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THE IMPACT OF THE USE OF LEAN PRODUCTION SYSTEM TECHNIQUES ON THE PERFORMANCE OF THE STAGES OF PROVIDING CLEANER PRODUCTION TO

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Abstract:

Many production systems have emerged that seek to achieve quality and competitive advantage, including the Lean Production system, which is the next step for the production system on time to rationalize the consumption of resources within the production process by eliminating losses in all its forms and thus providing cleaner production.

The research aims to shed light on some theoretical aspects of Lien Production and Cleaner Production, such as advanced manufacturing techniques adopted by companies in developed countries. And a statement of the role of measuring soft production in achieving competitive advantage by providing cleaner production to enhance the market position of the economic unit and improve the flow during production processes and develop them through continuous improvement programs, in addition to achieving many advantages, including reducing waiting times and increasing the level of productivity and others.

The study was based on the hypothesis that there is that the use of Linian production aims to provide cleaner production and thus improve competitive advantage, and to prove this was studied cleaner production and Lini production in terms of the theoretical framework of each of them and the provision of new products sustainable and measure the costs of production Lini and their role in achieving competitive advantage in light of environmental changes and achieving continuous improvement of the performance of various operations in the economic unit to maintain its survival and continuity and support its competitive position.

In light of this, a set of conclusions and recommendations related to the subject of the study were reached, the most important of which were:

- The use of soft production achieves profit and economic savings by reducing costs, increasing labor efficiency and production quality, reducing waste and preventing pollution and its effects, which leads to achieving cleaner production and thus raising the possibility of competition.
- The need to use different units of measurement in expressing data related to soft production to be an integrated picture that helps in the decision-making process, and this does not mean limiting these costs to a specific model, but constantly changing the model according to trends.

Keywords: Linific Production System, Cleaner Production, Competitive Advantage

RESEARCH METHODOLOGY

1.1 Research problem

Lack of awareness of officials within the cement plant in the public business sector of the concept of the soft

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production system, as it turned out that officials are aware of some techniques of the soft production system such as standardization of labor standards, total quality management and production system, in addition to the availability of some requirements for the application of the production system such as the availability of skilled labor and training centers, whether inside or outside the company, as well as concerned with all aspects related to the provision of cleaner production, represented in manufacturing, customers, cost and Quality control of materials and suppliers.

1.2 Relevance of research

The importance of the research lies in the importance of awareness towards the protection of the environment for the need to sustain natural resources and reduce waste in them, especially that their use by companies returns them to achieve profits, so it was necessary to focus on productive and operational strategies that take into account the aspect of environmental protection, and soft production is one of these strategies, and the research focuses on the basic concepts related to it in order to show the side that encourages companies to adopt it in the process of achieving cleaner production and thus achieving competitive advantage.

1.3 Research objective

1- Find out whether there are differences between the opinions of senior management, production and marketing officials in the companies under study about their perception of the techniques of the soft production system.

2- Highlighting some theoretical aspects of cleaner production as one of the advanced manufacturing techniques adopted by companies in developed countries, which take into account the importance of resources and reduce waste in order to sustain them, and determine the costs and savings achieved from it

3- Explaining the role of measuring the costs of cleaner production and its importance in achieving a competitive advantage and enhancing the market position of the economic unit as it takes into account environmental aspects and the preservation of environmental resources

1.4 Research hypotheses

Based on the problem that this research seeks to answer its question, the researchers formulated the following hypothesis:

((There is a significant correlation between LP and CP in achieving competitive advantage))

Knowledge bases of cleaner production

Definition of CP

Cleaner production refers to the reduction of waste generation and the development of a product that reduces environmental impact during the life cycle of that product (Tseng et al., 2008).)

The first definition of the United Nations Environment Programme (UNEP/IEO) of cleaner production in 1990is "the continuous application of an integrated preventive environmental strategy applied to processes, products and services to increase overall efficiency, and reduce environmental risks to humans." (Mia et al., 2018) This definition includes:

1. CP is a preventive strategy, that is, it extends beyond reforms and adjustments.
2. It does not focus on one aspect of the problem, but on several aspects
3. Emphasize the continuity of cleaner production efforts, and there is always room for improvement.
4. CP relates to processes, products, services and application areas.

In another definition, cleaner production is "the continuous application of an integrated preventive environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment" (Davis, 2012: 320).)

Cleaner Production Application Mechanisms

The implementation of CP requires the internal integration of the economic unit and requires an open continuous system based on good management leadership of the organizational structure and feedback from outside the structure through continuous communication with customers (Tseng et al., 2008).)

