

The Impact of Using the Lean Accounting Tools on Improving the Lean Planning Level in the Jordanian Industrial Public Shareholding Companies

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Abstract :-This study explored the impact of using the lean accounting tools on improving the lean planning level in the Jordanian industrial public shareholding companies. To meet the study's goals, the researchers developed a questionnaire. The questionnaire forms were passed to those companies that were listed in Amman Stock Exchange till 31/12/2020 (i.e. 42 companies). The researchers chose a sample consisting from 31 companies. Those companies use the lean accounting tools represent 73.8% of the population. It was found that using the lean accounting tools has an impact on improving the lean planning level in the Jordanian industrial public shareholding companies. Several recommendations were suggested by the researchers. For instance, the researchers recommend showing more attention by the Jordanian industrial public shareholding companies to using the lean accounting methods. They recommend showing more attention by the Jordanian industrial public shareholding companies to lean planning.

Key-Words: -Lean accounting tools, lean planning, The Jordanian industrial public share holding companies.

Received: May 22, 2021. Revised: April 12, 2022. Accepted: May 15, 2022. Published: June 9, 2022.

1 Introduction

1-1 Preface

The industrial sector witnessed many changes and developments. For instance, such developments include: developments to the production methods. Many industrial companies have been showing much attention to lean production. The lean production dimensions that have been receiving attention include: continuous improvement, the value added to customers, cost reduction, quality achievement, and elimination of the wastage of resources. They have been receiving attention in the aim of making a competitive advantage. The lean accounting concepts and methods today don't fit with those developments. Thus, those companies today search for accounting tools that fit with lean production. Such accounting tools include: lean accounting tools. Lean accounting involves modern accounting tools that contribute to eliminating the wastage of the resources used in the production process and operations. It aims at reassigning employees to various teams that are multidisciplinary teams. It aims at making continuous improvements to products with incurring the least costs. It aims to achieve that through eliminating the activities that don't add a value and re-arranging the activities in a manner that contributes to ensuring the flow of activities

and the delivery of products of high quality that meet customer desires and expectations. It aims at improving the decision making, control and planning processes [10]. Due to showing increasing attention shown to lean production by industrial companies and having changes to accounting practices, the attention shown to planning increased. The attention shown to accuracy and timeliness of information and reaching a competitive strategy increased. The attention today is shown much to the strategic dimension. This dimension become a basic requirement in successful management in light of lean accounting. Business from managing sales, operations and financial planning correctly [8], through which it is possible to access detailed, diverse and comprehensive data on the current and future situation of the organization and for each stream separately, including: the financial, operational and productivity aspects, in a simple, uncomplicated and inexpensive manner, and through which it is also possible to focus on offering a value for customers, meeting customers' desires, ensuring survival, and making a competitive advantage [1]. Therefore, this study aimed to identify the impact of applying lean accounting tools on improving lean planning in Jordanian industrial public shareholding companies.

1-2 Statement of the Problem:

Due to the development of the industrial sector, having technological progress, and changes to the production methods, and administrative and accounting concepts, the administrations of Jordanian industrial public shareholding companies had to keep abreast of these developments and shifts to lean production and adopt graceful accounting tools in an environment characterized by changes and intense competition. It also required these companies to pay attention to planning, especially in light of having an intense competition, limited resources, environmental variables and global developments, especially in light of lean manufacturing and lean accounting, and to go to lean planning so that these companies can take decisions efficiently and effectively and get rid of the activities that do not add the value of eliminating waste and loss in Resources and adding value to customers and focusing on comprehensive, diverse and clear performance measures that meet the operational, energy and financial aspects and reflect the empowerment of workers and their participation in improvement processes, which increases their ability to meet the requirements of local and global competitiveness and continuity and achieve competitive advantage, hence the problem of the study emerged through the link between the application of lean accounting tools Improving the level of lean planning in the Jordanian industrial public shareholding companies. It also aimed to offer answers to the following questions:

1. What is the level of application of lean accounting tools in Jordanian industrial public shareholding companies?
2. What is the level of interest of the Jordanian industrial public shareholding companies in lean planning?
3. What is the effect of applying lean accounting tools on improving the level of lean planning in Jordanian banks?

The following sub-questions arise from it

The first sub-question: What is the effect of applying target costing as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies?

The second sub-question: What is the effect of applying management by policies (Hoshin) as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies?

The third sub-question: What is the effect of applying the points box as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies?

The fourth sub-question: What is the effect of applying continuous improvement as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies?

The second sub-question: What is the effect of applying investment in people (employee satisfaction) as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies?

4. What are the most influential lean accounting tools on improving lean planning in Jordanian industrial public shareholding companies?

2 The objectives of the study:

This study aims to identify the impact of the application of lean accounting tools in improving the level of lean planning in Jordanian public shareholding industrial companies. This study aimed at:

1. Recognizing the level of application of lean accounting tools in the Jordanian industrial joint stock companies.
2. Recognize the degree of interest of Jordanian industrial companies in lean planning.
3. Explanation of the impact of applying lean accounting tools in improving lean planning in the Jordanian industrial joint stock companies.
4. Explanation of the impact of applying target costing as one of the lean accounting tools in improving lean planning in the Jordanian industrial public shareholding companies.
5. Explanation of the impact of applying management by policies (Hoshin) as one of the lean accounting tools in improving lean planning in the Jordanian industrial public shareholding companies.
6. Explanation of the impact of applying the points box as one of the lean accounting tools in improving lean planning in the Jordanian industrial public shareholding companies.
7. Explanation of the impact of applying continuous improvement as one of the lean accounting tools in improving lean planning

in the Jordanian industrial public shareholding companies.

