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Cost Management by Applying the Sustainable Balanced Scorecard and Quality Costs

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Abstract: The research aims to demonstrate the importance of industrial companies' reliance on modern administrative techniques in cost management, such as quality costs and the sustainable, balanced scorecard, in improving the quality of their performance and achieving competitive advantage and Studying the mechanism of applying the sustainable, balanced scorecard through quality costs and showing how they contribute to transforming the strategy of the economic unit into a common language used by all individuals and workers in the economic team to formulate performance measures according to the axes and perspectives included in the sustainable, balanced scorecard.

Keywords: Balanced Scorecard, Quality Costs, Sustainable

INTRODUCTION

Global competition has led to the necessity of using modern techniques that contribute to enhancing performance and help it obtain market share, as many units have used a new approach to measure and improve performance by integrating the balanced scorecard with total quality management, and this is through the units' keenness to achieve customer satisfaction. Since quality has been defined as fulfilling the requirements and expectations of the customer, and since one of the essential perspectives of the balanced scorecard is the customer's perspective, the unit seeks through this perspective to measure the performance of the team and the relationship with the customer and the extent to which his satisfaction has achieved by fulfilling his requirements. As one of the goals that the unit seeks to achieve, this confirms the role of the card and its integration with the objectives of quality management to improve performance and gain a competitive advantage. Hence, the integration between the balanced scorecard and total quality management is evident in terms of improving performance and achieving competitive advantage by improving the quality of products and increasing their value (kanji, 2001: 207) Where both the Balanced Scorecard and Total Quality Management have the same goal, which is to improve the performance of the economic unit, but the To reach this goal is different in both techniques, as the balanced scorecard focuses on the aspects that have standards and indicators that pertain to all aspects of the unit, whether internal or external, while total quality management focuses on the customer mainly and considers it the basis for improving the performance of the economic team through which you can obtain a larger market share that provides greater financial returns (Joovnovic, et, al, 2008:187).

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There is a relationship between the (Balanced Scorecard and Total Quality Management) (Hannulam et al.; 2003: 11), and this relationship takes one of the following two interpretations:

The first interpretation is the use of BSC as a tool to support the application of TQM. This interpretation looks at BSC as a tool that contains general measures (financial, customer, internal operations, education and growth, risk, community environment). These measures are related to the company's strategic goals to reach the success factors of the economic unit. An economical unit that adopts a TQM application must set performance measures by adopting BSC.

The second interpretation, it considers TQM as a strategic management tool through which the economic unit can reach its visions, goals, and objectives through the Balanced Scorecard perspectives, or in other words, TQM can have to viewed as a strategic tool that has been applied based on axes or perspectives (BSC).

Concerning the financial perspective and its relationship to quality costs, we see that the economic outlook in the balanced scorecard seeks to achieve an increase in revenues, improve profitability, and obtain new sources of revenue by getting the fair market share, as well as the financial perspective in the scorecard, seeks to reduce costs for the economic unit. The economy here is linking the financial outlook of the scorecard with the measures of quality costs through the use of measures of return on Quality and the service of the ratio of quality costs to sales (Hansen & Mowen, 2003: 408). It has noted that both the financial perspective and quality costs seek to improve profitability and reduce costs and thus improve performance The financial perspective of the economic unit (Al-Zamili, 2011:115) The researcher believes that the financial outlook of the scorecard seeks to maximize the company's profits and return on investment, as well as to increase the company's share price in the market. This perspective also aims to reduce the total costs of the economic unit and is done by using cost measures Quality, such as the use of measures of prevention costs based on quality programs, as well as cost engineering costs Product planning and design engineering, as well as relying on measures of external failure costs such as the number of marketing outlets, as well as the number of complaints submitted by customers and other measures affecting the financial perspective of the scorecard.

The customer's perspective in the Balanced Scorecard is related to quality costs measures, as (Horngren et al., 2012:693) explains that the customer's perspective seeks to achieve a set of goals related to customer satisfaction, as there is a relationship between this perspective and the measures of quality costs. The goal is to increase customer satisfaction. Standards of quality costs can be used by delivering products promptly and improving internal processes through the fees of internal failure and the charges of external oversight. This relationship lies in the main objectives of the customer's perspective in achieving customer satisfaction, and this is what total quality costs aim at by providing products to customers according to their needs and expectations (Al-Zamili, 2011:115).

