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RELATIONSHIP BETWEEN GREEN SUPPLY CHAIN AND LEAN SUPPLY CHAIN OF ITS EFFECT ON SUPPLY CHAIN PERFORMANCE: ANALYSIS STUDY AT AL ITTIHAD FOOD INDUSTRIES COMPANY \ BABYLON

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Key Words: Lean Supply Chain Dimensions, Processing Chain Performance, Green Supply Chain Dimensions.

ABSTRACT

The current research aims to identify the relationship between the green supply chain and lean supply chain and its impact on the performance of the processing chain/analytical study at Al Ittihad Food Industries/Babylon, the research adopted the analytical descriptive approach, with the sample being 300. A member of the staff of Al Ittihad Food Industries Company \ Babylon, who has knowledge and skills in their field of work, where their responses were recorded on a set of test items distributed to them in a questionnaire prepared by the researcher to identify the interest and availability of the green supply chain dimensions in the company in question and the performance indicators of a chain Fit in. The results of the statistical analysis of the data showed that there are positive indications of the supply of green processing chain dimensions in Etihad Food Industries/Babylon and that these indicators are important and have a direct impact on improving the performance of the processing chain in Etihad. Therefore, the researcher recommends that companies should move toward environmental protection through awareness of the damage caused by their operations and activities in the environment. The development of the industry should be carried out by increasing attention to the dimensions of the green processing chain, namely design, procurement, green manufacturing, rapid and efficient treatment of waste, dissemination of environmental awareness to consumers and the design of marketing mix for green products according to market requirements.

INTRODUCTION

Many companies are now seeking to adopt and implement modern economic concepts, especially in the conservation of environmental resources, the green processing chain and lean processing chain of concepts that many companies have adopted. These companies have been involved in green process chain operations and the reduction of environmental pollution due to resource scarcity. The green supply chain is the way to understand what it must behave about these causes and their environmental impacts that may be causing a company to be less efficient and less productive, as continued improvement in products and processes creates significant opportunities to prevent it Pollution and waste reduction Green marketing can be used, for example, to reduce resource waste during marketing and direct customers to practice environmentally friendly consumption. This reduces the cost of packaging and recycling, thereby enhancing the social reputation of companies and improving their services and product quality. The process of lean processing chain has also received the attention of companies, as it has emerged as an alternative and effective method to address the impact of resource shortages and to examine and identify the strengths and weaknesses of large production systems in local markets The more the customer is willing to pay, the better the value of the product and the more the logistics of lean supply chain, the more the customer is willing to pay, the more the product will improve the value of the product and create a special feature of the services of lean supply chain. In addition to developing the processes immediately and with the required quality of the products without wasting the input that is different from the traditional process applications.((Kruczek and Zebrucki., 2011: 355 in this research, the relationship between the green supply chain and lean processing chain as economic concepts and approaches adopted by many companies will be discussed and the impact of this relationship on the performance of the supply chain at the Union Food Industries Company in Babylon.

PART ONE: STUDY METHODOLOGY

First: Study Problem:

With business development moving, many companies are now seeking to adopt and implement modern economic concepts, especially in the conservation of environmental resources, green processing chain and lean processing chain of concepts adopted by many companies. When looking agile and green, we see that their time seems to be focused on reducing waste, but their results are toward seeking a more efficient system to reduce the production of unwanted products and the adverse environmental impacts in the entire processing chain and the company's internal processes. The dimensions of the green supply chain are considered an entry point for striking a balance between its dimensions and those of lean supply chain and the competitive requirements of companies. Effective logistics systems can improve the efficiency of different activities such as transport and lower the cost of rotation, while efficient production processes can improve production flexibility, reduce product lifecycle time and make them available to customers more quickly To reduce environmental costs and reduce corporate toxic emissions (JIA and Wang,2019:123). The dimensions that support green

and lean are dimensions and activities that may be somewhat similar in creating an efficient and organized system dedicated to continuous improvement where the concept (green supply chain and lean supply chain) helps It can be said that it is an effective tool to improve operations and minimize waste not only by reducing value-adding activities but also by reducing the material waste the system produces on which the current search problem is determined by the question " What is the relationship between Green supply chain and lean supply chain and what effect do they have on supply chain performance?

Second: Importance of Research

- Current research supports industrial companies' recent approach to adopting a productive philosophy and methods of work that deliver environmentally friendly products through green raw materials and lower energy production processes to reduce the pollution that is today's problem.
- It provides economic and business researchers with a conceptual or conceptual framework for the variables it has addressed, namely the green processing chain, lean processing chain, the performance of the processing chain and the sub-dimensions of each.
- It contributes to building a clear vision among industrial firms' workers about the activities and relationship of the green supply chain and lean supply chain, and its impact and role in improving the performance of the processing chain.

Third: Research Objectives

The current research aims at identifying the green supply chain and its effect on the performance of the supply chain at the Al-Ittihad Food Industries/Babylon Company through answering a number of questions including:

-What is the level of the company's considered implementation of the dimensions of the green supply chain and lean supply chain?
-What are the Correlations between the study variables represented in the green supply chain and lean supply chain and the improvement of the supply chain performance?
-How the dimensions of the green supply chain and lean supply chain affect the performance of the supply chain.

Fourth: Hypotheticals and Research Hypotheses

The research hypothesis chart presents the main idea of research, by showing the relationship of impact and correlation between the independent variable (process chain dimensions and green processing chain dimensions) and the dependent variable (supply chain performance dimensions), as in Figure 1 below.

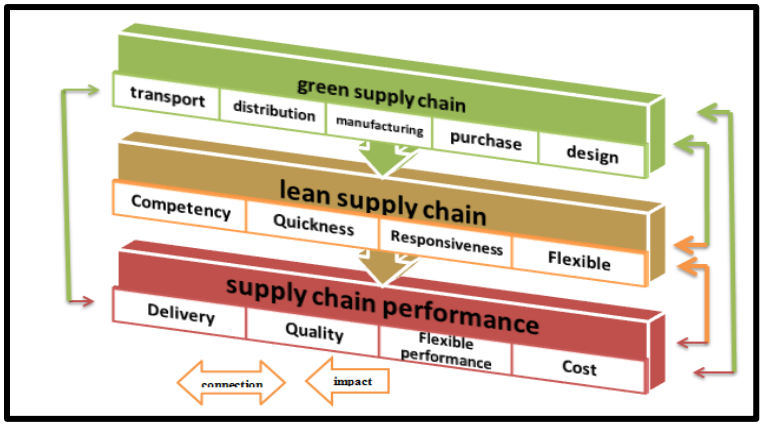

Figure (1) hypsography of the study
Source: Researcher preparation

Correlation Relationship Hypotheses

H_1: There is a significant correlation between the dimensions of the green supply chain combined and the dimensions of lean supply chain combined in the company's study community. The following sub-hypotheses follow from this main hypothesis:

1: There is a significant correlation between the green design and the dimensions of lean supply chain combined in the study community.
There is a significant correlation between the green purchase and the dimensions of lean supply chain combined in the study community.
3: There is a significant correlation between green manufacturing and the dimensions of lean processing chain combined in the study community.
4: There is a significant correlation between the green distribution and the dimensions of lean supply chain combined in the study community.
5: There is a significant correlation between the green transport and the dimensions of lean supply chain combined in the study community.

H_2: There is a significant correlation between the dimensions of the green supply chain combined and the performance of the supply chain in the company's study community. The following sub-hypotheses follow from this main hypothesis:

There is a significant correlation between the green design and the performance of the processing chain in the company's study community.
There is a significant correlation between the green purchase and the performance of the processing chain in the company's study community.
3: There is a significant correlation between green manufacturing and processing chain performance in the company's study community.
There is a significant correlation between the green distribution and the performance of the supply chain in the company's study community.
5: There is a significant correlation between the green transport and the performance of the supply chain in the company's study community.

This is a very important relationship between the dimensions of lean supply chain combined and the performance of the processing chain in the company's study community.
There is a significant correlation between flexibility and performance of the processing chain in the company's study community.
There is a significant correlation between the response and the performance of the processing chain in the company's study community.
3: There is a significant correlation between speed and performance of the processing chain in the company's study community.
There is a significant correlation between efficiency and performance of the processing chain in the company's study community.