8. Explanation of the impact of applying employee satisfaction as one of the lean accounting tools in improving lean planning in Jordanian industrial companies, public shareholding.
9. Revealing the tool is one of the most influential lean accounting tools on improving the lean planning of the Jordanian industrial public shareholding companies.

3 Literatures

3-1 lean accounting

Lean accounting is one of the most important things presented by modern accounting thought to keep pace with the progress and development in the manufacturing process, which has moved towards lean manufacturing, through which industrial companies have been able to incur the lowest possible costs and focus on the value provided to customers and eliminate the waste of resources and loss of resources and the best steps for work flow. The lean accounting system is an updated system for cost planning, measurement and control according to new foundations and standards. Lean accounting is able to provide the relevant financial and non-financial information that is needed to implement the lean strategy and which leads business organizations to achieve financial success. [14] lean accounting it provides modern performance measures that reflect lean performance and are commensurate with the lean behavior of organizations. About creating value for the customer, as well as providing relevant, timely information that is relevant to decision-making. The importance of lean accounting as seen by [38] also lies in its ability to form an organizational culture based on the principle of participation of all employees in the organization and motivating them to continuous improvement in all operations and thus work to organize the company's management and thus reduce time and cost and get rid of waste, lost and damaged in All operations and activities. [16] add that the importance of lean accounting arises from focusing on the strategies that achieve financial benefits for the organization. Hence, it becomes clear that the importance of lean accounting is attributed to focusing on eliminating waste and loss and its ability to provide temporary and relevant information for decision-making and focus on long-term improvement and adding value to the customer. That leads to achieving much financial success.

3-2 Lean Accounting Tools

lean accounting includes many tools. Each tool contributes to meeting the goal of its application. Consequently, a review of the lean accounting tools that were adopted in this study are as follows:

3-2-1 Target cost:

[31] Adds that the target cost is one of the strategic cost tools that leads to reducing the cost of the product in the design phase while maintaining to reach a competitive price and achieve profitability, as shown [22]. As the target cost "is the cost of manufacturing and marketing the product that includes access to the target selling price while achieving the profit margin required by the company." Between the market price and the planned profit, it represents the permissible target cost [5]. [25] add that the target cost is the cost expected to be obtained in the long-term from a single unit of products and services through which the company can achieve the target operating income when Selling it at the target price. The importance of applying the target cost stems manifests in the points below: [24]:

1. The target cost focuses on products that meet customer needs.
2. The process of designing and manufacturing products is carried out based on market requirements, thus reaching the target price planning, ensuring continuity and maintaining market share.
3. The process of designing and manufacturing products includes commitment and support from top to bottom.
4. The existence of a system of control of policies and strategies includes manufacturing so that market and production opportunities are determined based on market requirements, which represents the real cost control and availability mechanism instead of resorting to cost reduction.

[21] adds that the target cost can help in the strategic management of profits by reducing product costs in the product life cycle, as it is considered a means of managing cost and profitability together. [26] adds that the success of the application of target cost in Profit planning depends on the ability of the financial system to translate operational performance into financial values, and then evaluate the effects on future products and services. Hence, it can be said that the target cost is a tool for cost management and reduction and profit planning. This tool does that through reducing the cost at the stage of product

design and eliminating costs that do not add value and therefore this tool is concerned with the design of the product and all its details.

3-2-2 Management by Policies (Hoshin)

Management has been defined with policies (Hoshin): "It is the process of developing strategies and objectives, which are based on the performance of the previous year, and then use them to detect areas of improvement. Achieving them [30]. The Hoshin Kanri methodology is based on bridging the gap between the current actual performance and the target performance through focusing on quality control and continuous improvement activities. That's done through setting an annual plan to meet goals simultaneously, and Hoshin Kanri is a means of expressing and formulating strategic goals and future visions. And the development of means to turn it into a reality and a systematic expression of strategic planning or strategic management [29]. [13] she indicated that Hoshin planning aims to provide assistance to the organization in search of being able to identify a common goal and deliver this goal to all leaders and involve them in the planning process to meet the goal and hold them accountable for the extent of achieving their part, Hoshin's application also requires translating the strategic goal into activities and actions required day by day. [36] add that Hoshin's policy is not a strategic planning tool in itself, but rather an executive tool for the dissemination of the strategic plan at all administrative levels in the facility. Hence, the researchers find that management by policies (Hoshin) is an important administrative tool that is are consistent with the transformation of business organizations to agility, through which the business organization can identify areas and opportunities for change and improvement. Such management sets a clear vision that is translated into limited and detailed goals for all administrative levels with defining procedures. To meet these goals, a detailed implementation plan and an effective control plan for the results.

3-2-3 The points (Score) box

The score box is described as a table that offers an organized summary of the weekly results recorded in the Value Stream Performance Report. It is used to make decisions (routine and non-routine) from internal manufacturing or purchasing decisions, financing decisions, profitability decisions and product rationalization decisions. Through the points box, it is possible to evaluate the compatibility of the results with the objectives at each level of the unit in order to verify the effectiveness of agility and what must

be done to promote continuous improvement [34]. The points box includes three types of measurement indicators. Those indicators are shown below [15]:

1. operational indicators related to efficiency, quality and speed.
2. Unutilized energy data (enterprise resources).
3. The financial indicators related to the revenues and costs of each stream separately.