The researcher explains that this relationship stands out because the perspective of customers seeks to provide products and services that meet the needs and desires of customers. Selfishness cannot be achieved without relying on measures of quality costs such as measures of the costs of external failure such as improving the quality of products and reducing damaged ones, as well as relying on estimates of expenses External loss such as the number of units returned, the number of units charged, and other indicators.

The internal operations perspective and its relationship to quality cost measures, the relationship emerges through the fact that the internal operations perspective in the balanced scorecard seeks to improve the activities of organizing the work of all the units, which has formed from the value chain

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of research and development until the end of after-sales services (Arora, 2008: 836) This perspective is related to quality costs, as quality costs seek to improve the quality of internal processes in a way that ensures the provision of products to customers with the required quality, and this is consistent with the internal processes perspective in the balanced scorecard (Al-Zamili, 2011: 116).

The researcher shows that the goal of the internal operations perspective in the Balanced Scorecard is to improve the operational processes that start from research and development to after-sales operations and through design, production, and marketing. Examination of the raw materials included in the production process and relying on assessment costs measures through monitoring the production process and output under operation, as well as depending on measurements of external failure costs by identifying the number of units that have been recharged and repaired. The researcher shows that the goal of the internal operations perspective in the Balanced Scorecard is to improve the operational processes that start from research and development to after-sales operations and through design, production, and marketing. Examination of the raw materials included in the production process, relying on assessment costs measures through monitoring the production process and output under operation, and relying on measurements of external failure costs by identifying the number of units that have been recharged and repaired.

It is worth noting that there is a relationship between the learning and growth perspective in the Balanced Scorecard and the measures of quality costs, so we see productivity, product quality increase and development, customer service, human resource development, and motivation represent essential aspects in the perspective of learning and growth (Idris, Al-Galbi, 2009: 247). From the standpoint of the performance card, linking it to quality cost measures by focusing on increasing the capacity of employees to quality by providing a set of financial and non-financial measures that have been used to motivate and develop the skills of employees (Al-Zamili, 2011: 116).

The researcher explains that the goal of the learning and growth perspective in the scorecard is to develop the capabilities of employees and obtain their satisfaction to increase productivity and achieve the required quality for all processes and products, as well as seeks to support incentives and reward systems to provide good performance. Quality costs by focusing on measures and indicators of prevention costs such as training costs for employees and motivation expenses, and other actions related to learning and growth. Also, the view of the community environment is one of the important axes of the balanced scorecard. This perspective focuses on the aspects that contribute to the extent of the contribution of the economic unit to reducing pollution and protecting the environment. (Horngren et al., 2012:693), and (Al-Zamili) explains that it is possible to use measures of quality costs with this perspective through the use of those measures. Expenses of medical, transportation, restaurant, maternity leave, and study leave, either if the goal is to serve customers, then the scale of the ratio of after-sales costs to total quality costs is used (Al-Zamili, 2011: 117). During the use of the internal failure costs scale, for example, the use of the product quality index and the extent of its impact on the external environment of the economic unit, either the risk perspective aims at this perspective To reduce the risks to which the unit is exposed, whether they are financial risks or risks related to market share, and measures of quality costs can be used in the perspective of risks, for example using the measurement of prevention costs to know the financial risks that affect the unit as a result of its transactions.

Quality and Market Share to Improve Competitive Advantage:

The discovery of the direct relationship between quality and market share to reach the competitive advantage is the primary stimulus in dealing with a job with this degree of focus and attention. Indeed, many writers and researchers subject the existence of any economic unit to its success in

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achieving quality objectives, and this is through the idea that it leads to raising the level of Quality by reducing spoilage rates and also lowering costs and improving productivity, and then increasing sales and thus obtaining the fair market share and this will lead to a high return on investment, which can be einvested in the field of quality improvement and this will attract new customers and maintain existing customers (Al-Jubouri, 2010: 37).

Adopting quality as a competitive method contributes to achieving a set of benefits that lead to obtaining customer loyalty and not entering into a price war and the ability to accomplish the appropriate return without losing those customers. Quality has become a broader dimension than it is now, which is the continuous improvement of competitive advantage and to obtain linkage Between the quality and getting the market share to achieve competitive advantage is by focusing on the quality that contributes to strengthening the competitive position of the economic unit and contributes to the development of the unit's competitive style (Schroeder, 2013: 153)

Slack indicates that quality is a competitive advantage to achieve benefits that have a positive impact on both market share, revenues and costs, as payments can increase through the best sales offer at moderate prices, and at the exact time costs can decrease if programs are applied to improve efficiency, productivity and optimal use of capital (Slack et al., 2010: 592). The researcher believes that achieving quality and its continuous improvement leads to attracting the most significant number of customers, leading to an increase in the market share and then increasing its competitiveness.

