

THESIS

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**The Role of Quality Costs in Improving Competitive
Advantage of Industrial Companies in Palestine**

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Abstract

This research aimed to identify the Role of Quality Costs in Improving Competitive Advantage of Industrial Companies in Palestine, the population of the study consists of employees in industrial companies in Palestine, and the research sample amounted to 150 employees, the researcher used descriptive and analytical approach and questionnaire as a tool for the research, to describe the sample observations, analyze the research hypothesis, and test them. The analysis showed that respondents rated the impact of quality costs on their companies highly, with a relative weight of 77.1%. The competitive advantage of these companies was also perceived positively, with a relative weight of 81.0%. Moreover, a statistically significant positive correlation between quality costs and competitive advantage was found. This positive relationship extended across various quality costs, including control costs, evaluation costs, internal failure costs, and external failure costs, all of which were linked to enhancing the competitive advantage of industrial companies in Palestine.

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1 Chapter one: Introduction

Businesses that appear both nationally and internationally in today's competitive environment attach significant importance to quality to sustain their lives and provide customer satisfaction. In addition, businesses are among the main targets of producing quality goods and services to find new markets for them nationally and internationally. In this context, businesses that continue their commercial activities want to make themselves more compatible with the globalized world (Servet, 2020).

The cost of quality is defined as a methodology that allows an organization to determine the extent to which its resources are used for activities that prevent inferior quality, appraise the quality of the organization's products or services, and result from internal and external failures. Having such information allows an organization to determine the potential savings to be gained by implementing process improvements (Worrell, 2019).

Nowadays, manufacturing companies consider improving quality to upgrade customer satisfaction by reducing the cost of manufacturing and increasing efficiency. Integrating a quality-oriented manufacturing strategy and sustainability is key to the success of a manufacturing business. Therefore, Cost of Quality (COQ) plays a critical role in every manufacturing firm. Monitoring and controlling are critical components of quality improvement programs. Estimation of the COQ can be used to decide the limits of budgets. The COQ analysis helps organizations identify, measure, and control the consequences of inferior quality (Kau & Nel, 2019).

Organizations must identify, measure, and analyze to ensure that the product not only meets the required level of quality but also satisfies the customer in terms of cost competitiveness. The COQ is used as a performance measure, and cost reduction to prioritize quality improvement initiatives. COQ is the total costs incurred in the design, implementation, operation, and maintenance of a quality system, resources committed to continuous improvement, product failure, and all costs involved in achieving the quality of a product (Dimitrantzou, 2020).

The research seeks to identify the role of quality costs in improving the competitive advantage of industrial companies in Palestine.

1.1 Research Problem Statement:

Quality is a holistic part of an organization's total competitive advantage, and the role of the customer has thus become increasingly central in quality work. Quality is also connected with a company's business strategy, management, and leadership – and is seen as everyone's responsibility.

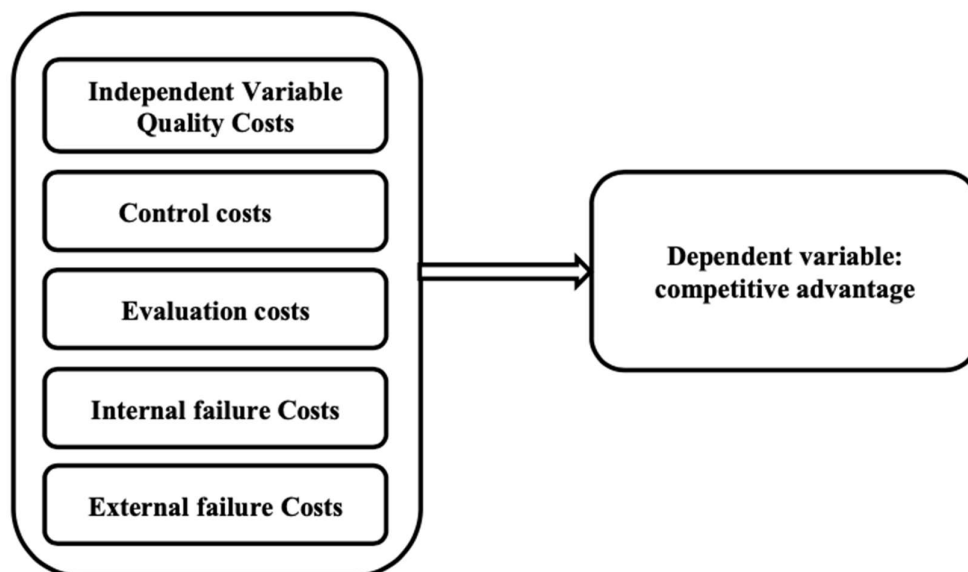
Many companies promote quality as the central customer value and consider it to be a critical success factor for achieving competitiveness. Even though quality is now considered to be a critical success factor for achieving competitiveness, the cost of the quality approach is not fully appreciated by organizations. This research attempts to answer the following main research question: What is the role of quality costs in improving the competitive advantage of industrial companies?

Research Variables:

1. **Independent variable:** Quality Costs is to:
 - Control costs.
 - Evaluation costs.
 - Internal failure Costs.
 - External failure Costs.
2. **Dependent variable:** competitive advantage.

Figure 1: Research Model

Source: Own editing



1.2 Research Hypotheses

The main hypothesis: There is a statistically significant correlation at level $\alpha \leq 0.05$ between the quality costs and competitive advantage of industrial companies.

So, we have several sub-hypotheses:

1. There is a statistically significant correlation at level $\alpha \leq 0.05$ between the control costs and the competitive advantage of industrial companies.
2. There is a statistically significant correlation at level $\alpha \leq 0.05$ between the evaluation costs and the competitive advantage of industrial companies.
3. There is a statistically significant correlation at level $\alpha \leq 0.05$ between the internal failure costs and the competitive advantage of industrial companies.
4. There is a statistically significant correlation at level $\alpha \leq 0.05$ between the external failure costs and the competitive advantage of industrial companies.

1.3 Research Objectives:

Research Objectives of the study are the following:

- To identify the role of quality costs in improving the competitive advantage of industrial companies.
- To focus on the quality costs of industrial companies.
- To identify the level of competitive advantage of industrial companies in Palestine.
- To provide suggestions and recommendations to the concerned authorities in light of the findings of the study.

1.4 Research Importance:

The importance of studying is the following:

1. **Scientific importance:** Where the study acquires its scientific importance using a scientific approach by the researcher enriching scientific knowledge in the field of quality costs and competitive advantage, the researcher hopes that this study will lead to a scientific addition that helps researchers in the academic field.
2. **Practical importance:** The importance of the study in practice is to provide a practical model for competitive advantage improving in the light of quality costs of industrial companies in Palestine, and the study is important through the community used because of its prominent role in serving the community

2 Chapter Tow: Literature Review

2.1 Quality Costs

Quality costs are all the costs that a manufacturer incurs to ensure it produces a quality product. Quality costs include both costs to prevent low-quality production and costs that arise after a low-quality product is produced.

The cost of quality is defined as a methodology that allows an organization to determine the extent to which its resources are used for activities that prevent inferior quality, appraise the quality of the organization's products or services, and result from internal and external failures. Having such information allows an organization to determine the potential savings to be gained by implementing process improvements (Worrell, 2019).

The cost of quality is a methodology used to define and measure where and what amount of an organization's resources are being used for prevention activities and maintaining product quality as opposed to the costs resulting from internal and external failures. The cost of quality can be represented by the sum of two factors. The cost of good quality and the cost of poor quality equals the cost of quality (Shafiei, 2020).

2.1.1 The Importance of Quality Costs:

The importance of quality costs is represented in the following (Hamoudeh, 2014):

1. Quality is a necessary tool in the success or failure of companies because of its role in creating a competitive position for the company in the market through several points that can explain the importance of quality, namely (gaining customer confidence, higher market share, employee loyalty, and cost reduction)
2. It includes the elements of cost and quality, which are among the four main success factors (cost, quality, time, innovation) for the organization.
3. It helps in effectively identifying waste at the level of production processes and thus helps speed up problem-solving improvement and development processes within the company.
4. Reducing material losses by preventing the loss of customers caused by quality problems, minimizing waste, and reducing the decline in efficiency in business performance.