Through the integration of these indicators, the management shall be able to take many critical decisions in the aim of improving the future state of the value stream and offering value to customers [6]. The benefits from the application of the points box by all people within the organization and each according to his point of view, as the value stream manager and the improvement team can through the points box design improvement programs and introduce gradual improvements, and executives can use the points box to simulate the potential effects of products and prepare capital investment plans [7]. Hence, the researchers found that the point box is considered one of the important tools in lean accounting, in which the business organization can obtain summaries of the results of the value stream with various, comprehensive and detailed measures, and focus the attention of the value stream team on areas through which continuous improvement can be achieved.

3-2-4 Continuous Improvement (Kaizen)

Continuous improvement (Kaizen) is considered one of the modern strategic management tools that aim at reducing costs, improving product quality and providing value to the customer. The future, introducing and adopting global changes and evaluating its work on the organization's performance [20]. It is also considered a gradual improvement approach by focusing on small improvement activities instead of large activities. That takes place through having innovation and great investment in technologies. The responsibility for its implementation lies with the senior management and the executive management [23]. The continuous improvement tool relies on simple and inexpensive methods or the lowest cost when improving. It seeks dividing complex processes into a group of sub-processes, and the focus is on improvement on these sub-processes as it is applied to all work elements and resources of the facility from individuals, techniques, time, inventory and performance methods and conducting operations. Continuous improvement relies on the support of management on continuous improvement

processes in the organization [27]. Hence, it can be said that the cost of continuous improvement is one of the important lean accounting tools in cost management. This tool is concerned with focusing on the areas of error and the occurrence of problems and making improvements to procedures and work activities in order to meet the desires of customers and exceed their expectations, through team work.

3-2-5 Investing in people (employee satisfaction)

Lean accounting depends on investing in the human element, which is one of the pillars of the success of the application of lean accounting tools by attracting the right people in terms of skill and scientific and practical competence, and that they have experience and knowledge in the accounting methods used in the company, the nature of the company's work and the activities it practices in addition to their practical and scientific experience. In lean accounting and its tools and how to apply them in the company's activities. Emphasis is also placed on developing their skills and capabilities through training and qualifying them scientifically and practically in order to enable them to apply and implement the lean accounting tools at the workplace and raise their job satisfaction [7]. However, most organizations that have switched to agility overlooked the importance of the need for active leadership and senior management, employee participation and a radical change in the institutional culture that makes training, participation and empowering workers very important in the success of the agile organization. The focus and attention was only on agile accounting tools, and business organizations were able to. Through agile accounting tools and based on the value flow from providing appropriate metrics around employee empowerment, such as metrics related to the number of continuous improvement proposals, metrics on the percentage of people involved in continuous improvement, and metrics on the level of training, many business organizations that have switched to agility use the method of profit sharing and give a share of the company's shares, any of the employees contributes to the improvement and success of the organization, in addition to its reliance on the results of the annual surveys in measuring the administrative capacity and its success and empowering the employees [33]. [19] add that employees are the most important element in the organization. The technical and financial resources become useless without having proper utilization and employment for human skills and capabilities.

Hence, we find that employee satisfaction or investment in people is one of the lean accounting tools that highlight the importance of the human element of workers in the organization in the success of the application of agility in the organization and making improvements.

3-2 Lean planning:

The change to the modern environment of manufacturing and the orientation of industrial companies towards lean manufacturing led to making a change to the accounting practices in terms of focusing on cost reduction, continuous improvement, control, performance measurement, decision-making, and orientation towards adopting lean accounting tools to fit with this transformation. Therefore, it was necessary for business organizations to focus on the strategic dimension of business organizations and finding a way through which to publish long-term strategic policies that lead to meeting the organization's goals and in line with the principles and components of lean accounting tools [13], and searching for what is consistent and achieves the concept of strategic agility, which emphasizes strategic thinking and a clear vision instead of From strategic planning, which focuses on searching for innovative models and ways to create value through access to new and innovative products and services, the ability to adapt, and continuous alignment with the strategic direction in the business environment [2]. Hence, the concept of lean planning appeared to suit this transformation and the changes to the work environment and modern administrative and accounting concepts. Lean planning is a modern concept through which business organizations are able to properly manage sales, operations and financial planning [8], [15]. Effective lean planning is based on two aspects. Those aspects are financial planning, which is concerned with obtaining financial resources at the lowest cost and the best conditions, and achieving the best investment of resources and within the least possible risks, in addition to planning to increase the volume of sales and increase profits, as well as planning to fulfill obligations on time [18]. Productive planning sets strategic goals of the organization. It sets the capabilities, financial and human resources that are needed to meet these goals, the mechanism for implementing this plan, and determines the time period required to accomplish each of these goals [35].

4 Previous studies

A study [8] aimed to explore the impact of using lean accounting tools in improving the level of

lean planning in the Central Bank of Kuwait through lean accounting tools (Hoshin planning, 3P approach, investing in people). The study found a statistically significant effect of using the lean accounting tools in improving the level of lean planning in the Central Bank. Kuwaiti.

