Assess the Impact of Supply Chain Practices on Improving Organizations Performance

An Applied Study on One of the Fast-moving consumer goods (FMCG) Companies in the Egyptian Context

ABSTRACT

The purpose of the study was to evaluate how using supply chains may improve organizations' performance (an applied study on one of the enterprises), the study methodology was done by case study and building a questionnaire and measuring its validity and distribution through a survey study and measuring its reliability, then conducting a field study and evaluating the study variables and conducting the evaluation and comparison process between them and testing the main and sub-hypotheses of the study, and extracting the results as mentioned in the research.

Keywords: Supply Chain, Transport, Practices, Improving, Performance, FMCG companies

تقييم تأثير ممارسات سلسلة التوريد علي تحسين أداء المنظمات: دراسة تطبيقية علي إحدي شركات السلع سريعة الاستهلاك في السياق المصري

ملخص

الغرض من الدراسة هو تقييم كيف يمكن أن يؤدي استخدام سلاسل التوريد إلى تحسين أداء المنظمات (دراسة تطبيقية على إحدى الشركات)، وتم اعتمدت منهجية الدراسة على دراسة الحالة وبناء استبانة، وقياس صدقها وتوزيعها من خلال دراسة استقصائية وقياس مدى مصداقيتها ثم إجراء دراسة ميدانية وتقييم متغيرات الدراسة وإجراء عملية التقويم والمقارنة بينها واختبار فرضيات الدراسة الرئيسية والفرعية واستخراج النتائج كما ورد في البحث.

الكلمات المفتاحية: سلسلة التوريد، النقل، الممارسات، تحسين الأداء، شركات السلع الاستهلاكية.

1. INTRODUCTION

Efficient and effective supply chains management (SCM) is crucial for organizations to succeed in today's global marketplace (Dehgani and Navimipour, 2019). Transportation is essential to the efficient movement of products and services via suppliers to final consumers in the field of supply chain management (Rushton et al., 2022). The interdependence of SCM and transportation is what distinguishes their connection, since transportation affects several supply chain phases including manufacturing, warehousing, and distribution (Eriksson et al., 2022). This article aims to provide a comprehensive analysis of the relationships between supply chain and transport, exploring the factors that influence these relationships and identifying strategies for optimizing their integration.

The importance of transportation within the supply chain cannot be overstated. Transportation serves as the connective tissue that binds suppliers, manufacturers, distributors, and customers together. It facilitates the physical movement of goods, enabling the timely delivery of products to meet customer demand. Efficient transportation management contributes to reduced lead times, enhanced customer satisfaction, and improved overall supply chain performance (Lambert et al., 2018).

The associations between supply chain management and transport is characterized by mutual interdependencies (Guertler and Spinler, 2015). Effective transportation management is essential for achieving the objectives of supply chain management, such as minimizing costs, maximizing responsiveness, and improving overall efficiency (Moons et al., 2019). On the other hand, the design and execution of supply chain processes directly impact transportation requirements and

operations. Factors such as inventory levels, order fulfillment strategies, and distribution network design significantly influence transportation needs (Giunipero et al., 2021).

To understand the associations between transport and supply chain, it is important to consider the various modes of transportation utilized within supply chain networks. Road, rail, air, and sea transport each have distinct characteristics and capabilities that make them suitable for specific types of products and supply chain configurations. The mode of transportation and the carriers chosen have an impact on the price, dependability, and sustainability (Christopher, 2016).

This research aims to analyze the key factors influencing the relationships between supply chain management and transport and provide insights into strategies for optimizing their integration in EGY Foods company as one of lead market Egyptian company. By examining scholarly literature, industry reports, and case studies, we seek to contribute to the understanding of how effective coordination between supply chain and transport can lead to improved supply chain performance, reduced costs, and enhanced customer satisfaction. The findings of this research will provide valuable insights for practitioners and academics alike, supporting informed decision-making in the complex and dynamic field of supply chain management.

Research Problem and Questions

The continued success of any company requires flexibility to change in order to cope with different needs, the dynamic changes and different events in the world surrounding it, and when the establishment's ability to achieve change is lower and slower than its competitors, its terminating may be looming, in the near horizon (Ahlstrom et al., 2020).

In the current competitive environment, businesses are developing mergers and clusters with a view to achieving competitive advantage, which has resulted in the effective management of these clusters (Gareche et al., 2019). The procedures of managing supply chains have become the most important in order to face the competition challenges (Craighead et al., 2020). Supply chains today are expected to respond quickly and efficiently to market changes to maintain success and create competitive advantage in the global market through focusing on time, resilience, cost and quick response (Chen, 2019).

In same manner, to the above-mentioned resilience and efficient supply chain procedures required to confront the upheaval market, for EGY foods company, the expenses related to transporting the final product to the different sales points or retailers are so expensive, which is the problem that should be investigated and solve it, whereas, by analysis the different aspects we found that the company own a large fleet which effect the product price, although that nature of that product price is not expensive, putting in different way, couldn't bear any increasing in cost that reflected on the final price .

Whereas the research problem could be drafted as "how may Egy food could reduce the transport cost to maintain the final product price in a competing price". The relationships between supply chain and transport cost are complex and multifaceted. Despite their significance, there is a need to comprehensively understand for the factors influencing these relationships and the strategies that organizations can adopt to effectively manage and reduce transport costs within the supply chain context. This research problem statement seeks to address the following questions:

a. What are key factors of transport costs contributing in the supply chain?

b. How do supply chain decisions, such as fleet management and distribution network, impact transport costs?

c. What strategies can organizations employ to optimize supply chain and transport cost integration?

Research Objectives

Based on the research problem and the questions raised by the paper that will be dealt with. The following objectives that the research seeks to develop, study and reach can be reached:

1- To determine the main variables affecting transportation costs in the context of the supply chain.
2- To investigate the effects of distribution network architecture and inventory management strategies on transportation costs.
3- To explore strategies and best practices for optimizing supply chain and transport cost integration.
4- To look at how developing technology might lower transportation costs and boost supply chain effectiveness.
5- To calculate the amounts to be carried in order to reduce the cost of transportation and improve reverse logistics.

Research Importance

Many studies have investigated supply chain management practices. Many other studies have examined the strategic cost of the supply chains independently, but very few of them have studied the two together in the Egyptian context, and the importance of research is highlighted by finding the lowest

possible cost of the final product and identifying the optimal units or quantities to be transported from the main warehouses to the requesting governorates within the demand and supply limits.

2. THEORETICAL ASPECT

One of the key mathematical techniques that aid in good decision-making is the transportation problem, the aim of which is to find an optimal method of transporting goods from their supply sources to their demand centers so that the cost is as low as possible, and the problem of transportation is one of the most prominent economic problems facing the service or production establishment (Rostamzadeh et al., 2015). It is important to reduce transport costs, which is an" important" element of the production process that supply sources are responsible for as a result of the distribution of goods to the customer (Strandhagen et al., 2017).

Concept of Supply Chain Management, Objectives and Importance

Being a relatively new idea, SCM has grown in importance in response to competition and problems, according to several research., as supply chain members have been able to track product production from the beginning of getting the basic materials from their sources till product distribution to the end customer (Ansari and Qureshi, 2015).

SCM is a strategic approach that aims to coordinate and integrate activities within the supply chain to facilitate the flow of products, services, information, and finances (Chopra and Meindl, 2021; Monczka et al., 2020). To maximize supply chain performance generally, it entails planning, carrying out, controlling, and monitoring a variety of procedures (Chopra and Meindl, 2021). The primary objective of SCM is to enhance

customer value and gain a competitive advantage (Christopher, 2016). Collaboration, information sharing, and the alignment of goals among supply chain partners are crucial for achieving operational excellence and delivering products and services efficiently (Lambert et al., 2020). SCM emphasizes the importance of efficient resource utilization, cost-effectiveness, and meeting customer demands (Chopra and Meindl, 2021).