1. The successful implementation of cleaner production requires not only internal cooperation between the administrative and technical organization and work teams, but in the long term it also depends on financing incentives, regulatory policies and the market (Silva, Medeiros and Vieira, 2017) and requires the adoption of a method CP has brought about many changes that can be summarized as (Yusup et al., 2015))

2- Adopting a set of procedural and administrative measures to improve Efficient use of resources, reduced costs and thus reduced of pollutants at the level of all sections of the economic unit.

3- Adopting a set of changes in the raw materials involved in the production processes to allow achieving cleaner production by reducing and/or eliminating toxic or dangerous materials and thus reducing the emission of pollutants and waste. This is achieved by introducing fundamental changes represented in filtering and replacing materials.

4- Adopting a set of technological changes based on making modifications to machines and equipment to reduce pollutants and waste, such as changes in the production process, modification of equipment and interior design of equipment and machines.

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5- Adopting a set of changes in the design of the product by changing its characteristics in order to reduce waste emission during and after using the product, and this is done through changing the composition of the product, changing its quality specifications, and others.

6- Reducing, reusing and recycling: This means preventing the generation of waste from its source, starting from reducing the use of raw materials and energy and reusing the waste generated from them to recycling them and making them useful materials after treatment. The principles of its application can be summarized in Table (1):

Table No. (1))

Principle	description
Input replacement	Use less hazardous materials with longer life
Resource conservation	Increase resource and energy efficiency in operations and reduce leakage losses
Internal Recycling	Closing material and energy rings for water and energy streams
technology	Use new technologies or redesign processes
Improve/change for the better	Improve product lifecycle and improve maintenance, facilitation, recycling and use

Ref: Yusup, Muhamad Zaki et alk2018 "

Measuring cleaner production costs

The CP approach is increasingly being applied and this necessitates the development of more adapted and better methods to support the measurement of CP components. Evaluation indicators in green accounting are increasingly being refined and used more specifically and frequently. (Mia et al., 2018)

The "cost" is considered essential in cleaner production, as its reports allow for improving environmental performance while reducing costs and supporting the identification and evaluation of environmental costs appropriate to decisions. Cleaner Production. EMS also provide information aimed at facilitating decision-making on cost reduction and investment in technology and material development and determines the environmental efficiency and environmental impacts of production processes and their market acceptance (Hens et al., 2018)

In an analysis of a number of companies' accounts and how the company's traditional accounting system was evaluating the costs and returns of the project, while the other assessment included costs and returns that were included in the companies' analysis, the indirect costs and returns included waste management costs, utilities, energy, water, sewage, Pollution treatment, and it becomes clear that the project under the second evaluation is more profitable than using the traditional analysis. Gray also suggested that the estimated costs that the facility needs to repair any environmental damage that occurred during the accounting period be defined in the clean production accounts as a measure of the facility's contribution to the depreciation of human capital. Natural money, similar to the extinction figures for the rest of the company's assets. Although the task is large and challenging in practice, this estimate of the "cost of repair and renovation" is the method recommended by the United Nations as a means of linking physical and monetary accounts at the national level by subtracting the cost of repair and renovation from operating profit, to a "sustainable profit" figure that takes into account damage environment resulting from the company's activities (Ekins, 2012)

However, apart from the need for guidelines and models to harmonize and simplify integrated management systems, there is still a lack of a recognized international standard, and the reason why environmental cost accounting uses both financial and non-financial data and different units to measure the consumption of natural resources and the impact of operations on energy, whether renewable or non-renewable (Hens et al., 2018)

THE SECOND TOPIC

Line production system

Concept of Lenin Production System:

The soft production system was defined as a flow of equipment, information, workers, and materials, and their conversion from raw materials to a finished product, where materials are examined, converted, and moved from one production stage to another, and

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so on until production is completed (Warnecke & Huser, 2018:38). .

While the soft production system was defined as a set of effective improvements that focus on improving production processes according to the needs and desires of customers (Ahlstrom, 2018:328), and eliminating waste of all kinds, as explained by (Engum, 2019:14):

- Muri:

It is the waste that results from poor administrative organization within the organization, and the soft production system focuses on planning operations well to avoid this type of waste.

-:Mura

It is the loss that results from the inconsistency and discrepancy in the quality and size of the products.

-Muda:

It is the waste that results from the activities carried out by workers, and the soft production system focuses on tools and techniques that contribute to converting waste into value to improve efficiency and reduce production time to avoid this type of waste.

The soft production system has also been defined as a program that seeks to eliminate waste, increase the perceived value of the customer, and improve profitability and competition by using tools and techniques that focus on teams and problem-solving approaches (Kovach et al., 2005:3).

