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ROLE OF LEAN ACCOUNTING IN REDUCTION PRODUCTION COSTS IN JORDANIAN MANUFACTURING CORP

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ABSTRACT

This study is created to identify the role of lean accounting in the reduction of production costs in Jordanian Manufacturing Corporation. To achieve the purposes of the study, the researchers develop a questionnaire consists of (72) items. The population of the study includes of managers of financial departments, workers in the department of human resources and information technology, and workers in the fields of sales, marketing and procurement. The questionnaire has been examined (56) Jordanian manufacturing corporations. The researchers in this work sent a random sample of the questionnaire for all components, which the total of questioners were (280) with average of (5) questionnaires for each company. A total of (242) questionnaires were retrieved, which (227) of them with percentage of 81% were capable of analyzing. On the other hand, (15) questionnaires incapable of analyzing because was uncompleted by the examiners. We can summarize the findings of the study in the following points; first, the most important one is the existence the role of adoption lean accounting in the reduction of production costs in Jordanian Manufacturing Corporation. The study concluded with some recommendations such as the activate the use of the value principle of Lean accounting was more high to eliminate waste and loss, and also to achieve maximum benefits for the company by finding solutions to the problems and obstacles that face the production process.

KAYWORDS: Lean Accounting, Manufacturing Company, Jordan

1. INTRODUCTION

In general, the science of accounting has a great progress and advance developing because of the industrial revolution, which requires us to seek and respond in order to obtain information in an easier and more lean way, to help us for making the right decision in the world of management accounting and management business. For these reasons, it is necessary to respond effectively and switch from traditional accounting systems to modern accounting systems, such as lean accounting, in order to identify the activities that add value to them and identify the activities that do not add value and delete them. This helps to minimize the production costs, maximize profits and achieve the desired goals of the company. Nowadays, the use of lean accounting is important especially for developing countries, which is used to create a value for the customer, enhance the lean in operating activities, achieve competitive advantage in the market, and eliminating the waste and dissipation that occurs in the production process.

1.1 Problem study

The traditional accounting is unsuitable to lean production process because it contains a large number of waste and loss. To mitigate this problem, the use of modern management accounting methods has been used such as the methods

of lean accounting, which emerged in modern times to reduce costs and maximize profits by providing a set of information to decision maker. We can summarize the questions of this study in the following points:

Q1: Does the lean accounting principle have a role in reducing production costs in Jordanian Manufacturing Corporation.

From this question we can derive the following sub-questions:

Q1-1: does the principle of value have a role in reducing production costs in Jordanian Manufacturing Corporation.
Q1-2: does the principle of value stream have a role in reducing production costs in Jordanian Manufacturing Corporation.
Q1-3: does the flow principle and pull principle of material have a role in reducing production costs in Jordanian Manufacturing Corporation.
Q1-4: does the principle of continuous improved "Kaizen" have a role in reducing production costs in Jordanian Manufacturing Corporation.

1.2 Purpose of the study

1) To understand the concept of lean accounting and its benefits.
2) To understand the role of lean accounting principle (value principle, value stream principle, flow principle and pull principle, and continuous improved "Kaizen") in reducing production costs in Jordanian Manufacturing Corporation.

1.3 Important of the study

This study focused on trying to know the role of lean accounting in reducing the production costs in Jordanian Manufacturing Corporation. The prior studies in lean accounting are few in Jordan. In addition, the studies of lean accounting are almost none in the Arab world. For these reasons, it is very important to increase the amount of the studies about the lean accounting especially for Jordanian Manufacturing Corporations.

1.4 Hypotheses

To answer the questions of the study and achieve its objective, the following hypotheses should be formulated:

H01: there is no statistically significant role at the level of significance (a ≤0.05) for the principle of lean accounting in reducing production costs in Jordanian Manufacturing Corporation.

H01-1: there is no statistically significant role at the level of function (a ≤0.05) for value principle in reducing production costs in Jordanian Manufacturing Corporation.
H01-2: there is no statistically significant role at the level of function (a ≤0.05) for value steam principle in reducing production costs in Jordanian Manufacturing Corporation.
H01-3: there is no statistically significant role at the level of function (a ≤0.05) for flow principle and pull principle in reducing production costs in Jordanian Manufacturing Corporation.
H01-4: there is no statistically significant role at the level of function (a ≤0.05) for continuous improved "Kaizen" in reducing production costs in Jordanian Manufacturing Corporation.

