facility Location Strategy

The geographical location for storage points creates a framework for logistics management, by determining the number, the place and the size of installations in addition to the precise demand. This determines the channels through which the products reach the market. The appropriate framework for the location is to include the movement of each product and the associated costs, starting by factory and construction site, passing through the points of storage arriving to customers. Reducing the total costs of supply chain management system and increasing profits, are the basis in selecting location strategy.

1.2.3. Inventory Decisions

The inventory decisions indicate the methods of managing the warehouse. There are other strategies including a selective selection of location of different elements in the production line inside the factory, as well as choosing the stores at the local or regional level in addition to the use of different methods in managing the inventory.

1.2.4. Transportation Strategy

The transportation strategy includes transportation decisions for the input materials, the finished products, the transportation methods, the shipping size⁶, the direction and the scheduling of the shipments. Those decisions are affected by the location of warehouse for customers and factories which in turn affect the location of stores.

Customer service, facility location strategy and inventory decisions altogether represent a core area in supply chain management, which is necessary because of its impact on the profitability and the returns on investment in the company. Therefore, it's necessary to have an overall and harmonic planning amongst all these different elements.

1.3. Logistics Decision-Making

Choosing the company's location has a strategic dimension, which complements planning in every company, whether the company exists already or it is a new company that is still within establishment. The existing companies may need to add a

new location in case of expansion. In addition to that, the new enterprises have to choose the suitable position. Selecting the right location is based on certain criteria.

1.3.1. Steps for Choosing the Right Location

There is a general procedure followed in such cases, which consists of the following steps⁷:

1. Identifying the important standards to compare between different alternatives.
2. Identifying the alternative locations.
3. Identifying the suitable region of the location.
4. Identifying some alternative locations inside the region.
5. Evaluating the alternative locations.

Some other factors may influence selecting the location such as⁸:

- The availability of labor.
- Proximity to markets.
- Proximity to energy sources and raw materials sources.
- Proximity of locations to each other in some cases.
- Interest rates, taxes, and the actual costs of properties ...etc.

In light of the contributions of studies by Yong et. all, Agrawal, Ramaswami and others, the factors that affect selecting the location for a multinational company abroad are in brief:

1. Market size
2. Economic growth rate
3. Raw material resources
4. Labor availability
5. Political and legal environment
6. Government policies
7. Competition degree
8. The geographical location
9. Transportation costs
10. Infrastructure and its quality

Tatoglus and Glaister added other factors as follows:

1. The privileges offered by the host countries to encourage the foreign direct investment for example(Tax exemption).
2. The availability of raw materials and inputs for production activities and their quality.
3. The power of labor unions.
4. The purchasing power.

1.3.2. Storage Decision-Making

The warehouses play an important role in logistics system, since they affect the costs and the profitability of companies.

1.3.2.1. Types of Warehouses⁹

The warehouse is the most common type of storage though other forms do exist (e.g., storage tanks, computer server farms). Some warehouses are massive-structured and can simultaneously support the unloading of numerous in-bound trucks and railroad cars containing suppliers' products, while at the same time loading multiple trucks for shipment to customers. Below, we discuss five types of warehouses:

Private Warehouses: This type of warehouses is owned and operated by channel of suppliers and resellers and used in their own distribution activity. For instance, a major retail chain may have several regional warehouses supplying their stores or a wholesaler will operate a warehouse in which he receives and distributes products.

Public Warehouses: The public warehouse is essentially the space that can be leased to solve short-term distribution needs. Retailers that operate their own private warehouses may occasionally seek additional storage space if their facilities have reached capacity or if they are making a special large purchase of products. For example, retailers may order extra merchandise to prepare for in-store sales or order a large volume of products that are offered at a low promotional price by a supplier.

Automated Warehouses: With advances in computer and robotics technology many warehouses now have automated capabilities. The level of automation ranges from a small conveyor belt transporting products in a small area all the way up to a fully automated facility whereas only a few people are needed to handle storage activity for thousands of pounds/kilograms of products. In fact, many warehouses use machines to handle nearly all physical distribution activities such as moving product-filled pallets (i.e.: platforms that hold large amounts of products) around buildings that may be several stories tall and the length of two or more football fields.

Climate-Controlled Warehouses: Warehouses of this kind handle storage of many types of products including those that need special handling conditions such as freezers for storing frozen products, humidity-controlled environments for delicate products, such as production of flowers, and dirt-free facilities for handling highly sensitive computer products.