It is also known as a systematic approach that seeks to identify and eliminate waste through continuous improvements to the product and the production process according to the needs of the customer, who is always looking for the best (Andersson et al., 2006:283).

Concept Technologies of Soft Production System:

There are many concepts related to the techniques of the soft production system, as (Greene, 2012:13) defined it as any tool that contributes to improving flow rates and achieving flexibility and continuous improvement. Flow cells, production by specific load capacity, problem solving teams, just-in-time production system, Kanban system, and other tools (Abdullah, 2003:10).

The tools of the soft production system were also defined as the techniques that contribute to eliminating waste, improving quality, and decreasing production costs and time (Engum, 2019:19), while (Steinlicht, 2018:70) defined them as the practices that the production system relies on to increase productivity. Productivity.

While it was also known as a set of tools that contribute to eliminating waste, improving quality rates, increasing customer added value, and raising production efficiency rates (Silva et al., 2011: 2).

(3) Technologies of the soft production system:

(Greene, 2002:25-27) presented a number of techniques and tools on which the soft production system relies in achieving its production goals that focus on the added value of the product provided to the customer. Schematic work instructions, visual control systems technology, one-piece flow technology, production withdrawal scheduling technology, comprehensive production maintenance technology, documented centralized maintenance technology, preventive maintenance technology, predictive maintenance technology, preparation and preparation times reduction technology, integrated production models technology, technology Production according to specified load capacity, Multi-skilled workforce technology, Customer demand production technology, Flow cell technology, Stocked material use point technology, Fault proofing technology, Self-checking technology, Successive checking technology, Stop-line technology, Automation technology, Kaizen technology, Experiment design technique, root cause analysis technique, statistical control technique, and problem-solving teams technique, while the study (Thomas, 2005:4) added to the aforementioned techniques value analysis maps technique. H.

While the study (Rivera & Chen, 2007: 689) added a number of other technologies represented in the group technology technology, the centralized factory technology (focal factory), the rapid resupply technology, the on-time supply technology, and the on-time shipping technology, while it added A study (Rathi & Farris, 2009: 1118) of total quality management technology refers to the aforementioned techniques as one of the techniques that aim to satisfy and maintain customers, as this technology seeks to improve the quality of products and the production process, as the study added (Raja, 2011: 35) also to the aforementioned techniques just-in-time production technique.

The techniques and tools on which the soft production system relies to achieve its objectives were classified according to the importance of the techniques, as well as their purpose, as follows:

* First classification:

The technologies are classified according to the importance of each technology, and this classification includes the flow and includes the 5S system, standardized work standards, planning instructions for work, visual monitoring systems, one-piece flow, production pull scheduling, comprehensive production

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maintenance, documented central maintenance, and predictive maintenance Preventive maintenance. Flexibility includes reduced set-up times, compact production models, production-to-load capacity, multi-skilled workforce, and production according to customer demand. Production capacity includes flow cells, point of use of stored materials, fault proof, and self-inspection. and sequential checking, off-line, and automation, while continuous improvement includes kaizen, experimental design, root cause analysis, statistical control, and problem-solving teams (Greene, 2002:24-27).

*Second classification:

The technologies were classified according to the purpose for which each technology aims, and this classification includes quality and continuous improvement tools, including continuous improvement teams, quality control tools, root-of-cause analysis, continuous improvement tools, value tables planning, error proofing and automation, while Tools and techniques of soft production operations include determining load levels, withdrawals, one-piece flow, production line balance, work standards and manufacturing cells, while system support tools and techniques include visual monitoring systems, 5S system, and reducing preparation, processing and maintenance times. Inclusive productivity and multi-skilled work teams (Steinlicht, 2010:71).

THE THIRD RESEARCH

Competitive advantage and the impact of the use of soft production system techniques on the performance of the stages of introducing cleaner production to achieve it

The concept of competitive advantage

Competitive advantage, in terms of meaning, refers to the characteristic that distinguishes the economic unit from other competing units, and achieves a strong position for it towards the different parties. Any economic unit can achieve competitive advantage in different ways, but the most important of these ways is that the economic unit has low costs (produced at competitive costs and sold at a low price), or that the economic unit can distinguish its products (creativity in products) or impressionistic (advertisement, name and nickname).