2. LITERATURE REVIEW

Samad et. al. (2017) proposed to illustrate the role of modern accounting methods such as lean accounting for supporting and optimizing the use of resources. This helps to create a value for the organization, eliminate the activities that do not add value, and to eliminate the shortcomings of traditional accounting methods by applying modern

accounting methods such as lean accounting. Samad et. al. used the qualitative research approach to study the types of accounting methods in the Swedish industrial companies, which one case study has been studied related to these industrial companies. The results showed that the accounting approach of these companies become more oriented towards the use of modern accounting methods because traditional accounting methods do not fit the process of lean production. Finally, they recommended that the scope of research should expanded further to explore the relationship between lean accounting principles and cost accounting techniques by creating a value and linking this value with the value stream in order to provide a clear vision for future improvement of the company.

Al-Rahimi (2016) have the advantages of studying the philosophy of lean accounting and to identify its tools and principles. This helps to illustrate the difference between the use of traditional accounting methods and the method of lean accounting in various levels such as the difference between them in reducing costs, their tools, and their roles in reducing the production cost in Jordanian manufacturing corporation. Al-Rahimi. used the descriptive analytical method to illustrate the results. The results showed that the lean accounting has a significant role in reducing costs in Jordanian Manufacturing Corporation, which the statistical results showed a value of (a ≤0.05) compared with other traditional methods. In addition, they recommended that the management of Jordanian Manufacture Corporation should use the application of lean accounting to ensure the success of this application.

Hijazi (2015) have the advantages of studying the extent of applying the lean accounting in Jordanian Manufacturing Corporation. Furthermore, they studied about the factors that hinder the process of applying the lean accounting in Jordanian Manufacturing Corporation. Hijazi. used questioner as a tool of collection information from these corporations. In addition, they used the descriptive analysis method to illustrate the results of these questioners. The researcher has reached several results, including, there are some elements that helps to apply the lean accounting within the systems of these corporations, such as economic factors and culture factors. In addition, they showed that the most industrial corporations used accurate and detailed method to estimate different kinds of information that reflects the performance of employees, which helps to apply the decentralized management system. All of this will help to facilitate the process of applying the lean accounting in these corporations. Finally, they recommended the Jordanian industrial corporations to focus on a lean accounting method to increase the profits instead of using the traditional accounting techniques.

Pentlickl (2014) have the advantages of exploring the elements that facility and constraint the process of applying the lean accounting methods and tools in different kinds of corporations.have made a face to face interview with the operations managers, Chief Executive Officers (CEOs) and Chief financial Officers (CFOs) of these corporations. The data were collected through interviews with senior leaders (CEOs, operations managers, deputy director of operations, CFOs and general managers) in 617 small and medium sized corporations. The result of the study showed that every small or medium size companies must establish its special and organized methods for the process of applying the lean manufacturing and lean accounting. At the end, they recommended that manufacturing corporation should use lean accounting at all stages of productivity, which is considered a major philosophy of work and production.

2.1 Theoretical framework

lean accounting can be defined as follows:

Lean accounting is a modern accounting approach that reflects lean practices and lean thinking by increasing the usefulness of work and improving the decision-making process by providing understandable and accurate information. In addition, it is used to eliminate the waste and loss that created based on the traditional accounting systems. This leads to increase the profits of the economic unit. (Kazem, 2014, p. 5). The researchers in this area defined the lean accounting as a modern administrative accounting system, which is aimed to increase the profits, search for perfection, the elimination of waste and loss, and deliver the products to customers without delay. In addition, it aims to achieve the desired goals of the companies, which helps the managers of the companies by making the appropriate administrative decisions in accurate in time manner. At the end, this leads to reducing costs and maximize profits.