2.1.2 Monitoring Quality Costs Utilizing Key Performance Indicators

Monitoring quality costs is an essential prerequisite for the introduction of an efficient quality management system. They represent an important instrument for the improvement of the quality and efficiency of the organization because they are the fundamental of strategic decisions and have a direct influence on the profit size. For the evaluation of the performance of the quality management systems, a system of quantitative indicators based on quality costs and the

economic and financial results of the company should be developed. Through the following, a comparative analysis of the main models for evaluating the performance of quality management systems is presented (Firescu & Popescu, 2015):

1. Deming Model

- Purpose of development: Japanese industrial reorientation towards quality.
- Accessibility degree: Limited High.
- Conformance with a certain model: It does not require that candidates should conform to a certain model.
- Model type: Two-dimensional: TQM bases; TQM purposes.
- Criteria quantification: It is not standardized but depends on the importance, extent, and role of each criterion.
- Dependence on Benchmarking: Less dependent
- Feedback: The evaluation report is only given to qualified candidates

2. M. Baldrige Model

- Purpose of development: Recognition of American organizations with outstanding quality management achievements.
- Accessibility degree: High
- Conformance with a certain model: It requires that candidates conform to a certain model.
- Model type: Three-dimensional: strategy and action plans; system; information and analysis.
- Criteria quantification: Definite
- Dependence on Benchmarking: Dependent
- Feedback: The evaluation report is given to all the organizations taking part in the competition. (Evans & Lindsay, 2016)

3. EFQA Model

- Purpose of development: The orientation of European organizations towards excellence sustainable by the systematic identification and promotion of the best practices.
- Accessibility degree: High
- Conformance with a certain model: It requires that candidates conform to a certain model.
- Model type: Two-dimensional: determining factors; results.
- Criteria quantification: Definite

- Dependence on Benchmarking: Relatively strong emphasis
- Feedback: The evaluation report is given to all the organizations taking part in the competition. (EFQM, 2013)

4. Juran Model

- Purpose of development: Promoting the Romanian organization's competitiveness through quality.
- Accessibility degree: High
- Conformance with a certain model: It requires that candidates conform to a certain model.
- Model type: Two-dimensional: determining factors; results.
- Criteria quantification: Definite
- Dependence on Benchmarking: Compulsory
- Feedback: The evaluation report is given to all the organizations taking part in the competition. (Juran, 1988; Godfrey, 1999)

2.1.3 Dimensions of Quality Costs:

Quality costs have financial and non-financial dimensions, the dimensions of quality costs can be summarized in the following dimensions:

1. Prevention costs: These are the costs that occur to prevent the production of non-conforming products. Examples of prevention costs (Garrison, 2014):

- Costs of developing quality systems.
- Quality department costs.
- Costs of quality training programs.
- Costs of obtaining and analyzing quality data.
- Costs of reporting on quality.
- Quality engineering costs.
- Costs of quality improvement projects.

2. Evaluation costs: These are the costs that occur to discover those individual units of the product that do not meet the specifications. Examples of evaluation costs include the following (Ammer, 2016):

- Costs of examining the materials received.
- Product testing during the manufacturing process.
- Final product inspection.
- Test equipment maintenance costs.

- The costs of supervising the examination and testing of activities.
 - Equipment impairment testing costs.
- 3. Internal failure costs:** These are the costs that occur when a non-conforming product is discovered “before” it is shipped to the customer. Examples of internal failure costs include the following (Garrison, 2014):
- Re-manufacturing costs.
 - Re-examination costs.
 - Scrap and damaged costs.
 - Re-manufacturing costs.
 - Costs of disposal of defective products.
- 4. External failure costs:** These are the costs that occur when a non-conforming product is discovered “after” it has been shipped to the customer. Examples of external failure costs include the following (Ammer, 2016):
- Costs of returns, repairs, and allowances.
 - The costs of compensation and guarantees.
 - Loss of sales costs due to poor quality.
 - Costs of examining consumer complaints during the warranty period.
 - Product recall costs.

2.1.4 Nonfinancial Measures of Total Quality Costs:

The non-financial measures are always linked to quality and customer satisfaction to explain what activities are needed to achieve the best quality of production and increase customer satisfaction in the economic unit. Also, improving the design quality and conformance quality will finally achieve financial results. The most important is the improving profits and thus improving the financial performance of the economic unit. Using the non-financial and financial measures will be more suitable to assess economic performance in a modern manufacturing environment. We must focus on customer satisfaction, operation management, and decision-making based on facts, continuous improvement, and motivated employee involvement, as well as strategic planning, creativity, and change. Also, we must focus on employee training to develop their skills and study the markets from the customer and competitor sides, and to benefit from nonfinancial standards of total quality costs; the economic unit must focus on quality improvement programs and work to focus on designing the best quality products instead of focusing on checking the quality at the end of the production process,

in other words, works according to Crosby slogan of Zero Defective that said "producing good products from the beginning" (Soror, 2017).

2.1.5 Some of the non-financial quality measurements:

- a) Process yield: the rate of best output goods from output to total output.
- b) Manufacturing Lead Time: (The time spent converting direct materials to finished output due to the different manufacturing processes in the economic unit).

The best example of a company that has used total quality costs standards for evaluating the quality of its internal operations is Photon Company, where the managers of the company believe that the improvement of these standards will lead at the end to customer satisfaction with the economic unit and its products as well as “reducing total quality costs and achieve the best financial performance costs.”

These include the following measures (Horngren et al., 2009):

- 1. The time rate to repair defective goods to the total time.
- 2. The proportion of products returned to work.
- 3. The number of changes in the processes or product design or the decline in total quality costs.

2.2 Competitive Advantage

In the modern global market, because of globalization and rapid technological changes, firms need to compete with national rivals and international firms. This immense global pressure continues to alter the environment in which firms operate, and traditional industrial strategies are becoming less effective. For survival, companies must build “core competencies” by implementing quality practices, cost-effective, competitive pricing policy, internet marketing, sound strategy basis, product innovation, and predicting buyer behavior for high customer satisfaction (Gupta and Nanda, 2015). Whenever the strategies used are successful in leveraging the firm’s performance, the firm is likely to gain an advantage over its competitors in the marketplace and thus earn a higher return. The strategies built on particular resources that are rare, valuable, and difficult to imitate are proving more efficient than others and are being considered as the main drivers of creating sustainable competitive advantages. In this unpredictable business environment, a variation in regional economic performance has become a common feature in a nation’s economy both in developing as well as developed countries (Delgado et al., 2014).

2.2.1 Definition of Competitive Advantage:

The concept of competitive advantage has taken center stage in discussions of business strategy in recent years. Statements about competitive advantages abound, but an accurate definition is elusive. The common theme when reviewing the use of the term competitive advantage in strategy literature is value creation. However, there is not much accord on value to who and when. An enterprise has a competitive advantage if it can create more economic value than the marginal (breakeven) competitor in its product market (Alsaqqa, 2017).

Competitive advantage refers to the ways that a company can produce goods or deliver services better than its competitors. It allows a company to achieve superior margins and generate value for the company and its shareholders (Lestari, 2020).

2.2.2 Facets of Competitiveness

1. Price competitiveness: Historically, the term competitiveness has been used primarily to draw attention to the cost position of firms or countries. It is still often used today when new low-cost competitors challenge an economy (or a firm or industry). It is this narrow focus on costs that was criticized by Krugman (1994A, 1994B) as "elusive and meaningless" at the conceptual level and as "misleading or even dangerous" at the policy level since this narrow interpretation implies that cost reduction is the only effective policy response. Complaints about losing competitiveness focus on wages as the main cost component, but they also extend to high energy prices and taxes. This preoccupation with costs comes from the origin of the concept of competitiveness at the level of the firm. However, even at the firm level, the theory of the firm and management theory emphasizes that success in oligopolistic markets depends on "competitive advantage" and capabilities generated by innovation (Aiginger, 2006).
2. Quality competitiveness: Later, competitiveness came to be seen as more than an accounting result comparing costs and revenues at one point in time. A broader interpretation of the term evaluates the sources of competitiveness of firms and countries as well as their prospects. This involves examining the processes that lead to a favorable cost or productivity position and the opportunities to sustain or improve it. Competitiveness in this sense is about processes and abilities (Ketels, 2013).