Porter defines competitive advantage as the ability of an economic unit to innovate and discover and apply new methods that are more effective and efficient before they are discovered by competitors. These methods help produce products with lower cost, higher quality, shorter manufacturing and marketing time, and more flexibility in responding to changes in customer needs and desires, which ultimately leads to customer satisfaction and an increase in market share (Porter, 1990,6), as defined by Wang. It is the superiority of the economic unit and its distinction in reducing costs better than it is with competitors, and working to meet the needs, desires and requirements of customers for products and delivering them to them in a timely manner through an integrated supply chain, taking into account the element of quality and competitive price (Wang, et, al, 2011: 100)

The importance of competitive advantage

An economic unit can achieve a set of benefits when it possesses a competitive advantage, provided that this advantage is maintained and developed continuously, and these benefits are as follows:

(1) The superiority of competitors helps achieve customer satisfaction and loyalty for the economic unit, as when the focus is on innovation and the use of modern technology to provide products that meet their needs, the perceived value of customers will improve and the value of this unit will increase from their point of view.

2) The competitive advantage helps the economic unit to grow rapidly and adapt to various environmental changes better than competitors, by relying on innovation and following the best methods of design, production and marketing, thus expanding markets and exploiting more job opportunities.

(Progress, et al, 2013: 171)

3) If the economic unit distinguishes its products from competitors, it makes customers willing to pay higher prices to obtain the distinctive products offered by the economic unit to them, and thus this unit can set a price policy for its products, and thus profitability will increase (Lynch & Ariely, 2000:86)

4) The competitive advantage helps in increasing the market share of the economic unit through remarkable improvements in its products and services provided to customers and thus achieving their satisfaction. The strategic concept of customer satisfaction is linked to maintaining existing customers and acquiring new customers, which leads to increased sales and profits in addition to increasing its share in market and thus improve financial performance

5) Competitive advantage helps the economic unit in determining and applying the appropriate competitive strategy, through which it can confront competitors, and thus helps in distinguishing and outperforming others as a result of providing products and services

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that are compatible with the needs, desires and requirements of customers.
(porter, 2008:35)

Dimensions of competitive advantage

The dimensions of competitive advantage are viewed as the basic success factors necessary for competition, which economic units must adopt to achieve customer satisfaction and loyalty, as the success of these units depends on the amount of their success and superiority in the continuous improvement of these dimensions, and therefore they are a measure of performance through which the competitive advantage can be maintained. And many researchers have agreed that there are four dimensions of competitive advantage, namely:

First: the lowest cost

The economic units must focus on this dimension by making the costs of design, production and marketing as low as possible so that they are less than what competitors bear. The lowest cost dimension can be achieved by reducing waste and loss of time and resources alike, by directing materials, wages and expenses to make The cost of a unit of production is as low as possible by coordinating the cost with what the customer desires of components and functions and reducing any costs that do not add value to the customer. Costs can be reduced through the optimal use of resources, including the effective use of the available production capacity of the economic unit, in addition to Commitment to continuous improvement processes in the quality of each of the processes, products and services by using modern technology in design and manufacturing processes, as well as taking advantage of opportunities to reduce costs and improve performance in order to achieve customer satisfaction (29-28, 2012).

Second: high quality

The importance of quality increases as a competitive strategy used by economic units to adapt to changes in the modern business environment, and if quality is adopted as a competitive strategy, it will help achieve customer satisfaction and avoid the economic unit entering a price war, so quality must be improved because it is inexpensive and can improve the reputation of the economic unit and increase its market share (and quality is an important tool for the process of continuous improvement of competitive advantage by focusing on solving problems and working on understanding customer requirements to meet them (Schroeder 2000: 2000)

Third: less time to respond to the customer

Time is seen as a competitive advantage that enables the economic unit to take advantage of the investment opportunities available to it, as well as the speed of bringing the idea to the market and shortening the life cycle of the product, and therefore time is a strategy that helps achieve a competitive advantage, without neglecting its other dimensions (Hemmatfar, et, al .2010:162). The customer response time is referred to as the time that adds value to the customer, and this time includes the time of receiving the order from the customer, the time of the main manufacturing and the time of delivery of the product to the customer, and for the purpose of reducing the response time to the customer through which the competitive advantage can be achieved, the time that does not add must be excluded value, especially waiting time, examination, testing, preparation, handling and storage (Horngren, et al, 2012:681.

Fourth: Flexibility in responding to changes in customers' needs and desires

It is the extent of the ability of the economic unit to respond quickly to changes that may occur in the needs and desires of customers. The economic unit adapts its systems and operations according to these needs and desires, and according to developments in the modern business environment with regard to the speed of innovation and the introduction of new products. Thus, flexibility is an important competitive dimension due to rapid changes. In the tastes and behaviors of customers, flexibility refers to the ability of the economic unit to provide products and services that suit the needs and desires of customers and respond to them quickly.