Second: the independent variables of the study:

The most important principles of lean accounting are:

2.1.1 Principle Value:

The starting point for lean thinking and lean production is to determine the value, which this can be done by the end customer. For these reasons, the value can be considered as a product or service or both of them together, which meet the needs of the consumer at the agreed time with a specific cost. All of this can be determined through continuous communication with customers. (Womack and Jones,2003).

The key of lean accounting is the value driven by customers, where the value chain is derived from the value that created via the customers. Therefore, the customer requests will affect the productivity in lean environment, which the orders of purchase, storage of inventory, and scheduling of work orders will interact according to customer requirements. This refers to the effect of the concept of zero production in just in time system (Hutchinson & Liao, 2009). The researchers illustrate that the process of applying the concept of value principle in the companies is based on providing the raw materials to produce different kinds of products, which will be created according to the customers' requirements to satisfy their wishes and satisfaction. This will help to reduce production costs and maximize profits.

2.1.2 Principle value stream:

It contains all the activities and steps that are based on converting the raw materials to a final product such as (service, commodity, or mixture between both of them). It includes three main functions, including, physical conversion tasks, problem solving tasks, and information management tasks (Mirzaei, 2011). After determining the value, the workers in this area should go to know and define the steps of all the activities that are used to convert the raw materials to a final product. This procedure contains three main steps. These steps can be summarized as follows: (Womack and Jones,2003):

a) Includes the task of problem solving that are based on the idea of the exact design of the product and then the converting the exact design to a final product.
b) The mission of all activities that concern of converting the raw materials to a final product.
c) Include the activates of information management that is used to organize and schedule the activities to meet the production needs.

The company must be fully informed of all activities related to the production process and also should take care about the activities that are outside the boundaries of the company. In addition, the mapping of the value stream that is used to identify the waste and loss. This helps to eliminate these problems easily. The stage of determining the value stream is considered as an important step as many companies, which cannot be ignored this because it provides benefits of eliminating the waste and loss easily (Womack and Jones,2003).
In addition, researchers believe that the process of applying the principle of the value stream in the company is used to solve the problems and information management through the process of converting raw materials to a finished product. This helps to eliminate of all forms of waste and loss that occur in the process of converting raw materials to a final product and even the process of delivering of the product to the customer; therefore, the increasing the profits and reduce the cost will be guaranteed.

2.2 Flow principle and pull principle

When the value is defined and determined and also the map of value stream is drawn for a given product, in this stage, we can apply the flow principle and the pull principle. The material flow principle is based on the development of a set of tasks for each step of production through mass production process. This helps the company to increase the number of machines and workers in order to increase the quantity of production. This surplus will be as a form of continuous flow along the value stream, which is ready to meet the needs of customers. The flow principle is based on the previous principles where the value is determined and the value stream is drawn for a specific product. Based on that the source of excessive and waste can be identified in the production process. Therefore, the process of minimization the production

costs and maximization of profits will be guaranteed. In accordance with these principles, equipment and persons in each group shall be operated at a maximum speed of production in order to produce a big quantity of products that not exceed the needed amount. Therefore the production of large quantities exceeding the amount of production required of the customers leads to the survival of the products and parts of the final product for a long time in the stores, which leads to waste and loss such as excessive production, so a mixture must be applied between the flow principle and pull principle to maintain the balance between the flow of materials And pulling materials in the ideal position.

The principle pull is based on the request of the product from the customers and then the company to withdraw the raw materials needed to manufacture this product from the market and be along the stream of value, which leads to the low level of inventory and the time of retention, the principle pull depends on the quantity of supply and consequently reduces the level of inventory and retention time, and there is a disadvantage use of the principle pull, the greater the amount of production reduces the benefit of reducing the cost of the unit produced, In order for companies to benefit from reducing the cost of the productive unit, the higher the quantity of production the greater the mix of the pull principle and flow principle, This means that there are steps based on the pull principle and other steps based on the flow principle during the supply chain. Therefore, lean organizations reduce the time it takes to work, reduce the inventory and reach the final product to the customer as quickly as possible by using the flow principle and pull principle. (simchi,et al.,2008) Standpoint of the researchers: the difference between the principle flow and the principle pull in short, as the principle of flow is production in large quantities and not at the request of customers to achieve a specific goal or policy, the principle pull material is produced at the request of customers and not randomly.