A study [6] aimed to explore the possibility to assess and measure the performance at the health units through using the lean accounting methods. He targeted the box score. It was found that the box score directly raises the performance level in the health units of the departments and the divisions. The box score offers various financial and non-financial indicators that allow the management to make further improvements related to performance, quality, efficiency, and speed in delivery. Such indicators that allow the management to get rid of the unnecessary operations. It was found that the box score eliminates the wastage in resources through conducting comparison between streams of value and promoting competition between them. The box score supports the good streams.

A study [39] aimed at identifying the nature of the integration between the lean accounting tools, the dimensions of the balanced scorecard, and the evaluation of balanced strategic performance by applying two tools of the lean accounting tools (value stream and continuous improvement) on the Kufa cement plant in Iraq and making a comparison of the strategic performance. Before applying the two lean accounting tools and then slimming the performance in the study sample company, the study reached a set of results, the most important of which is that there is complementarity between the lean accounting tools and the dimensions of the balanced scorecard, and that the application of the lean accounting tools discussed in the study had a positive impact on improving strategic performance.

A study [3] aimed to identify the extent of the complementarity of the relationship between lean accounting techniques and tools and the sustainable balanced scorecard, and that the use of lean accounting techniques in Iraqi economic institutions, the study sample, led to a positive relationship to the application (value flow, continuous improvement and performance fund) as one of the techniques Lean accounting and improving sustainable strategic performance.

A study [4] aimed to offer a conceptual framework on lean accounting and its role in organizational performance. The researcher reached several results. It was found that the application of lean accounting tools effectively leads to the elimination of all forms of waste and

presents simplified and understandable reports compared to traditional systems. Thus improving the performance of companies that embrace Lean Manufacturing.

A study [17], This study offers a framework on measuring and managing strategic performance in organizations that depend on lean production, using the Hoshin Kenri methodology instead of the balanced scorecard and based on the x-matrix and catch-ball matrix through a study. A case on Toshiba Elaraby Company in Menoufia Governorate in Egypt, with interviews held by providing a framework for measuring strategic performance based on the Hoshin methodology instead of the balanced scorecard. It is based on waste-free production and the Hoshin Kenrin methodology is a suitable alternative.

A study [37] aimed to implement performance measurement for lean management through lean performance measures and the balanced scorecard, and thus design the lean strategy, by studying a case study on the production of printed circuit boards from the Belsen area, focusing on measuring the process performance of one of the main processes through measures Lean performance and non-financial indicators. The study reached a set of results, the most important of which is that this methodology and the performance measures it contains led to the support and improvement of operations management systems, improvement of quality, reduction of process time, cost reduction, and process control. Lean organization.

A study [13] aimed to offer a review about the use of lean accounting tools. Such tools include: Hoshin policy, score box, restricting operations, six sigma, integrated planning system, sales, operational processes, and financial planning. He aimed to shed a light on the use of such tools in the organizations that use accounting methods that fit with the lean manufacturing process and aim at developing policies, and strategies and raise profits.

A study [11] concluded that there is an application of the lean accounting tools (cost-based activity, management on Activity basis, target cost, balanced scorecard, production on time). combined in the Jordanian public shareholding industrial companies at an average level, in addition to the presence of many obstacles that limit the application of lean accounting in these companies, including the lack of knowledge of corporate management about the advantages and benefits of applying lean accounting tools. Lean accounting tools in Jordanian public shareholding industrial companies affect cost reduction.

A study [32] aimed to demonstrate the reality of lean planning through an illustrative example in semi-practical companies in the Netherlands by applying an approach to improving periodic tables, the study reached a set of results, the most important of which is the application of this approach led to an increase in the efficiency and effectiveness of planning and helped improve production quality and supply chain coordination. It also showed the importance of participatory workers, organizations and systems. Supporting decisions in continuous improvements, and in the event that advanced technology is available, will lead to further improvement in the effectiveness of this approach.

5 The Study’s Hypotheses and Study Model

5-1 The Study’s Hypotheses

Based on the elements of the study’s problem and its objectives, the hypotheses of the study were formulated, as shown below:

Main Hypothesis

H0: There was no statistical impact at ($\alpha \leq 0.05$) significant level of applying lean accounting tools (target costing, management by policies (Hoshin), points fund, continuous improvement, investing in people (employee satisfaction)) in improving the level of lean planning in Jordanian public Shareholding Company.