Distribution Center: There are some warehouses where product storage is considered a very temporary activity. These warehouses serve as points in the distribution system at which products are received from many suppliers and quickly shipped out to many customers. In some cases, such as with distribution centers handling perishable food, most of the products enter in the early morning and are distributed by the end of the day.

1.3.3. Transportation Decision-Making

A key objective of product distribution is to get products into customers' hands in time. While delivery of digital products can be handled in a fairly smooth way by allowing customers to access their purchase over the internet (e.g., downloading softwares, gaining access to subscription material...etc.), tangible products require a more careful management of delivery options in order to provide an optimal level of customer service. But as we know, "optimal" does not always translate into fastest.

In terms of delivering products to customers, there are six different modes of transportation: air, digital, pipeline, rail, truck, and water. However, not all modes are an option for all marketers. Each mode offers advantages and disadvantages on key transportation features that include¹⁰:

- **Product Options** - This feature is concerned with the number of different products that can realistically be shipped using a certain mode. Some modes, such as pipeline, are very limited in the type of products that can be shipped while others, such as truck, can handle a wide-range of products.
- **Speed of Delivery** - This refers to how quickly it takes products to move from the shipper's location to the buyer's location.

- **Accessibility** – This transportation feature refers to whether the use of a mode can allow final delivery to occur at the buyer's desired location or whether the mode requires delivery to be off-loaded onto other modes before arriving at the buyer's destination. For example, most deliveries made via air must be loaded onto other transportation modes, often trucks, before they can be delivered to the final customer.
- **Cost** – The cost of shipment is evaluated in terms of the cost per item to cover some distance (e.g., mile, kilometer). Often for large shipments of tangible products cost is measured in terms of tons-per-mile or metric-tons-per-kilometer.
- **Capacity** – Refers to the amount of product that can be shipped at one time within one transportation unit. The higher the capacity the more likely transportation cost can be spread over more individual products leading to lower transportation cost per-item shipped.
- **Intermodal Capable** – Intermodal shipping occurs when two or more modes can be combined in order to gain advantages offered by each mode. For instance, in an intermodal method called piggybacking truck trailers are loaded onto railroad cars without the need to unload the trailer. When the railroad car has reached a certain destination the truck trailers are off-loaded onto trucks for delivery to the customer's location.

There are five key decisions that determine the transportation process requirements in any company:

- 1- The number and size of warehouses.
- 2- Selecting the right means of transportation to transfer goods in time.
- 3- Choosing the suitable equipment according to the properties of products.
- 4- Determining the financial requirements for the company in case of buying new means of transportation.
- 5- Choosing the operational requirements of the means of transportation according to places where it will be used to maximize benefits and minimize cost.

1.3.3.1. Factors Associated with the Transportation Market:

In addition to the characteristics of the product, the cost of transport it is also affected by some considerations related to the market conditions, such as:

- The degree of competition.
- Transportation distance.
- Nature of government restrictions imposed on transportation.

1.3.3.2. The framework of Transport decision-making:

Transportation process requirements are based on five basic decisions, those decisions are mentioned as follows:

1. The number and size of storage depots, including moving the raw materials, and transferring possibilities to factories and the movement of the finished product from factories to customers.
2. Choosing the required means of transportation that will carry the goods taking into consideration the duration of time and the distance.
3. Choosing the customized equipment to perform the work, in terms of the selection of appropriate means of transportation depending on the type of product characteristics.
4. Determining the financial requirements, by determining the costs of equipment.
5. Choosing the operational requirements depending on where they are using the equipment in order to increase the rate of benefit and decrease costs.

These decisions are interrelated but must first determine the distribution network by selecting the number and size of storage repositories that will be used.

Section Two: The Field Study

This study consists of a survey process that included companies working in the field of textile in the city of Tlemcen. The steps involved in this study are as follows:

2.1. The Aim of the Study

The purpose of the study is to achieve two goals. The first is trying to apply the proposed models for managing logistics system costs, while the second objective is about testing the validity of the hypotheses that have been developed to ensure some

statistical relationships between the variables subject of study to check the ability of implementing these mechanisms of partnership within this framework.

2.2. Research sample

The sample of the study has been selected with a great concern made up of a group of companies working in textile and spinning sector in Tlemcen. The common element between these companies is producing various products that may undertake and use the logistics system.

The sample has been chosen based on the following reasons:

- This industry is facing a great competition, especially with the changes occurring at the level of foreign trade today.
- The focus on improving the mechanisms of joint work between the companies involved in producing joint products.