Impact Hypotheses

H_4: there is a significant effect between the dimensions of the green supply chain combined and the dimensions of lean supply chain combined in the company's study community. The following sub-hypotheses follow from this main hypothesis:

1 : there is a significant effect between the green design and the dimensions of lean supply chain combined in the study community.
There is a significant effect between green purchase and the dimensions of lean supply chain combined in the company Study Community.
3 : there is a significant impact between green manufacturing and the dimensions of lean processing chain combined in the study community.
There is a significant effect between the green distribution and the dimensions of lean supply chain combined in the study community.
5: There is a significant effect between green transport and the dimensions of lean supply chain combined in the company's study community.

H_5: There is a significant impact between the dimensions of the green supply chain combined and the performance of the supply chain in the company's Study Community. The following sub-hypotheses follow from this main hypothesis:

1 : there is a significant effect between green design and processing chain performance in the company's study community.
There is a significant effect between green purchase and processing chain performance in the company's study community.
3 : there is a significant impact between green manufacturing and the dimensions of lean processing chain combined in the study community.
There is a significant effect between green distribution and supply chain performance in the company's study community.
5: There is a significant effect between green transport and the performance of the supply chain in the company's study community.

H_6: There is a significant impact between the dimensions of lean supply chain combined and the performance of the processing chain in the company's study community. The following sub-hypotheses follow from this main hypothesis:

1 : there is a significant effect between flexibility and performance of the processing chain in the company's study community.
There is a significant effect between the response and the performance of the processing chain in the company's study community.
3 : there is a significant effect between speed and performance of the processing chain in the company's study community.
There is a significant effect between efficiency and performance of the supply chain in the company Study Community.

Fifth: Limits of Research

1 Human borders: Represented by a sample of employees and department managers in the Union Company for Food Industries in Babylon
2 place borders: Represented in the headquarters of the Union Company for Food Industries in Babylon where the research was carried out
3 time limits: The application of the search was extended from 27/12/2021 to 6/2/2022.

Sixth: Society and The Research Sample

- **Research community**: The current research community comprises all workers of the Union Food Industries Company in Babylon (workers, employees, people and unit officials, their assistants and department managers), reaching the research community (1,125).
- **sample**: In its final form, it was comprised of (300) individuals, at 26% of the research community, where the sample size was determined by the equation (Steven Thambson) in (Shmati, 2014:90) described below.
-

$$n = \frac{N * P(1-P)}{\left(N-1 * (D^2 + Z^2)\right) + P(1-P)}$$

whereas:
n = sample size
N = community size
P = probability value equal to 0.05
Z = the standard score corresponding to the significance level (95 (0.
D = error rate equal to 0.05

Seventh: Research Methodology

This is the first time that the research has been based on the study of the problem and the answer to the questions of the research, the researcher has adopted the descriptive analytical method of research.

Eighth: Research Tools and Data Collection Methods:

1 resolution form: Designed with five alternatives (strongly agreed, agreed, neutral, not agreed, strongly disagreed) and measured in accordance with the 5-Laker measure.

2. Documents and records in the Union Company for Food Industries \ Babylon.

Ninth: Stable and True Resolution

1 Stability : Axis, vertebre number, the vacuum coefficient.
2. Apparent honesty: Offering resolution to refereers.
Tenth: Statistical methods: The following statistical methods and methods will be adopted:

1. **frequencies**: to review the answers of the study sample members.
2. **mean**: to display the average answers of the study sample members about the study variables.
3. **Standard deviations**: to find out the dispersion of the answers of the study sample members received from their arithmetic averages
4. **Relative importance**: the percentage of answers of the study sample members to the study variables.
5. **Pearson correlation coefficient** to find out the type and strength of the relationship between of the study variables.
6. **Simple Liner regression** coefficient to determine the effect of the two independent variables (green supply chain) and (lean supply chain) on the dependent variable (supply chain performance).

PART TWO: THEORETICAL FRAMEWORK

First: Green Supply Chain

Concept Of Green Supply Chain

The green processing chain is an effective tool for improving environmental, economic and social performance and for improving long-term relationships between suppliers, customers and producers. The green processing chain is also seen as integrating environmental elements and maximizing the overall environmental benefits by relying on product lifecycle input through product design, choice of materials, manufacturing, sales and recovery period, thereby helping the company achieve sustainable development and improve economic and social performance And Environmental Environment (Guang et al., 2012:54).

The Green supply Chain is an important innovation that helps extend production processes (Shakhar, 2013:247), " a strategic integrated system that takes into consideration green concepts with the supply chain, as I consider it (Luthra et al., 2013: 33) " process involving green purchase dimensions, green manufacturing, green distribution, and reverse supplies in the green supply chain. The concept of a green processing chain also represents environmental principles, which are incorporated into a mechanism to regulate processors and assess their environmental performance and their ability to develop environmentally friendly products. It is the upper and lower flow of raw materials and finished goods and information associated with suppliers, the

company, vendors and end customers (Kotler and Astanong., 2000:354; Hwang and Kim, 2019:4)).

Importance Of Green Supply Chain

a. Implementing green supply chain dimensions results in economic benefits, improved environmental performance and reduced waste
b. Choose an environmentally friendly provider that works on providing raw materials that do not harm the environment Evans, 2009:188).
c. The effective implementation of the dimensions of the green supply chain plays an important role in increasing the competitiveness and economic performance of companies as well as in developing the capacity of companies for environmental performance as well as other dimensions of performance such as cost and quality (Nieemann, 2016:981) (Gandhi et al., 2015:96)
d. Increase opportunities for innovation, continuous improvement of eco-friendly products and new markets for green products (Farahani et al., 2009:20).

Objectives Of Green Supply Chain:

a. Conserving the environment, reducing waste volume, and sustaining natural resources (KADAM,2017:39).
b. Reducing waste while ensuring customer satisfaction and maximizing profits (Lakshmi MEA and Chitraani,2014:1)
c. Achieve high performance and competitive advantage by implementing green supply chain dimensions in industrial sectors and working on green products (ASRAWI,2016:20).
d. Achieving efficiency, increasing market share and reducing environmental risk (AMEMBA et al., 2013:51)
e. Green supply chain offers the right product to the customer at the right cost, format and quantity (Chin et al.,2015:695).

Dimensions Of Green Supply Chain:

A. **Green Design**: It is intended to design products that comply with environmental requirements that take into account environmental safety and health during production processes and product life cycle, and is a common input for changing potentially harmful or hazardous substances or processes with a less hazardous substance or process, and is undesirable when it leads to rapid depletion of scarce resources (Amemba et al., 2013;54). The Green Design Activity is described as the entry that looks at reducing the environmental impact of a product through its life cycle and design process (RYUN, 2010:3), i.e. the design of a good or service that promotes environmental awareness, It aims to design products in a way that reduces resource consumption and energy, emission of hazardous substances, reusable and recyclable product design, recovery of resources, parts and components, and resource efficiency, this is somewhat acceptable when it integrates activities that continuously improve the product's overall environmental performance by Technical innovation and the development of environmentally friendly products, but not acceptable when it leads to the rapid depletion of

rare materials, green design has been named many by the names of sound design (ESD), design for the environment (DFE), and sustainable design (SD). Choudhari and Seth, 2011.4988, confirmed Luthra et at,2013:938; Masoumik Etal.,2015:671), on the importance of leanking about a green eco-product in design, innovation and continuous improvement, through green design, which is one of the main dimensions of the green supply chain, a large proportion of the cost calculated by the product's life is guaranteed and determined at the design stage.

B. **Green Manufacturing:** One dimension of the Green supply Chain, which uses a systematic approach to activities that require less energy consumption, less waste in materials needed for production C, and less environmental pollution Song .,2009:240) (Gao,Li, and. It relies on the use of green energy sources and low energy consumption such as solar energy and waste recycling (reverse supply).also known as green production or eco-manufacturing, which relies on energy saving and consumption reduction, and controls pollution and the entire production process through advanced technology and management to reduce pollution and waste (Huiyu, 2010:17). Green manufacturing aims to continuously improve production processes and manufacture eco-friendly products in order to prevent pollution (water, air, soil) (Routroy., 2009:290)) and it uses low-impact inputs that operate efficiently and minimize waste and pollution, he noted (Adeline and Kusumastuti,2017:5) to a number of indicators that express green manufacturing are as follows:

- Reduce the amount of resources and energy used in the manufacturing process.
- Use the energy-friendly environment that consumes less electricity.
- Reducing the amount of emissions and waste harmful to the environment.