Productivity Relationship with Profitability Quality

Quality is closely related to productivity, but there is an opinion that it is two sides of the same coin. Maintaining and maintaining quality leads to a positive impact on productivity. In contrast, poor quality affects productivity through inefficient production resources (Al-Tai, 2010: 75). It explains (Stevenson, 2014: 50). The combination of quality and productivity leads to maximizing the competitiveness of economic units. It is through measuring the effectiveness of resource use and expressed by the ratio of outputs to inputs, and (Schroeder, 2007: 153) indicates that there is a relationship between quality and productivity and the positive effects of, Therefore, as improving productivity and reducing spoilage will reduce costs and create value for the economic unit, and this will lead to an increase in the market share of the unit, and this will lead to increased revenues and higher returns for the economic unit, thus increasing the profits of the economic unit.

Improvement Quality Relationship with Profitability and Reduce Cost

Most studies indicate the importance of quality costs and through their elements in reducing costs and improving profitability, because when quality costs are reduced, it leads to a reduction in total production costs, so work must be done to improve quality, and here (Al Bakri) indicates that any quality improvement process leads to cost reduction As a result of poor quality, this is used as a catalyst for growth, market share and profitability, as well as other expected benefits such as customer loyalty, higher company shares, and improved productivity for it (Al Bakri, 2000: 126; Kuratko, 1998: 16) indicates that the quality improvement process must lead To the need to reduce costs arising from defects that appear in the product and work to address them in order to achieve zero defects, and this is through spending on the elements of prevention costs that will lead to reducing the aspects of failure in the quality of internal and external and this will lead to a significant reduction in product costs, and studies indicate Also, the quality improvement process will lead to an increase in market share and productivity at the same time, which will lead to a rise in revenues and thus increase the profit of the economic unit. Render) Improving quality plays an essential role in increasing the economic unit's profitability, which is done by improving the efficiency of operational

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processes and reducing total quality costs. And increase its profits (Heizer Render, 2016:170) indicates that quality costs can be a powerful tool used by management in improving quality, as the defect has reduced to the least possible by focusing on prevention costs to reduce the costs of both types of failure. As the quality costs can provide information that helps in controlling the cost reduction programs in general, and the quality improvement programs lead to an increase in revenues through the expansion of current products and the production of new products that can meet the needs and expectations of customers (Al-zamili, others, 2010: 232). Al-Bakri explains that the quality improvement cycle can reduce costs and increase profits.

The researcher believes that any quality improvement has a positive role in reducing the total costs of the product, and this is by focusing on the costs of prevention that lead to the reduction of spoilage and scrap, which in turn will lead to total quality costs and thus will lead to a reduction in total manufacturing costs and also that any quality improvement will lead to satisfying The aspirations of customers and thus will lead to an increase in the market share and then will lead to a rise in sales, which leads to a rise in the profits of the economic unit.

Methodology

The research aims to demonstrate the importance of industrial companies' reliance on modern administrative techniques in cost management, such as quality costs and the sustainable, balanced scorecard, in improving the quality of their performance and achieving competitive advantage. The productivity, sales, and profitability of the industrial company and its reputation in the market, which could lead to the creation of a negative competitive gap between that company and the competing companies, and the lack of financial measures in evaluating performance under traditional systems leads to a lack of clarity in the management's vision in improving the quality level of its performance.

The researcher relied on the methods of data analysis related to the figure. The study used an external worksheet. He calculated the percentages of each axis of the balanced, sustainable scorecard attempt and its impact on the cost of quality and the effect of both in managing costs.

The research also proved the research hypothesis, which states a correlation between the sustainable, balanced scorecard and quality costs and its contribution to managing costs.

Importance of the research

This research focuses on an essential aspect of the Iraqi economy, which is the industrial sector, which contains industrial companies trying to employ all potentials, material, and human energy, adopting the best ways to enhance the positive aspects to improve their performance achieve their competitive advantage.