As the aim of the research is to look for ways to give the domestic industry a competitive advantage, in addition to limit the dependency on the logistics system outside the country.

Accordingly, three companies have been selected in the public sector, namely:

- National Company for Heavy Textile Industries: “Mantal”.
- National Company for Silk Textile Industries. “Soitexe”.
- National Company for weaving and silk printing. “Soitine”.

And other three companies in the private sector that are as follows:

- Limited Liability Company for (Lemrabet Kadour): LIT MAG.
- Limited Liability Company for (Ashashi Abdul Wahab) LACHATEX.
- Company Limited Liability for (Taleb Ahmed Shawki) MATELAS
ATLAS.

2.3. The Study Population: The study population has been identified according to the following conditions:

The study was applied on the workers at each of the following departments with in the company: the department of marketing and sales, accounting and financial department, the department of production, purchases department, the department of the control and planning and the department of human resources management.

-The employee should be experienced i.e.: other than his university level. Table 01 shows the types of lists used in this study.

2.4. Designing the Standards Used in the Study: this study has taken into account the clarity and objectivity in the formulation of the questions contained in the survey.

The questions within the formulation were well explained to attract the attention of the workers and to attempt to emphasize the importance of choosing the right and actual degrees that expresses their real situation.

2.5. Data collection: This step consists of two sub-phases, which include preparation phase and arrangement-of-the-collected-data phase.

“**LIKERT SCALE**” measurement has been adapted in this study. This measurement consists of five degrees (1-5) related to the evaluation of the worker and the degree of assessment, where the degree (5) refers to “very important”, (4)to “important”, (3)to “average interest”, (2) to “non-significant” and (1) to “not important at all”.

2.6. Testing the Study Tools(Truthful, Internal Consistency): the sincerity of the internal consistency of the components of the survey was measured through the correlation coefficient between the degree of the element and the total score of the dimension (axis) to which they belong, and this is called the structural honesty. It has been used to ensure the genuineness of elements of all axes. The sample data reached 38 elements. These elements were restored and used in calculating the correlation coefficients between each degree and dimension, i.e.: for every axis of the study as is shown in the tables (2,3,4,and 5)

Through the preceding tables (2,3,4 and5), it is clear that all correlation coefficients for each dimension and overall dimension of the scale (axis)were high and statistically significant at the level of significance (5%).The rise in correlation coefficients and statistical significance gives confidence to the ability of the measurement to measure the variables subject of study.

2.7. Testing the Study Tools (Stability of the Measurement): Stability refers to the possibility of obtaining the same results if there was a re-application of this tool using the same elements:

The internal constancy method is used to estimate the stability and constancy of the tool. Since the main objective of this study is testing stability and constancy of the tool we consider a Cronbach's alpha stability coefficient which is quite standard in the literature (see table 06).

From the obtained results we can conclude that the tool of measurement was stable and true. This allows this tool to be a suitable and effective measuring instrument that can be applied with confidence.

2.8. Hypothesis testing

2.8.1. Testing the First Hypothesis: Multiple regression was performed to demonstrate the relationship between all variables of location and overall logistics system costs. The following equation represent this relationship:

$$Y_1 = a_0 + a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + \xi$$

Where:

Y_1 : represents the first variable (overall logistics system costs)

a_0 : Constant

X_1 : Customer Service

X_2 : Running demand orders

X_3 : Transportation

X_4 : Inventory Management

ξ : random error

This test is based on the following formula for the null hypothesis and alternative hypothesis as follows:

Null Hypothesis: There is no fundamental difference between the importance of the location decision-making factors and the overall logistics system costs.

Alternative Hypothesis: There is a statistically significant relationship between at least one of the independent variables (1-4) and the first dependent variable.

The Table (07) shows the multiple regression results related to the first dependent variable after running the (SPSS, 17) statistical software.

From the results shown in the table (07), R was about 0.55, which refers to an acceptable degree of correlation. Whereas R^2 reached 0.31 which is a poor degree of correlation, and that is due to other reasons.

The F value which reached 2.856 showed the validity of the model for prediction and interpretation, which is confirmed by the significance level that stood at 0.044, this means the rejection of the null hypothesis. This hypothesis supposed that there is no fundamental difference between the importance of the location decision-making factors and the overall logistics system costs. Through multiple regression results, the variables in the first axis were statistically non-significant, whereas “Sig” value for each variable was greater than 0.05. That means those variables are not statistically significant.