C. **Green purchasing:** It is of great importance in building long-term strategic relationships with providers, and is considered the most effective driving force for companies to work on developing environmentally friendly products and services (General, 2000:219). The basic idea of green procurement is to reduce resource consumption, select the right equipment, select the right materials with little negative impact on the environment, use methods and techniques, and set environmental requirements for the types Procurement and logistical support (technical, financial) for those equipped to achieve environmental objectives (Gabriel, 2016:41). A greater focus is on environmentally conscious dimensions including resource reduction, waste elimination, reuse, recycling, technology and material replacement without affecting physical property (Chen,2012 : 2546). One of the most important reasons for companies to adopt a green purchase according to Hectare et al., 2011:545) is as follows:

- Responding to the needs and desires of customers in the dimensions of environmentally friendly activities.
- Reduce the costs and financial requirements of green supply chain operations.

(Also) Wisner et al., 2012:102)) that green purchasing is a key function with multiple objectives, including material guarantee and other purchases by the Company to meet the manufacturing needs and environmental objectives of the Company.the importance of green purchasing is illustrated by the following: (FUTIou,2007:27)

- To minimize environmental pollution and emissions.
- Improve the competitiveness of firms in local markets and contribute to the creation of new markets.
- Provides markets with new products with low environmental impact and emission.
- Helps increase the recyclability of products in the company.

D. **Green distribution**: Green distribution includes green packaging to reduce the size of packaging, use of green packaging materials, promote recycling and reuse programs, use of reusable packaging methods and use of the warehouse system (Chin et al., 2015:697) Green distribution also includes activities and transportation that aim to improve the environmental performance of the company's Green supply chain by processing the raw materials of Mukonza and Swarts,2019:6) The green distribution consists of green packaging and green logistics, where packing characteristics such as size, shape and materials affect distribution because of their impact on the transport characteristics of the product, and the better packaging, together with different rearranged loading patterns, can reduce material usage, increase storage space usage, and reduce the amount of processing required. (Ninlawan et al., 2010:2).

E. **Green transport:** One of the main activities of the green supply chain operations. (Wang and Lua, 2010:11-12), which aims to increase the amount of products transported or transported at the lowest cost and possible environmental damage during transport or street traffic, which has a positive effect on reducing CO2 emissions. Fuel combustion of transport to integrate the green supply chain and the environmental, economic and social sustainability of the community that serves it. (Schafer, 1998:455-477) companies should implement the green transport system in the short term by taking advantage of off-peak times, redefining the number of trucks for road transport, identifying less congested roads, establishing a centralized storage and distribution area, or creating an interlocking distribution network. (Cazzaniga and Foschi, 2002:222),

Second: Lean Supply Chain:

Concept Of Lean Supply Chain:

Lean (Sezen &Frdogan.,2009:70) processing chain is a well-designed series to deliver products quickly to the end customer while minimizing waste and responding to change, and the agility of the supply chain is a catalyst for the company that strives to become more efficient and agile, and that companies that use the agility of their supply chain are able to Provide better value to the customer by being able to respond efficiently to the needs and needs of the customer. Womack et al. 1994:16 (Womack et al. 1994:16) also introduced a

concept for a lean processing chain that focused on the added value of the customers that provide quick response to their demands and eliminate the waste of resources in all its forms to ensure the smooth operation of the company and the matching of production operations with the demand for products (Bruce and Lucy Daly., 2004:53), lean processing chain: It is a business system for organizing and developing products, processes, equipment and customer relations that requires less human effort, less space, less capital invested in equipment, less time to deliver products with less defects and to satisfy the customers' needs and desires than the wide production system.

Importance Of Lean Supply Chain:

The importance of lean supply chain is:

a. To eliminate or at least reduce waste in any way.
b. Establish cooperative relationships with partners while achieving balance, cooperation and competition.
c. Eliminate bottlenecks.
d. Increasing capabilities .
e. Increase customer satisfaction
f. Improve communications.
g. Limit cycle time.
h. Reduce storage through lean supply chain.

1- **Reasons and motives for lean supply chain**

There are several reasons that led the companies to adopt lean supply chain.

a. The need for improved operations: Due to technological developments, companies have adopted the dimensions of lean processing chain, which has resulted in improved quality levels, as well as reduced business costs to achieve added value and maximize benefits for the benefit of customers and the company.
b. Increasing external processing levels: Companies increase their purchasing of materials and other components from external sources rather than production, as companies spend a large amount on processing and related activities such as packaging, packaging and sorting.
c. The spread of globalization: The spread of globalization extends the physical scope of the processing chain as the global processing chain faces many obstacles (after the clients, long waiting times for the processors, the spread of quick delivery opportunities, different circulation, financial volatility factors, cultural and language differences) and others.
d. Competition pressures: Competition pressures lead to increasing the number of new products, shortened product life cycle and increasing demand for original products, which leads some industrial companies to adopt rapid response strategies and reduced waiting times.
e. The need for inventory control: Inventory plays a key role in the success of the supply chain, as well as the importance of coordinating stock levels throughout the supply chain.

Dimensions Of Lean Supply Chain

Flexible

Means the ability of the agile supply chain to provide products and services in a timely and cost-effective manner for a changing and fast-changing environment (Aziati et al.,2018:5), and that a flexible system must be able to change in order to deal with a changing environment (Schurig,2016:18). The principle of flexibility is based on the use of methods and equipment that enable them to perform a variety of tasks under a variety of working conditions (min.,2015:191).flexibility in the agile supply chain gives companies the ability to respond purposefully to environmental changes and uncertainty and contribute to the development of quality products and services. Sabegh et al.,2019:37) there are several types of flexibility, as follows: Behrouzi and Yew Wong.,2012:10) (Lima, Drohomeretski., 2012:10))

a. Size flexibility: The ability of a company to change the flexibility of production (increase or decrease) to accommodate changes or fluctuations in the level of customer orders.
b. Product mix flexibility: Means the ability of the producer to offer a wider range or variety of products to its customers.
c. Flexibility of delivery: Means the ability of the company to deliver products at different times in response to the demands of the end customers.

Quickness

A company's responsiveness to customers is essential to success, a measure of company performance evaluation and a key competitive advantage that depends on customer satisfaction both now and in the future. (Krajewsky et al .,2010:15)

The speed dimension can be defined as the ability of a company to adapt to changes in the environment and the market quickly, efficiently and in a timely manner, and the ability to adjust the mix and quantity of products to the desired quality, and the speed of response is the company's ability to cope with external disturbances easily and intuitively, remote sensing and more responsive Because they are able to quickly meet demand in peak situations (Leifan and Hua Yi., 2012:3269) adds (slack et al. , 2007:403) the goal of rapid response is to meet the basic requirements of end customers by delivering the right goods in demand, in quantity and quality required and at a competitive cost.

Responsiveness

The concept of response is defined (qrunfleh, 2010: 51) as " the ability of a company to respond in a timely manner to meet the needs and desires of its customers". Hayat et al2012:346) described it as " the company's ability to react to changing customer needs and desires or circumstances ". " The output

from the process of the supply chain to provide the greatest customer service in terms of product quality, quantity and time required for the production and delivery of products in a timely manner, " said Beamon. Hayat et al., 2012:350) explained that the goal of the response is to deliver on time, reduce costs through the chain, and accurately inform the prediction of demand. Rapid response requires the ability to identify, respond to and recover from changes. In this way, there are three common sub-capabilities to respond: Identifying change, then reacting to change, and recovering from change (Jarlid and Soderberg., 2015:15).

***Competency*:**

The adequacy of the supply and demand side is the main asset that enables the consolidation of lean processing chain and as an important capacity that can lead to competitive advantage, because lean processing chain requires an unusual combination of competencies. Finance, and it (to create value for processors, manufacturers and customers (Flothmann et al., 2018:1)

" we are not satisfied with the requirements of the customer, " he said, adding that the basic objective of the customer is to meet the requirements of the product or service of a particular customer's status, while providing other value-added services. While the supply control capability includes different processes related to raw material (such as cost optimization at different stages such as this enables the company to eliminate waste by effectively controlling time and allocating resources, thus facilitating the agile processing chain to meet customers' needs (Mandal.,2017:357;Mandal:2015:244)

THIRD: SUPPLY CHAIN PERFORMANCE

Concept Of Supply Chain Performance

(Kim, 2004:38) is seen as the integration of key business processes, which include the provision of products, services and information by suppliers to customers in such a way that the customer and the parties involved receive value added. (Beamon, 1999:275) believes that there are a number of performance measures used to measure the efficiency of the company, which achieves effectiveness and benchmark comparison among companies. Performance measurement is important in achieving competitive advantage and continuous improvement among companies, as companies focus on determining the necessary performance standards for the processing chain with several factors to be considered: Quality, service, cost, and wait time (Zhang and Liu, 2008:1). (Sonia et al.,2008:1) The process chain performance measurement is the process of measuring the real business performance in the company environment to develop plans, programs, processes and continuous improvement through specific criteria such as creativity, cost, customer, quality, etc. and physical monitoring of the arrival of the end product to the customer.