Supply chain management involves the management of interconnected components across procurement, production, logistics, and customer service (Chopra and Meindl, 2021; Monczka et al., 2020). These components, including demand forecasting, inventory management, supplier relationship management, production planning and scheduling, transportation and logistics management, and customer order fulfillment, collaborate to ensure the smooth flow of materials, information, and financial resources (Chopra and Meindl, 2021; Monczka et al., 2020). The integration and coordination of these activities are crucial for optimizing efficiency, minimizing costs, reducing lead times, and enhancing customer satisfaction (Christopher, 2016; Monczka et al., 2020). Advanced technologies, such as supply chain software systems, data analytics, and automation, play a vital role in enabling real-time visibility, decision-making, and collaboration among supply chain partners (Chopra and Meindl, 2021; Monczka et al., 2020).

The business community at present is concerning about the supply chain management, whether on the part of large, multi-national companies or the small companies, which, in the context of the global financial crisis and economic development, have grown to be an important component of the supply chain, which requires change. All facilities have once again refocused on the supply chains (Handfield et al., 2020).

Supply Chain Management Objectives

SCM encompass a range of strategic goals that organizations aim to achieve in their supply chain operations. These objectives include improving operational efficiency, reducing costs, and enhancing customer satisfaction (Chopra and Meindl, 2016; Lambert, Cooper and Pagh, 1998). SCM focuses on streamlining processes, optimizing resource utilization, and delivering the right products to customers at the right time and location (Chopra and Meindl, 2016). It aims to enhance overall supply chain performance and create value for customers (Christopher, 2016). By implementing efficient supply chain practices, organizations can reduce costs, improve productivity, and achieve higher profitability (Lambert et al., 1998). Furthermore, SCM seeks to meet customer expectations, increase loyalty, and enhance the overall customer experience (Christopher, 2016).

Supply chain resilience and risk mitigation are critical objectives of supply chain management (Christopher, 2016; Narasimhan and Talluri, 2009). Organizations focus on building robust supply chains that can withstand disruptions and effectively manage risks associated with various factors, including demand volatility, supplier disruptions, and natural disasters (Christopher, 2016). Risk management strategies, such as contingency planning, diversification of suppliers, and supply chain redundancy, are employed to minimize the impact of disruptions and ensure uninterrupted operations (Chopra and Sodhi, 2014; Christopher, 2016). Furthermore, supply chain management aims to foster collaboration and drive innovation among supply chain partners (Lambert, Cooper, and Pagh, 1998). By sharing information, engaging in joint initiatives, and collaborating on product design and development, organizations can leverage the collective expertise of the supply chain

network to enhance innovation and gain a competitive advantage (Lambert et al., 1998; Monczka et al., 2009). Collaborative supply chain relationships also contribute to achieving shared objectives, such as cost reduction, sustainability improvement, and social responsibility (Christopher, 2016; Monczka et al., 2009).

Roles of Supply Chains in Reducing Costs

According to Christopher (2016), supply chains have an important role in reducing costs through efficient logistics and transportation management. This involves selecting cost-effective transportation modes, optimizing routes, and consolidating shipments to maximize container utilization. Supply chain technologies, such as transportation management systems (TMS) and route optimization software, contribute to achieving transportation cost efficiencies. Additionally, effective demand planning and forecasting within supply chains help minimize costs associated with excess production or stockouts by aligning production, inventory, and distribution plans with customer demand. Demand planning tools and techniques, such as collaborative planning, forecasting, and replenishment (CPFR), enable organizations to synchronize their supply chain activities with demand fluctuations, leading to improved cost efficiencies (Lee and Billington, 1993).

As mentioned by (Monczka et al., 2020), one of the primary advantages of effective SCM is the potential for reducing costs within an organization. Supply chains provide several mechanisms that contribute to cost reduction. Firstly, by streamlining processes and eliminating inefficiencies, supply chains help optimize resource utilization, leading to cost savings. Efficient procurement and inventory management practices ensure that the right number of materials is available at the right time, reducing inventory holding costs and the risk

of stockouts. Additionally, supply chain networks enable organizations to leverage economies of scale through centralized purchasing and production, resulting in lower unit costs. By effectively managing transportation and distribution, supply chains also help minimize logistics expenses (Mathew et al., 2013). Through these cost-saving mechanisms, organizations can achieve higher profitability and remain competitive in the marketplace (Sangvikar et al., 2021).

In this context, the continued success of any company requires its ability to change to meet the needs of the changing world around it and to compete to be creative and inventive in order to fulfill its objectives efficiently and effectively and to achieve the competitive advantage that enables it to cope with competitors. It is necessary then to find ways to remain in the market and to achieve its objectives efficiently and effectively (Cohen and Roussel, 2013).

In the last decade of the last century, the challenge has shifted to cost management through the value chain, and as the value of the materials and services purchased as a percentage of the sale price has increased, companies have found that they have to manage a complex chain involving international suppliers, partnership contract manufacturers, plant-owned production and service centers, logistics providers, and a chain of transportation service providers (Christopher, 2016). In light of the rapidly changing fact that the final product was thought to be the last phase in the supply chain with a direct relationship to the and end customer, and that supply chains were solely responsible for reducing product cost and competitiveness, cost-cutting was a very crucial area that needed to be addressed (Hugos, 2018).

The Relationship Between Supply Chain and Transport

In this section we will try to illustrate the intricate relationships between SCM and transportation, highlighting their interdependence and the impact of effective transportation management on supply chain performance. Through a thorough review of scholarly literature and industry reports, this research sheds light on the key factors that influence these relationships and identifies strategies for optimizing supply chain and transport integration. The findings emphasize the importance of collaboration, technology adoption, and efficient logistics operations in enhancing supply chain efficiency, reducing costs, and achieving competitive advantages.

- The global marketplace has become increasingly interconnected, necessitating efficient and streamlined supply chain operations (Attaran, 2017). The movement of products and services is facilitated by transportation, which serves as the foundation of supply chain networks (Pournader et al., 2020). The interdependence of SCM and transportation is what distinguishes the two fields of study, with transportation having a significant impact on crucial supply chain operations including sourcing, production, inventory control, and distribution (Yadav and Barve, 2015). This article aims to provide a comprehensive analysis of these relationships, examining their implications for supply chain performance and exploring strategies to enhance their integration.
- Interdependencies Between Supply Chain and Transport: Transportation is an integral component of the supply chain, serving as the link between suppliers, manufacturers, distributors, and end customers. The efficient movement of goods from one point to another is essential for meeting customer demands, minimizing lead

times, and reducing costs. According to Lee and Whang (2020), effective coordination between supply chain partners and transportation providers enables the seamless flow of goods, reduces delays, and improves overall customer satisfaction. Conversely, disruptions in transportation, such as delays, capacity constraints, or breakdowns, can have a significant negative impact on supply chain performance (Lambert et al., 2018). Thus, it is crucial to establish robust relationships and collaborate closely with transportation partners to ensure a smooth and responsive supply chain.

- Supply Chain-Transport Relationship Influencing Factors The interaction between SCM and transport is influenced by a number of factors (Zhang et al., 2015). The supply chain network's geographic reach is an important consideration. Global supply chains require complex transportation solutions, involving multiple modes of transport, customs procedures, and cross-border regulations (Christopher, 2016). Technology adoption also plays a pivotal role, as innovative tools such as real-time tracking systems, fleet management software, and route optimization algorithms enable more efficient transportation operations (Gligor and Holcomb, 2018). Furthermore, the choice of transportation mode (e.g., road, rail, air, or sea) and the selection of carriers impact the speed, cost, and reliability of supply chain activities (Ketikidis et al., 2020). These factors, among others, require careful consideration to achieve optimal supply chain and transport integration (Cohen and Roussel, 2013).