2.8.2. Testing the second hypothesis: Multiple regression was performed to test the relationship between all alternative strategies for the transportation and the overall logistics system costs. This relationship is presented in the following equation.

$$Y_2 = a_0 + a_1X_5 + a_2X_6 + a_3X_7 + a_4X_8 + \xi$$

Where:

Y_2 : Represents the second dependent variable (logistics system cost)

a_0 : the Constant.

X_5 : Refers to the impact of the associated costs with the selected means of transportation on the total cost of the logistic system cost.

X_6 : Refers to the time taken in transporting goods.

X_7 : Refers to trust and reliability in the selected means of transport.

X_8 : Refers to the ability to cover the market by using the selected means of transportation.

ξ : Refers to random error.

This test is based on the following formula for the null hypothesis and alternative hypothesis:

Null hypothesis: There is no fundamental difference between the importance of the location decision-making factors and the overall logistics system costs.

Alternative hypothesis: There is a statistically significant relationship between at least one of the independent variables (1-4) and the second dependent variable.

The Table (08) shows the multiple regression results related to the second dependent variable after running the (SPSS, 17) statistical software.

From the results showed in the above table, R was about 0.671, which refers to a very good degree of correlation. Whereas R^2 reached 0.450 that refers to an acceptable degree of correlation.

The F value which reached 5.314 showed the validity of the model for prediction and interpretation. This is confirmed by the significance level that stood at 0.003, which means the rejection of the null hypothesis. This hypothesis assumes that there is no fundamental difference between the importance of the location decision-making factors and the overall logistics system costs.

Through results obtained in the table (09), it is clear that only the variable that refers to trust and reliability in the selected means of transportation was significantly related to the second dependent variable, while the other independent variables were not. The constant was 2.456 and its “t” statistic was 6.475 with a p value equal to 0.000. That means the constant was statistically significant and has an effect on the second dependent variable. The estimated equation can be written as follows:

$$2Y_2 = 0.456 + 208 X_7$$

Whereas the other independent variables were statistically non-significant.

The “Sig” value for each variable was greater than 0.05, which means that those variables were not statistically significant.

2.8.3. Testing the Third Hypothesis: A multiple regression has been performed to demonstrate the relationship between variables related to the decision-making factors of choosing location and the logistics system costs. This relation is expressed as follows.

$$Y_3 = a_0 + a_1 X_9 + a_2 X_{10} + \xi$$

Where:

Y_3 : Represents the third dependent variable (logistics system cost).

a_0 : Constant.

X_9 : Refers to the reliance on public warehouse.

X_{10} : Refers to the reliance on private warehouse.

ξ : Refers to random error.

This test is based on the following formula for the null hypothesis and alternative hypothesis:

Null hypothesis: There is no fundamental difference between the importance of the location decision factors and logistics system costs.

Alternative hypothesis: There is a significant relationship between at least one of the independent variables (1-4) and the third dependent variable.

Table (10) shows the multiple regression results related to the third dependent variable after running the (SPSS, 17) statistical software.

From the results shown in the above table, R was about 0.364, which refers to a poor degree of correlation. Whereas R^2 reached 0.132, which refers to an unacceptable degree of correlation.

The F value which reached 2.137 showed that the model is invalid for prediction and interpretation. This means the acceptance of the null hypothesis. This hypothesis assumes that there is no fundamental difference between the importance of the location decision-making factors and the overall logistics system costs.

Through results obtained from the multiple regressions for the variables in the third axis in the table above, it is clear that all variables subject of study were statistically non-significant. While the “Sig” for each variable was greater than 0.05, which means that those variables were not statistically significant.

Conclusion

Through this research we have identified some of the costs of the logistics system and features of the activities of the companies subject of study within the system. Thus, this study was meant to find out the disadvantages that may limit the effectiveness of such activities in influencing the market and competition. This study aimed to test the validity of hypotheses that have been developed, and to test some of the assumptions contained within those relationships and then determine the effect of the determinants of supply decision-making on the costs of this system. We have come to the following conclusions:

- There is a significant difference in the impact of selecting transportation decision-making factors and the total costs of the logistics system. Some companies suggest some factors that are different from others without linking the relationship between these factors, and it has consequences. While customer service, running demand orders, transportation and inventory management, altogether affect the total cost of logistics system to a certain extent, there are still other factors that may affect the system's total cost as well.
- There is a fundamental difference in the impact of transportation decision-making factors on the total cost of the system, as the costs associated with the selected means of transportation, in addition to the taken time in transporting goods, and, moreover, the ability to meet market needs. All these factors have various effects on the total cost of the logistics system. However, what explains the costs of logistics system in a more partial form are factor of trust and reliability. Some other explanatory variables remain out of this study and may affect the total cost of logistics system.
- There is no important difference in the impact of storage decision-making factors on the total cost of the logistics system. Whilst there is no distinction is made between public warehouses and private warehouses in effecting the total cost of the logistics system, therefore, the inventory

management remains dependent on the logistics system strategy followed by the company.