The impact of the use of soft production system techniques on the performance of the stages of introducing cleaner production

The application of the cleaner production approach is one of the ways to achieve the goal of environmental upgrading and sustainable development that contribute to preserving and optimal use of resources, and reducing pollutants resulting from industrial processes, in addition to the direct relationship between cleaner production and sustainable development. Also, the lowest cost is a major goal that enables the economic unit to compete and confront competitors, as reducing costs contributes to reducing the selling prices of products and thus increasing the demand for the products of the economic unit, which means increasing sales and thus increasing profits and improving the wind level. Therefore, reducing costs will help The economic unit is able to reach competitive prices for its products offered to customers so that it can

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outperform others and achieve a competitive advantage (Ataman, 2009).

The most important technologies of the soft production system that help achieve cleaner production and thus achieve competitive advantage are the following:

1-5S system:

This technology consists of five Japanese words concerned with creating a clean and organized work environment, represented in classification, arrangement, cleaning, standardization and support (Greene, 2002:25). It also supports the Lenin production system by providing complete information that helps in the decision-making process (Nagarajan, 2019:14).

The 5S system consists of the following:

1- Sort:

It means arranging what workers need in the workplace (Sobanski, 2009:217), and it represents the first principle of conscious management so that it is easy to get rid of unnecessary items in the workplace, and it is based on the principle of identification (Engum, 2009:20), and it is measured This axis is through the documentation dimension, as it is concerned with determining the daily needs necessary within the workstations to perform the required production operations (Nagarajan, 2009:90).

2- Set-In-Order:

It means paying attention to placing machines and tools in their specific places and arranging the shelves of stores to reduce losses resulting from unnecessary movements (Sobanski, 2009:217), and it is based on the principle of having a place for everything and everything in its place (Engum, 2009:20). This axis is measured through the priority dimension, as it is concerned with determining the priority of daily needs within work stations to perform the required production operations (Nagarajan, 2009:90).

3- Shine:

And it means paying attention to cleaning the different warehouse areas, tools, equipment, and the areas surrounding the stores, which leads to raising the morale of the work team (Sobanski, 2009:217), and it reflects the importance of maintaining a clean work environment, and thus the ease of carrying out inspections and obtaining the best Results (Engum, 2009:21), and this axis is measured through the dimension of daily reports, as it is concerned with identifying daily cleaning operations within workstations, in order to facilitate the performance of the required work (Nagarajan, 2009:90).

4- Standardization:

And it means the availability of clear and specific criteria necessary for the availability of conscious management (Sobanski, 2009:217), which requires defining the necessary criteria in each workstation (Engum, 2009:22), and this axis is measured through the dimension of timetables, as it is concerned with defining special tasks In each work station, according to which the various actions are performed (Nagarajan, 2009:90).

5- Sustain:

It means developing deep roots in the company and choosing the best ways to perform business (Sobanski, 2009:217), in addition to providing an effective system of punishment and reward (Engum, 2009:22). Higher education on the success of the implementation of the 5S system and the provision of types of support, whether financial, technical and human support (Nagarajan, 2009:90).

2- Flow Cells:

Flow cell technology is defined as the plans in which all the materials, machines, and parts necessary to complete the production of a specific part are available (Greene, 2002:25). Waste in the Productive System (Basu, 2009:56).

Flow cells are a path that shows the movement of materials in general and describes the sequence of operations in particular, in addition to helping them in training new operators, communicating with unified standards of management, and driving continuous improvement initiatives (Feld, 2011:51).

3- Pull Production Scheduling (Kanban):

Kanban technology is defined as cards attached to parts containers during the production process. This card includes the container number, description of the parts it contains, the number of parts inside, the previous production stage, and the subsequent production stage.

This technology helps in preventing overproduction as it contributes to determining the number of parts produced that are identical to the needs of customers and ensuring the regular flow of parts and materials without the need for an inventory. Customer satisfaction (Junior & Filho, 2010:16).

4- Kaizen (continuous improvement):

The continuous improvement technique is defined as focusing on improvement work by operators or engineers of multifunctional teams, analyzing and applying improvements to specific work areas (Greene, 2002:26), and improvement is not limited only to the efforts of senior management, but is based on the participation of All workers in the middle and lower managements, and these continuous gradual

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improvements enhance the ability to achieve improvement and reduce the quantities stored and reduce errors and lead times (Marrot, 2006:34).
This technique is based on defining the target area, defining the aspects that need improvement, defining the objectives to be reached, selecting the necessary team to carry out these improvements, and providing full support from senior management. Continuous improvement activities also require analyzing the current situation and generating the necessary change proposals. Presenting these suggestions to senior management, assigning change procedures, implementing change, tracking activities, and following up the results of change (Tayne, 2010:21).