Strategies for Optimizing Supply Chain and Transport Integration: To enhance the relationship between supply chain management and transport, organizations can employ various

strategies. First, developing strong partnerships and collaboration with transportation providers fosters better communication, understanding, and joint decision-making (Giunipero et al., 2021). Second, leveraging technology and adopting digital solutions enable improved visibility, real-time tracking, and data-driven decision-making throughout the supply chain (Lai et al., 2022). Third, investing in efficient logistics operations, such as warehouse management systems, cross-docking facilities, and last-mile delivery solutions, enhances the overall effectiveness and responsiveness of supply chain and transport activities (Pfohl et al., 2016). By integrating these strategies, organizations can achieve greater supply chain efficiency, cost reduction, and improved customer satisfaction (Mostafa et al., 2019).

3. RESEARCH METHODOLOGY

One of Egypt's top enterprises to produce snacks is Egy Foods, whose production ultimately included confectionery and chips. The firm succeeded to establish itself as the market leader in Egypt despite beginning with a modest manufacturing capacity and gradually increasing it over the years. The business is also dedicated to raising the caliber of its current offerings and launching new ones at competitive pricing in response to shifting consumer preferences.

In 2020, the company experienced some economic challenges, the most important of which was the Covid-19 crisis, which had a big impact on sales as a result of the fact that the company's products are not a priority for human needs because most of the products of the firm are recreational products, and because of the crisis experienced by Egypt, the company's sales were affected by the disruption of universities and schools and dependence on the main food and medicinal products, which resulted in the company being affected by economic matters

and some losses as a result of paying salaries and reducing production processes. The company made the decision to cut down, freeze training and advertising, stop investments and inject funds, and as far as possible try not to reduce or eliminate the human factor so that the company could offer the same product at a lower price and try to compete in the Egyptian market. The top management directed all divisions to reduce expenses and rationalize consumption. Forsomuch, the supply chain & logistics department has the highly expenses which is circa 60% of the total corporate budget, the company proceeded to organizing supply chain department, and relied on it to reduce expenditure cost and maintain the product price.

In this section, the researcher reviews the statistical analysis of the study, which includes statistical analysis using both the case study and the questionnaire, and this analysis includes four successive stages, as follows:

- **The first stage**: incorporates statistical analysis utilizing a case study, which seeks to gather historical data for this time period of the research in order to evaluate the present status of the company's performance.
- **The second stage**: includes statistical analysis using the questionnaire and aims to measure the awareness and readiness of the employees' company to implement the Supply Chain Concept and their ability to carry out the required improvement within the company.
- **The Third stage**: integrates statistical analysis with a case study that tries to bring about the needed change in the business.
- **The fourth stage**: includes statistical analysis using the questionnaire and aims to measure and check the

improvement which occurred in the company and test the hypotheses of the study,

Study Model and Variables

Figure (1) shows the variables of the study, the independent variable (Supply Chain) that affects the dependent variable (Performance of Organization) and its two dimensions (Productivity, Cost), in addition to the demographic

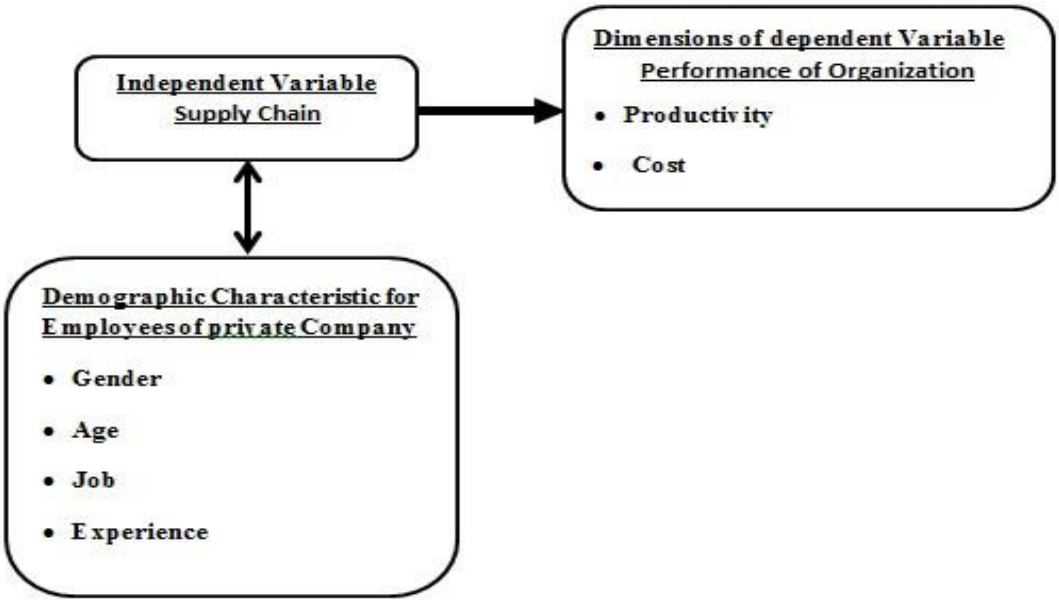

Figure 1. Model and variables of the Study
Source: Prepared by researcher

characteristics of employees in the private company (gender, age, job, experience) that affects the independent variable (Supply Chain).

Study Hypotheses

Based on the study's questions and objectives, the researcher formulated (2) main hypotheses from which (2) sub-hypotheses emerged, and their statement is as follows:

- **The first main hypothesis**: which states that *"**there is a significant difference among employees of private company in their perception of the independent variable (Supply Chain) according to their demographic characteristics (gender, age, job, experience)?**"*
- **The second main hypothesis**: which states that *"**there is a significant relationship between implementing the (Supply Chain) and the improvement of the (Performance of Organization) of the private company**"*, and two sub-hypotheses emerged from it, their statement is as follows:
  - The first sub-hypothesis: *"There is a significant relationship between implementing the (Supply Chain) and increase of the (Productivity) as a first dimension of the (Performance of Organization) of the private company".*
  - The second sub-hypothesis: *"There is a significant relationship between implementing the (Supply Chain) and decrease of the (Cost) as a second dimension of the (Performance of Organization) of the private company".*

Data Collection Tools and Procedures

To answer specified research questions, test hypotheses, and assess results, data collection is the act of acquiring and measuring information on relevant variables in a predetermined, methodical way. In order to establish a solid case for an answer to a question, it is essential that all data gathering efforts aim to

gather high-quality evidence. This evidence may then be used in a rich data analysis. The method that was used are mainly secondary research that enables the researcher to establish a foundation for the research, the researcher depended on some journals, books and publications. Aside from primary quantitative research, one of the five well-known methods for gathering and analyzing empirical data in business research—experiments, surveys, analysis of archival data, histories, and case studies—can be used to gather up-to-date and accurate information. Surveys were employed by the researcher as the second primary mode of data collection in this study. The "questionnaire form" is the instrument used to gather the data. The questions' preparation and phrasing, order and succession within a logical context, and appropriateness for statistical processing techniques were all taken into consideration by the researchers. The following procedures were used to construct the questionnaire:

- The researchers studied educational literature and earlier pertinent studies before developing the words and questions of the study questionnaire and utilized them to create the study instrument.
- The prototype tool was presented to the study's scientific supervisor, and with his help, the questionnaire was developed and changed significantly.
- According to the five-dimensional Likert scale shown in figures (1, 2, 3, 4, and 5), the researcher assigned weights to certain questionnaire parts.

Design of the Questionnaire

The surveys were given directly to the workers face-to-face, and the majority of the items were scored using a five-point Likert-type answer scale, with 5 being the strongest

disagreement and 1 being the strongest agreement. The questionnaire is composed of three sections, (Appendix 1) as follows:

- Section (1): relates to demographic characteristics (gender, age, education, job, and experience) for employees.
- Section (2): relates to evaluation of employees to the independent variable (Supply Chain) which has (9) questions.
- Section (3): relates to evaluation of employees to the dependent variable (Performance of Organization) which has (10) questions numbered from (1–9), and distributed on two dimensions (Productivity, Cost) and their statement are as follows:

  - **First Dimension (**Productivity**)**: which has five questions numbered from (1-5).