2.3 Continues Improvements "Kaizen:

Continuous improvement " Kaizen" principle is the approach of a lean manufacturing system whereby a currency mechanism develops production by continuous improvement, reducing the cost of defective production, The quality of the product ensures continuous improvement, which reflects the satisfaction of the customer and achieves the company's goals. Kaizen is a Japanese term meaning improvement Which gained fame through Kaizen book: The Key to Japanese Competitive Success (Imai,1986), Staff stewardship and strong administrative support are important for continuous improvement For example, Japan's Honda Motor Company has been hiring staff to assemble the exterior parts of the car from a designed by design engineers. (Kasson and Ahlstrom, 1996, Martinez and Perez, 2001).

The continuous improvement "Kaizen" of the company's should make the company efforts to reduce waste and eliminate it. The process of productivity improvement should be continuous and constant and be to infinity, Employees in the organization should be encouraged and must have responsibilities to improve the company's products and operations and be able to bring about new changes, The continuous improvement "Kaizen" concept provides improvements in small, but fast reliable steps that have long-term impact, Through the continuous improvement "Kaizen", it aims to slow gradual but long-term improvement as well as improvement from day to day (Laura,2010).

And raise the quality to the highest level possible continuously, that is, a continuous search to reduce costs and eliminate the damage and improve quality and performance processes that increase the satisfaction and value of the customer (Drury,2006). Standpoint of the researchers: The application of the principle of continuous improvement "Kaizen" It is based on progressive and continuous improvements to the infinity and perfection search, leading to product development and product quality improvement and achieves customer satisfaction, which contributes to reduce production costs and maximize profits and achieve the goals of the target company.

2.4 Society study

The population of the study included of Jordanian manufacturing corporations that included in Amman stock exchange, which the summation of these corporations is equal to (56) corporations. This percentage is acceptable based on a study in (Sekaran, 2010). This study focused on all the managers of these corporations such as the managers of the departments, divisions of finance, production, human resources, information technology, sales, marketing, procurement and supply. 280 questionnaires have been distributed to these corporations in average (5) questionnaires for each

company. 242 questionnaires have been retrieved from these companies in which just 227 questionnaires can be analyzed. This represents a total of 81.1% of all the distributed questionnaires whereas a total of 15 questionnaires unable of analyzing because they were uncompleted**.**

3. STATISTICAL TREATMENTS

A program has been used Statistical Package for Social Sciences- SPSS in the following statistical analysis:

1) Descriptive Statistics: The percentages, frequencies, arithmetical averages (mean), and standard deviations were used to provide a comprehensive description of the percentage of the members' agreement for the parts of the study.
2) Descriptive statistics procedures through.
3) Cronbach Alpha to measure the stability of the of the study (questionnaire).
4) One-Sample t-test to test the hypotheses of the study
5) The relative importance was determined according to the following formula and according to the five-measure of the answer alternatives for each paragraph:

$$Length\ of\ the\ period = \frac{(highest\ \lim it\ of\ alternatives - lowest\ \lim it\ of\ alternative)}{number\ of\ level}. \quad (1)$$

$$Length\ of\ the\ period = \frac{(5-1)}{3} = 1.33 \quad (1)$$

Where the numbers of levels are: low, moderate, high, and based on it:

- Level low if it reaches arithmetic average from 1 to less than 2.33;
- Level moderate if it reaches arithmetic average from 2.33 to less than 3.66;
- Level high if it reaches arithmetic average from 3.66 to 5.00.

Stability test of the study instrument:
The results were calculated Cronbach's Alpha as follows

Table 01: Cronbach's Alpha "Study tool"

Number	Distance	Alpha value
1	Principle value	0.664
2	Principle stream value	0.679
3	Flow principle and pull principle	0.642
4	Continues improve "Kazin"	0.775
5	Lean accounting	0.846

We can note that the values of the coefficient of internal consistency "Cronbach's Alpha" are in the range of (0.664 - 0.846). Based on that all the values are greater than (0.60). This indicates the consistency between the paragraphs of the study instrument and reliability of the study tool for statistical analysis.