Opinions of the specialized sample on the extent of the impact of the use of soft production system techniques on the performance of the stages of introducing cleaner production to achieve the competitive advantage

Preface:
This topic involves analyzing the opinions of the competent sample on the extent of the impact of the use of soft production system techniques on the performance of the stages of introducing cleaner production to achieve the competitive advantage in the cement plant, the research sample.
First: the study population and sample
The study population represents the entities related to the work of the soft production system and cleaner production, and the target group in this study (university professors, cement factory accountants)
Second: Characterization of the research sample
1- Description of the research sample according to the profession
2- :

Table (2)
Distribution of study sample by profession

Categories	stributed Forms	Redeemed Forms	valid Forms	falid Forms	ercentage
University Professors	25	23	-----	23	49%
Cement Plant Accountants	25	24	1	24	51%
Total	50	47	3	93	100%

By observing the previous table, it is clear that the number of correct forms used in statistical analysis is (50) forms (94% of the total distributed forms, where one form was excluded due to data error or deficiency, as the study sample was distributed among the approved specializations and the percentage of university professors was (49%), and the percentage of cement plant accountants (51%).
Third: Authenticity and stability of the form
The researcher used the Alpha method to ensure the stability of the form and the self-honesty method to ensure the validity of the form as shown in Table (3).

Table (3)
Honesty and stability coefficient for the form lists

M	Dimensions	Alfa Cronbach Alpha	Self-honesty
1	After the cleaner production in the cement plant	0.741	0.862
2	The importance of cleaner production in achieving competitive advantage in the cement plant	0.789	0.888

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Through the study of the previous table, it is found that the value of the coefficient of honesty and stability is acceptable to all dimensions representing the questionnaire for the research sample, and the values of the stability coefficient ranged between (0.74 1 – 0.789), which are high values, which indicates the stability of the form, and the values of the self-honesty coefficient ranged between (0.862 – 0.888) which is high values, which indicates the subjective honesty of the form, and therefore it can be said that the coefficients of stability and honesty are high and of good significance for the purposes of research and achieving the objectives of the research, and can be relied upon to generalize the results to the study population.

FOURTH: HYPOTHESIS TESTING

Table () presents the results of the descriptive statistical analysis of the effect of using the techniques of the Lean production system on the performance of the stages of providing cleaner production to achieve the competitive advantage of the sample in question in terms of the parameters of the arithmetic mean of the responses of the study sample, and the level of dispersion of those responses from the hypothetical mean of the measurement tool of (3) as well as the analysis of the relative importance in terms of their percentage weight, as in the following paragraphs:

First: The first hypothesis: there is no difference between the practices of the **Linian production system**, the cleaner production in **the cement plant, the research sample, and the requirements of cleaner production in international measurements**

To ensure acceptance or rejection of the hypothesis, the frequency, percentage, mean and standard deviation of CP practices in the cement plant were calculated to find the differences and similarities between them and the CP requirements in international measurements..

Table (4)
Repeatability, percentage, mean and standard deviation of CP dimension in cement plant (n=152)

M	Phrases	Average Arithmetic	Deviation Normative	agree completely	agree	neutral	I don't agree	I don't agree completely	Grade Weighting	Percentage Discretionary %	Ka^2 value
1	The cement plant takes into account the environmental aspects in the production processes	1.78	0.92	72	51	21	6	2	271	35.66	119.91
		Percentage %		47.37	33.55	13.82	3.95	1.32			
2	The cement plant disposes of waste from production cleanly.	3.36	1.05	7	29	35	65	16	510	67.11	64.97
		Percentage %		4.61	19.08	23.03	42.76	10.53			
3	The management of the cement	3.41	1.08	7	28	34	62	21	518	68.16	54.38
		Percentage %		4.61	18.42	22.37	40.79	13.82			

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	plant is working to educate its members about the need to pay attention Preserving the environment.									
4	The cement plant uses modern methods of production in order to worry harmful products of gases and solids or liquids.	3.18	1.06	8	36	43	51	14	483	63.55	45.57
		Percentage %		5.26	23.68	28.29	33.55	9.21			
5	The cement plant tries to take advantage of some by-products by recycling them appropriately	3.38	1.02	6	27	39	64	16	513	67.50	66.36
		Percentage %		3.95	17.76	25.66	42.11	10.53			
6	The cement plant maintains the safety of its workers from the symptoms that may result from their contact	3.22	0.99	6	34	42	60	10	490	64.47	66.95
		Percentage %		3.95	22.37	27.63	39.47	6.58			