2.2.3 Competitive Advantage Measurement Indicators:

Competitive advantage measurement indicators represented by (Benckendorff & Zehrer, 2017):

1. Profitability: Profitability is a sufficient indicator of the current competitiveness of the project

2. **Manufacture cost:** The average manufacturing cost compared to the competitors' manufacturing cost is a sufficient indication of competitiveness.
3. **Total factor productivity:** The total productivity evaluates the overall effectiveness of the enterprise in converting the total production factors into products, and it is possible to compare the total productivity of factors or their growth for several enterprises at local and international levels, and their growth can be attributed either to technical changes and the movement of the cost function downward or to economies of scale.
4. **Poor productivity** can be explained by less efficient management or by a degree of ineffective investment. The lower marginal cost of the institution, compared with the costs of competitors, leads to greater market share because of the decrease in the total costs and their reflection on the price level, so the enterprise's profit increases.

2.2.4 Market share:

Market share refers to the portion or percentage of a market earned by a company or an organization. In other words, a company's market share is its total sales concerning the overall industry sales of the industry in which it operates (Zaluki, 2016).

Impact of Market Share

1. **Economies of scale:** An increase in a company's market share can allow the company to operate on a greater scale and increase profitability. It also helps the company develop a cost advantage compared to its competitors.
2. **Increased sales:** An increase in market share also helps boost a company's total sales. When consumers notice the brand loyalty of most of their peers, the remaining consumers are also driven to purchase that product.
3. **Increased customer base:** An increase in market share also helps a company widen its customer base. When a majority of the consumer base is loyal towards one brand or product, the rest may also follow.
4. **Reputation:** An increase in market share will help enhance the reputation of a company. A good reputation, in turn, helps boost sales and broaden the customer base.
5. **Dominating industry:** With an increase in market share, a company increases its dominance over the industry it operates in.
6. **Increased bargaining power:** With an increase in market share, a company starts to dominate an industry. With increased dominance over the industry, a company can exercise certain powers such as greater bargaining power. The company starts to enjoy an upper hand and can negotiate to its advantage with suppliers and distribution channel members.

2.2.5 Determinants of Competitive Advantage:

1. Production factors: the matter here does not depend on the mere abundance of low-cost and high-quality production factors, but rather on the efficiency of their use. If they are characterized by flexibility and innovation, achieving a competitive advantage depends on the extent of the continuous improvement and development of production factors.
2. Local demand: local demand plays an important role in improving the competitive advantage, as it prompts the necessity to study the characteristics of local demand, its quality, the extent of its progress, the speed of its saturation, and its ability to reflect the nature of consumers' needs, as the presence of a demand that is more sophisticated, complex and rapidly saturated, and is very consistent with the requirements of the global market. It is what drives innovation and development that is the core of competitiveness.
3. The institution's strategy, objectives, and the prevalence of local competition: This determinant includes the objectives of the existing institution, its strategy, methods of organization and management, and the relationship of shareholders to the management of the institution. It also includes the role that competition plays in the local market in achieving the institution's competitive advantage. Non-price, through development and raising the level of efficiency and product quality, will qualify it to enter foreign markets.
4. The status of related industries and support for that activity and the extent of their existence: meaning that there are related and support industries within the country, and related industries mean those industries that participate with the industry in which the establishment is active, whether they are inputs or distribution channels, as well as industries that produce complementary materials to this industry, as for the support industries. It refers to those industries that provide support to a specific industry in terms of the inputs required by the production process (Jara, 2017).

2.2.6 Competitive advantage dimensions:

- **Cost dimension:**

Porter (1991) argued the cost dimension of competitive advantage in many of his publications through the 1980s. Cost dimension or the cost leadership strategy is the most common strategy among companies as their goal is to reduce their cost to be a cost leader. Porter also argued that many companies commit the same strategic error or myopia with this strategy as implementing this strategy, the company must be a cost leader, not seeking to achieve that position. Hill (2000) states in his research that when the profit margins are low, most companies will attempt to lower their cost to achieve a higher return, Hill also agreed with Porter's finding in achieving a competitive advantage, companies must choose

between lowering their cost or differentiating their products to justify charging premium prices to survive the competition.

- **Quality dimension:**

Helms (1996) described quality and productivity as strategic weapons to achieve competitive advantage. The increase in quality of production or the supply chain would lead to an increase in the company's market share. The concept of quality has many dimensions, Lee and Zhou (2000) described it as the provision of products or services that meet or exceed the customers' needs and expectations. Monden (2019) viewed it as an indefinable term with subjective characteristics. Juran Jm (1969) described quality as the "fitness for use", Juran considered the customer's perspective in defining quality as customers are the determinant of what satisfies their needs and what does not.

- **Delivery dimension:**

Customers value their needs, and delivery plays a significant role in meeting those needs in the right amount and at the right time, that delivery is ensuring that the right product is delivered in the right amount to the right destination at the right time from the right source (Alafifi, 2021).

- **Flexibility dimension:**

Flexibility is the ability of the company to respond effectively to the change in surroundings. Mandelbaum's research provided the foundation that shed light on the importance of flexibility in coping with and responding to the dynamics of the business environments. Flexibility is rated for multiple dimensions; product flexibility which refers to the ability to modify, substitute, and add to the product to satisfy the change in customers' needs and expectations; volume flexibility which refers to the ability of manufacturing systems to vary total production volume economically (Alafifi, 2021).

2.2.7 Obstacles to the Application of Competitive Advantage:

Obstacles to the application of competitive advantage are as follows (Bardawil, 2022):

- Weak administrative structures in society.
- Lack of interest, low level of human resources, and underdevelopment of administrative communication processes.
- The absence of a database and management information system.
- Lack of team spirit.
- Absence of optimal utilization and better performance of operations.
- Failure to measure opportunities and identify environmental threats.

- The deterioration of effective organizational behavior.

2.3 Previous Studies

This part will show highlights of previous studies on quality costs and competitive advantage, and these studies will be presented according to chronological order from newest to oldest as follows:

- **Study Yadegari (2022): A robust time-cost-quality-energy-environment trade-off with resource-constrained in project management: A case study for a bridge construction project**

This study aims to consider the sustainability pillars in scheduling projects and the uncertainties in modeling them. To model the study problem, robust nonlinear programming (NLP) involving the objectives of cost, quality, energy, and pollution level is applied with resource constrained. According to the results, as time diminished, the cost, energy, and pollution initially decreased and then increased, with a reduction in quality. To make the model close to the real world by considering uncertainties, the cost and quality tangibly improved, and pollution and energy consumption declined. We applied the augmented "-constraint method" to solve the proposed model. According to the results of the research regarding the time-cost, time-quality, time-energy, and time-pollution charts, as uncertainty increases, the cost and quality will improve, and pollution and energy will decrease. The proposed model can be employed for all industrial projects, including roads, construction, and manufacturing.

- **Study Garg (2021): Understanding the components and magnitude of the cost of quality in building construction.**

The present study seeks to establish a relationship between project defect score (PDS), representing the quality of construction in the project, and the COQ in the building construction industry. The study also seeks to estimate the contributions of the various components to the overall COQ in the construction industry, along with their distribution and interrelationships among themselves. A framework for estimating COQ was developed, and the data regarding prevention, appraisal, and failure costs were collected from 122 projects. Various mathematical and statistical tools like Pearson's correlation, multiple linear regression (MLR), and curve fitting have been used for data analysis. The prevention–appraisal–failure (PAF) model was found to be appropriate to estimate COQ, and the prevention, appraisal, conformance cost (COQ), and failure cost were found to vary between 0.19 and 8%, 0.05 and 5%, 0.3 and 10% and 0.01 and 5%, respectively, whereas

the overall COQ varied from 3.5 to 10.01% of the project cost. The correlations between various components of COQ were found to be significant. MLR suggested that appraisal cost is more impactful in reducing failure cost than prevention cost. Using curve fitting, the cubic model appropriately represented all interrelationships. The optimal overall COQ was found to be 3.86%, and the reasons for low COQ have been explored.

- **Study Biadacz (2020): Quality cost management in the SMEs of Poland.**

The purpose of the study is to examine the research problem that represents an attempt to approximate the importance of quality costing in managing a modern enterprise using the selected enterprises from small and medium-sized enterprises (SMEs) in Poland. The primary goal of the research is a need to acquire knowledge about the use of quality cost accounts in enterprises operating in Poland. Research has been conducted in the SMEs of production and services. From October 2018 to December 2018, survey-based research was carried out in the selected SMEs of production and service in Poland. The targeted participants of the study are from medium-sized enterprises employing 50–250 people. The pilot studies conducted in companies indicate that modern enterprises are focused on quality. Many enterprises declare to be continuously improving quality systems and quality costing. However, generally, these are large companies that have implemented ISO standards, often part of international corporations. The survey results of the study shows that medium-sized enterprises still make little use of modern cost accounting variants. Based on the study, only 9.75% (39 enterprises) from a representative group of 400 companies from the sectors of manufacturing, services, and production, as well as service companies, apply quality costing. Some of the other enterprises are only taking measures to implement quality cost accounting.