3.1 Analysis of study questions

This part of the study describes variables of the study and paragraphs of the questionnaire. The average and standard deviation have been calculated for the paragraphs of the questionnaire in order to judge on the degree of approval and to determine the relative importance of each paragraph. The results of this study were as follows:

3.1.1 Principle value

Table 02: Averages and standard deviations for the paragraphs of the value principle

Number	Paragraphs	Mean	Std. Dev.	Rank	Relative importance
1	Products and services are provided according to the needs and desires of customers to increase profits and reduce production costs.	4.066	0.882	1	High
2	The principle of value in lean accounting is used to eliminate waste and loss and also to achieve the maximum benefits of the company, which contributes to reduce production costs	3.634	0.859	7	Moderate
3	The company explains its operations in the development of existing products and the development of new products to reduce production costs.	3.739	0.863	3	High
4	The company allows people (clients and employees) to see and understand how value flows in the production process to increase profits or reduce costs.	3.612	0.781	8	Moderate
5	The Company excludes activities that do not add value. In addition, it works to maintain the host activities that increase the value, which helps to increase in the value of products and thus reduce production costs and increase profits	3.683	0.823	6	High
6	The value of sales is determined by satisfying the customer's desires in the produced , which aims to eliminate of activities that do not add value and thus reduce production costs.	3.806	0.871	2	High
7	The company meets the requirements of customers that helps to achieve the added value to the product.	3.714	0.858	5	High
8	The company determines the added value of all activities in the production process.	3.733	0.883	4	High
General measure		3.748	0.466		High

From the table above, we observe that the relative importance of the general average of the value principle paragraphs is high, which the general average and standard deviation are equal to (3.748) and (0.466) respectively. The paragraph of (products and services are provided according to the needs and desires of customers to increase profits or reduce production costs) ranked first with an average of (4.066) and a high relative importance while the paragraph of (the company allows people (customers and employees) to see and understand how the value flow in the production process to increase profits or reduce costs) at the last rank, with an average of (3.612), and a moderate relative importance.

3.1.2 Principle value stream:

Table 03: Averages and standard deviations for the paragraphs of the principle value stream

Number	Paragraphs	Mean	Std. Dev.	Rank	Relative Importance
1	Hourly daily reports are developed to measure the ability to terminate tasks and provide fast reverse feedback in the event of a problem which reduces production costs	3.626	0.790	7	Moderate
2	The value stream principle in lean accounting is used to determine the overall flow of all production activities and their operation in an integrated manner, thus is contributing to reduce production costs	3.617	0.808	8	Moderate
3	The company uses the income cost stream to detect cost management, thereby reducing production costs.	3.749	0.811	2	High
4	The use of the value stream principle in lean accounting helps to provide accurate details of each production stage that arises within the industrial company, thus contributing to lower production costs.	3.665	0.816	5	High
5	The use of the lean value stream principle helps to determine the process flow mechanism, which contributes to reducing production costs.	3.700	0.840	4	High
6	The company adopts the principle of value stream in the detection of common methods on production processes, which contributes to reduce production costs	3.722	0.840	3	High
7	The company outlines the necessary steps of completing the production processes from the time the customer request is received until the processing and delivery of the products, which aims to the reduction of production costs.	3.811	0.869	1	High
8	The company uses the principle of value stream in determining all steps and activities undertaken by the company, and its total costs to accurately increase profits or reduce costs.	3.656	0.773	6	Moderate
General measure		3.693	0.455		High

From Table 3, we observe that the relative importance of the general average for value stream principle of the paragraphs is high, which its average is equal to (3.693) with standard deviation equal to (0.455). The paragraph of (the company outlines the necessary steps of completing the production processes from the time the customer request is received until the processing and delivery of the products, which aims to the reduction of production costs) ranked first with an average of (3.811) and a high relative importance. On the other hand, the paragraph of (the value stream principle in lean accounting is used to determine the overall flow of all production activities and their operation in an integrated manner, thus is contributing to reduce production costs) came in the last rank, with an average of (3.617), and a moderate relative importance.