  - **Second Dimensions (**Cost**)**: which has four questions numbered from (6–10).

Population and Sampling

The target population, sampling frame, sample size, and sampling procedure are all introduced by the researcher in this section.

- **Target Population:** The wider group to whom the researcher seeks to apply the research's results is known as the target population.
- **Sampling Frame:** The sampling frame is the group from which the researcher will select the sample.
- **Sample Size and Sampling Technique:** To ensure the validity, precision, reliability, and scientific and moral integrity of the study, the determination of the overall

sample size is a crucial component of the study design. The sample size for this study shall be analyzed using (Minitab 19) tool, these tools require knowledge of the target population size, and a determination as to the maximum desirable margin of error, as well as, the acceptable confidence level. In this study, the target population size is 500,000. The researcher will set the significance level at 0.05 (5% margin error) and consequently, the confidence interval at 0.95 (95% certainty).

The sample size of the study is calculated by using the statistical programs (Minitab 19) and researcher found the corresponding sample size to be (75) from research population; and researcher randomly selected the workers and gave out (90) to ask for their assistance; (80) employees responded to the questionnaire, and (75) of the feedbacks are complete, i.e., there are no blanks in the questionnaire.

4. DATA ANALYSIS AND TEST HYPOTHESES

Evaluation of Study Variables before Improvement

A. Evaluation of Study Variables before Improvement using Case Study

a) Company Status before Improvement:

After studying and analyzing all the items enclosed, it was clear that:

- The fuel line only represents 56% of the budget of the Department of Transport, which requires study and attempts to reduce this item.
- The company's reliance on Jumbo cars for long-haul trips like Upper Egypt or Sinai.

b) Solution

First, after studying the operation of the fleet of the company, it shows the following:

The average operation of the trucks represents 55.9% of the operation of the Jumbo as enclosed.

c) Analysis

The average load of the trucks is 4000 cartons, which takes 76 minutes to load, and the average load of a Jumbo car is 1000 cartons, which takes 40 minutes of loading, where the Jumbo represents ¼ the load of the trucks at the same cost as previously attached.

After calculating the cost of the trip to transfer 4,000 cartons for 4 Jumbo cars, taking more than 1,800 kilometers of a round trip, and other charges (fuel - oils - repairs - spare parts – driver's commission - major governorates exit tolls - scales - GPS), the cost of the carton is £2.30 and the cost of the 4,000 cartons of trucks is charged for the same round trip, and the cost of the carton is 1.7 pounds per carton.

To be sure to transfer all the cartons to be shipped to the branch, the following is required:

- Calculating all the needs of the branches and agents.
  - Turning all needs into transports whether trucks or jumbo.
  - Calculating the cost of transporting all the needs of the agents or branches either in trucks or Jumbo.
  - Identifying the largest branches, customers or agents that can be covered by trucks.

- Calculating the daily coverage of the branches and agents from the quantities required after agreement with the Sales Department and the demand Planning Department based on the storage space available.
- Studying the problem of the difficulty for trucks to enter the agents' areas or the selling branches because of the roads or the space of the branch or the agent.
- Changing some branches and choosing suitable branches in terms of space or storage space and access to the branch.
- Changing some agents to other agents allowing for the same conditions.
- Changing product pick-up times in some branches by road to overcome the ban on some trucks from traveling on ring roads.
- Changing operation in the main warehouses to load trucks in the proper time, calculating the arrival time to the branches and calculating the time of storage and the wait time in order to avoid having the truck stay overnight in front of the branches because of the ban on some roads.
- Agreeing to change the trucks' delivery dates for certain agents.
- Periodic monitoring of the company's fleet on the GPS route to prevent delay in the receipt of the goods with the planned speed control of the company, the comfort of the driver, and the extent to which the time required to reach the branches and selling agents has been met.

The experiment and measurement were for one year in some branches, which resulted in the saving of L.E 1.23 per carton per load, and after calculating the required quantities all year-round, it led to saving 4.5 million pounds in the corporate budget, which resulted in a cost reduction of the carton and trying to compete in the Egyptian market with the same quality and without dispensing the human element.

After the agreement to rely on shipping the cartons by the previously agreed way: shipping the cartons to the branches of sale and sales agents in trucks, and not jumbo cars, in order to reduce the cost of the carton, some other implementation challenges have appeared.

Procedure for transport section:

- Measuring all trucks of company in cubic meter (length * width * height) from inside the trucks.
- Cubing all direct-haul cars or importing Jumbo-type cars in cubic meters from the inside.

After these measurements, the following was found:

- All the trucks have different sizes from the inside.
- The length, width, and height of the trucks vary.
- The truck sizes range from 60 cubic meters to 70 cubic meters to 80 cubic meters and beyond 90 cubic meters. There are also lesser sizes available.
- There are also different sizes in Jumbo vehicles, ranging from 12 cubic meters to 18 cubic meters.

B. Evaluation Of Employees' Awareness to Implement Supply Chain Using Questionnaire

To measure the employee's awareness to check their readiness to implement **Supply Chain concept** in the company, the researcher design the questionnaire to collect data from the employees of the company, and in this section researcher presents and discuss the following items, descriptive analysis of the sample, evaluation of the study variables before improvement the independent variable (**Supply Chain**) and the dependent variable (Performance of Organization) and it two dimensions (Productivity, Cost) and testing first main hypothesis before Improvement to test the effect of demographic characteristics (gender, age, education, job, and experience) for employees on the independent variable.

Stability of Data Collection Tool before Improvement

Stability refers to the scale's consistency and stability, i.e., the scale consistently produces the same results when applied to the same sample with a probability equal to the parameter's value. There are many ways to calculate the stability of the data collection tool, including the method of reapplication of the test, and the Alpha Cronbach method. Cronbach's alpha is determined in this study for each of the questionnaire's components, and Table (1) displays the results. These values vary between (0.749, 0.969), which is bigger than 0.6 (a level considered "acceptable" in social science research), and they reflect a high level of consistency in the respondents' responses.

Table 1. Cronbach's Alpha for Constructs of the Questionnaire before Improvement

Variables of the Study		No. of Items	Cronbach's Alpha
Independent Variable (Supply Chain)		9	0.969
Dependent Variable (Performance of Organization)	Productivity	5	0.817
	Cost	4	0.749
	Total	9	0.862
Total		18	0.923

Evaluation of Study Variables before Improvement using Questionnaire

Evaluation of the study variables the Supply Chain and Performance of Organization and Before improvement, its two dimensions (Productivity, Cost) were calculated using the means and standard deviations of employee perceptions for these variables in the sample. The results were then validated in the population using four (1-Sample T) tests between employee perceptions and the researcher's expected value (4). The following are reviews of the procedures' outcomes:

a) **Evaluation of the Independent Variable before Improvement:** Table (2) shows the answers of employee's perception for the independent variable (Supply Chain) before improvement, and it is clear from this table that it has mean that equal (3.289) which is moderate and standard deviation equal (1.106) and gap equal (14.22%).

Table 2. Employee's perception for independent variable before Improvement

	Mean	Standard Deviation	Gap
Supply Chain	3.289	1.106	14.22%

To confirm the significance of the previous results in the population (1-Sample T) test was performed between employees perceived and expected values for the independent variable (Supply Chain) and the results of this test are shown in Table (3) which accept the alternative hypothesis and reject the null hypothesis, which validates that there is a significant difference for employees' perceived and less than expected value for that variable in the population. which confirm the previous results through (P value = 0.000), which is less than (0.05), and this means that the previous results are less significant than expected.