Implementation

The sustainable Balanced Scorecard will be applied using the company's quality costs to know the reality of the practical performance of the laboratory, where the need has arisen to use new indicators and measures of performance commensurate with the changes that have occurred in the business environment. These measures focus on the financial and non-financial aspects of performance. During field experience In the company, it was found that the company focuses on financial measures only without showing any interest in non-financial measures. However, non-financial measures are considered a significant challenge facing any company. Despite their importance, the company's management did not have the slightest idea about these measures. In light of this, the

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researcher will prepare The balanced performance card for the laboratory with its six aspects, depending on the total quality costs, as follows:

Financial Perspective: This financial perspective is one of the essential card perspectives. It focuses on the economic aspects related to quality and aims to achieve strategic goals and know the profits earned by the laboratory. The financial factors related to quality and costs can be measured by improving profitability and reducing costs. With the costs of quality and in line with the nature of the work of the Factory:

A - Return on Quality: This indicator shows the relationship between realized profits and quality costs. It shows the profitability of the dinar spent on total quality costs, and the following equation can measure it:-

$$\text{Return on quality} = \frac{\text{Net profit}}{\text{Total quality cost}} * 100$$

$$\text{Return on quality} = \frac{2236625}{32796855} = 6.8\%$$

Any increase in the percentage of this indicator is a good indicator of performance on the efficiency of the plant in achieving profits due to spending on quality costs. **B- Sales profitability:** This indicator shows the profitability of one dinar achieved from the value of

sales: who can measure it through the following equation:

$$\frac{\text{Net profit}}{\text{the sales}} * 100$$

Sales Profitability =

$$\text{Sales Profitability} = \frac{2236625}{131600000} = 1.7\%$$

Any increase in this indicator has been considered a good condition for the plant and reflects the efficiency of the plant in achieving profitability for each sale of the plant's product. **C - The ratio of quality costs to net sales:** It can be measured through the following equation:

$$\text{Ratio of quality costs to net sales} = \frac{\text{Quality costs}}{\text{sales}} \times 100$$

$$\text{Ratio of quality costs to net sales} = \frac{32796855}{131600000} = 24.92\%$$

This ratio shows the relationship between quality costs to net sales. Whenever this ratio decreases, it indicates a performance improvement through the increase in the value of sales and the survival of quality costs the same or reduced.

The ratio of total quality costs to total manufacturing costs: This indicator can be measured through the following equation:

$$\text{Ratio of quality costs to total manufacturing costs} = \frac{\text{Quality costs}}{\text{total manufacturing costs}} \times 100$$

$$\text{Ratio of quality costs to total manufacturing costs} = \frac{32796855}{110442275} = 29.7\%$$

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The higher the ratio, the higher the quality and manufacturing costs, and the lower the percentage, the lower the quality costs and manufacturing costs for the product, which is what the factory seeks.

The research will adopt the analysis method depending on an external working paper that has been adopted in analyzing and calculating the percentage shown for each of the attempts of the sustainable, balanced scorecard and its relationship to quality costs and their impact on cost management.

It is evident from the above that the rate of return on quality has been recorded (6.8%), and this indicates the improvement of factory profits through increasing profits compared to quality costs. Raising these percentages, which are considered weak, and about the quality costs to sales index, it has recorded at (24.92%), where we notice a decrease in the number of quality costs. Finally, the quality costs to the total manufacturing cost index recorded a percentage of (29.7%), indicating the high total quality costs compared to manufacturing costs.

Through the indicators of the customers' perspective in accounts calculated by the researcher in an external working paper, the market share index between two years has recorded (7%) and (17.4%), indicating the expansion of the market share the sample. Still, this percentage remains weak compared to the market situation for that on The management of the laboratory conducted intensive studies and research to obtain a larger market share in the future, and the indicator of the ratio of external failure costs to the total quality costs between two years has recorded (7.95%) and (9.87%), which is a high percentage, and this reflects the high costs of external failure, The indicator of the rate of repair requests between two years was (3.1%) and (3.4%), and this indicates an increase in the percentage of repair requests, and this indicates the failure of the plant due to the lack of improvement in its performance. Finally, the warranty costs to external loss costs between two years recorded (98.15%).) and a percentage (97%), which shows the high warranty costs for both years, which indicates that the factory seeks to preserve its customers.

From the perspective of internal operations, it is clear that what was calculated in an external worksheet by the researcher, the employee productivity ratio index was recorded for two years (3719 units for each worker) and the other year (9221 units for each worker). For the sample, therefore, the laboratory management must advance and improve this indicator for the better to achieve higher levels of productivity.