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	with the raw materials involved in the production processes									
7	The management of the cement plant urges workers to find ways to restore Use some raw materials or waste correctly.	3.28	1.01	8	27	43	63	11	498	65.53	69.45
		Percentage %		5.26	17.76	28.29	41.45	7.24			

***^{Ka2} value at 0.01 significance and freedom (5) = 13.280**

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It is clear from Table No. (14) that the average of the opinions of the research sample on the phrases after the cleaner production in the cement factory ranged between (1.78 to 3.41) and the deviation coefficient ranged between (0.92 to 1.08), and there are also differences between the opinions of the research sample in the responses in favor of the response the above; As the calculated values of Ca2 are higher than their value at a significant level (0.01).

1- The phrase No. (1), which stipulates that "the cement plant takes into account the environmental aspects in production processes," got the lowest percentage (35.66%) and an average of (1078).

2- I got phrase No. (4), which stated that "the cement plant uses modern methods of production in order to remove harmful products from gases and solid or liquid materials." The second lowest percentage was (63.55%) with an average of (3.18), and the indication was in favor of the response, according to the opinions of the research sample.

3- I obtained phrase No. (3), which stated that "the cement plant management is working to educate its members on the need to take care of preserving the environment." At the highest percentage of (68.16%) and an average of (3.41), and the indication was in favor of the response does not agree according to the opinions of the research sample.

4- The phrase No. (5), which stipulates "the cement plant is trying to benefit from some by-products by recycling them in an appropriate manner," got the second highest percentage of (67.50%) with an average of (3.38). opinions of the research sample.

Through the previous results, we find that there are deficiencies in accounting practices in the dimension of cleaner production in the cement factory; Since cleaner production practices do not reflect cleaner production requirements in international measurements, they do not have the necessary quality.

Through these results, the first hypothesis was rejected, which stated that there is no difference between cleaner production practices in the cement factory, the research sample, and cleaner production requirements in international measurements.

And accepting the alternative hypothesis, which stated that there is a difference between cleaner production practices in the cement factory, the research sample, and cleaner production requirements in international measurements.

Second: The second hypothesis: There is no relationship in the impact of the use of soft production system techniques on the performance of the stages of introducing cleaner production to achieve the competitive advantage in the cement plant, the research sample.

To ensure the acceptance or rejection of the hypothesis, the frequency, percentage, mean, and standard deviation were calculated to provide appropriate information that is accepted by the relevant parties in the cement factory, the research sample, to find the relationship between cleaner production and achieving competitive advantage.

Table (5)
The effect of using the techniques of the Lini Production System on the performance of the stages of providing cleaner production to achieve competitive advantage in the cement plant research sample (n=152)

M	Phrases	Average Arithmetic	Deviation Normative	agree completely	agree	neutral	I don't agree	I don't agree completely	Grade Weighting	Percentage Discretionary %	Ka^2 value
1	Sufficient personnel are available to implement LP techniques	1.57	0.77	85	52	11	3	1	239	31.45	178.92
		Percentage %		55.92	34.21	7.24	1.97	0.66			
2	The Department provides the necessary	1.8	0.73	55	76	17	4	0	274	36.05	87.63
		Percentage %		36.18	50	11.18	2.63	0			

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	financial support for the implementation of the									
3	Solving the problems of cement plant management in how to dispose of plant waste and waste, by rehabilitating it, such as plastics used in cement covers.	1.99	0.68	33	90	26	3	0	303	39.87	107.84
		Percentage %		21.71	59.21	17.11	1.97	0			
4	Solving problems related to bags and packaging processes, through the use of the cement plant for environmentally friendly packages that are not polluting and dissolved in nature.	2	0.61	26	102	22	2	0	304	40.00	152.42
		Percentage %		17.11	67.11	14.47	1.32	0			
5	Improving the environmental conditions of workers to work in	2.01	0.75	36	85	25	6	0	305	40.13	89.63
		Percentage %		23.68	55.92	16.45	3.95	0			

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	a clean, safe and pollutant-free environment									
6	Increasing environmental awareness among Woroud employees and familiarizing them with legal requirements	1.78	0.88	74	43	30	5	0	270	35.53	65.11
		Percentage %		48.68	28.29	19.74	3.29	0			
7	Improving the image of the institution, which increases its good reputation.	1.89	0.54	30	109	12	1	0	288	37.89	188.16
		Percentage %		19.74	71.71	7.89	0.66	0			
8	Achieving clean production to comply with local and international environmental standards	1.68	0.83	80	44	24	4	0	256	33.68	82.95
		Percentage %		52.63	28.95	15.79	2.63	0			
9	Improve environmental performance by reducing air emissions and eliminating environmentally	2.09	0.62	18	108	21	5	0	317	41.71	175.74
		Percentage %		11.84	71.05	13.82	3.29	0			