Importance Of Supply Chain Performance

(Mentzer,2003:459) believes that implementing and improving the performance of the enterprise supply chain benefits in several areas:

a. Reduction in the cost of processing and capital costs .
b. Increase market share and sales .
c. Increase the profit margin of the products and increase the company's cash flows.
d. Increase the efficiency of manufacturing at all levels and accomplish business in an excellent manner.
e. Enhance customer contact and acquisition.
f. Achieve operational excellence and increase the company's market value.

Dimensions Of Supply Chain Performance

a. **Cost:** Providing a service or product at the lowest possible cost to the satisfaction of the company's customers requires it to design and operate operations to make them effective by using accurate analysis of processes, labor processing, methods used, waste or rework, overhead, and other factors such as investments in automated facilities or technology to lower the cost per unit of The producer (Homgren et al., 2000:463), expressed (Ferry et al., 2007:20) as efficient, which includes the costs of waste, storage costs, transport costs, labor and profit. It also referred to it (LITTE, 2010:3) as " Sales, demand Planning, Scheduling, Purchase, Wholesalers, Stock circulation, and Rate of return for Storage and Transportation". (Halme, 2012:26) describes it as " a feature that describes the operating cost of a process and includes labor, material, transport costs ", that the processing chain costs can be direct or indirect, fixed or variable, short-term or long-term, Companies must offer some sort of cost adjustment between the characteristics of their products and services and, in general, most companies choose to reduce total costs in order to lower employee compensation rates and achieve higher levels of productivity (Abou-MOGHLI et al., 2012:4)

b. **Flexibility:-** refers to how fast the processing chain performs in responding to changes in the external environment, random market fluctuations, and the ability to change based on customer requirements (Shafiee et al.,2014:21) as defined by Mogeni,2016:2224) as the ability to respond to uncertainty about size, distribution, and response related to the new product. This is essential in building a sustainable competitive advantage in a turbulent market, reducing the impact of uncertainty over the performance of the supply chain by helping companies to introduce new products that quickly support rapid product allocation, reducing the time period in manufacturing and reducing the cost of customized products, The company's performance is therefore improved and its products are delivered in a timely manner (Porter, 2011:195) and there are several areas in which flexibility can be shown, as follows:

- Product flexibility: Ability to respond to changing customer needs through new product designs.

- In the case of the first two years of the year, the number of people in the world has increased by more than one year.

Flexibility can be the company's ability to deliver a variety of products at the right time, its ability to develop existing products and improve its processes to deliver new products that meet the needs and desires of our customers (2016:120).

c. **Quality:** It is an integrated approach to achieve and maintain high quality production with a focus on maintenance, continuous improvement of operations and prevention of defects at all levels and in all company functions in order to meet or exceed customer expectations (Beckman and Sinha, 2005:115), and quality can be achieved through two dimensions, One is design quality, which means adapting product design to its function, and the other is the matching quality, which represents the company's ability to convert inputs into outputs according to the specific design characteristics (Abou-MOGHLI et al.,2012:4) Quality is critical to the success of many public or private industrial or service companies as a key pillar for achieving competitive advantage (Alghamdi,2016:145). It is also able to deliver products at a cost and zero defects, ensure that the company is discriminated against in the current market competition, and represent the overall qualities and characteristics of the product that meet the requirements of the customers.it is therefore an important factor for the company's survival, growth and competitiveness (Al-Najjar, 2016:120). It means the degree of excellence in a particular good or service offered by Chamsuk et al.,2017:103).

d. **Delivery**:- Delivery is defined as the time lost from the date of receipt of the order from the supplier to the receipt of the product ordered by the customer, the Delivery Timeout (the waiting period) consists of several sub-strings including the internal delivery in each of the supplier's departments and the external delivery time associated with the transfer of the final product to the customer (Lockamy and McCormack, 2004:1192), early or late deliveries can result in the introduction of products in the form of excess cost in the performance of the supply chain. Early deliveries contribute to increased inventory retention costs while late deliveries contribute to increased downtime costs and loss of a company's reputation in the business market. Delivery is also viewed as the total delivery time the activity requires from start to finish as companies can consider delivery To compete with each other this may include (Abou et al., 2012:4)

- Delivery time, which is a reflection of the efficiency of processing chain performance and a source of competitive advantage when companies try to reduce the time between receiving and accepting customer orders.
- Delivery is the standard for companies to comply with delivery schedules previously agreed with customers.

Delivery can be measured by time delay or operating speed at the time specified between a customer's order for a particular product and then the receipt of that product. Delivery can therefore be used as a competitive factor to reduce the costs of any better customer service (Porter, 2011:13).

PART THREE: PRACTICAL FRAMEWORK

First: Encode the Measurement Tool and Display Its Most Important Tests

The study community is a factor (1125) and therefore the study sample covered (292) a factor in the sample concerned, so the researcher tabbed the data and classified them according to the statistical package of the program (SPSS.V.27&AMOS.V.26) in order to extract the required results, in addition to the description of the survey statistics and the interpretation of the study results through the mathematical circles, the relative importance of the standard deviations of the study paragraphs. The second section of this chapter examined the relationship between the study variables and the measurement of the modeling of the structural equation and the response of the adopted variable to the improvement of the individual variables, and for the purpose of facilitating the statistical analysis process, the variables included in the study were substituted by a set of symbols and acronyms shown in Table 1.

Table (1) Encoding of the measurement tool axes

variables	**dimensions**	**No.**	**Cod**	
green supply chain	green design	5	GA	GSC
	green purchase	5	GB	
	green manufacturing	5	GC	
	green distribution	5	GD	
	green transport	5	GEE	
lean supply chain	Flexible	5	LA	LSC
	Quickness	5	LB	
	Responsiveness	5	LC	
	Competency	5	LD	
supply chain performance	Cost	5	PA	PSC
	Flexible performance	5	PB	
	Quality	5	PC	
	Delivery	5	PD	

Second: Analysis of normal distribution

A normal distribution of study data should be made available when analyzing, and this assumption can be verified by using the Kolmogorov-smirnov test as well as by graphs. If the values are similar to the bell shape, then the data drawn from the studied sample follows the normal distribution. This is explained by the forms of natural distribution of data for the dimensions used in the study, which represent an extension of the results of the natural distribution shown in Table 2. In addition, the acceptance and rejection of the subordination of data to the test of natural distribution depends on two hypotheses:

Zero hypothesis: Data drawn from the sample studied follows the normal distribution at a sign level greater than (0.05).

Alternative hypothesis: Data drawn from the sample studied does not follow the normal distribution at a sign level less than (0.05).