- **Study Sturm (2019): long-run dynamics between the cost of quality and quality performance.**

The purpose of this paper is to build up empirical evidence for increasing quality performance in manufacturing in the long run. The authors then examine whether it is possible to reduce internal and external failure costs over time without increasing prevention and appraisal expenditures in return. Finally, a scale effect in reducing quality cost is measured to clarify the long-run dynamics between quality cost and quality performance. The authors conduct statistical analysis on a large sample secondary data set to reveal relationships between the total cost of quality, its components, and overall quality performance. Significantly higher quality performance and lower quality cost are observed in the long run. Quality costs grow less than half as fast as sales volume, pointing to a

significant scale effect on quality cost reduction.

- **Study Psomas (2018): Cost of quality measurement in food manufacturing companies: the Greek case.**

The purpose of this paper is to focus on the cost of quality (COQ) of food manufacturing companies. The study aims at empirically validating the conceptual structure of the core dimensions of COQ (prevention, appraisal, internal and external failure cost) and determining their level and relationships. Determining the reasons for not measuring COQ, as well as the barriers and benefits of the COQ measurement, is also an aim of the present study.

Greek food manufacturing companies were approached through a structured questionnaire, and 91 participated in the study. Exploratory and confirmatory factor analysis, descriptive statistics, and correlation analysis are applied for data analysis.

The structure of the core dimensions of COQ is empirically validated, while all of them range within medium levels and are interrelated. The reasons for companies not measuring COQ, as well as the barriers to companies measuring the COQ, are not significant. On the contrary, significant benefits are derived from the COQ measurement.

- **Study Sahbat (2018): Environmental quality costs and their role in strategic decision making.**

The adoption of cost-effective economic units depends on the awareness and understanding of their administrations in taking positive attitudes and internal advocacy to include environmental costs in decision-making, as well as allocating costs to products; all this will contribute to the success of managing the economic unit and achieving its objectives in society due to the interrelation of the environmental management cost and the products design management and the environmental management. A questionnaire was distributed to a sample of 55 specialists in this field. The results show that there is a mutual effect between environmental quality costs and strategic decision-making. These decisions, taken in the light of the environmental quality costs, are more accurate, and they enable higher management to reach better strategic decisions, and environmental cost management improves the environmental performance of the economic unit. The lack of commitment of economic units to the standards of environmental pollution leads to damage to the environment and natural resources. It has been recommended to increase the efforts of government agencies to combat pollution and follow up economic units on an ongoing basis and impose fines.

- **Study Srar (2017): The Importance of Total Quality Costs in The Evaluation of The Strategic Performance.**

The total quality costs can provide information that gives a clear view of the actual execution by ensuring the effectiveness of corrective action when it gathers information about the implementation of the procedure to identify the extent to which this procedure can address quality problems, in other words, to identify solutions of these problems also to know if it was successful or not, the total quality costs can provide a set of indicators and measures for short and long term goals of the economic unit which is linked to these objectives and future strategic visions of economic units which support the evaluation process of strategic performance of these units.

- **Study Malik (2016): Cost of quality: findings of a wood products manufacturer**

Today, substantial investments are made to improve the bottom line, and cost of quality (COQ) is a tool that identifies weaker areas where these investments should be directed. In the literature, the authors find various COQ models and their applications, but it is deficient in providing a standard format of a “Quality Cost Procedure” for a COQ program’s company-wide deployment. A procedure was thus developed, and its effectiveness was evaluated for implementation. The paper aims to discuss these issues. The COQ program was implemented in the production department of a wood products manufacturer using the action research approach. Prevention, Appraisal, and Failure Cost models were employed. Data collection was challenging; however, stakeholders were interviewed, data were acquired from the Management Information System, and various reports were reviewed for cost elements. Total COQ as a percentage of sales was found to be 11, while as a percentage of material cost was 15 percent. It was found through the implementation that the development of a quality cost procedure is highly iterative, and a standard format is proposed in the Appendix. This procedure worked satisfactorily, and the company is confident of moving to the next phase of the company-wide deployment of the COQ Program.

3 Chapter Three: Research Methodology

This chapter presents the methods & procedures followed by the researcher in conducting the research. It includes the methodology of data, population, samples of the research, the tool of the research and questionnaire, and statistical methods that were used in data analysis. the following details of the above.

3.1 Methodology of Research:

To achieve the objectives of the research, the researcher used a descriptive-analytical approach that addresses "The role of quality costs in improving the competitive advantage of industrial companies in Palestine." The descriptive-analytical method compares, explains, and assesses to reach meaningful generalizations that enhance the stock of knowledge on the subject by collecting data from various sources. primary and secondary sources as follows:

- primary sources: by looking inside the field to distribute questionnaires to research some vocabulary research, inventory, and collection of the necessary information about research, and then discharged and statistical analysis and use of appropriate statistical tests to reach significance and value indicators to support the research.
- secondary sources: The researcher used secondary data sources to address the theoretical framework for the research through the following:
 - Arab and foreign references and books addressed the issue of research.
 - Periodicals, articles and published studies, and master's and doctoral theses related.
 - The researcher hired reports and bulletins issued by institutions and related centers.
 - The researcher hired the Internet and electronic copies on its pages.

3.2 The Population and the Research Sample:

The population of the research consists of employees in industrial companies in Palestine, and the research sample amounted to (150) employees.

3.3 Research Tools:

The researcher seeks through this research to analyze the role of quality costs in improving the competitive advantage of industrial companies in Palestine. The prepared questionnaire contains the following parts:

Part I: Demographic information about participation.

Part II: Quality Costs consists of four dimensions that contain 24 paragraphs, as follows:

1. Control costs.

2. Evaluation costs.
3. Internal failure costs.
4. External failure costs.

Part III: Competitive Advantage consists of 10 paragraphs.

The researcher used the Likert scale to correct the questionnaire paragraph, according to the point scale, it is clear in Table (1):

Table 1: Indicate Likert Scale

(Source: Own researcher)

Degree of approval	Mean	Relative Weight %
Extremely low	Less than 3.6	Less than 36%
Low	More 3.6 – 5.2	More 36% - 52%
Medium	More 5.2 – 6.8	More 52% - 68%
large	More 6.8 – 8.4	More 68% - 84%
Exceptionally large	More 8.4 – 10	More 84% - 100%

3.4 Validity of the Questionnaire:

It means to measure the response questionnaire prepared for the measure; the validity of the questionnaire has been verified through the following:

1. Internal Validity:

Table 2: Internal validity for questionnaire paragraph

(Source: Own researcher)

No	Paragraph	Correlation Coefficient (R)	P-value
Quality Costs			
First dimension: Control costs.			
1	The company takes care of the costs of prevention to prevent any defects in its products.	0.67	0.000*
3	The company pays attention to the costs of maintaining and calibrating the control devices periodically.	0.88	0.000*
2	The company is concerned with circuit costs and quality engineering.	0.79	0.000*

4	The company is concerned with the costs of controlling production processes.	0.88	0.000*
5	The company is interested in reviewing and analyzing quality data.	0.83	0.000*
6	The company is concerned with the costs of training workers in the field of quality.	0.80	0.000*
Second dimension: Evaluation costs			
1	The company determines the costs of the final inspection of the products before carrying out the process of supplying them.	0.90	0.000*
2	The company conducts maintenance procedures for quality equipment and production lines on an ongoing basis.	0.86	0.000*
3	The company is interested in calculating inventory costs to ensure that the value of stored products does not fall.	0.84	0.000*
4	The company examines the raw materials involved in the production process.	0.92	0.000*
5	The company examines samples of the products at the end of the production process.	0.78	0.000*
6	The company examines samples of the products under manufacture during the production process.	0.91	0.000*
Third dimension: Internal failure Costs			
1	The company analyzes the reasons for producing poor quality products.	0.81	0.000*
2	The company checks the rebooted products.	0.82	0.000*
3	The company estimates the cost of wasted materials.	0.80	0.000*
4	The company estimates the cost of storing the raw materials that become exhaust.	0.63	0.000*
5	The company cares about the costs of maintenance, breakdowns and halting of the production process.	0.65	0.000*
6	The company estimates the number of defective units that have been remanufactured.	0.70	0.000*
Fourth dimension: External failure Costs			
1	The company follows a policy of avoiding loss arising from customer dissatisfaction with product quality.	0.77	0.000*