5-2 The Study’s Model

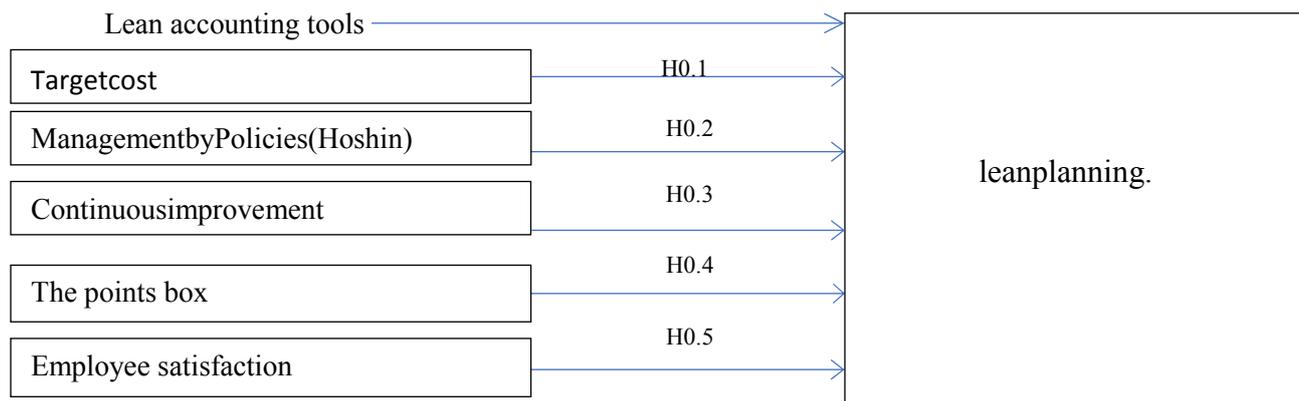


Fig.1: The study’s model

6 Methodology

This study is based on the use of the descriptive correlative approach, for its relevance to the purposes of the current study related to “the impact of the application of lean accounting tools in improving the level of lean planning in Jordanian industrial public shareholding companies to obtain by referring to the relevant literature. The study also used the survey method to obtain data from its primary sources.” And

The sub-hypotheses:

H0.1: There was no statistical impact at ($\alpha \leq 0.05$) significant level of applying target cost as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies.

H0.2: There was no statistical impact at ($\alpha \leq 0.05$) significant level of applying management by policies (Hoshin) as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies.

H0.3: There was no statistical impact at ($\alpha \leq 0.05$) significant level of applying the points box as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial joint stock companies.

H0.4: There was no statistical impact at ($\alpha \leq 0.05$) significant level of applying continuous improvement as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial joint stock companies.

H0.5: There was no statistical impact at ($\alpha \leq 0.05$) significant level of applying investment in people (employee satisfaction) as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial joint stock companies.

that is by developing an appropriate questionnaire to measure the variables of the study model, and after distributing it to the study sample, the appropriate statistical methods were used.

6-1 Population and Sample

The population of the present study consists of the industrial companies listed on the Amman Stock Exchange until 31/12/2020, which are (42) industrial companies, according to the web site

of the Amman Stock Exchange and the Securities Commission (www.ase.com.jo). The study sample included the industrial companies applied for tools Lean accounting formally identified(31) industrial companies after direct contact with the industrial joint stock companies listed on the Amman Stock Exchange until the end of 2020. , department head, administrative or cost accountant, chief accountant, internal auditor, production employee) in these Jordanian industrial joint-stock companies. (341) questionnaire forms were distributed to the study sample members, and 314 questionnaires were retrieved and 15 questionnaire forms were excluded that were not valid for statistical analysis, thus reaching the number of valid questionnaires for analysis. The statistician has (309) questionnaires at a rate of 90.6%, which is a statistically acceptable percentage.

6-2 Statistical methods

The descriptive statistics methods that were used to analyze data are shown below:

- Frequencies and percentages to describe the study sample members.
- Cronbach Alpha coefficient value to measure the instrument’s reliability.
- Means and standard deviations.
- The multiple regression test and the simple regression test.

6-3Instrument:

The instrument was designed by the researchers. It aims to identify the impact of applying lean accounting tools on improving the level of lean planning, a field study in Jordanian industrial companies with reference to theoretical literature and previous studies .

This instrument involves three parts that are

mentioned below:

1. The first part collects data about demographic information (i.e. current job, academic degree, and years of experience).
2. The second part collects data about lean accounting tools, and includes paragraphs (1-40), and the tool was designed along the lines of the five-year Likert scale, where the following aspects were addressed: (the first aspect deals with the target cost, and includes paragraphs (1-8), the second aspect It deals with management by policies (Hoshin), and it includes paragraphs from (1-8), the third aspect deals with the points box, and includes paragraphs (1-8), the fourth aspect deals with the cost of continuous improvement, and includes paragraphs (1-8), and the fifth aspect includes employee satisfaction, and includes paragraphs (1-8).
3. The third part collects data about lean planning, and includes paragraphs (1-14).

6-4 Validity and reliability of the instrument:

To measure the validity of the instrument, the questionnaire was passed to several faculty members chosen from the Public Accounting Department in Jordanian universities, in order to express their opinions on the validity of the content and the affiliation of the phrases to the scale and their suitability for measuring what they were designed to measure. 54) Paragraph, which indicates the apparent validity of the tool.

Reliability of the instrument: To measure the reliability of the tool, it was used to calculate the correlation coefficients between each of the items in the scale by using the coefficient (Cronbach's alpha). Table (1) shows the test results.

Table (1): Reliability coefficient values (Cronbach alpha coefficient values)

Variables	Cronbach'salpha coefficient values
Target cost	0.851
Management by Policy (Hoshin)	0.853
Points Box	0.899
The cost of continuous improvement	0.885
Staff satisfaction	0.857
lean planning	0.890

Based on table (1), the values of Cronbach's alpha coefficient for the sub-aspects of the scale were higher than(0.70). [28] which are acceptable values for the purposes of the current study. It was taken

into account that the five-point Likert scale used in the study should be graded according to the rules and characteristics of the scales as follows table (2):

Table (2) : The five point Likert scale was used for classifying the means:

answer alternatives				
Strongly Agree	Agree	neutral	Disagree	Strongly disagree
5	4	3	2	1

