



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

INTERNATIONAL JOURNAL
OF CURRENT RESEARCH

International Journal of Current Research
Vol. 13, Issue, 08, pp.18646-18649, August, 2021

DOI: <https://doi.org/10.24941/ijcr.41911.08.2021>

RESEARCH ARTICLE

THE ROLE OF QUALITY COST PROGRAMS IN IMPROVING THE INDUSTRIAL DEVELOPMENT PROCESS IN YEMEN

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ARTICLE INFO

Article History:

Received 25th May, 2021

Received in revised form

20th June, 2021

Accepted 23rd July, 2021

Published online 31st August, 2021

Key Words:

Quality costs (QC), World Trade Organization (WTO), Yemeni industries, Actual evidence for implementing the QC system.

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ABSTRACT

For industrial companies to survive for a more extended period in a highly competitive market, these companies must replace traditional cost systems with a quality costing system. The purpose of this study is to shed light on the role that quality cost programs play in improving the wheel of economic development for least developed countries by providing a review of some successful uses of quality cost programs as well as focusing on the essential variables that led to the deterioration of Yemeni industries, and their inability to compete in the local and foreign markets. It clarifies the treatments that Yemeni companies must follow to raise the quality of their productivity. This study concluded that most of the evidence presented by the literature that quality improvement and cost measurement processes lead to an actual and significant reduction in quality costs for companies implementing quality cost programs, but this evidence is still few and limited to developed countries.

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Citation: Riyadh Y. Alsada, Dr. Yathish Kumar and Dr. Wahib AL-Hubaishi. "The role of quality cost programs in improving the industrial development process in Yemen", 2021. *International Journal of Current Research*, 13, (08), 18646-18649.

INTRODUCTION

The shift from the competition strategy to the containment strategy currently practiced by international companies and the obligations imposed by the World Trade Organization's anonymity in lifting restrictions on imported products have made the least developed countries unable to compete, even at the level of their domestic markets. Therefore, it is imperative that these least developed countries, including Yemen, direct their interest in implementing comprehensive quality management, enabling them to raise their productivity level and balance quality and cost in manufacturing. Whereas industrial firms can understand the implications of poor productivity through the successful use of quality costing methods. This concept has been described by several authors, as CoQ was defined by (Juran 1951) as costs that would disappear if there was no defective output. Likewise, it is the costs incurred in avoiding mistakes the first time, meaning doing things right the first time (Crosby 1976). CoQ can be described as an organized method that enables institutions to

production costs and raising the quality level to get rid of inferior products. This study aims to clarify the benefits that can be achieved from the application of quality cost programs, such as a tool in identifying the causes of poor quality, using them as a guide in long-term forecasting, reducing the rate of error, organizing the production process, determining the total production costs, and assisting in continuous improvement and development, for quality, etc. The study also aims to clarify the role that quality cost programs play in improving the least developed countries economic development wheel. This study will focus on essential variables that led to the deterioration of Yemeni industries and their inability to compete in the local markets themselves, the role of the Yemeni government in raising the level of the industrial sector, and the standards used. In the industrial industry at present, the problems and obstacles that led to the deterioration of the Yemeni industry, the treatments that Yemeni companies must follow to raise the quality of their productivity.

A BRIEF HISTORY OF THE YEMENI INDUSTRIAL SECTOR: The Yemeni industrial sector is relatively young

compared to many other countries. This sector's activity was limited before the Yemeni revolution to some traditional and primitive industries and crafts. No industry was mentioned, except for the oil refinery established in 1956AD in Aden and Sana'a's textile factory. The Yemeni economy witnessed a remarkable recovery at the beginning of the seventies, covering all fields of the economy. The government began to pay great attention to this sector by setting plans, policies, and programs to support and encourage the industrial sector. At that time, these enterprises started producing consumer goods for the local market and absorbing the increasing number of the workforce. Also, this sector began to contribute to the formation and rise of the gross domestic product continuously, as this development is due to the support that the government provided through the policies that were presented and the measures that have been taken, such as imposing restrictions on imports, raising customs tariffs and facilitating access to financing Necessary, etc. At the beginning of the 1990s, this sector began to decline and the rate of investment in it decreased, which made the Yemeni government adopt the mechanism of market forces as a method for economic development, opened the way for the private sector to play its role in leading the development process, and that the state's role is limited to the supervisory, guiding and regulatory process, so that in the late 1990s the private sector acquired 95% of the total industrial establishments. During the same period, the industrial sector witnessed a modest performance rate. It concentrated on a limited number of industrial activities, the most important of which were: food and construction industries, despite the government's interest in this sector as an actor capable of attracting local and foreign investments.

This sector faced many problems and difficulties that impeded its growth and development in light of a newly established Yemeni industry that was unable to meet the effects of policies, measures taken by the Yemeni government after implementing the financial and administrative reform program in 1995, the most important of which are: liberalizing foreign trade, lifting restrictions on import licenses, reducing customs duties and raising interest rates on borrowing; This led to high production costs and consequently the inability of industrial projects to produce goods that compete with foreign goods (National Information Center and Central Statistical Organization., 2000-2010).