2	The company bears the costs of receiving and exchanging products returned from customers.	0.80	0.000*
3	The company bears the costs of the compensation it gives to clients.	0.58	0.000*
4	The company bears the costs of complaints when there are defects in its products.	0.70	0.000*
5	The company checks the products before they go out to the market to ensure their specifications.	0.57	0.000*
6	The company processes defective products upon receipt by customers.	0.45	0.000*
Competitive Advantage			
1	The company adopts strategies based on keeping up with developments.	0.59	0.000*
2	The company provides distinctive and unique services to its customers.	0.89	0.000*
3	The company has the ability to create products that help convince customers.	0.72	0.000*
4	The company supports research and development plans.	0.82	0.000*
5	The company works to limit the entry of competitors by focusing on quality.	0.78	0.000*
6	The company improves the performance of employees through training programmers.	0.85	0.000*
7	The company emphasizes commitment to leadership excellence standards.	0.92	0.000*
8	The company periodically evaluates and develops work systems.	0.80	0.000*
9	The company is interested in measuring customer satisfaction.	0.87	0.000*
10	The company contributes to defining business strategies according to customer needs.	0.86	0.000*

* Correlation is statistically significant at $\alpha \leq 0.05$.

It was calculated Internal consistency for the questionnaire paragraph on the research sample amounting to 150 by calculating the correlation coefficient between each with a total degree for each dimension, and Table 2 shows that the correlation coefficients indicated significance at the

level 0.05, where the probability value of each paragraph of less than 0.05 and so paragraphs of the questionnaire are valid to set the measure.

2. Structural Validity:

Table 3: The correlation coefficient between the five dimensions and the total degree of the questionnaire

(Source: Own researcher)

Dimension	Correlation Coefficient (R)	P-value
Control costs.	0.87	0.000*
Evaluation costs.	0.90	0.000*
Internal failure costs.	0.87	0.000*
External failure costs.	0.84	0.000*
Competitive Advantage.	0.89	0.000*

* Correlation is statistically significant at $\alpha \leq 0.05$.

Table (3) indicates that the correlation coefficients between the degree of each dimension of the questionnaire and the total degree for the questionnaire, the correlation coefficients are statistically significant at $\alpha \leq 0.05$, while the probability value for all paragraphs is less than 0.05.

3.5 Reliability of the Questionnaire:

A reliable questionnaire means that it consistently produces the same results when administered multiple times under the same conditions and circumstances. In other words, the reliability of the questionnaire refers to its stability, indicating that the results do not change significantly when it is re-administered to the same group of participants over certain time intervals. After applying the questionnaire, Cronbach's alpha coefficient was used to measure its reliability.

Table 4: Cronbach's alpha coefficient for the questionnaire reliability scale

(Source: Own researcher)

Dimension	Number of paragraphs	Cronbach's alpha coefficient
Quality costs	24	0.95
Competitive Advantage.	10	0.93
Total questionnaire paragraphs	34	0.96

Table (4) indicated that the value of Cronbach's alpha for the total questionnaire is 0.96, this expresses that the questionnaire having a high coefficient of reliability.

Normal Distribution Test: Kolmogorov - Smirnov Test

Table 5: Normal Distribution Test

(Source: Own researcher)

Total questionnaire paragraphs	Z-Value	P-value
	1.08	0.19

The previous test Kolmogorov - Smirnov to see if the data follow a normal distribution or not test is necessary in the case of hypothesis testing because most parametric tests require that the data distribution be normal, and Table (5) test results as the probability value of each dimension more than 0.05 (*sig.* > 0.05) and this indicates that the data follow a normal distribution and parametric tests should be used.

3.6 Statistical Methods:

The researcher emptied and analyzed the questionnaire through Statistical Package for the Social Sciences (SPSS), and it was used through the following styles.

1. Descriptive statistics such as percentage, arithmetic average, standard deviation, and relative arithmetic average are used in categories of variable frequency according to a researcher in the description of the variables research.
2. Person Correlation Coefficient: to make verification of consistency questionnaire paragraphs.
3. Cronbach's Alpha coefficient: to know the reliability of questionnaire paragraphs.
4. Kolmogorov-Smirnov (K-S) test: Used to determine whether a single sample of data follows a normal distribution.
5. T-Test: for the mean single sample (One sample T-test) to know the difference between the mean paragraph and medium neutral.

4 Chapter Four: Data Analysis and Hypotheses Testing

This chapter aims to achieve the objectives of the research, and for that, the researcher collected data required by the research tool "questionnaire," was empty and analyzed statistically, and conducted the necessary tests, which have been detailed in the previous chapter, the researcher used the Statistical Package for the Social Sciences (SPSS), in the analysis of data, and to reach the research result.

4.1 Statistical Description of the Study Sample:

4.1.1 Demographic distribution

The following is an overview of the sample's characteristics based on demographic information.

❖ Distribution of the characteristics of the sample according to gender:

The study sample was divided based on gender, with the distribution of males and females in the Table below:

Table 6: Distribution of the sample according to gender

(Source: Own researcher)

Gender	Frequency	Percentage%
Male	129	86
Female	21	14
Total	150	100

It is clear from the results in Table (6) that 86% of the research sample were male, while females accounted for 14% of the research sample.

❖ Distribution of the characteristics of the sample according to qualifications:

Table 7: Distribution of the sample according to qualifications

Qualifications	Frequency	Percentage%
Diploma	39	26
Bachelor	90	60
Master	21	14
Total	150	100

It is clear from the results table (7) that 26.0% of the sample academy qualifications are diplomas, then 60.0% are bachelor's, 14.0% are master's, and most of the participants in the study have completed their bachelor's degree.

❖ **Distribution of the characteristics of the sample according to Job Title:**

Table 8: Distribution of the sample according to experience years

(Source: Own researcher)

Job Title	Frequency	Percentage%
Director	12	8
Deputy Director	6	4
Head of Department	51	34
Employee	81	54
Total	150	100

It is clear from the results in Table (8) that 8.0% are directors, 4.0% are deputy directors, 34.0% are heads of department, and 54.0% are employees.

❖ **Distribution of the sample according to experience years**

Table 9: Distribution of the sample according to experience years

Experience Years	Frequency	Percentage%
less than 5 years	21	14.0
5 less than 10 years	81	54.0
10 and above	48	32.0
Total	150	100.0

It is clear from the results in Table (9) that 14.0% experience years for them (less than 5 years), 54.0% (5 less than 10 years), 32.0% (10 and above).

4.2 Descriptive analysis of the study variables

In this analysis, the researcher evaluates the dimensions of the study in relation to the research population using a one-sample t-test for each questionnaire item. This test assesses whether the mean response significantly differs from the neutral value of 3. If the p-value (sig) is greater than the significance level, it indicates that the opinions are close to neutrality.

4.2.1 Descriptive statistics for Quality Costs:

The researcher used the appropriate descriptive tests, the arithmetic mean, standard deviation, the relative weight of the quality costs dimensions and the total score, then the researcher analyzed the data for each of the quality costs dimensions:

Table 10:Results of descriptive analysis of quality costs dimensions

(Source: Own researcher)

No	dimension	Mean	Standard deviation	Relative Weight %	T Test	P-value	Rank
1	Control costs.	3.88	0.73	77.6	8.479	0.000	2
2	Evaluation costs.	3.92	0.84	78.5	7.755	0.000	1
3	Internal failure Costs.	3.81	0.60	76.2	9.554	0.000	3
4	External failure Costs.	3.80	0.60	76.1	9.540	0.000	4
Total degree		3.85	0.62	77.1	9.738	0.000	

Table 10 shows that the relative weight of the total score for respondents' answers regarding the Quality Costs sections is notably high at 77.1%. Within this, the evaluation costs dimension ranks first with a relative weight of 78.5%. The Control Costs dimension follows in second place with a relative weight of 77.6%, while the Internal Failure Costs dimension ranks third at 76.2%. Lastly, the External Failure Costs dimension ranks fourth with a relative weight of 76.1%.