Based on the aforementioned information, the values of the means reached by the study were dealt with as follows based on the following equation: The highest value - the lowest value of the answer alternatives divided by the number of

levels $(5-1) = 4 = 1.33$. Thus, the interval is 1.33 this value is equal to the length of the category. 3, The low level of $1.00 + 1.33 = 2.33$ The moderate level is from $2.34 + 1.33 = 3.67$ The high level is from 3.68 to 5.00

7 Results

7-1 Description of the characteristics of the sample:

Table (3): Distribution of the members of the sample in accordance with the demographic variables

Variables	Repetition	percentage
Occupation		
General Manager of the company	22	7.20
Deputy General Manager	25	8.10
Chief Financial Officer	31	10.0
Department/administrative unit manager	42	13.60
Head of the Department	42	13.60
Management or cost accountant	35	11.30
Main accountant	38	12.30
Internal Auditor	26	8.40
production employee	48	15.50
Degree		
BA degree	204	66.00
MA degree	45	14.60
PhD degree	12	3.90
Other	48	15.50
Years of Experience		
Less than 5 years	58	18.80
5- Less than 10 years old	154	49.80
10- Less than 15 years old	62	20.00
15 years and over	35	11.40

The results of analyzing the demographic characteristics of the respondents indicate that there is a diversity of job titles between (general manager, deputy general manager, chief financial officer, department/administrative unit manager, chief valuer, management or costs accountant, chief accountant, internal auditor, production employee). That means that they are relevant and knowledgeable about the company's planning methodology and have experience and knowledge of the applied management

accounting and cost accounting systems, as the results mentioned above in the table and according to educational qualifications indicate that 84.2% of the respondents hold at least a bachelor's degree, and 18.5% of the holders of higher degrees from a master's degree and a doctorate. That gives confidence in the answers of the study sample members that they have scientific qualifications that make them able to understand the variables of the study and answer the questions of the questionnaire. The results of the above table also show that 49.8% of the

respondents from the study sample have at least 5 years of experience, which enhances the results obtained that the study sample individuals have sufficient and practical experience and the ability to answer the study questions in all transparency and objectivity.

7.2 Questionnaire Analysis

Analysis of descriptive data is shown below for answering to questionnaires and testing the hypotheses:

Table (4): The first question results.

No.	lean accounting tools	Mean	Std.	Rank	Level
3	Points Box	3.21	0.81	1	moderate
2	Management by Policy (Hoshin)	3.20	0.73	2	moderate
1	Target cost	3.15	0.74	3	moderate
4	The cost of continuous improvement	3.14	0.81	4	moderate
5	Staff satisfaction	3.03	0.77	5	moderate
Lean accounting tools as a whole		3.15	0.70		moderate

*The values are arranged in the descending order

Based on table (3), the arithmetic averages for (application of lean accounting tools) range between (3.21 - 3.03). The application of lean accounting tools shows an arithmetic mean of (3.15), which is of the average level, and it came in the first place was the Points Fund, which had the highest arithmetic mean, which amounted to (3.21) and a standard deviation (0.81), which is of the average level. And in the third place came the target cost with an arithmetic mean (3.15) and a standard deviation (0.74), which is from the average level, and in the fourth place came the cost of continuous improvement with an arithmetic mean (3.14) and a standard deviation

The results related to the first question: What is the level of application of lean accounting tools in the Jordanian industrial joint stock companies? To answer the first question, the arithmetic means and standard deviations were calculated. That was done to identify the responses of the study sample members to the level of application of lean accounting tools in the Jordanian industrial joint stock companies. Table (4) shows those values:

(0.81) which is from the average level, and finally in the fifth place came satisfaction. The employees have an arithmetic mean (3.03) and a standard deviation (0.77), which is of the average level as well.

The results related to the second question: What is the level of interest of the Jordanian industrial companies contributing to lean planning? The arithmetic means and standard deviations of the responses of the members of the sample were calculated from the items of interest of the Jordanian industrial companies contributing to lean planning. Table (5) shows those values:

Table (5): The second question results.

No.	lean accounting tools	Mean	Std.	Rank	Level
1	The company has a clear vision and mission that reflects the priorities of the company's future needs and achieves the best competitive position	3.27	1.04	1	moderate
8	Within the company, a team of executives is formed to translate the company's vision into accurate long-term goals linked to performance measures that are compatible with lean organizations	3.23	1.03	2	moderate
3	All employees of the company participate in the improvement processes and link all administrative levels to the company's strategy to verify the availability of the required resources and skills. The responsibilities of each work team are defined in the value stream and work cell.	3.22	1.05	3	moderate

5	The managers of the work teams or departments in the company determine the improvement projects for the coming year in order to ensure that the goals are achieved	3.21	1.03	4	moderate
13	The company's strategy is linked to daily activities and management, and the progress in achieving the strategy is monitored daily and at periodic intervals	3.20	1.06	5	moderate
10	The required initiatives and activities are identified at the value stream level and the current and future situation is analyzed to identify activities that add value to customers	3.17	1.11	6	moderate
2	Long-term strategic goals are translated into short-term goals at the level of limited value streams that are measurable and achievable with limited timing.	3.14	1.07	7	moderate
6	The skills of employees are linked to the strategic priorities of the company and the use of performance measures related to employee empowerment and the extent of their participation in the implemented improvement plans	3.13	1.05	8	moderate
4	A detailed daily operational plan is prepared to ensure the availability of the required resources and the fulfillment of the wishes and requests of customers	3.11	1.08	9	moderate
14	The organization's strategy is continuously reviewed an achievable goals are published to all functional units to obtain consensus from employees and managers and link them to daily activities and management.	3.10	1.09	10	moderate
9	The financial and non-financial measures of the value stream are relied upon to plan and control and compare operational, energy and financial performance for each week	3.09	1.11	11	moderate
12	Simplified financial reports are prepared according to value streams, visual reports and non- financial performance measures on the progress in achieving the organization's strategy on an annual basis	3.09	1.07	12	moderate
11	The company sets annual or quarterly plans for ease of implementation and follow-up of their achievement	3.06	1.15	13	moderate
7	Value stream managers are involved in financial planning and financial budgeting	3.03	1.04	14	moderate
general arithmetic mean		3.15	0.69		moderate