Table (2) the normal distribution of study dimensions and variables

variables	**Kol-Smi**	**df**
green design	0.151	**292**
green purchase	0.155	**292**
green manufacturing	0.114	**292**
green distribution	0.164	**292**
green transport	0.170	**292**
green supply chain	**0.204**	**292**
Flexible	0.179	**292**
Quickness	0.145	**292**
Responsiveness	0.152	**292**
Competency	0.187	**292**
lean supply chain	**0.199**	**292**
Cost	0.193	**292**
Flexible performance	0.198	**292**
Quality	0.193	**292**
Delivery	0.200	**292**
supply chain performance	**0.188**	**292**

Source: results of SPSS.V.27

The results of the table (2) show that the data in the analysis follows normal distribution and this is because the intangible value of the tests is higher than (0.05), which indicates that the data in the analysis is subject to the normal distribution test and that the alternative hypothesis that requires that is rejected (Data for variables and dimensions in an analysis are not tested for normal distribution.) a zero hypothesis is accepted that (data for variables and dimensions in an analysis are tested for normal distribution.) Figure () also shows that the study data followed the normal distribution in terms of its bell shape in its normal course

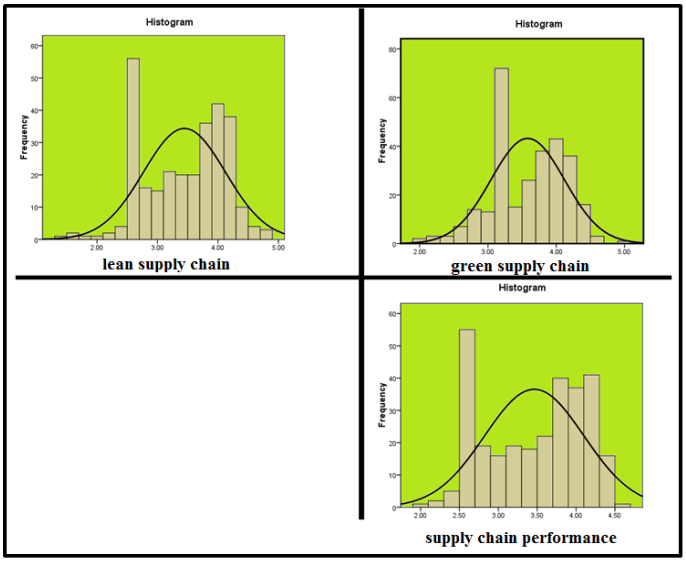

Figure (2) the normal distribution curves of study variables
Source: Researcher preparation based on the outputs of SPSS.V.27

Third: Test the Measuring Tool

This paragraph is concerned with measuring the integrity of the study tool by testing the validity and stability that will ensure accurate and objective results toward the paragraphs that have been developed to measure the study variables, as follows: -

Study Tool Ostensible Validity:

The apparent validity indicates that the resolution measurement tool must be presented to a group of experts in order to evaluate, refine, and judge the tool in order to appear more accurately appropriate to the target sample. Therefore, after the measurement tool has been distributed to a group of experts, according to which agreement reached 75% on the reformulation of some of the items of the tool to be better reflected, which were presented in Annex 1.

Thresher Measurement Tool Stability

Stability is the extent to which the measurement is free of bias or error, and this ensures that the results obtained from the measurement are consistent and stable over different time periods, as stability indicates consistency of the scale of study and stability of the results obtained from the scale over different time periods. The structural stability of the measuring tool is verified by the use of the alpha-kronbach test and the alpha-kronbach value must be higher than (0.70) to be accepted, and the stability coefficient of the tool has been calculated using the alpha-kronbach correlation coefficient to show the stability of the study variables, as in Table (3).

Table (3) alpha coefficients of study variables

variables	**dimensions**	**No.**	alpha coefficients	
green supply chain	green design	5	0.772	0.862
	green purchase	5	0.740	
	green manufacturing	5	0.793	
	green distribution	5	0.797	
	green transport	5	0.782	
lean supply chain	Flexible	5	0.763	0.862
	Quickness	5	0.755	
	Responsiveness	5	0.775	
	Competency	5	0.796	
supply chain performance	Cost	5	0.826	0.829
	Flexible performance	5	0.814	
	Quality	5	0.828	
	Delivery	5	0.813	

The results in Table 3 for alpha-chronbach coefficients indicate that all study variables dimensions range from 0.740 to 0.828, which are statistically acceptable values in administrative and behavioral research because their value is greater than the required standard, and the study measurement tool is relatively stable. This is the same as the persistence of study variables by (0.862) for the green supply chain variable, lean supply chain, and (0.829) for the performance variable of the supply chain, so it can be said that the measurement tool can be highly stable in the interest of the sample studied and achieve its intended objectives.

FOURTHLY: TEST AND ANALYZE STUDY HYPOTHESES

First: Test Correlation Hypotheses

This paragraph is concerned with measuring the Correlation between the green supply chain and lean supply chain and the performance of the supply chain by using the Sperman Correlation based on (AgunBiade & Ogunyinka standard, 2013:314) in order to determine the strength and type of the relationship between the study variables, as shown in Table (4).

Table (4) scale criterion for the power of a coefficient of a Correlation

degree of correlation	**strength of correlation**
1.00-.90	very strong
. 90-.70	strong
.70 -.50	moderate
.50-.30	low
.30-.00	very low

Source: Agunbiade, Dawud Adebayo & Ogunyinka, Peter I. , 2013 ," Effect of Correlation Level on the Use of Auxiliary Variable in Double Sampling for Regression Estimation " Open Journal of Statistics, NO. 3, ,.p 314.

The correlation matrix (5) results show a correlation between study variables, which can be explained as follows:

H1: Statistically significant correlation between the green supply chain and the performance of the supply chain.

The results of table 5 indicate that there is a strong, statistically significant correlation between the green supply chain and the performance of the supply chain (0.927), which, according to the assessment of Agunbiade et al., 2013), is very strong. The strength of the Correlation toward the dimensions of the performance of the supply chain ranged from 0.843 for the performance flexibility to 0.859 for the cost dimension, indicating the interest of the studied sample in improving their flexibility in using knowledge, experience, and skills flexibly to improve their supply chain performance.

1: There is a statistically significant correlation between the green design dimension and the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery).
The results of the table (5) show a statistically significant correlation between the green design dimension and the performance of the supply chain and a strong (0.815), which is somewhat strong according to the assessment (Agunbiade et al.,2013), and the strength of the Correlation to the performance dimensions of the supply chain ranged from 0.687 for the delivery to 0.923 for cost dimension. He pointed out the interest of the studied sample in developing its ability to deliver the required products according to the design desired by the customer and to meet its requirements and satisfy its desires.
2: There is a relation of moral statistical significance between the green purchase dimension and the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery).
The results of the table () show a statistically significant correlation between the green purchase dimension and the performance of the supply chain and a strong correlation (0.864) according to the evaluation of Agunbiade et al.,2013). He pointed out that the sample was focused on providing high quality products in order to ensure a significant improvement in the performance of their supply chains.
3: A statistically significant correlation between the green manufacturing dimension and the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery).
The results of table 5 show a statistically significant correlation between the green manufacturing dimension and the performance of the supply chain with a strength of 0.764, and the strength of the Correlation toward the performance dimensions of the supply chain ranged from 0.627 for the performance flexibility to 0.873 for the quality dimension. He pointed out that the studied sample focused on the flexibility of its performance in order to improve its ability to adapt to different environmental changes.
4: A relation of moral statistical significance between the green distribution dimension and the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery).
The results of table 5 show a statistically significant correlation between the green distribution dimension and the performance of the supply chain and a

strong (0.873), which, according to the evaluation of Agunbiade et al.,2013, is strong. He pointed out the interest of the studied sample in developing its capabilities in order to ensure a green distribution of its products by reducing costs and delivering products in the right place and time.

5: There is a relation of moral statistical significance between the green transfer dimension and the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery).

The results of table 5 indicate a statistically significant correlation between the green transfer dimension and the performance of the supply chain and a strong (0.817), which is, according to the assessment of Agunbiade et al., 2013). The strength of the Correlation toward the performance dimensions of the supply chain ranged from (0.723) to (0.779) for the performance flexibility dimension to (0.779) for the quality dimension, indicating the interest of the studied sample in making improvements in tandem with environmental changes by ensuring the delivery of high-quality products through the use of easy and secure green transportation methods.

Table (5) correlation matrix between green supply chain and supply chain performance

	Cost	Flexible performance	Quality	Delivery	**supply chain performance**
green design	.923**	.695**	.701**	.687**	.815**
green purchase	.755**	.924**	.725**	.762**	.864**
green manufacturing	.651**	.627**	.873**	.662**	.764**
green distribution	.761**	.762**	.771**	.915**	.873**
green transport	.758**	.723**	.779**	.744**	.817**
green supply chain	.859**	.843**	.857**	.849**	.927**

H2: A statistically significant correlation between lean supply chain and the performance of the processing chain.

The results of table 6 show that there is a strong, statistically significant correlation between lean supply chain and the performance of the processing chain (0.816). The strength of the Correlation toward the dimensions of the performance of the supply chain ranged from (0.696) to (0.796) for the performance flexibility dimension to (0.796) for the cost dimension, indicating the focus of the studied sample on improving the flexible supply chain performance in order to enhance the flexibility of the supply chain.

1: There is a correlation of moral statistical significance between the flexibility of processing and the performance of the processing chain of its dimensions (cost, flexibility of performance, quality, and delivery).