1. Descriptive statistics for control costs:

Table 11: Dimension Paragraph Analysis: Control costs

(Source: Own researcher)

No.	Paragraph	Mean	Standard deviation	Relative Weight %	T Test	P-value	Rank
1	The company takes care of the costs of prevention to prevent any defects in its products.	3.82	1.00	76.4	5.776	0.000	6
2	The company pays attention to the costs of maintaining and calibrating the control devices periodically.	3.90	0.84	78.0	7.584	0.000	2
3	The company is concerned with circuit costs and quality engineering.	3.84	0.93	76.8	6.361	0.000	5

4	The company is concerned with the costs of controlling production processes.	3.98	0.87	79.6	7.977	0.000	1
5	The company is interested in reviewing and analyzing quality data.	3.88	0.85	77.6	7.333	0.000	3
6	The company is concerned with the costs of training workers in the field of quality.	3.86	0.95	77.2	6.416	0.000	4
Total degree		3.88	0.73	77.6	8.479	0.000	

The first dimension was analysed using a t-test to determine whether the average response for each paragraph, as well as the overall dimension, reached or exceeded a neutral value of 3. The results indicated that the arithmetic mean for all paragraphs was 3.88, with a standard deviation of 0.73 and a relative weight of 77.6%. The t-value was 8.479, and the p-value was 0.000, which is less than 0.05. This signifies that the average response for the "Control Costs" dimension exceeds the neutral level of 3, reflecting a favourable opinion from the sample, and the results are shown in Table (11).

2. Descriptive Statistics for evaluation costs

Table 12: Dimension Paragraph Analysis: Evaluation costs

(Source: Own researcher)

No.	Paragraph	Mean	Standard deviation	Relative Weight %	T Test	P-value	Rank
1	The company determines the costs of the final inspection of the products before carrying out the process of supplying them.	3.98	1.02	79.6	6.794	0.000	2
2	The company conducts maintenance procedures for quality equipment and production lines on an ongoing basis.	3.90	0.99	78.0	6.397	0.000	4
3	The company is interested in calculating inventory costs to ensure that the value of stored products does not fall.	3.92	0.99	78.4	6.595	0.000	3
4	The company examines the raw materials involved in the production process.	4.16	0.98	83.2	8.400	0.000	1

5	The company examines samples of the products at the end of the production process.	3.78	0.89	75.6	6.216	0.000	6
6	The company examines samples of the products under manufacture during the production process.	3.80	0.90	76.0	6.261	0.000	5
Total degree		3.92	0.84	78.5	7.755	0.000	

By-test paragraphs, the second dimension was tested to see if the average degree of response of each paragraph of the dimension and the time, tension in general, has reached a degree of neutrality of three or increased or decreased it, it was found that the arithmetic mean of all paragraphs equal to 3.92, and standard deviation equal to 0.84, and the relative weight equal to 78.5%, and the value of test T equal to "7.755", and p-value equals 0.000, which is less than 0.05, which indicates that the average degree of response to the dimension of the "Evaluation costs" has increased the degree of neutrality is 3, and this shows approval of characteristic sample on this dimension, and the results are shown in Table (12).

3. Descriptive Statistics for internal Failure costs

Table 13: Dimension Paragraph Analysis: Internal Failure Costs

(Source: Own researcher)

No.	Paragraph	Mean	Standard deviation	Relative Weight %	T Test	P-value	Rank
1	The company analyzes the reasons for producing poor quality products	3.92	0.67	78.4	9.780	0.000	2
2	The company checks the rebooted products	3.92	0.60	78.4	10.830	0.000	1
3	The company estimates the cost of wasted materials	3.72	1.01	74.4	5.036	0.000	5
4	The company estimates the cost of storing the raw materials that become exhaust.	3.66	0.89	73.2	5.216	0.000	6
5	The company cares about the costs of maintenance, breakdowns and halting of the production process	3.88	0.77	77.6	8.050	0.000	3
6	The company estimates the number of defective units that have been remanufactured	3.76	0.96	75.2	5.600	0.000	4
Total degree		3.81	0.60	76.2	9.554	0.000	

By T-test paragraphs third dimension was tested to see if the average degree of response of each paragraph of the dimension and the dimension, in general, has reached the degree of neutrality is 3 or increased or decreased it, it was found that the arithmetic mean of all paragraphs equal to 3.81, and standard deviation equal to 0.60, and the relative weight equal to 76.2%, and the value of test T equal to "9.554", and p- value equals 0.000, which is less than 0.05, which indicates that the average degree of response to the dimension of the "Internal failure Costs" has increased the degree of neutrality is 3, and this shows approval of characteristic sample on this dimension, and the results are shown in Table (13)

4. Descriptive Statistics for external failure costs

Table 14:Dimension Paragraph Analysis: External Failure Costs

(Source: Own researcher)

No.	Paragraph	Mean	Standard deviation	Relative Weight %	T Test	P-value	Rank
1	The company follows a policy of avoiding loss arising from customer dissatisfaction with product quality.	3.84	1.08	76.8	5.521	0.000	4
3	The company bears the costs of receiving and exchanging products returned from customers.	3.64	1.05	72.8	4.330	0.000	6
2	The company bears the costs of the compensation it gives to clients.	3.84	0.68	76.8	8.723	0.000	3
4	The company bears the costs of complaints when there are defects in its products.	3.90	0.91	78.0	7.000	0.000	2
5	The company checks the products before they go out to the market to ensure their specifications.	3.68	0.91	73.6	5.264	0.000	5
6	The company processes defective products up on receipt by customers.	3.92	0.75	78.4	8.655	0.000	1
Total degree		3.80	0.60	76.1	9.540	0.000	

By T-test paragraphs fourth dimension was tested to see if the average degree of response of each paragraph of the dimension and the dimension in general has reached degree of neutrality is 3 or increased or decreased it, it was found that the arithmetic mean of all paragraphs equal to 3.80, and standard deviation equal to 0.60, and the relative weight equal to 76.1%, and the value of test T equal to "9.540", and p- value equals 0.000, which is less than 0.05, which

indicates that the average degree of response to the dimension of the "External failure Costs" has increased the degree of neutrality is 3, and this shows approval of characteristic sample on this dimension , and the results are shown in Table (14)

4.2.2 Descriptive Statistics for Competitive Advantage

Table 15:Dimension Paragraph Analysis: Competitive Advantage

(Source: Own researcher)

No.	Paragraph	Mean	Standard deviation	Relative Weight %	T Test	P-value	Rank
1	The company adopts strategies based on keeping up with developments.	4.06	1.00	81.2	7.509	0.000	6
3	The company provides distinctive and unique services to its customers.	4.08	0.78	81.6	9.812	0.000	4
2	The company could create products that help convince customers.	3.88	0.75	77.6	8.340	0.000	10
4	The company supports research and development plans.	4.08	0.83	81.6	9.211	0.000	5
5	The company works to limit the entry of competitors by focusing on quality.	4.00	0.81	80.0	9.354	0.000	9
6	The company improves the performance of employees through training programmes.	4.08	0.72	81.6	10.549	0.000	3
7	The company emphasizes commitment to leadership excellence standards.	4.00	0.67	80.0	10.553	0.000	7
8	The company periodically evaluates and develops work systems.	4.00	0.76	80.0	9.354	0.000	8
9	The company is interested in measuring customer satisfaction.	4.12	0.80	82.4	9.912	0.000	2
11	The company contributes to defining business strategies according to customer needs.	4.18	0.77	83.6	10.776	0.000	1
Total degree		4.05	0.63	81.0	11.698	0.000	

By T test paragraphs Competitive Advantage dimension was tested to see if the average degree of response of each paragraph of the dimension and the dimension in general has reached degree of neutrality is 3 or increased or decreased it, it was found that the arithmetic mean of all

paragraphs equal to 4.05, and standard deviation equal to 0.63, and the relative weight equal to 81.0%, and the value of test T equal to "11.698", and p- value equal 0.000, which is less than 0.05, which indicates that the average degree of response to the dimension of the "Competitive Advantage" has increased the degree of neutrality is 3, and this shows approval of characteristic sample on this dimension , and the results are shown in Table (15).

4.3 Test Hypotheses of Research

The main hypothesis: There is a statistically significant correlation at level $\alpha \leq 0.05$ between the quality costs and competitive advantage of industrial companies in Palestine.