*The values are arranged in the descending order

Based on table (9), the mean of (Lean Planning) is (3.15) which is moderate. Paragraph No. (1) shows the highest arithmetic mean which is (3.27) with a standard deviation (1.04), which is from the average level, and the paragraph stated (the company has a clear vision and mission that reflects the priorities of the company's future

needs), and in the last place paragraph No. (7) came with an arithmetic average of (3.03) and a standard deviation of (1.04) which is of the average level, where the paragraph states (Value stream managers are involved in financial planning and financial budgeting

7.3 Hypotheses Testing

Main Hypothesis

To test the first main hypothesis, a multiple regression analysis test was used, the results were as follows:

Table (6): The main hypothesis regression test results:

Dimensions	Unstandardized Coefficients		Standardized Coefficients	T	Sig T
	B	Std. Error	β		
Target cost	.464	.020	.498	23.332	*.000
Management by politics "Hoshin"	.214	.022	.226	9.590	*.000
Points Box	.078	.023	.093	3.353	*.001
The cost of continuous improvement	.425	.016	.502	26.390	*.000
Staff satisfaction	.053	.017	.059	3.088	*.002

* Statistically significant at the level ($\alpha \leq 0.05$) tabular value (t) = (± 1.96)

Promotion (10), my promotion, my promotion, my promotion, nominations, nominations, my promotion, my promotion, the promotion of the general Jordanian industrial companies, as their calculated value amounted to (23.332, 9.590, 3.353, 26.390, 3.088) respectively, which are significant values at the level of significance ($\alpha \leq 0.05$), and through the results it is clear that the null hypothesis is rejected and the hypothesis

accepted. It states that: There was a statistical effect at ($\alpha \leq 0.05$) significant level for applying lean accounting tools (target costing, management by policies (Hoshin), points fund, continuous improvement, investing in people (employee satisfaction)) in improving the level of lean planning in Jordanian public Shareholding Company.

Sub-hypotheses of the main hypothesis:

The first sub-hypothesis:

Table (7): The first sub- hypothesis regression test results:

Independent variable	R Correlation coefficient	B Relationship direction	R ² Coefficient of determination	B Prediction	D.F	F	Sig
Target cost	0.888	0.888	0.789	0.827	308	1145.552	0.000*

*: This sign means that the value is significant at the significance level of (0.05).

Table (7) shows that there is a direct positive correlation between (target cost) and improving the level of lean planning in the Jordanian industrial joint stock companies, where the value of the correlation coefficient reached (0.888), which are statistically significant values at the significance level (0.05), and it is clear from the table (11) That the target cost can explain (78.9%) of the changes that occurred to improving the level of lean planning in the

Jordanian industrial joint-stock companies, and therefore the null hypothesis is rejected and the alternative hypothesis is accepted. This hypothesis states the following: There was a statistically significant effect - at the significance level ($\alpha \leq 0.05$) for applying target cost as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies.

The second sub-hypothesis:

Table (8): The second sub- hypothesis regression test results:

Independent variable	R Correlation coefficient	B Relationship direction	R ² Coefficient of determination	B Prediction	D.F	F	Sig
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Management by Policy (Hoshin)	0.879	0.879	0.773	0.832	308	1042	0.000*
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*: This sign means that the value is significant at the significance level of ($\alpha \leq 0.05$)

Table (8) shows that there is a direct positive correlation between (Management with Policies ("Hoshin") and the improvement of the level of lean planning in the Jordanian industrial joint stock companies, where the value of the correlation coefficient reached (0.879), which are statistically significant values at the level of significance (0.05). Based on table (12), it can be clear that management by policies can explain (77.3%) of the variance in improving the level of

lean planning in the Jordanian industrial joint-stock companies, and therefore the null hypothesis is rejected and the alternative hypothesis is accepted. This hypothesis states the following: There was a statistically significant effect at the level ($\alpha \leq 0.05$) of applying management by policies (Hoshin) as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies.

The third sub-hypothesis:

Table (9): The third sub- hypothesis regression test results:

Independent variable	R Correlation coefficient	B Relationship direction	R ² Coefficient of determination	B Prediction	D.F	F	Sig
Points Box	0.880	0.880	0.775	0.743	308	1058.054	0.000*

*: This sign means that the value is significant at the significance level of (0.05).

Table (13) shows that there is a direct positive correlation between (points box) and improving the level of lean planning in the Jordanian industrial joint stock companies, where the value of the correlation coefficient reached (0.880), which are statistically significant values at the significance level ($\alpha \leq 0.05$), and it is clear from the table (13) The points box can explain (77.5%) of the changes that occurred to improving the level of lean planning in the

Jordanian industrial joint-stock companies, and therefore the null hypothesis is rejected and the alternative hypothesis is accepted. This hypothesis states the following: There was a statistically significant effect at the level ($\alpha \leq 0.05$) of applying the points box as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial joint stock companies.