The results of the table (5) indicate a statistically significant correlation between the processing flexibility and the performance of the processing chain and a strong (0.599), which is moderate according to the assessment

(Agunbiade et al.,2013), and the strength of the Correlation to the performance dimensions of the processing chain ranged from (0.523) to (0.583) for the performance flexibility dimension.

2: There is a correlation of moral statistical significance between the speed dimension and the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery).

The results of the table (6) show a statistically significant correlation between the speed dimension and the performance of the supply chain and a strong (0.783). He pointed out that the studied sample focused on the speed of responding to customers' requirements by improving performance flexibility and delivering these requirements on time.

3: There is a correlation of moral statistical significance between the response dimension and the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery).

The results of table (6) have resulted in a strong, statistically significant correlation between response and supply chain performance (0.765), which, according to the assessment of Agunbiade et al., 2013), is strong. The strength of the correlation toward the dimensions of the performance of the supply chain ranged from (0.662) to (0.726) for the performance flexibility dimension to (0.726) for the quality of the quality of the products required by the market, pointing out the interest of the studied sample in responding to the specifications of the products required by the market through focusing on the quality of the raw materials in order to be introduced into the manufacturing process and reducing waste.

4: There is a correlation of moral statistical significance between the adequacy dimension and the performance of the processing chain with its dimensions (cost, flexibility of performance, quality, and delivery).

The results of the table (6) show a statistically significant correlation between the adequacy dimension and the performance of the processing chain and a strong (0.738), which according to the evaluation of Agunbiade et al.,2013), and the strength of the Correlation to the dimensions of the performance chain performance range ranged from 0.604 for the performance flexibility to 0.764 for the cost dimension.

Table (6) correlation matrix between lean supply chain and the supply chain performance

	Cost	Flexible performance	Quality	Delivery	**supply chain performance**
Flexible	.583**	.523**	.548**	.549**	.599**
Quickness	.737**	.678**	.723**	.742**	.783**
Responsiveness	.720**	.662**	.726**	.705**	.765**
Competency	.764**	.604**	.688**	.663**	.738**
lean supply chain	.796**	.696**	.760**	.753**	.816**

H3: A statistically significant correlation between the green supply chain and lean supply chain

The results of Table 7 show a statistically significant correlation between the green supply chain and lean processing chain, which is strong according to the assessment of Agunbiade et al.,2013; The strength of the Correlation toward the dimensions of lean supply chain ranged from 0.672 for the flexible processing dimension to 0.842 for the speed dimension, pointing out that the studied sample concentrated on using the green supply chain quickly in order to ensure that the raw materials are used in a flexible manner and minimize waste as possible. Several sub-hypotheses come from this hypothesis:

1: There is a statistically significant correlation between the dimension of the green design and lean processing chain in its dimensions (processing flexibility, speed, response, and efficiency).

The results of the table (7) show a statistically significant correlation between the green design dimension and lean processing chain (0.809), which is strong according to the assessment (Agunbiade et al.,2013), and the strength of the Correlation to lean supply chain dimensions ranged between (0.684) of the processing flexibility dimension to (0.744) of the response dimension.

2: The existence of a statistically significant correlation between the green purchase dimension and lean processing chain in its dimensions (processing flexibility, speed, response, and efficiency).

The results of the table (7) show a statistically significant correlation between the green purchase dimension and lean supply chain with strength (0.758) the strength of the Correlation toward the dimensions of lean supply chain ranged between (0.534) the processing elasticity dimension to (0.742) the speed dimension, indicating the interest of the studied sample in purchasing the least harmful substances in the environment and processing Suppliers of materials are quickly finished to cover as much market space as possible.

3: A statistically significant correlation between the green manufacturing dimension and lean processing chain of its dimensions (processing flexibility, speed, response, and efficiency).

The results of Table 7 show a statistically significant correlation between the green manufacturing dimension and lean processing chain with a strength of 0.766, which, according to the assessment of Agunbiade et al.,2013, is strong. The strength of the Correlation toward the dimensions of lean supply chain ranged from (0.636) to (0.750) for the response dimension, indicating the focus of the studied sample on providing raw materials that meet the adequacy of their manufacturing requirements in order to meet customer requirements as much as possible.

4: A statistically significant correlation between the dimension of the green distribution and lean processing chain of its dimensions (processing flexibility, speed, response, and efficiency).

The results of table 7 show a statistically significant correlation between the green distribution dimension and lean processing chain with a strength of 0.820 (Agunbiade et al.,2013), and the strength of the Correlation toward lean supply chain dimensions ranged between 0.562 for the processing flexibility dimension to 0.812 for the speed dimension.

5: A statistically significant correlation between the green transport dimension and lean processing chain of its dimensions (processing flexibility, speed, response, and efficiency).

The results of table 7 show a statistically significant correlation between the green transport dimension and lean processing chain with a strength of 0.827 (Agunbiade et al.,2013), and the strength of the Correlation to lean supply chain dimensions ranged from 0.590 for the processing flexibility to 0.792 for the speed dimension.

Table (7) Correlation matrix between green supply chain and lean supply chain

	Flexible	Quickness	Responsiveness	Competency	**lean supply chain**
green design	.684**	.735**	.744**	.709**	.809**
green purchase	.534**	.742**	.714**	.686**	.758**
green manufacturing	.666**	.679**	.750**	.636**	.766**
green distribution	.562**	.812**	.762**	.753**	.820**
green transport	.590**	.792**	.788**	.750**	.827**
green supply chain	.672**	.842**	.838**	.791**	.888**

Second: Test the hypotheses of effect

This section is concerned with testing pre-determined Impact hypotheses for the purpose of determining whether they can be judged by acceptance or rejection as described in the following paragraphs:

Key hypothesis 4: There is a significant impact relationship to the dimensions of the green supply chain (green design, green purchase, green manufacturing, green distribution, green transfer) and the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery), as these will be investigated according to the multiple linear regression equation as follows:

$$Y = a + \beta_1 GA + \beta_2 GB + \beta_3 GC + \beta_4 GD$$

whereas:

A represents the slope parameter
β is the value of the beta coefficient
Y represents supply chain performance
Thus, the levels of impact among the variables will be analyzed by testing the fourth key hypothesis. Table () shows that the statistical indicators between the green processing chain and the performance of the processing chain are as follows:

$$Y = a + \beta_1 GA + \beta_2 GB + \beta_3 GC + \beta_4 GD + \beta_5 GE$$
$$Y = 0.117 + 0.207\ GA + 0.304\ GB + 0.162\ GC + 0.319\ GD + 0.041\ GE$$

Based on the regression equation referred to above, several fundamental points may be identified, the most important of which are:

1. The calculated value of F for the model is 373.707, which is higher than the tabular value of 1.879 at a sign level equal to 0.001, i.e., with a significant value of 0.05, and based on this, the alternative hypothesis (having a significant Impact relationship to the dimensions of the green processing chain (green design, green purchase, green, In addition to the above, the Durban-Watson test (1.660) shows that there is no linear relationship between the dimensions of a single variable because it is close to 2).
2. The value of the determinant factor (R) shows the contribution of the green processing chain to the interpretation of (0.859) of the changes and issues that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits and model of the current study.
3. The β1-bound coefficient contributed to explaining (0.207) the performance of the supply chain, meaning that increasing the green design by one-unit results in an improvement of (21%) the performance of the supply chain. The Green Purch dimension (β2) LPF also contributed to explaining (0.304) the supply chain performance, meaning that a 1-unit green purchase increase leads to an (30%) improvement in the performance of the processing chain. The Green Manufacturing dimension (β3) has contributed to explaining (0.162) the performance of the supply chain, meaning that an increase in green manufacturing by one-unit results in an improvement of (16%) the performance of the processing chain. The β4 dimension's binomial coefficient contributed to explaining (0.319) the performance of the supply chain, meaning that an increase in the green distribution by one-unit results in an improvement of (32%) the performance of the processing chain. Finally, the β5 bound coefficient contributed to explaining the performance of the processing chain, meaning that an increase of one unit of green transport results in an improvement of (4%) the performance of the processing chain.