The indicator of the ratio of internal failure costs to quality costs between two years recorded (32.82%) and (35.63%), which has considered a large and influential percentage in the performance of the laboratory, as the internal failure rate is significant, as these percentages exceed (30%) of the quality costs for that on The management of the factory worked to increase spending on prevention costs to reduce the costs of internal failure, while scrap costs recorded between two years (18.99%) and (18.62%) and this means a decrease in this indicator. This leads to improved internal processes, albeit slowly. The hand of the ratio of quality costs to the total units produced between the two years (6679) dinars per unit and (2560) dinars per unit and indicates a decrease in the share of one assembled unit in quality costs, and this is a good indicator of the improvement in the performance of the plant, for lower costs in general per unit.

It is clear from the learning and growth perspective indicators calculated in an external paper, which is the recording of the ratio of training costs between two years (15.49%) and (14.89%) quality training. As for the percentage of quality trained workers, the indicator has been recorded between two years (10.6%) and (14.3%), and this means that the number of trainees has increased. Still, this

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percentage remains low compared to the number of workers. Therefore, the laboratory management should work on the advancement of training programs to raise the performance of workers on quality.

Incentives and rewards ratio index between two years recorded (3.81%) and (4.5%) with a difference of (0.69%), and this shows the factory's lack of interest in workers and their training. (1095,606 dinars/worker) and this shows the increase in the value of the revenue generated by each worker between the two years.

We note from the indicators of the perspective of the societal environment is the recording of the hand of the ratio of the costs of risks and environmental pollution to the total costs of quality between two years (5.5%) and (6.3%), and this shows the high percentage of risks caused by environmental pollution, so the management of the laboratory should strive and try to reduce environmental pollution from To preserve the environment. The indicator of the percentage of expenses spent on serving employees on quality between two years was (30%) and (28.3%), with a capacity difference of (1.7%), and this means a decrease in the percentage of spending on workers, and this indicates the lack of attention of the factory management to workers and the indicator of the rate of services expenses has recorded After the sale between the two years, a ratio of (14.5%) and a percentage of (11.7%), with a difference of (2.8%), and this indicates a decrease in the expenses of after-sales services provided to customers.

From the perspective of risks, it is clear that the ratio of external failure costs to net sales between two years is (1.98%) and (2.12%) with a difference of (0.14%). To reduce risks, the indicator of the ratio of internal and external failure costs to the total quality costs between two years was (40.7%) and (45.5%). For both years, the factory management should reduce this percentage to avoid the risks arising from it. The ratio of hidden quality costs to internal failure costs between the two years has been recorded at a rate of (1.85%) and (3%), and this shows the rise in hidden quality costs and that every increase in this percentage causes risks that lead to the loss of sales and then the loss of customers and this leads to the loss of the company for its competitive advantage.

Discussion and Conclusions

We note from the above six indicators the process of cost management among all indicators and measures of the sustainable, balanced scorecard based on the elements of quality costs, which is the process of achieving the goal of the research, which is to reach indicators and measures of financial and non-financial performance through quality costs using the sustainable, balanced scorecard. Also, the questions presented were answered about the research problem. Any economic unit can use financial and non-financial measures through the balanced scorecard and total quality management, which improve the unit's performance and reduce its costs. We note that the economic perspective used indicators and measures (return on quality, profitability ratio on sales, ratio of quality costs to net sales, ratio of quality costs to total manufacturing costs)—performance of the unit and improving its financial position, thus improving its competitive position.

The indicators and measures of the customers' perspective show the existence of this integration, i.e., between the sustainable, balanced scorecard and total quality management by adopting the elements of quality costs. We note that the ratio of external failure costs to quality costs and hands of the balance of repair requests and warranty costs to external failure costs all help the research sample company gain and maintain customer loyalty despite recording weak percentages during the two years. We also note that the indicators of the internal operations perspective show this integration between the two technologies through the use of measures of internal failure costs to measure the level of performance progress, and this serves to reduce and reduce defects to form And to produce a

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product that meets the desires and aspirations of customers. We also note through indicators of learning and growth perspective the integration process between the two techniques adopted by the researcher through the research hypothesis. And the expertise of the workers on quality will lead to the production of a product free of defects thanks to the workers' performance, which leads to increased performance Competitive laboratory performance of the research sample.

The perspectives of the societal environment and risks are among the views that significantly impact the balanced scorecard, despite it recording low ratios and indicators for the factory. For example, the hand of the percentage of after-sales services expenses to quality costs aims to provide a service that contributes to maintaining customers and gaining their loyalty, as well as an indicator The ratio of external failure to net sales, which is one of the indicators of the risk perspective, as it helps the laboratory to avoid risks related to the market share.

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