3.1.3 Flow principle and pull principle

Table 04: Averages and standard deviations for the paragraphs of the flow principle and pull principle

Number	Paragraphs	Mean	Std. Dev.	Rank	Relative importance
1	A specific cost is given to any product that the company produces it or develops it based on an original product. All of these products produced based on customers' desire to increase profits or reduce costs	3.974	0.830	2	High
2	The cash capacity received from customers (cash flow) is measured by measuring the average daily sales volume	3.947	0.876	3	High
3	The use of the principle of material flow and the pull of materials helps to reduce the time that is taken to work the products, reduce the retention period of the inventory and helps also to deliver the final product to the customer as soon as possible. This helps to reduce the production costs	3.907	0.880	4	High
4	he company determines the maximum permitted cost of the new product or for developing an old product in order to achieve sales growth, minimizing production costs and maximizing profits	4.040	0.843	1	High
5	The company relies mainly on the principle of material flow and pull of material in reducing production costs	3.718	0.882	7	High
6	The company relies on the principle of material flow and pull of material in cost control	3.771	0.873	6	High
7	The company adopts the principle of the flow of materials and the pull of materials to meet the needs and desires of customers by providing products with an acceptable cost and high quality.	3.775	0.916	5	High
8	The company relies on the principle of material flow and the pull of materials in planning to maximize profits.	3.687	0.843	8	High
General measure		3.852	0.464		High

From the Table4, we can notice that the relative importance of the general average of the flow principle and pull of principle paragraphs is high, which its average is equal to (3.852) with a standard deviation of value (0.464). The paragraph of (the company determines the maximum permitted cost of the new product or for developing an old product in order to achieve sales growth, minimizing production costs and maximizing profits) ranked first with an average of (4.040) and a high relative importance/ on the other hand, the paragraph of (the company relies on the principle of material flow and the pull of materials in planning to maximize profits) comes in the last rank, with an average of (3.687), and a high relative importance.

3.1.4 Continues Improvements "Kaizen":

Table 05: Averages and standard deviations for the continues improvements "Kaizen":

Number	Paragraphs	Mean	Std. Dev	Rank	Relative important
1	Employees are involved in the development plans of products to improve quality and performance. Therefore, the reduction in the product cost will be guaranteed.	3.643	0.842	8	Moderate
2	The company is working to make adjustments and improvements to its production processes gradually and continuously. This helps to reduce production costs.	3.855	0.810	2	High
3	The company follows the continuous improvement principle of Kaizen to produce a high quality product, maximize benefit, and to reduce production costs.	3.894	0.850	1	High
4	The company provides all the necessary information about accounting to apply the principle of continuous improvement "Kaizen" in reducing production costs.	3.762	0.860	5	High
5	The company adopts the principle of continual improvement in the process of predicting the amount of cost reduction, including, material purchase, labor, material use in manufacturing processes. This leads to reduce production costs.	3.749	0.956	6	High
6	The company will include the expected future improvements during the period of future budget. After that, include them in figures of budget. This leads to reduce production costs	3.802	0.868	3	High
7	The company depends on the principle of value stream in the process of administration control and continuous improvement "Kaizen", which helps to reduce production costs	3.670	0.771	7	High
8	The company adopts the principle of continuous improvement "Kaizen" on all production processes, which leads to reduce production costs.	3.784	0.858	4	High
General measure		3.770	0.428		High

Based on Table 5, we observe that the relative importance of the general average related to the paragraphs of Continues Improvements "Kaizen" is high, which its average is equal to (3.770) with a standard deviation of value (0.428). The paragraph of (the company follows the continuous improvement principle of Kaizen to produce a high quality product, maximize benefit and to reduce production costs) ranked first with an average of (3.894) and a high relative importance. However, the paragraph of (employees are involved in the development plans of products to improve quality and performance. Therefore, the reduction in the product cost will be guaranteed) comes in the last rank, with an average of (3.643), and a moderate relative importance.