Table (8) the effect of the green supply chain on the performance of the supply chain using multiple linear regression

variables		**green supply chain in supply chain performance**
	Constant	**0.117**
green design	β_1	**0.207**
green purchase	β_2	**0.304**
green manufacturing	β_3	**0.162**
green distribution	β_4	**0.319**
green transport	β_5	**0.041**
Correlation coefficient value	**R**	**0.927**
Selection parameter value	$\mathbf{R^2}$	**0.859**
F calculated value		**373.707**
F tabular value		**1.879**
	Sig.	**0.000**
Significance level at 0.05		**moral**
Durban Watson Value		**1.660**

The nature and type of relationship between the dimensions of the green supply chain on the performance of the supply chain can also be explained by the following subassumptions:

1: The green design has a significant impact on the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery), as the analysis will be carried out according to the simple linear regression model, as follows:

$Y = a + \beta (GA)$
$Y = 0.243 + 0.909 (GA)$

The explanation of the regression equation above provides a set of important results:

1. The calculated value of the model is 574,563, which is higher than the tabular value of 1.879 at a sign level equal to 0.001, i.e. a significant value of 0.05, and based on the above the alternative hypothesis (the presence of a significant Impact relationship of the green design in the performance of the processing chain at its dimensions is accepted (Cost, performance flexibility, quality, and delivery) in addition to the above, the Durban-Watson test was worth (1,630), which shows that there is no linear relationship between the dimensions of one variable because it is close to (2).
2. The value of the determinant parameter (R) shows the contribution of the green design to the interpretation (0.665) of the changes and issues that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits of the current study model.
3. The Green Design dimension (β) border slope coefficient shows that an increase in the green design by one-unit results in an improvement of (91%) the performance of the supply chain.
4. The regression parameter is 0.243, indicating that the green design is equal to zero, so the performance of the supply chain will not be less than this value.

There is a significant Impact relationship between the green purchase and the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery), as the analysis will be carried out according to the simple linear regression model, as follows:

$Y = a + \beta (GB)$
$Y = 0.860 + 0.767 (GB)$

The explanation of the regression equation above provides a set of important results:

1. The calculated value of (F) for the estimated model is (854.906) higher than the tabular value of (1,879) at a sign level equal to (0.001), i.e., with a significant value of (0.05), the alternative hypothesis (the presence of a significant Impact relationship for green purchase in the performance of the processing chain at its dimensions is accepted (Cost, performance flexibility,

quality, and delivery) in addition to the above, the Durban-Watson test was worth (1.997), which shows that there is no linear relationship between the dimensions of one variable because it is close to (2).

2. The value of the determination factor (R) shows the contribution of the green after purchase to the interpretation (0.747) of the changes and issues that limit the improvement of the processing chain performance, and the residual value is due to variables outside the limits and model of the current study.
3. The Green Pitch (β) parameter shows that a 1-unit increase in green purchase results in an improvement of (0.767) supply chain performance.
4. The regression parameter is (0.860) indicating that the green purchase is equal to zero, so the supply chain performance will not be less than this value.

3: There is a significant Impact relationship of green manufacturing to the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery), as the analysis will be carried out according to the simple linear regression model, as follows:

$Y = a + \beta (GC)$
$Y = 0.364 + 0.869 (GC)$

The explanation of the regression equation above provides a set of important results:

1. The calculated value of (F) for the estimated model is 405.399, higher than the tabular value of (1,879) at a sign level equal to (0.001), i.e., with a significant value of (0.05), the alternative hypothesis (the presence of a significant Impact relationship of green manufacturing in the performance of the processing chain at its dimensions is accepted (Cost, performance flexibility, quality, and delivery) in addition to the above, the Durban-Watson test was worth 1,621, which shows that there is no linear relationship between the dimensions of one variable because it is close to (2).
2. The value of the determinant parameter (R) shows the contribution of the green manufacturing post to the interpretation (0.583) of the changes and issues that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits of the current study model.
3. The Green Manufacturing dimension (β) border slope coefficient shows that an increase in green manufacturing by one unit results in an improvement of (0.869) the performance of the supply chain.
4. The regression parameter is (0.364) indicating that the green manufacturing is zero, so the performance of the supply chain will not be less than this value.

4: There is a significant impact on the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery), as the analysis will be carried out according to the simple linear regression model, as follows:

$Y = a + \beta (GD)$
$Y = 0.651 + 0.823 (GD)$

The explanation of the regression equation above provides a set of important results:

1. The calculated value of (F) for the estimated model is (926,463) higher than the tabular value of (1,879) at a sign level equal to (0.001), i.e., with a significant value of (0.05), the alternative hypothesis (the presence of a significant Impact relationship of the green distribution in the performance of the processing chain at its dimensions is accepted (Cost, performance flexibility, quality, and delivery) in addition to the above, the Durban-Watson test was worth (0.1784), which shows that there is no linear relationship between the dimensions of one variable because it is close to (2).
2. The value of the determinant parameter (R) shows the contribution of the green design dimension to the interpretation of (0.762) of the changes and issues that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits of the current study model.
3. The binomial coefficient of the green distribution dimension(β) shows that an increase in the green distribution by one-unit results in an improvement of (0.823) the performance of the supply chain.
4. The regression parameter is (0.651) indicating that the green distribution is equal to zero, so the performance of the supply chain will not be less than this value.

5: There is a significant Impact relationship between the green transport in the performance of the processing chain and its dimensions (cost, flexibility of performance, quality and delivery), as the analysis will be carried out according to the simple linear regression model, as follows:

$Y= a + \beta (GE)$
$Y= 0.448 + 0.878 (GE)$

The explanation of the regression equation above provides a set of important results:

1. The calculated value of the model is 580.647, which is higher than the tabular value of 1.879 at a sign level equal to 0.001, i.e. a significant value of 0.05, and based on the above the alternative hypothesis (the presence of a significant Impact relationship of the green transport in the performance of a series of its dimensions is accepted (Cost, performance flexibility, quality, and delivery) in addition to the above, the Durban-Watson test was valued at 1,641, which shows that there is no linear relationship between the dimensions of one variable because it is close to (2).
2. The value of the determination factor (R) shows the contribution of the post-green transfer to the interpretation of (0.667) of the changes and issues that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits and model of the current study.
3. The β (Green Transport dimension) border slope coefficient shows that an increase in green transport by one unit results in an improvement of (0.878) the performance of the supply chain.
4. The regression parameter is 0.448, indicating that the green transfer is equal to zero, so the performance of the supply chain will not be less than this value.

Table (9) consequences of the effect of the dimensions of the green supply chain on the performance of the supply chain

supply chain performance							
	Constant	**β**	**R^2**	**F calculated value**	**F tabular value**	**Sig.**	**Durban Watson Value**
green design	0.243	0.909	0.665	574.563	1.879	0.000	1.630
green purchase	0.860	0.767	0.747	854.906			1.997
green manufacturing	0.364	0.869	0.583	405.399			1.621
green distribution	0.651	0.823	0.762	926.463			1.784
green transport	0.448	0.878	0.667	580.647			1.641

Source: Prepared by the researcher based on the SPSS.V.27 program

Key hypothesis 5: A significant impact relationship to the dimensions of lean processing chain (flexibility of processing, speed, response, adequacy) and process chain performance at its dimensions (cost, flexibility of performance, quality, and delivery)

This will be investigated according to the multiple linear regression equation as follows:

$Y = a + \beta_1 LA + \beta_2 LB + \beta_3 LC + \beta_4 LD$

Whereas:
A represents the slope parameter
β is the value of the beta coefficient
Y represents supply chain performance
Thus, the levels of impact among the variables will be analyzed by testing the fourth key hypothesis. Table () shows that the statistical indicators between lean processing chain and the performance of the processing chain are as follows:

$Y = a + \beta_1 LA + \beta_2 LB + \beta_3 LC + \beta_4 LD$
$Y = 0.381 – 0.042 LA + 0.403 LB + 0.356 LC + 0.184 LD$

Based on the regression equation referred to above, several fundamental points may be identified, the most important of which are:

1. The calculated value of the model is 116.166, which is higher than the tabular value of 1.879 at a sign level equal to 0.001, i.e. a significant value of 0.05, and based on the above, the alternative hypothesis of a significant Impact relationship to the dimensions of the processing chain (flexibility, speed, response, and In addition to the above, the Durban-Watson test (1.602) shows

that there is no linear relationship between the dimensions of one variable because it is close to (2).

2. The value of the determination factor (R) shows the contribution of lean processing chain to the interpretation of 0.698 of the changes and issues that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits and model of the current study.