In the end, it can be said that the logistics system decision-making aims to improve product quality, customer service and company profitability level, in order to maximize the benefits and minimize the costs.

Table Appendices

Table 01: The Number of Survey Lists Distributed, Received and the number of Disposed Lists.

Lists company	Distributed- lists		Received-lists		Non-Received- Lists		Disposed-lists		Valid-list	
	N°	%	N°	%	N°	%	N°	%	N°	%
	MANTAL Ltd	20	25.97	05	06.49	15	19.48	0	0	05
SOITEXE Ltd	20	25.97	15	19.48	5	06.49	0	0	15	19.48
SOITINE Ltd	20	25.97	11	14.28	9	11.69	0	0	11	14.28
LIT MAG Ltd	5	6.49	3	3.89	2	2.60	0	0	02	2.59
LACHATEX Ltd	2	2.59	2	2.59	0	0	0	0	02	2.59
MATELAS-ATLAS Ltd	10	13.01	03	3.89	7	9.10	1	1.29	02	2.59
Sum	77	100	39	50.64	38	49.36	1	1.29	38	49.36

Source: Computed by Authors.

**Table 02: Correlation Coefficients for the first Axis “1st dependentVariable”:
The impact of Location decision-making factors on the total cost of the
Logistics-System**

Variable N ^o	Correlation Coefficient «R»	Significance level
1	0.844	0.000
2	0.924	0.000
3	0.802	0.000
4	0.674	0.000

Source: Computed by Authors.

**Table 03: Correlation Coefficients for the second Axis(2nd dependent variable):
The impact of Transportation decision-making factors on the Total cost of the
Logistics-System.**

Variable N ^o	Correlation Coefficient «R»	Significance level
5	0.808	0.000
6	0.805	0.000
7	0.808	0.000
8	0.825	0.000

Source: Computed by Authors.

**Table 04: Correlation Coefficients for the third Axis (3rd dependent variable):
The impact of Inventory decision-making factors on the Total cost of the Logistics-
System.**

Variable N ^o	Correlation Coefficient «R»	Significance level
9	0.905	0.000
10	0.876	0.000

Source: Computed by Authors.

Table 05: Correlation Coefficients for the all Axis (all dependent variable):

Dependent Variable	Dimension (Axis)	Correlation Coefficient R	Significance level Sig
1	The impact of Location decision-making factors on the total cost of the Logistics-System.	0.817	0.000
2	The impact of Transportation decision-making factors on the Total cost of the Logistics-System.	0.889	0.000
3	The impact of Inventory decision-making factors on the Total cost of the Logistics-System.	0.763	0.000

Source: Computed by Authors using SPSS 17.

Table 06: Stability Coefficients for all dependent variable using Alpha Cronbach Coefficient

Dependent Variable	Dimension (Axis)	Alpha Cronbach Coefficient
1	The impact of Location decision-making factors on the total cost of the Logistics-System.	0.827
2	The impact of Transportation decision-making factors on the Total cost of the Logistics-System.	0.823
3	The impact of Inventory decision-making factors on the Total cost of the Logistics-System.	0.737

Source: Computed by Authors using SPSS 17.

Table 07: Results of Multiple Regression for the first dependent Variable that represent the “Cost of Logistics System”.

Sig	dF	F	R ²	R
0.044	4	2.856	0.305	0.553

Source: Computed by Authors.

Table 08: Results of Multiple Regression for the second dependent Variable that represent the “Cost of Logistics System”.

Sig	dF	F	R ²	R
0.003	4	5.314	0.450	0.671

Source: Computed by Authors.

Table 09: Coefficients of Multiple Regression for the third dependent Variable that represent the “Cost of Logistics System”.

Variable	B	t	Sig
Constant	2.456	6.475	0.000
X ₇	0.208	2.140	0.000

Source: Computed by Authors.

Table 10: Results of Multiple Regression for the third dependent Variable that represent the “Cost of Logistics System”.

Sig	dF	F	R ²	R
0.137	2	2.137	0.132	0.364

Source: Computed by Authors.

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