To compare between the lean accounting principles, the following table has been prepared:

Table (6): Averages and standard deviations for the principles of lean accounting

Number	Principles of lean accounting	Mean	Std. Dev.	Rank	Relative importance
1	Principle value	3.748	0.466	3	High
2	Principle value stream	3.693	0.455	4	High
3	Flow principle and pull principle	3.852	0.464	1	High
4	Continues improvement	3.770	0.428	2	High
Lean accounting		3.766	0.354		High

We can notice that the tested companies are applied the principles of lean accounting in significant manner. This is clear in the average in these principles in which is equal to (3.766) with a standard deviation equal to (0.354). The principle of material flow and the pull of materials was ranked first with an average of (3.852) and a standard deviation of (0.464), while the principle of value stream principle had a last ranking with an average of (3.693) and standard deviation of (0.455).

3.1.5 (1-9): Test the hypotheses of the study:

The hypothesis and sub-hypotheses have been studied by using a t-test for one sample. This test was used to determine the range of deference between the value of sample responses and the value of (3.5), which the value of (3.5) represents the average choice of responses for the sample paragraphs. Based on sample test, we can notice that the answers of choice (not strongly agreed) is not been selected. Therefore, the means for other responses have been calculated. In addition, the significance of value (t) has been calculated based on the difference between the arithmetic average of the sample responses and the average (default mean) based on value of (Sig t). The difference of these values can be considered as significant value, if the value of (Sig t) is less than 0.05. the results of this study can be summarized as follows:

The main hypothesis:

There is no role for the adoption of lean accounting in reducing production costs in Jordanian Manufacturing Corporation.

This hypothesis and its sub-hypotheses aimed to test the role of lean accounting in reducing production costs in Jordanian Manufacturing Corporation.

Table 07: The results of the t-test of the hypothesis number 1 (H01)

Hypothesis	Mean	Std. dev.	presumptive average	Different between average	Calculated value t	Function level Sig t*
H01	3.7660	0.3536	3.5000	0.2660	11.333	0.000

It's clear based Table (7) that the average of the role of lean accounting in reducing production costs was (3.7660), which is greater than the standard computational average of value (3.5) that adopted by the other researchers. The difference between the obtained average and standard average was equal to (0.2660). This difference is significant based on the value of the sign (Sig = 0.000), which is smaller than (0.05). On the other meaning, this means that the respondents agreed with the role of lean accounting in reducing production costs. Therefore, this rejects the first hypothesis (H01) and accepting the alternative which states that:

Sub-hypothesis (H01-1): **"there is a role to adopt lean accounting in reducing production costs in Jordanian Manufacturing Corporation"**

H01-1: There is no role to apply the principle of value in reducing production costs in Jordanian Manufacturing Corporation.

Table 8: presents the results of the t-test of the H01-1 as follows:

Hypothesis	Average	Std. dev.	Presumptive average	Different between average	Calculated vale t	Function Level t*
H01-1	3.7483	0.4660	3.5000	0.2483	8.029	0.000

It's clear based Table (7) that the average of the role of value principle in reducing production costs in Jordanian manufacturing corporation was (3.7483), which is greater than the standard computational average of value (3.5) that adopted by the other researchers. The difference between the obtained average and standard average was equal to (0.2483). This difference is significant based on the value of the sign (Sig = 0.000), which is smaller than (0.05). On the other meaning, this means that the respondents agreed with the role of value principle in reducing production costs. Therefore, this rejects the sub-hypothesis (H01-1) and accepting the alternative which states that:

"There is a role to apply the value principle in reducing production costs in Jordanian Manufacturing Corporation"

Sub-hypothesis (H01-2): there is no role to apply value stream principle in reducing costs in Jordanian Manufacturing Corporation.

Table 09: The results of the t-test of the H01-2 as follows:

Hypothesis	Average	Standard deviations	Presumptive average	Different between average	Calculated vale t	Function Level t*
H01-2	3.6933	0.4584	3.5000	0.1933	6.402	0.000

Table (7) shows that the average of the role of value stream principle in reducing production costs in Jordanian manufacturing corporation was (3.6933), which is greater than the standard computational average of value (3.5) that adopted by the other researchers. The difference between the obtained average and standard average was equal to (0.1933). This difference is significant based on the value of the sign (Sig = 0.000), which is smaller than (0.05). On the other meaning, this means that the respondents agreed with the role of value stream principle in reducing production costs. Therefore, this rejects the sub-hypothesis (H01-2) and accepting the alternative which, states that:

"There is a role to apply the value stream principle in reducing production costs in Jordanian Manufacturing Corporation"

H01-3: there is no role to apply flow principle and pull principle in reducing costs in Jordanian Manufacturing Corporation.