The Fourth sub-hypothesis:

Table (10): The fourth sub- hypothesis regression test results

Independent variable	R Correlation coefficient	B Relationship direction	R ² Coefficient of determination	B Prediction	D.F	F	Sig
Continuous improvement	0.910	0.910	0.827	0.770	308	1471.507	0.000*

*: This sign means that the value is significant at the significance level of ($\alpha \leq 0.05$).

Table (10) shows that there is a direct positive correlation between (continuous improvement) and the improvement of the level of lean planning in the Jordanian industrial joint stock companies, where the value of the correlation coefficient reached (0.910), which are statistically significant values at the significance level (0.05), and it is clear from the table (10) That continuous improvement explains the percentage (82.7%) of the variance in improving

the level of lean planning in the Jordanian industrial joint-stock companies, and therefore the null hypothesis is rejected and the alternative hypothesis is accepted. This hypothesis states the following: There was a statistically significant effect at the level ($\alpha \leq 0.05$) of applying continuous improvement as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial public shareholding companies.

The fifth sub-hypothesis:**Table (11): The fourth sub- hypothesis regression test results**

Independent variable	R Correlation coefficient	B Relationship direction	R ² Coefficient of determination	B Prediction	D.F	F	Sig
Employee satisfaction	0.805	0.805	0.649	0.716	308	567.018	0.000*

*: This sign means that the value is significant at the significance level of ($\alpha \leq 0.05$).

Table (11) shows that there is a direct positive correlation between (employee satisfaction) and the improvement of the level of lean planning in the Jordanian industrial joint stock companies, where the value of the correlation coefficient reached (0.805), which are statistically significant values at the significance level (0.05), and it is clear from the table (15) that employee satisfaction explains (64.9%) of the variance in improving the level of lean planning in the Jordanian industrial joint-stock companies, and therefore the null hypothesis is rejected and the alternative hypothesis is accepted, which states

that :

There was a statistically significant effect at the level ($\alpha \leq 0.05$) of employee satisfaction as one of the lean accounting tools in improving the level of lean planning in the Jordanian industrial joint stock companies.

The fourth question : The stepwise multiple regression test was used to predict Lean planning through lean accounting tools in the Jordanian industrial companies and identify the most important ones in relation to the impact. Table (12) presents the results of this test:

Table (12): The first question results.

Model	lean accounting tools	The coefficient of determination -R ²	Value F	Sig.F
1	The cost of continuous improvement	.827	1471.507	0.00*
1+2	Target cost	.957	3425.131	0.00*
1+2+3	Management by politics "Hoshin"	.966	2857.517	0.00*
1+2+3+4	Points Box	.967	2220.976	0.00*
1+2+3+4+5	Staff satisfaction	.968	1828.566	0.00*

*: This sign means that the value is significant at the significance level of ($\alpha \leq 0.05$).

Table (12) shows that the most influential lean accounting tools in Lean planning in industrial companies was (continuous improvement cost) and it explained (82.7%) of the variance in Lean planning, and secondly came (target cost) and it explained with the cost of continuous improvement what it accounted for (95.7%) of the variance in the dependent variable (Lean planning), and came third (Management by Policies "Hoshin"). It explained with the previous variables a rate of (96.6%) of the changes that occurred to lean planning, and came fourth (Point Box) with the previous variables. To explain the percentage (96.7%) of the variance in lean planning, and fifth came (staff satisfaction) to explain the percentage (96.8%) of the variance in lean planning.

8 Conclusions

1. It was found that the attitudes of the study sample members towards approval of the average level of application of lean accounting tools in the Jordanian public shareholding industrial companies, where the points fund tool came first, then the policy management tool (Hoshin), then the target cost, followed by the cost of continuous improvement and in Last rank is employee satisfaction.
2. It was found that the attitudes of the study sample members towards approval of the interest and pursuit of the Jordanian public shareholding industrial companies towards the application of lean planning, with a relative importance of medium.
3. It was found there is a significant effect of applying the combined lean accounting tools (target costing, management by policies

(Hoshin), points fund, continuous improvement, employee satisfaction) in improving lean planning in Jordanian industrial companies.

4. It was found that there is a significant effect of applying (target cost, policies (Hoshin, points box, continuous improvement, employee satisfaction) as separate application in improving lean planning in Jordanian industrial companies.
5. It was found that the most prominent Lean accounting tools influencing the improvement of Lean planning in the Jordanian industrial companies is the continuous improvement cost tool. Optimization cost, target costing, management by Hoshin policies, points fund, and employee satisfaction.

9 Recommendations:

1. Increasing the interest of Jordanian public shareholding industrial companies in expanding the application of lean accounting tools and benefiting from their advantages in terms of reducing costs and meeting customers' desires, enabling them to maintain market share and achieve competitive advantage.
2. Increasing the attention of the administrations of Jordanian public shareholding industrial companies in the application of lean planning and benefiting from the comprehensiveness and diversity of reports and performance measures and indicators that can be provided through lean planning.
3. Increasing the awareness among the managers in Jordanian public shareholding industrial companies about the importance of applying lean accounting tools and its impact on improving lean planning.
4. Conducting more studies about the importance of applying lean accounting tools and their impact on improving lean planning in other sectors.

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