Table 3. (1-Sample T) for independent variable before Improvement

Supply Chain	Sample Size	Mean	Standard Deviation	SE Mean	Upper Bound for μ	T-Value	P-value
	75	3.289	1.106	0.128	3.502	-5.57	0.000

b) Evaluation of the Dependent Variable before Improvement: Table (4) displays the responses from employees on their perceptions of the dependent variable (Organizational Performance) prior to improvement. It is evident from this table that the dependent variable has a mean of equal (3.514), which is moderate, a standard deviation of equal (0.689), and a gap of equal (9.72%).

Table 4. Employee's Perception for Dependent Variable before Improvement Mean

Performance of Organization	Mean	Standard Deviation	Gap
	3.514	0.689	9.72%

To confirm the significance of the previous results in the population (1-Sample T) test was performed between employees perceived and expected values for the dependent variable (Performance of Organization) and the results of this test are shown in Table (5) which rejects the null hypothesis and accepts an alternative hypothesis that validates that there is a significant difference for employees' perceived and less than expected value for that variable in the population. This alternative hypothesis confirms the previous results through (P value = 0.000), which is less than (0.05), and this means it is less significant than the (0.05) value.

Table 5. (1-Sample T) for Dependent Variable before Improvement

Performance of Organization	Sample Size	Mean	Standard Deviation	SE Mean	Upper Bound for μ	T-Value	P-value
	75	3.514	0.689	0.080	3.647	-6.11	0.000

c) **Evaluation of Two Dimensions of Dependent Variable before Improvement:** Table (6) shows the answers of employee's perception for the two dimensions (Productivity, Cost) of the dependent variable (Performance of Organization) before improvement, and it is clear from this table that the mean for the dimension (Cost) comes first and it mean equal (3.577) and with standard deviation equal (0.727) and gap equal (8.47%), while the dimension (Productivity) has mean equal (3.373) with standard deviation equal (0.816) and gap equal (12.53).

Table 6. Employee's Perception for Dimensions of Dependent Variable before Improvement

Dimensions of dependent variable	Mean	Standard Deviation	Gap
Productivity	3.373	0.816	12.53%
Cost	3.577	0.727	8.47%

To confirm the significance of the previous results in the population two (1-Sample T) test were performed between employees' perceived and expected values for the for the two dimensions (Productivity, Cost) of the dependent variable (Performance of Organization) and the results of these tests are shown in Table (7) which support alternative hypotheses that demonstrate that employees perceive a significant difference in the two dimensions of the dependent variable (organizational performance), productivity and cost, and that this difference is less than expected. This confirms the earlier findings through (P value = 0.000), which is less than (0.05), and this means rejecting null hypotheses and accepting alternative hypotheses.

Table 7. (1-Sample T) for Dimensions of Dependent Variable before Improvement

Performance of Organization	Sample Size	Mean	Standard Deviation	SE Mean	Upper Bound for μ	T-Value	P-value
Productivity	75	3.373	0.816	0.094	3.530	-6.65	0.000
Cost		3.577	0.727	0.084	3.717	-5.04	0.000

d) Results of Evaluation of the Study Variables before Improvement: Results of evaluation of the study variables before improvement proved that:

- Evaluation of the study variables the independent variable and the dependent variable and its two dimensions before improvement all are moderate and less than the expected value proposed by the researcher (4).
- These results gave indication that the awareness of employees is not sufficient to implement (Supply Chain) in the company and they need intensive training course. But before implementation of this training course the researcher must measure the variance between employees by testing the first main hypothesis.

C. Testing First Main Hypotheses Before Improvement

In this part, the effect of demographic characteristics (gender, age, education, job, and experience) for employees on the independent variable (Supply Chain) was studied in order to test the first main hypothesis, which states that "there are no significant differences between employees in their perception of independent variable according to their demographic characteristics (gender, age, education, job, experience). To achieve that the differences between company's employees perceived values for their answers for mean in the sample are calculated and to confirm the significance of these results in the population through using (Two sample T) test for male and female and four ANOVA tests for the other demographic characteristics (age, education, job, and experience), the following are review of those results, and Table (8) shows the answers of employees about (Supply Chain) according to their demographic characteristics (gender, age, education, job, experience), and it is noted from this table the following:

- The number of males equal (67) with a percentage of (89.3%), and the mean for the independent variable equal to (3,267) with standard deviation equal (1.105) and with

gap equal (14.66%), while the number of females equal (8) with a percentage of (10.7%), and the perceived mean for the independent variable equal to (3,472), has a disparity of 10.56 percent and a standard deviation of 1.166.

- The number of employees with age (less than 30 years) equal (34) and with highest percentage equal (45.3%), and the mean of their perception for the independent variable equal (2,801) with standard deviation equal (1.286) and with gap equal (23.98%), followed by employees of age (45 years and above), whose number equal (26) and has a percentage of (34.7%), and the mean of their perception for the independent variable equal (3,756) employees aged 30 and under received the lowest percentage (20%) and the mean of their perception for the independent variable was equal to 3,585, with standard deviation equal to (0.765) and gap equal to (4.88%); their number was 15, and they received the lowest standard deviation (0.659) and gap equal to (8.30%).
- The number of employees with educational qualifications (intermediate education and below) equal (43) and has highest percentage of (57.3%), and the mean of the independent variable equal (2,964), with standard deviation equal (1.235) and with gap equal (20.72%), followed by employees with educational qualifications (higher education), whose number equal (30) and has a percentage of (40.0%), and the mean of the independent variable equal (3,737) with standard deviation equal (0.688) and with gap equal (5.26%), while employees with educational qualifications (Postgraduate studies) their number was (2), and they got the lowest percentage

of (2.7%), and the mean of the independent variable was (3,560) with standard deviation equal (1.410) and with gap equal (8.80%),.

- The employees with the job (higher management), whose number equal to (58) has a percentage of (77.3%), it has mean equal to (3,460), with standard deviation equal (0.939) and with gap equal (10.80%), followed by the employees in the job (Executive Management), whose number equal (9) and has a percentage of (12.0%), and the mean of the independent variable equal to (2,025), with standard deviation equal (1.340) and with gap equal (39.50%), while the employees in the job (middle management), their number was (8), and they got the lowest percentage of (10.7%), and the mean for the independent variable was (3,472) with standard deviation equal (1.166) and with gap equal (10.56%).
- The employees with experience (>= 10 years and Less than 15), whose number equal to (42) has a percentage of (56.0%), and it has mean equal to (3,418), and with standard deviation equal (0.897) and with gap equal (11.64%), followed by employees with experience (less than 10 years), whose number equal (18) and has a percentage of (24.0%), and the mean of the independent variable equal to (3,778), and with standard deviation equal (0.899) and with gap equal (4.44%), while employees with experience (15 years or more) whose number equal to (15) and has the lowest percentage (20.0%), and the mean of the independent variable equal to (2.341). and with standard deviation equal (1.342) and with gap equal (33.18%).

Table 8. Perception of Employees of Independent Variable According to Type

	Variables	Frequency	Percentage (%)	Mean	Standard Deviation	Gap
Type	Male	67	89.3%	3.267	1.105	14.66%
	Female	8	10.7%	3.472	1.166	10.56%
Age	Less than 30 years	34	45.3%	2.801	1.286	23.98%
	30 years and less than 45	15	20.0%	3.585	0.659	8.30%
	45 years and above	26	34.7%	3.756	0.765	4.88%
Education	Intermediate education	43	57.3%	2.964	1.235	20.72%
	Higher education	30	40.0%	3.737	0.688	5.26%
	Postgraduate studies	2	2.7%	3.560	1.410	8.80%
Job	higher management	58	77.3%	3.460	0.939	10.80%
	middle management	8	10.7%	3.472	1.166	10.56%
	Executive Management	9	12.0%	2.025	1.340	39.50%
Experience	≤ 10 years	18	24.0%	3.778	0.899	4.44%
	>= 10 and ≤ 15 years	42	56.0%	3.418	0.897	11.64%
	15 years or more	15	20.0%	2.341	1.342	33.18%
Total		75		3.289	1.106	14.22%

To ensure the validity and significance of the previous results in the population, (Two sample T) test between the mean of the employees answers (males, females) at the company for the independent variable and four ANOVA tests for the other demographic characteristics (age, education, job, and experience), were conducted and table (9) confirming that there are no differences in the perception of males and females of the independent variable, that is, there is no effect of the type of employees in the company for the independent variable, and this was proven by the value of (P value) whose value equal to (0.649), which exceeds (0.05), indicating that the null hypothesis is not rejected.