Table 10: presents the results of the t-test of the H01-3 as follows:

Hypothesis	Average	Std. dev.	Presumptive average	Different between average	Calculated vale t	Function Level t*
H01-3	3.8524	0.4638	3.5000	0.3524	11.448	0.000

Table (7) shows that the average of the role of flow principle and pull principle in reducing production costs in Jordanian manufacturing corporation was (3.8524), which is greater than the standard computational average of value (3.5) that adopted by the other researchers. The difference between the obtained average and standard average was equal to (0.3524). This difference is significant based on the value of the sign (Sig = 0.000), which is smaller than (0.05). On

the other meaning, this means that the respondents agreed with the role of flow principle and pull principle in reducing production costs. Therefore, this rejects the sub-hypothesis (H01-3) and accepting the alternative, which concludes that:

"There is a role to apply flow principle and pull principle in reducing production costs in Jordanian Manufacturing Corporation"

H01-4: there is no role to apply continues improvements" kaizen" in reducing costs in Jordanian Manufacturing Corporation.

Table 11: the results of the t-test of the H01-4 as follows:

Hypothesis	Average	Standard deviations	Presumptive average	Different between average	Calculated vale t	Function Level t*
H01-4	3.7698	0.4281	3.5000	0.2698	9.497	0.000

Table (7) shows that the average of the role of continues improvements" kaizen" in reducing production costs in Jordanian manufacturing corporation was (3.7698), which is greater than the standard computational average of value (3.5) that adopted by the other researchers. The difference between the obtained average and standard average was equal to (0.2698). This difference is significant based on the value of the sign (Sig = 0.000), which is smaller than (0.05). On the other meaning, this means that the respondents agreed with the role of continues improvements" kaizen" in reducing production costs. Therefore, this rejects the sub-hypothesis (H01-4) and accepting the alternative, which concludes that:

"There is a role to apply continues improvements" kaizen in reducing production costs in Jordanian Manufacturing Corporation"

4. CONCLUSIONS

Based on the preliminary data collected by the researchers, and based on statistical analysis and hypothesis testing, the following results were obtained:

The results of the descriptive analysis showed that the attitudes of the respondents of sample test were towards approving the role of lean accounting principles in reducing production costs in the Jordanian manufacturing corporation with a high level of relative importance. In addition, the results showed that the principle of flow material and pull material was first in terms of relative importance, while the principle of value stream came in last ranking with the high relative importance of all lean accounting principles. The results of the first main hypothesis test showed that there is a role to adopt lean accounting in reducing production costs in Jordanian industrial Manufacturing Corporation. This result proved the opinion of the respondents about the role of lean accounting principles in reducing production costs. The results of the sub-Hypotheses test showed that there is a role to adopt lean accounting principles in reducing production costs in Jordanian manufacturing corporation, This result also showed the importance and high relative importance to adopting lean accounting principles in reducing production costs.

5. RECOMMENDATIONS

Depending on the results, the researchers recommend the following:

1) The need for senior departments and executive departments in industrial companies to increase the activation of lean accounting principles to increase the flow of value in operational activities, to identify and promote activities that add value to products, and to delete activities that do not add value to products.
2) To activate the use of the value principle in lean accounting in a higher manner, to eliminate waste and loss and to achieve the maximum benefits of the company, in order to reduce production costs.

3) To activate the use of the value stream principle in lean accounting in order to determine the overall flow of all production activities and work in an integrated manner, and the development of daily reports per hour to increase the ability to detect and solve obstacles. This leads to reducing production costs.
4) Relying on the principle flow material and pull material, and linking this principle to the needs and desires of customers to provide competitive products in terms of quality and price.
5) Increase the level of participation of employees in the development of the company plans to improve quality and performance, and to take their views and suggestions regarding production processes, and the flow of value.

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