To answer this hypothesis, we found the Pearson correlation coefficient to study the relations between the quality costs and competitive advantage of industrial companies in Palestine, and the results are shown through the following tables:

Table 16: The Results of Main Hypotheses

(Source: Own researcher)

Quality Costs	Competitive Advantage	
	Correlation Coefficient (R)	P-value
	0.79	0.000*

*Correlation is statistically significant at $\alpha \leq 0.05$

Table 16 indicates that there is a positive correlation with statistical significance between the quality costs and competitive advantage of industrial companies in Palestine, as the P-value is less than 0.05.

The following Sub hypotheses were extracted as follows:

1. There is a statistically significant correlation at level $\alpha \leq 0.05$ between the Control costs and competitive advantage of industrial companies in Palestine.

To answer this hypothesis, we found the Pearson correlation coefficient to study the relations between the Control costs and competitive advantage of industrial companies in Palestine, and the results are shown through the following tables:

Table 17: The Results of First Hypotheses

Control costs	Competitive Advantage	
	Correlation Coefficient (R)	P-value
	0.71	0.000*

*Correlation is statistically significant at $\alpha \leq 0.05$

Table 17 indicates that there is a positive correlation with statistical significance between the Control costs and competitive advantage of industrial companies in Palestine, as the P-value is less than 0.05.

2. There is a statistically significant correlation at level $\alpha \leq 0.05$ between the Evaluation costs and competitive advantage of industrial companies in Palestine.

To answer this hypothesis, we found the Pearson correlation coefficient to study the relations between the Evaluation costs and competitive advantage of industrial companies in Palestine, and the results are shown through the following tables:

Table 18: The Results of Second Hypotheses

(Source: Own researcher)

Evaluation costs	Competitive Advantage	
	Correlation Coefficient (R)	P-value
	0.73	0.000*

*Correlation is statistically significant at $\alpha \leq 0.05$

Table 18 indicates that there is a positive correlation with statistical significance between the Evaluation costs and competitive advantage of industrial companies in Palestine, as the P-value is less than 0.05.

3. There is a statistically significant correlation at level $\alpha \leq 0.05$ between the Internal failure costs and competitive advantage of industrial companies in Palestine.

To answer this hypothesis, we found the Pearson correlation coefficient to study the relations between the Internal failure Costs and competitive advantage of industrial companies in Palestine, and the results are shown through the following tables:

Table 19: The Results of Third Hypotheses

Internal failure Costs	Competitive Advantage	
	Correlation Coefficient (R)	P-value
	0.74	0.000*

*Correlation is statistically significant at $\alpha \leq 0.05$

Table 19 indicates that there is a positive correlation with statistical significance between the Internal failure Costs and competitive advantage of industrial companies in Palestine, as the P-value is less than 0.05.

4. There is a statistically significant correlation at level $\alpha \leq 0.05$ between the external failure costs and competitive advantage of industrial companies in Palestine.

To answer this hypothesis, we found Pearson correlation coefficient to study the relations between the External failure Costs and competitive advantage of industrial companies in Palestine, and the results are shown through the following table:

Table 20:The Results of Fourth Hypotheses

(Source: Own researcher)

External failure Costs	Competitive Advantage	
	Correlation Coefficient (R)	P-value
	0.64	0.000*

*Correlation is statistically significant at $\alpha \leq 0.05$

table 20 indicates that there is a positive correlation with statistical significance between the external failure costs and competitive advantage of industrial companies in Palestine, as the P-value is less than 0.05.

5 Chapter Five: Conclusions and Recommendations

The following chapter includes the conclusions that the researcher produced after researching the significant results that were deduced from the statistical analysis of dependent and independent variables of the research and hypotheses. Moreover, the researcher sheds light on the possible recommendations depending on the results.

5.1 Conclusions:

The Conclusions of The Research Dimensions:

1. It is clear from the results of the research that the relative weight of the total score of the respondents' responses to the quality costs paragraph was a large degree and amounted to 77.1%

The evaluation costs dimension was first ranked with relative weight 78.5%, while the control costs dimension was second ranked with relative weight 77.6%, then the Internal failure Costs third ranked with relative weight 76.2%, while the External failure Costs dimension fourth ranked with relative weight 76.1%.

2. It is clear from the results of the research that the relative weight of the total score of the respondents' responses to the Competitive Advantage paragraphs was large degree and amounted to 81.0%.

The Conclusions of The Research Hypotheses:

1. There is positive correlation with statistical significance between the quality costs and competitive advantage of industrial companies in Palestine.
2. There is positive correlation with statistical significance between the Control costs and competitive advantage of industrial companies in Palestine.
3. There is positive correlation with statistical significance between the Evaluation costs and competitive advantage of industrial companies in Palestine.
4. There is positive correlation with statistical significance between the Internal failure Costs and competitive advantage of industrial companies in Palestine.
5. There is a positive correlation with statistical significance between the External failure Costs and competitive advantage of industrial companies in Palestine.

5.2 Recommendations:

1. Need to pay more attention to the quality costs and report them in the financial statements due to their significance in reducing the costs and increasing the revenues.

2. Need to pay more attention to the prevention and appraisal costs on the one hand, since increasing these costs shall lead to reducing the internal and external failure costs.
3. I recommend increasing the implementation of quality cost systems in industrial companies by organizing specialized training courses for accounting teams. This will enhance their understanding and application of these systems, leading to better management of quality-related costs.
4. Industrial companies need to focus on policies aimed at reducing the cost of quality by increasing investment in prevention and evaluation measures. Properly allocating resources to these areas will help minimize defects and failures, ultimately lowering overall quality costs.
5. Encouraging industrial companies to obtain quality certification and produce high-quality and defect-free products.

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7 Annexes

MATE Organizational and Operational Regulations

III. Requirements for Students

III.1. Study and Examination

Regulations Appendix 6.13: The

MATE Uniform Thesis /thesis /

final thesis / portfolio guidelines

Annex 4.2: Declaration of public access and authenticity of the thesis/thesis/dissertation/portfolio

DECLARATION

The public access and authenticity of the thesis/dissertation/portfolio¹

Student's name: Aljamal Rahaf

Student's Neptun code: AMWJJ3

Title of thesis: The Role of Quality Costs in Improving Competitive Advantage of Industrial Companies in Palestine

Year of publication: 2024

Name of the consultant's institute: Hungarian University of Agriculture and Life Science

Name of consultant's department: Faculty of Economics and Social Sciences

I declare that the final thesis/thesis/dissertation/portfolio submitted by me is an individual, original work of my own intellectual creation. I have clearly indicated the parts of my thesis or dissertation which I have taken from other authors' work and have included them in the bibliography.

If the above statement is untrue, I understand that I will be disqualified from the final examination by the final examination board and that I will have to take the final examination after writing a new thesis.

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I acknowledge that the use and exploitation of my thesis as an intellectual work is governed by the intellectual property management regulations of the Hungarian University of Agricultural and Life Sciences.

I acknowledge that the electronic version of my thesis will be uploaded to the library repository of the Hungarian University of Agricultural and Life Sciences. I acknowledge that the defended and

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- confidential thesis 5 years after the submission

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Date: 2024.October.25



Student's signature

MATE Organizational and Operational Regulations

III. Requirements for Students

III.1. Study and Examination

Regulations Appendix 6.13: The

MATE Uniform Thesis / thesis /

final thesis / portfolio guidelines

Annex 5.2: Content extract

(abstract)

Title of thesis: The Role of Quality Costs in Improving Competitive Advantage of Industrial Companies in Palestine

Student author name: Aljamal Rahaf

Specialism, training level and work order named:

Faculty of Economics and Social Sciences, bachelor's degree

Institute/department (where the thesis was written) named

Department of Business Administration and Management

Abstract

This research aimed to identify the Role of Quality Costs in Improving the Competitive Advantage of Industrial Companies in Palestine, the population of the study consists of employees in industrial companies in Palestine, and the research sample amounted to (150) employees, the researcher used descriptive and analytical approach and questionnaire as a tool for the research, to describe the sample observations, analyze the research hypothesis, and test them. The analysis showed that respondents rated the impact of quality costs on their companies highly, with a relative weight of 77.1%. The competitive advantage of these companies was also perceived positively, with a relative weight of 81.0%. Moreover, a statistically significant positive correlation between quality costs and competitive advantage was found. This positive relationship extended across various quality costs, including control costs, evaluation costs, internal failure costs, and external failure costs, all of which were linked to enhancing the competitive advantage of industrial companies Palestine.