Table 9. (Two sample T) test of Employees' Perception of Independent Variable According to Gender

	Type	Mean	Standard Deviation	SE Mean	95% CI for Difference	T-Value	DF	P-value
Supply Chain	**Male (67)**	3.267	1.105	0.140	-1.206, 0.795	-0.47	8	0.649
	Female (8)	3.472	1.166	0.410				

According to Table 10, there are differences in how the employees perceive the independent variable (Supply Chain) in relation to the demographic characteristics (age, education, job, and experience). This was demonstrated by the P value, which ranges between (0.000, 0.011), which is less than (0.05), and confirmed by the F calculated, which ranges between (4.84, 9.25), which is higher than (F tabulated = 3.124).

Table 10. ANOVA of Employees' Perception of Independent Variable According to Demographic Characteristics

Source	DF	SS	MS	F-Value	P value
Age	2	15.100	7.550	7.22	0.001
Error	72	75.340	1.046		
Total	74	90.440			
Education	2	10.710	5.355	4.84	0.011
Error	72	79.730	1.107		
Total	74	90.440			
Job	2	16.340	8.170	7.94	0.001
Error	72	74.100	1.029		
Total	74	90.440			
Experience	2	18.488	9.244	9.25	0.000
Error	72	71.952	0.999		
Total	74	90.440			

Before improvement, the test findings for the first primary hypothesis somewhat supported the following:

- There are no gender-related variations in private firm employees' perceptions of the independent variable (Supply Chain) prior to improvement.
- Prior to improvement in accordance with other demographic variables (age, education, job, and experience), there are considerable disparities amongst employees in private companies regarding their view of the independent variable (Supply Chain).

The previous results proved employees in the private company needs training for Supply Chain concepts, and then a program was implemented with intensive training for employees, based on the scientific material mentioned in literature review mentioned before. The training lasted for three months from (August, September, and October 2021). The company's sites were also equipped with devices and equipment for the (Supply Chain) and the training of employees on these devices and equipment were done such that employees are ready and able to apply the (Supply Chain) in the company and make the required improvement.

Improvement of Performance of Organization Using Case Study

a) Results and Analysis:

Previous measurements and actions taken have resulted in an indication of the following:

- Wasting 30% of the current capacity to utilize trucks, as the current rate of utilization is 70%.
- The average time taken to load trucks during the day is 54 minutes, as the amount of three trucks per 54 minutes leads to 72 trucks in 24 hours.

b) Measures taken:

- Classifying all cartons to be shipped in trucks into price categories.
- Cubing all cartons to be shipped (length, width, height) as illustrated.
- Deciding the way in which trucks are sorted from the inside based on the cubing of the trucks; the length, width, and height; and the allowed waste percentage, while taking care of the contribution ratios required for sorting in cases of loading common trucks of all price classes.
- Agreeing to increase the utilization percentage of storage areas to 85%, instead of 70%, by re-arranging the cartons according to saving and moving the number of cartons that are more than the old situation.
- Re-dividing the number of workers by the shifts of work based on the time when the loading processes are piled up for each shift.
- Re-measuring for the same month the rate of utilization of trucks by the new situation after the adjustment, knowing the results of the measurement and measuring the time spent loading the trucks.

c) Results of Measurements

- The average percentage of utilizing trucks from the inside after sorting changes within the trucks has risen to 85%.
- Increasing the average time taken to load trucks during the day to 64 minutes. Provision of 250 to 300 cartons per truck, 8% more than the old situation.

- Saving in transporting 300 cartons, representing 1/3 of Jumbo's truck's load.
- Provision of 300 cartons per truck: 54 trips in thirty days lead to 486.000 cartons.
- Saving 972,000.00 L.E., the value of 122 transfers in an average of 8000 L.E. as rent of a single transfer.

d) Conclusion

All the above-mentioned solutions are based on each other.

- Reliance on using the fleet owned by the company to transport products in the case of nearby branches to production plants, not relying on other means of rent, because of increased costs and reliance on the company fleet of trucks, not jumbo trucks, in the case of long travel to faraway branches, such as Upper Egypt, because of increased travel of more than 1,800km back and forth to reduce expenses (fuel - oils - repairs - spare parts – driver's fees – main cities 'gateways tariffs- scales- GPS)
- Cubing sizes of trucks' boxes, replacing of smaller trucks with larger ones, investing in larger trailers or cubic boxes, after counting the return on investment in purchase and sales, counting the return difference from that project, and stopping some trailers with smaller cubic boxes.
- Changing sorting the truck from the inside based on the cubing of the trucks (length, width, height) and agreeing on the allowed waste percentage, while taking care of the contribution ratios required for sorting in cases of loading common trucks of all price classes, along with agreeing to increase the utilization percentage of storage areas to 85%, instead of 70%, by re-arranging the cartons

according to saving and moving the number of cartons that are more than the old situation and not affecting the product quality.

- This resulted in a saving of 1.23 L.E. per carton per payload. After calculating the required amounts throughout the year, a saving of 4.5 million was made in the company's budget, which reduced the cost of the carton, attempted to compete in the Egyptian market with the same quality and did not dispense with the human component.

A. Validate Improvement of Performance of Organization using Questionnaire

To check and validate improvement of performance of organization using questionnaire, the researcher distributed again questionnaire on the same sample and measured the stability and perceived values of employees for the independent and dependent variables and their two dimensions after improvement, and then evaluate if the second major hypothesis and its two supporting hypotheses are true, as will be discussed below.

Stability of Data Collection Tool after Improvement

The Cronbach's Alpha technique is used once more using the same prior equation to determine the level of stability on the responses of employees' perception for all constructs of study variables after improvement. As shown in Table (11), it appeared that the reliability coefficient of the data collection tool ranged between (0.819, 0.960), and these values are good because they are higher. According to these findings, it can be concluded that the data collecting instrument has the internal stability of its statements and that it fulfils the study's

objectives. The acceptable value (0.6) shows that a high degree of stability is available in these responses.

Table 11. Cronbach's Alpha for Constructs of the Questionnaire After Improvement

Variables of the Study		No. of Items	Cronbach's Alpha
Independent Variable (Supply Chain)		9	0.960
Dependent Variable (Performance of Organization)	Productivity	5	0.819
	Cost	4	0.836
	Total	9	0.910
Total		**18**	**0.969**

Evaluation of the Study Variables after Improvement

Evaluation of the study variables the independent variable (Supply Chain) and the dependent variable (Performance of Organization) and its two dimensions (Productivity, Cost) after improvement were done through calculation of the mean, and standard deviation, for employee's perceptions for the these variables in the sample, then validate the results in the population through applying four (1-Sample T) tests between employee's perceptions and the expected value proposed by the researcher (4), the following are review for the results of these procedures:

a) **Evaluation of the Independent Variable After Improvement:** Table (12) shows the answers of employee's perception for the independent variable (Supply Chain) after improvement, and it is clear from this table that it has mean that equal (4.456) which is high and standard deviation equal (0.507) and with no gap.

Table 12. Employee's perception for independent variable after Improvement

Supply Chain	Mean	Standard Deviation	Gap
	4.456	0.507	-9.13%

To confirm the significance of the previous results in the population (1-Sample T) test was performed between employees' perceived and expected values for the independent variable (Supply Chain) and the results of this test are shown in Table (13) which accept the alternative hypothesis and reject the null hypothesis by showing that there is a significant difference for employees' perceived and greater than expected value for that variable in the population (P value = 0.000), which is less than (0.05) and confirms the previous results.