3. The β1 has contributed to the interpretation of the processing chain's performance (-0.042), indicating an interest in improving processing flexibility by one unit in order to ensure an improvement of the processing chain's performance of 0.042. The β2 has also contributed to explaining (0.403) the performance of the supply chain, meaning that a 1-unit speed increase results in an improvement of (40%) the performance of the supply chain. The β3 shows a downstream factor that contributed to an explanation (0.356) of the processing chain performance, meaning that a 1-unit increase in response results in an improvement of (36%) the performance of the processing chain. It is evident that the β4 has contributed to explaining (0.184) the performance of the processing chain, meaning that an increase in efficiency of one-unit results in an improvement of (18%) the performance of the processing chain.

Table (10) effects of the effect of lean supply chain on the performance of the supply chain using multiple linear regression

variables		**lean supply chainin supply chain performance**
	Constant	0.318
Flexible	β_1	- 0.042
Quickness	β_2	0.403
Responsiveness	β_3	0.356
Competency	β_4	0.184
Correlation coefficient value	**R**	0.836
Selection parameter value	$\mathbf{R^2}$	0.698
F calculated value		166.166
F tabular value		1.879
	Sig.	**0.000**
Significance level at 0.05		***moral***
Durban Watson Value		**1.602**

The nature and type of relationship of the effects of lean supply chain dimensions on the performance of the supply chain can also be explained by the following subassumptions:

1: There is a significant impact on the flexibility of the process in the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery), as the analysis will be carried out according to the simple linear regression model, as follows:

Y= a + β (LA)
Y= 1.020 + 0.689 (LA)

The explanation of the regression equation above provides a set of important results:

1. The calculated value of the model is 162.249, which is higher than the tabular value of 1.879 at a sign level equal to 0.001, i.e. a significant value of 0.05, and therefore the alternative hypothesis (the presence of a significant Impact relationship of the processing flexibility in the performance of the processing chain at its dimensions is accepted (Cost, performance flexibility, quality, and delivery) in addition to the above, the Durban-Watson test was worth 1.907, which shows that there is no linear relationship between the dimensions of one variable because it is close to 2.
2. The value of the determination factor (R) shows the contribution of the green design after the interpretation of (0.359) of the changes and issues that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits and model of the current study.
3. The downstream coefficient of the processing elasticity dimension (β) shows that an increase in processing flexibility by one-unit results in an improvement of (0.689) the performance of the processing chain.
4. The regression parameter value (1,020) indicates that the processing flexibility is equal to zero, so the performance of the supply chain will not be less than this value.

There is a significant impact on the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery), as the analysis will be carried out according to the simple linear regression model, as follows:

$Y= a + \beta (LB)$
$Y= 0.826 + 0.768 (LB)$

The explanation of the regression equation above provides a set of important results:

1. The calculated value of the form (F) is 458.622, which is higher than the tabular value of (1.879) at a sign level equal to (0.001), i.e. a significant value of (0.05), and based on this, the alternative hypothesis (a significant Impact relationship to the speed of the processing chain in its dimensions is accepted (Cost, performance flexibility, quality, and delivery) in addition to the above, the Durban-Watson test was valued at 1,511, which shows that there is no linear relationship between the dimensions of one variable because it is close to (2).
2. The value of the determination factor (R) shows the contribution of the green design after the interpretation of 0.613 of the changes and issues that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits and model of the current study.
3. The speed dimension (β) slope coefficient shows that increasing speed by 1 unit results in an improvement of (0.768) supply chain performance.
4. The regression parameter value was (0.826) indicating that the speed is equal to zero, so the supply chain performance will not be less than this value.

3: There is a significant impact relationship of the response to the performance of the processing chain in its dimensions (cost, flexibility of performance, quality, and delivery), as the analysis will be carried out according to the simple linear regression model, as follows:

$Y= a + \beta (LC)$
$Y= 0.475 + 0.854 (LC)$

The explanation of the regression equation above provides a set of important results:

1. The calculated value of the model (F) is 408.034, higher than the tabular value (1.879) at a sign level equal to 0.001, i.e. a significant value of 0.05, and based on the above, the alternative hypothesis (the presence of a meaningful impact relationship to the response to the performance of the processing chain is accepted in its dimensions (Cost, performance flexibility, quality, and delivery) in addition to the above, the Durban-Watson test was valued at 1.962, which shows that there is no linear relationship between the dimensions of one variable because it is close to 2.
2. The value of the determinant parameter (R) shows the contribution of the green design after the interpretation (0.585) of the changes and issues that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits and model of the current study.
3. The β shows that a 1-unit increase in response results in an improvement of (0.854) supply chain performance.
4. The regression parameter value was (0.475) indicating that the response is equal to zero, so the performance of the supply chain will not be less than this value.

4: There is a significant effect relationship of sufficient significance to the performance of the processing chain with its dimensions (cost, flexibility of performance, quality, and delivery), as the analysis will be carried out according to the simple linear regression model, as follows:

$Y= a + \beta (LD)$
$Y= 1.218 + 0.654 (LD)$

The explanation of the regression equation above provides a set of important results:

1. The calculated value of the model is 346.435, which is higher than the tabular value of 1.879 at a sign level equal to 0.001, i.e., with a significant value of 0.05, and based on the above the alternative hypothesis (the presence of a significant Impact relationship to the adequacy of the performance of the processing chain in its dimensions is accepted (Cost, performance flexibility, quality, and delivery) in addition to the above, the Durban-Watson test was worth 1.932, which shows that there is no linear relationship between the dimensions of one variable because it is close to 2.
2. The value of the determinant parameter (R) shows the contribution of the green design after the interpretation of (0.544) of the changes and issues

that limit the improved performance of the processing chain, and the residual value is due to variables outside the limits and model of the current study.

3. The efficiency dimension (β) slope coefficient shows that an increase in efficiency of 1-unit results in an improvement of (0.654) the performance of the supply chain.

4. The regression parameter value was (1.218) indicating that the adequacy is equal to zero, so the performance of the supply chain will not be less than this value.

Table (11) effects of the effect of lean supply chain dimensions on the performance of the supply chain

supply chain performance							
	Constant	**β**	**R^2**	**F calculated value**	**F tabular value**	**Sig.**	**Durban Watson**
Flexible	1.020	0.689	0.359	162.249	1.879	0.00	1.907
Quickness	0.826	0.768	0.613	458.622			1.511
Responsiveness	0.475	0.854	0.585	408.034			1.962
Competency	1.218	0.654	0.544	346.435			1.932

Source: Prepared by the researcher based on the SPSS.V.27 program

PART FOUR: CONCLUSIONS, RECOMMENDATIONS AND PROPOSALS

First: Conclusions: The Results Have Been Shown

1. The existence of a meaningful correlation between the green supply chain and lean supply chain and the performance of the processing chain, which is evidence of the company's interest in improving the mechanisms of its processing chain to improve the performance of its internal operations.
2. The presence of a mental effect on the green supply chain and lean supply chain on the performance of the supply chain, indicating the contribution of the green supply chain, lean supply chain, and the performance of the supply chain to reducing the negative environment by ensuring a high improvement in the performance of the supply chain.
3. The interest of the concerned company in setting priorities is to design products with less energy use and raw materials, thus contributing to the design of the products in a way that allows recycling and utilization of the waste of the production process.
4. The company prefers to purchase environmentally certified raw materials regardless of the price level, indicating that the company is keen to provide advice and guidance to those equipped to adopt environmental programs.
5. The company concerned is keen to achieve excellence by improving quality, and improving product quality through skills development, recruitment and training of staff.

Second: Recommendations: Based on The Results, The Researcher Recommends the Necessity Of:

1. The company concerned should endeavor to design products that are user-friendly and low-risk, requiring it to design the process in a way that does not pose a health threat.
2. The company concerned should focus on dealing with suppliers interested in providing environmentally friendly raw materials, which would require it to discuss and improve the procedures of the green supply chain.
3. The company is interested in absorbing new changes and offering its products with specifications that meet the customer's expectations and exceed their expectations.
4. The company is keen on using methods that reduce the cost of processing materials, which requires it to make its operations, products and circulation relatively flexible in performance.
5. The company's adoption of a learning, training and development culture to move forward in agile, requiring it to build agile value as a strategy for achieving outstanding competency.

Third: Proposals

In addition to the current research, the researcher suggests conducting similar studies, including:

1. The relationship between the green supply chain and lean supply chain and its impact on achieving logistic excellence in Al-Ittihad Food Industries/Babylon.
2. The relationship between the green supply chain and lean supply chain and its impact on achieving competitive advantage in the Union for Food Industries/Babylon.

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