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	harmful waste										
10	Reducing the percentage of taxes imposed on the institution and benefiting from it financially.	1.97	0.63	29	103	16	4	0	299	39.34	156.47
		Percentage %		19.08	67.76	10.53	2.63	0			

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It is clear from Table No. () that the average opinions of the research sample in the phrases of the axis of providing appropriate information that are accepted by the relevant parties in the cement plant ranged between (1.57 to 2.09) and the deviation coefficient ranged between (0.54 to 0.88), and there are differences between the opinions of the research sample in the responses in favor of the higher response, as the calculated Ka2 values are higher than their value at a significant level (0.01).

- Statement No. (1), which stated that "there are sufficient workers to implement soft production techniques", received the lowest percentage (31.45%) and an average of (1.57), and the indication in favor of the response was completely consistent according to the opinions of the research sample.
- Phrase No. (8), which stipulated "achieving clean production in order to comply with local and international environmental standards," got the second lowest percentage of (33.68%) with an average of (1.68), and the indication in favor of the response was completely agreed according to the opinions of the research sample.
- Phrase No. (9), which stipulated "improving environmental performance by reducing the rate of air emissions, and abandoning waste harmful to the environment," got the highest percentage of (41.71%) with an average of (2.09), and the indication in favor of the response was consistent according to the opinions of the research sample .
- Phrase No. (5), which stipulated "improving the environmental conditions for workers to work in a clean, safe and pollutant-free environment," got the second highest percentage of (40.13%) with an average of (2.01), and the indication was in favor of the response, according to the opinions of the research sample.

Through the previous results, we find that there is a relationship between cleaner production and achieving the relevant competitive advantage in the cement factory, the research sample.

Through these results, the second hypothesis was rejected, which stated that there is no relationship between cleaner production and achieving competitive advantage in the cement factory, the research sample.

And accepting the alternative hypothesis, which stipulates that there is a relationship between cleaner production and achieving the advantage

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. Soft production achieves profit and economic savings by reducing costs, increasing work efficiency and production quality, reducing waste and preventing pollution and its effects, which leads to raising the possibility of competition.
2. Lean production is a feasible administrative method that fulfills the growing desires of the customer and society for products and services that are environmentally friendly and less harmful to them. It also improves the technical quality and health and environmental safety of the product, which gives the economic unit a competitive advantage through its distinguished production.
3. Through Lean production, less resources and energy are used, and less waste and emissions are generated, thus reducing the occurrence of harmful environmental impacts.
4. Cleaner production is a practical way to apply sustainable development to the environment and competitive advantage at the same time, and to achieve a safe work environment.
5. There is no international standard or specific model that includes calculating cleaner production costs and accounting for them in approved units of measurement.
6. Companies that adopt cleaner production achieve a competitive advantage by reducing pollution and waste, and also support management in reducing environmental costs, through reports on the costs of environmental obligations that have occurred, and indicate environmental activities related to prevention and control, and prevent environmental damage.

RECOMMENDATIONS

Through the applied study and its findings, the researcher recommends the following:

1. Providing the necessary financial and technical support for the application of the soft production system within the cement plant under study in the public business sector in the Republic of Iraq.
2. Full readiness to bear the risks resulting from the application of a new production system and work to overcome all obstacles to ensure the success of the application of the soft production system within the cement plant under study in the public business sector in the Republic of Iraq.
3. Increasing interest, spreading awareness, and encouraging the adoption of a cleaner production strategy for all business sectors, as it includes flexibility in application according to the nature of the activity.

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4. It is possible to reach a special model to be adopted by the economic unit according to its vision of the strategy without being restricted to a specific model in presenting cleaner production costs.
5. The need to use different units of measurement to express data related to cleaner production in order to be an integrated image that helps in the decision-making process, and this does not mean limiting these costs to a specific model, but rather constantly changing the model according to trends.
6. The necessity of investing in cleaner production and adopting its mechanisms to reap its benefits in the long term in increasing profitability and competitiveness.
7. The need to strive continuously to reduce the consumption of resources in a way that reduces their useful life or in a way that leads to the generation of waste, and to adopt alternatives that protect the environment in preventing pollution instead of treating it, and investing in advanced technology that achieves this.

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