Table 13. (1-Sample T) for independent variable after Improvement

Supply Chain	Sample Size	Mean	Standard Deviation	SE Mean	Upper Bound for μ	T-Value	P-value
	75	4.456	0.507	0.059	4.359	7.79	0.000

b) Evaluation of the Dependent Variable After Improvement: Table (14) shows the answers of employee's perception for the dependent variable (Performance of Organization) after improvement, and it is clear from this table that it has mean that equal (4.491) which is high and standard deviation equal (0.430) and with no gap.

Table 14. Employee's perception for dependent variable after Improvement

Performance of Organization	Mean	Standard Deviation	Gap
	4.491	0.430	-9.81%

To confirm the significance of the previous results in the population (1-Sample T) test was performed between employees perceived and expected values for the dependent variable (Performance of Organization) and the results of this test are shown in Table (15) which rejects the null hypothesis and accepts an alternative hypothesis that supports the existence of a significant difference for employees' perceived and greater than expected value for that variable in the population. This alternative hypothesis confirms the previous results through (P value = 0.000), which is less than (0.05), and this means it is less significant than the null hypothesis.

Table 15. (1-Sample T) for Dependent Variable after Improvement

Performance of Organization	Sample Size	Mean	Standard Deviation	SE Mean	Upper Bound for μ	T-Value	P-value
	75	4.491	0.430	0.050	4.408	9.89	0.000

c) **Evaluation of Two Dimensions of Dependent Variable After Improvement:** Table (16) shows the answers of employee's perception for the two dimensions (Productivity, Cost) of the dependent variable (Performance of Organization) after improvement, and it is clear from this table that the mean for the dimension (Productivity) comes first and its mean equal (4.555) and with standard deviation equal (0.395) and with no gap, while the dimension (Cost)

has mean equal (4.427) with standard deviation equal (0.491) and with no gap.

Table 16. Employee's Perception for Dimensions of Dependent Variable after Improvement

Dimensions of dependent variable	Mean	Standard Deviation	Gap
Productivity	4.555	0.395	-11.09%
Cost	4.427	0.491	-8.53%

Two (1-Sample T) tests were conducted to compare employees' perceived and expected values for the two dimensions of the dependent variable (Organizational Performance) in order to confirm the significance of the earlier findings in the population. The results of these tests are shown in Table (17), which rejects null hypotheses with a P value less than (0.05) and confirms the earlier findings, and accept alternative hypotheses which validate that there is a significant difference for employees perceived for the two dimensions (Productivity, Cost) of the dependent variable (Performance of Organization), and which greater than expected value.

Table 17. (1-Sample T) for Dimensions of Dependent Variable After Improvement

Performance of Organization	Sample Size	Mean	Standard Deviation	SE Mean	Upper Bound for μ	T-Value	P-value
Productivity	75	4.555	0.395	0.046	4.479	12.15	0.000
Cost		4.427	0.491	0.057	4.332	7.52	0.000

d) Results of Evaluation of the Study Variables After Improvement: Results of evaluation of the study variables after improvement proved that:

- Evaluation of Supply Chain and Performance of Organization and its two dimensions (Productivity, Cost) after improvement all are high and greater than the expected value proposed by the researcher (4).
- These findings demonstrated that the supply chain implementation in the business enhanced the organization's performance across both of its dimensions -- productivity and cost -- and provided the first evidence of a link between the two and its two dimensions (Productivity, Cost), which gave indication about the correctness of the second main hypotheses and its two sub emanating sub hypotheses, but this result needs validation by using simple regression tests between (Performance of Organization) and its two dimensions (Productivity, Cost) as dependent variables and the (Supply Chain) as independent variable.

The researcher validated the validity of the second major hypothesis and its two sub-emanating sub-hypotheses in the next section.

B. Testing Second Main Hypothesis After Improvement

To confirm the relationship and impact of the independent variable (Supply Chain) on the dependent variable (Performance of Organization) and its two dimensions (Productivity, Cost), after improvement, the researcher calculated, implemented and conducted the following:

- Calculating Pearson correlation coefficients matrix between the independent variable (Supply Chain) on the

dependent variable (Performance of Organization) and its two dimensions (Productivity, Cost), in the sample.

- Confirm this relationship between the independent variable with the dependent variable and its two dimensions (Productivity, Cost), in the population by conducting three simple regression tests between the dependent variable its two dimensions (Productivity, Cost), and the independent variable.

In the following, the researcher presents a summary of the procedures and tests carried out to confirm the relationship and the impact between the independent variable (Supply Chain) and the dependent variable (Performance of Organization) and its two dimensions (Productivity, Cost), in after improvement.

Pearson Correlation Matrix for the Second Main Hypothesis

Table (18) shows the matrix of Pearson correlation coefficient between the dependent variable (Performance of Organization) and its two dimensions (Productivity, Cost), and the independent variable (Supply Chain) in the sample after improvement, and the table makes it obvious that there is a direct and positive correlation between them, which is statistically significant at the level of (0.05). The dependent variable's two dimensions' Pearson correlation coefficients were as follows: (0.926, 0.950), which are also positive values and statistically significant at a level (0.05), and the independent variable's independent correlation coefficient was equal to (0.969), which is also positive and high and statistically significant at a level (0.05).

Table 18. Pearson correlation matrix between study variables after improvement

Dimensions of dependent variable (Performance of Organization)	Correlation coefficients	Significance
Productivity	0.926	0.000
Cost	0.950	0.000
(Performance of Organization)	0.969	0.000

The previous results confirm the existence of a positive, strong and significant relationship between Supply Chain and Performance of Organization, in the company after improvement, and this initially proves that the second main hypothesis, but confirmation of this result required the implementation of the three simple regression tests between the dependent variable its two dimensions (Productivity, Cost), and the independent variable.

Testing Second Main Hypothesis

The second main hypothesis test, it was done by computing the Pearson correlation coefficient between the independent variable (Supply Chain) and the dependent variable (Performance of Organization), as it was determined from Table (18), which equals (0.969), which is a positive and significant value. It was proven that the independent and dependent variables did, in fact, have a significant positive association. And Table (19) displays the findings of this test, which demonstrate that the regression model between them is significant through the value of (P-value), which is equal to (zero), which is less than the value (0.05), and its confirmation by the value of (F calculated), which is equal to (1128.67), which is greater than the value of (F tabulated = 3.122). The coefficient of determination (R^2), whose value is (0.939), was used to evaluate how much the independent variable influenced

the dependent variable., which means that its value (93.9%) of changes in the dependent variable (Performance of Organization) in the private company are caused by changes in the independent variable (Supply Chain).

Table 19. Simple regression between the independent and dependent variables

Source	DF	SS	MS	F test	
Regression	1	12.825	12.825	**Value**	**Significant**
Error	73	0.829	0.011	1128.67	0.000
Total	74	13.654			

Additionally, the previous findings demonstrate that "the Supply Chain and the enhancement of Organizational Performance in the Private Company, have a substantial association, and that its value (93.9%) of changes in Performance of Organization result from changes in the Supply Chain. These results prove the correctness of the second main hypothesis, to confirm its correctness, its two sub-hypotheses emanating from it are proven as follows:

Testing the Two Sub-Hypotheses of Second Main Hypothesis

The following two straightforward regression tests were used to examine the two sub-hypotheses arising from the second major hypothesis:

a) Testing the first sub-hypotheses of Second Main Hypothesis

The first sub-hypotheses of the second main hypothesis test, which was done by calculating the Pearson correlation coefficient between the independent variable (Supply Chain) and the dimension productivity of the Performance of

Organization as it was found from Table (18), which equal to (0.926), which is a positive and significant value. The validity of the strong positive relationship between the independent variable and the dimension productivity of the Performance of Organization was confirmed. And Table (20) displays the test findings, which demonstrate that the regression model between them is significant since the P-value is equal to zero, which is less than the value (0.05) and its confirmation by the value of (F calculated) which equal to (441.85), which is greater than the value of (F tabulated = 3.122). The level of influence of the independent variable on the dimension productivity of the Performance of Organization dependent variable was estimated through the coefficient of determination (R^2) whose value is (0.858), which means that its value (85.8%) of changes in the dimension productivity of the dependent variable (Performance of Organization) in the private company are caused by changes in the independent variable (Supply Chain).