Hungarian University of Agriculture and Life Science

Szent István Campus

Faculty of Economics and Social Sciences

أخي الفاضل، أختي الفاضل

تحية طيبة وبعد...

أتوجه إليكم بفائق التقدير والاحترام نرجو حسن تعاونكم لإنجاح هذه الدراسة، وتحقيقاً لأغراض استكمال درجة البكالوريوس في إدارة الأعمال بعنوان: **دور تكاليف الجودة في تحسين الميزة التنافسية للشركات الصناعية في فلسطين.**

لذا أتمنى منكم التفضل بالمشاركة الفاعلة والبناءة، والتي تشكل رافداً مهماً في إتمام هذه الدراسة، وأرجو تعاونكم بتزويدي بالبيانات اللازمة والضرورية،

من خلال تعبئة هذا الاستبيان والإجابة العلمية على جميع الأسئلة المطروحة،

لما لذلك من أثر جوهري في الوصول إلى نتائج دقيقة وقاطعة يمكن الاعتماد عليها ويمكن تعميمها.

وتفضلوا بقبول فائق الاحترام والتقدير

إعداد الطالبة: رهنف الجمل

أولاً: البيانات الشخصية:

- الجنس : () ذكر () أنثى
- المؤهل العلمي : () دبلوم () بكالوريوس () ماجستير () دكتوراه
- المسمى الوظيفي : () مدير () نائب مدير () رئيس قسم () موظف
- الخبرة الوظيفية: () أقل من 5 سنوات () من 5 إلى أقل من 10 سنوات () أكثر من 10 سنوات

ثانياً: متغيرات الدراسة:

م	الفقرة	درجة الموافقة			
		كبيرة جداً	كبيرة	متوسطة	قليلة جداً
أولاً: تكاليف الجودة					
المحور الأول: تكاليف الوقاية					
1	تهتم الشركة بتكاليف الوقاية لمنع حدوث أي عيوب في منتجاتها.				
2	تهتم الشركة بتكاليف صيانة ومعايرة أجهزة الرقابة بشكل دوري.				
3	تهتم الشركة بتكاليف دوائر وهندسة الجودة.				
4	تهتم الشركة بتكاليف التحكم في العمليات الإنتاجية.				
5	تهتم الشركة بمراجعة وتحليل بيانات الجودة.				
6	تهتم الشركة بتكاليف تدريب العاملين في مجال الجودة.				
المحور الثاني: تكاليف التقييم					
1	تحدد الشركة تكاليف الفحص النهائي للمنتجات قبل القيام بعملية توريدها.				
2	تجري الشركة اجراءات الصيانة لمعدات الجودة وخطوط الانتاج بشكل مستمر.				
3	تهتم الشركة بحساب تكاليف المخزون للاطمئنان على عدم هبوط قيمة المنتجات المخزنة.				
4	تفحص الشركة المواد الأولية الداخلة في العملية الانتاجية.				
5	تفحص الشركة عينات من المنتجات في نهاية العملية الانتاجية.				
6	تفحص الشركة عينات من المنتجات تحت التصنيع أثناء العملية الانتاجية.				
المحور الثالث: تكاليف الفشل الداخلي					
1	تحلل الشركة الأسباب المؤدية لإنتاج منتجات رديئة الجودة.				
2	تفحص الشركة المنتجات المعاد تشغيلها.				
3	تقدر الشركة تكلفة المواد المهجرة.				
4	تقدر الشركة تكلفة تخزين المواد الخام التي أصبحت عادم.				

م	الفقرة	درجة الموافقة			
		كبيرة جداً	كبيرة	متوسطة	قليلة جداً
5	تهتم الشركة بتكاليف صيانة الأعطال وتوقف العملية الانتاجية.				
6	تقدر الشركة عدد الوحدات المعيبة التي تم إعادة تصنيعها.				
المحور الرابع: تكاليف الفشل الخارجي					
1	تتبع الشركة سياسة تجنب الخسارة الناشئة عن عدم رضا العملاء عن جودة المنتج.				
2	تتحمل الشركة تكاليف استقبال وتبديل المنتجات المرجعة من العملاء.				
3	تتحمل الشركة تكاليف التعويضات التي تمنحها للعملاء.				
4	تتحمل الشركة تكاليف الشكاوي عند وجود عيوب في منتجاتها.				
5	تفحص الشركة المنتجات قبل خروجها للسوق للتأكد من مواصفاتها.				
6	تقوم الشركة بمعالجة المنتجات المعيبة عند استلامها من قبل العملاء.				
ثانياً: الميزة التنافسية					
1	تتبنى الشركة استراتيجيات تستند على مواكبة ما يستجد.				
2	تقوم الشركة بتقديم خدمات مميزة وفريدة لعملائها.				
3	يتوفر لدى الشركة القدرة على ابتكار منتجات تساعد في إقناع العملاء.				
4	تدعم الشركة خطط البحث والتطوير.				
5	تعمل الشركة على الحد من دخول منافسين من خلال التركيز على الجودة.				
6	تحسن الشركة من أداء العاملين من خلال البرامج التدريبية.				
7	تؤكد الشركة على الالتزام بمعايير التميز القيادي.				
8	تعمل الشركة على تقييم وتطوير أنظمة العمل بشكل دوري.				
9	تهتم الشركة بقياس رضا العملاء.				
10	تساهم الشركة في تحديد استراتيجيات العمل وفقاً لاحتياجات العملاء.				

Questionnaire translation

First: Demographic data

- Gender: Male () Female ()
- Qualifications: Diploma () Bachelor () Master () PhD ()
- Job Title: Director () Deputy Director () Head of Department () Employee ()
- Experience Years: less than 5 years () 5 less than 10 years () 10 and above ()

Second: Study variables

No.	Paragraph	Degree of approval				
Quality costs						
First dimension: Control costs						
1	The company takes care of the costs of prevention to prevent any defects in its products.					
2	The company pays attention to the costs of maintaining and calibrating the control devices periodically.					
3	The company is concerned with circuit costs and quality engineering.					
4	The company is concerned with the costs of controlling production processes.					
5	The company is interested in reviewing and analyzing quality data.					
6	The company is concerned with the costs of training workers in the field of quality.					
Second dimension: Evaluation costs						
1	The company determines the costs of the final inspection of the products before carrying out the process of supplying them.					
2	The company conducts maintenance procedures for quality equipment and production lines on an ongoing basis.					

3	The company is interested in calculating inventory costs to ensure that the value of stored products does not fall.					
4	The company examines the raw materials involved in the production process.					
5	The company examines samples of the products at the end of the production process.					
6	The company examines samples of the products under manufacture during the production process.					
Third dimension: Internal failure Costs						
1	The company analyzes the reasons for producing poor quality products.					
2	The company checks the rebooted products.					
3	The company estimates the cost of wasted materials.					
4	The company estimates the cost of storing the raw materials that become exhaust.					
5	The company cares about the costs of maintenance, breakdowns and halting of the production process.					
6	The company estimates the number of defective units that have been remanufactured.					
Fourth dimension: External failure Costs						
1	The company follows a policy of avoiding loss arising from customer dissatisfaction with product quality.					
2	The company bears the costs of receiving and exchanging products returned from customers.					
3	The company bears the costs of the compensation it gives to clients.					
4	The company bears the costs of complaints when there are defects in its products.					
5	The company checks the products before they go out to the market to ensure their specifications.					

6	The company processes defective products upon receipt by customers.					
Competitive Advantage						
1	The company adopts strategies based on keeping up with developments.					
2	The company provides distinctive and unique services to its customers.					
3	The company has the ability to create products that help convince customers.					
4	The company supports research and development plans.					
5	The company works to limit the entry of competitors by focusing on quality.					
6	The company improves the performance of employees through training programmers.					
7	The company emphasizes commitment to leadership excellence standards.					
8	The company periodically evaluates and develops work systems.					
9	The company is interested in measuring customer satisfaction.					
10	The company contributes to defining business strategies according to customer needs.					

DECLARATION

AlJamal Rahaf H N (name) (student Neptun code: AMWJJ3) as a consultant, I declare that I have reviewed the thesis and that I have informed the student of the requirements, legal and ethical rules for the correct handling of literary sources.

I recommend to be defended in the final examination.

The thesis contains a state or official secret: yes no^{*1}

Date: 2024. november 2.


insider consultant

¹ The appropriate one should be underlined.