Table 20: Simple regression between independent variables and dimension productivity of dependent variables

Source	**DF**	**SS**	**MS**	**F test**	
Regression	1	9.926	9.926	**Value**	**Significant**
Error	73	1.640	0.022	441.85	0.000
Total	74	11.566			

And the previous results prove that "there is a significant relationship between the Supply Chain and the increasing the dimension productivity of the Performance of Organization in the private company, and that its value (85.8%) of changes in the dimension productivity of Performance of Organization result from changes in the Supply Chain. These results prove the correctness of the first sub-hypotheses of second main hypothesis.

b) Testing the second sub-hypotheses of Second Main Hypothesis

The second sub-hypotheses of the second main hypothesis test, which was done by calculating the Pearson correlation coefficient between the independent variable (Supply Chain) and the dimension cost of the Performance of Organization as it was found from Table (18), which equal to (0.950), which is a positive and significant value. The validity of the strong positive relationship between the independent variable and the dimension cost of the Performance of Organization was confirmed. And Table (21) displays the findings of this test, which demonstrate that the regression model between them is significant through the value of (P-value), which is equal to (zero), which is less than the value (0.05), and its confirmation by the value of (F calculated), which is equal to (669.82), which is greater than the value of (F tabulated = 3.122). The level of influence of the independent variable on the dimension cost of the Performance of Organization dependent variable was estimated through the coefficient of determination (R^2) whose value is (0.858), which means that its value (90.2%) of changes in the dimension cost of the dependent variable (Performance of Organization) in the private company are caused by changes in the independent variable (Supply Chain).

Source	**DF**	**SS**	**MS**	**F test**	
Regression	1	16.093	16.093	**Value**	**Significant**
Error	73	1.75	0.024	669.82	0.000
Total	74	17.847			

And the previous results prove that “there is a significant relationship between the Supply Chain and the decreasing the dimension cost of the Performance of Organization in the private company, and that its value (90.2%) of changes in the

dimension cost of Performance of Organization result from changes in the Supply Chain. These results prove the correctness of the second sub-hypotheses of second main hypothesis.

5. RESULTS AND RECOMMENDATIONS

Through the use of the administrative literature, this study addressed the role of fleet management in maximizing the food supply chain sustainability during a pandemic, as well as the practical aspect through what was produced by the questionnaire by analyzing the answers of the sample members about the two variables of the study resulted in a number of results on both the theoretical and field levels, which are presented as follows

1- Results of evaluation of the study variables before improvement proved that:

   - Evaluation of Supply Chain and Performance of Organization and its two dimensions (Productivity, Cost) before improvement all are moderate and less than the expected value proposed by the researcher (4).
   - These results gave indication that the awareness of employees is not sufficient to implement (Supply Chain) in the company and they need intensive training course. But before implementation of this training course the researcher must measure the variance between employees by testing the first main hypothesis.

2- The tests conducted on the first primary hypothesis prior to improvement somewhat supported the following claims:

- In terms of how they perceived the independent variable (Supply Chain) prior to improvement, employees in private companies did not differ significantly based on gender.
- There are significant differences between employees in private company for their perception of the independent variable (Supply Chain) before improvement according to other demographic characteristics (age, education, job, and experience).

3- The results of the improvement of Performance of Organization in the private company using case study proved the following:

- Reliance on using the fleet owned by the company to transport products in the case of nearby branches to production plants, not relying on other means of rent, because of increased costs and reliance on the company fleet of trucks, not jumbo trucks, in the case of long travel to faraway branches, such as Upper Egypt, because of increased travel of more than 1,800km back and forth to reduce expenses (fuel - oils - repairs - spare parts – driver's fees – main cities 'gateways tariffs- scales- GPS)
- Cubing sizes of trucks' boxes, replacing of smaller trucks with larger ones, investing in larger trailers or cubic boxes, after counting the return on investment in purchase and sales, counting the return difference from that project, and stopping some trailers with smaller cubic boxes.
- Changing sorting the truck from the inside based on the cubing of the trucks (length, width, height) and agreeing on the allowed waste percentage, while

taking care of the contribution ratios required for sorting in cases of loading common trucks of all price classes, along with agreeing to increase the utilization percentage of storage areas to 85%, instead of 70%, by re-arranging the cartons according to saving and moving the number of cartons that are more than the old situation and not affecting the product quality.

- This resulted in a saving of 1.23 L.E. per carton per payload. After calculating the required amounts throughout the year, a saving of 4.5 million was made in the company's budget, which reduced the cost of the carton, attempted to compete in the Egyptian market with the same quality and did not dispense with the human component.

4- Results of evaluation of study variables after improvement using questionnaire proved that:

- Evaluation of the study variables the independent variable and the dependent variable and its two dimensions after improvement all are high and greater than the expected value proposed by the researcher (4).
- These results proved that implementation of the Supply Chain in the company improved the Performance of Organization dimensions (Productivity, Cost), and that give initial indication that there exist a relationship between (Supply Chain) and (Performance of Organization) and its two dimensions (Productivity, Cost), which gave indication about the correctness of the second main hypotheses and its two sub emanating sub hypotheses, but this result needs validation by using simple regression tests between (Performance of

Organization) and its two dimensions (Productivity, Cost) as dependent variables and the (Supply Chain) as independent variable.

5- Results of evaluation of the study variables after improvement proved that:

- Evaluation of the study variables the independent variable and the dependent variable and its two dimensions after improvement all are high and greater than the expected value proposed by the researcher (4).
- These findings demonstrated that the implementation of the supply chain in the company improved the organization's performance across its two dimensions of productivity and cost, and they provided the first evidence of a link between the supply chain and these outcomes, which gave indication about the correctness of the second main hypotheses and its two sub emanating sub hypotheses, but this result needs validation by using simple regression tests between (Performance of Organization) and its two dimensions (Productivity, Cost) as dependent variables and the (Supply Chain) as independent variable.

6- In addition, the earlier findings demonstrate that "there is a considerable association between the Supply Chain and the improvement of Organizational Performance in the Private Company, and that its value (93.9%) of changes in Organizational Performance are caused by changes in the Supply Chain. These findings demonstrate that the second primary hypothesis is true, and this is supported by:

- The previous results that proved “there is a significant relationship between the Supply Chain and the increasing the dimension productivity of the Performance of Organization in the private company, and that its value (85.8%) of changes in the dimension productivity of Performance of Organization result from changes in the Supply Chain. These results prove the correctness of the first sub-hypotheses of Second Main Hypothesis.
- Additionally, earlier findings demonstrated that "there is a significant relationship between the Supply Chain and the decreasing the dimension cost of the Performance of Organization in the private company, and that its value (90.2%) of changes in the dimension cost of Performance of Organization result from changes in the Supply Chain." These findings demonstrate that the second sub-hypothesis of the second main hypothesis is true.

6. RECOMMENDATIONS

In light of the study's findings, the researcher suggests that the private corporation be managed as follows:

- Because the supply chain idea has a good impact on increasing performance on the one hand and ensuring customer loyalty on the other, management must focus on its prompt implementation in the company.
- The importance of conducting a feasibility study for each new method to be applied and a comparison between the costs resulting from this application and the benefits that occurs to the organization as a result of that.
- The importance of the management in the organization to consult other organizations that have applied the modern

methods to be applied in order to benefit from the experience of these organizations and to identify strengths and weaknesses in order to strengthen the first and avoid the second.

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