THE REASONS THAT LED TO THE DETERIORATION OF THE YEMENI INDUSTRIAL SECTOR:

A set of variables has negatively affected the industrial sector, its growth, and its development. Among these reasons led to the decline of the Yemeni industrial industry, joining the World Trade Organization at an early date before preparing the Yemeni industry, qualifying it, adapting to new developments, changes, and early preparation for that process as the Yemeni markets became the source of imported products, which led to the inability of national products to compete with them. Therefore, the most pronounced adverse effects and results that resulted from the previous strategy for industrialization were the weak productivity of Yemeni industry, the high costs of production, the low quality of many commodities and local products, and the invalid interest in specifications, standards, and quality due to the absence of competition. In addition, the establishment of several industries that do not have a competitive advantage in their production and their continuation in light of large and high

government support. Moreover, once protection and subsidies were lifted, the Yemeni industry could not keep pace with new developments and withstand competition from foreign industrial products. It suffers from a weak ability to dispose of its production in the local market and low sales and revenues. Consequently, this sector began to face the problem of low rates of utilization of its productive capacities, waste of energy and potential, and a significant increase in production costs. Which ultimately led to the exposure of many of these industries to accumulated losses and even stopped or closed some of them in recent times.

SCALES USED IN YEMEN INDUSTRIAL ESTABLISHMENTS:

There are major deficiencies in the quality activities, as there is no noticeable interest in international standards for quality systems by Yemeni industrial companies. Therefore, most of these industries lack the simplest elements of quality, for example, the lack of a department specialized in quality activities, policies, and systems, the failure to provide modern laboratories for examining and testing products, the machines used in the calibration of devices and equipment. Moreover, there is a deficiency in applying statistical, administrative concepts to address manufacturing problems in general at different stages to address low quality. Many industrial companies in Yemen still use the 100% comprehensive inspection system to control defective production in production. All of these are still practiced by many Yemeni industrial companies, except for companies that have been able to prepare themselves by obtaining the ISO international quality certificate, to increase confidence in their products, reputation, consumer respect for their management, and thus have made a good impression in the markets both local, Arab and foreign (Al-Maradhi 2006).

THE OBSTACLES THAT THE YEMENI INDUSTRIAL SECTOR FACES:

There are many problems, negative phenomena that hinder the growth of the Yemeni industrial sector:

The problems that hinder the growth of the Yemeni industrial sector: Many studies dealt with the issues and challenges that the Yemeni industrial industry suffers (Al-Maradhi 2006).

Natural problems: it is predictable problems. With its expertise and available resources, the facility manager can solve this type of problem, as shown in Table I.

Abnormal problems: it is problems that the facilities management can solve with the support of the external environment. As these issues include rare, strange cases, which the facilities alone cannot solve, it is necessary to rely on the external environment to help them solve these problems. Despite the development witnessed by the Yemeni industrial sector, it still faces many difficulties, obstacles, and challenges, which it must overcome and solve, in addition to its need for a lot of rehabilitation, modernization, and raising its competitive efficiency, which has become a condition that must be overcome efficiently and effectively if establishments want Business survival, growth, and continuation. This will not happen, except by keeping pace with recent and rapid developments and changes in industrial technology, information technology, communications, modern management, and accounting methods, the most important of which are adopting total quality management philosophy.

Table I. Ranking of natural problems based on their priority, Impact on the industry, and proposed solutions

the obstacle	The type of Impact on the local industry	The proposed solutions
The absence of a strategic vision	The inability of establishments to adapt to environmental changes due to lack of preparation for it.	Training administrative leadership on using strategic analysis tools and convincing them of the importance of using them.
Increase labor preparation costs and increase turnover.	Increased labor costs. They are not taking advantage of the learning curve. Greater organizational disloyalty and job satisfaction.	Scientifically studying the reasons for increasing the labor turnover rate, treating this scientifically. Considering the organization's members as partners, not employees.
Inefficiency.	The inability of price competition and low profits.	Scientifically evaluating performance. Diagnosing the causes of deficiencies. Arranging them based on importance. Treating it scientifically.
Importing most of the inputs from abroad.	Establishments operating under a state of high uncertainty in terms of availability of materials, prices, etc., and increased costs.	Begin to gradually develop local sources of inputs regardless of costs and constraints.
Lack of market orientation	Thus, consumer dissatisfaction with the product ease of conversion to competitors' products, reducing sales and increasing losses.	The scientific study of the market, diagnosing the needs and desires of the consumer first and then designing an appropriate marketing mix.
The modesty of the efficiency of administrative leadership.	Wrong decisions. The absence of innovation and creativity, thus the establishment's activity based on trial and error.	Designing an effective model for selecting managerial leadership based on competence regardless of other factors.
The intensity of the competition.	The difficulty of competition.	A holistic view of the organizational environment (external and internal), based on which the strategy is formulated according to strengths, weaknesses, opportunities, and threats.
The small size of the establishments.	Inability to compete due to the modesty of various capabilities.	Integration on scientific grounds.

(Al-Maradhi 2006).

Table II. Successful use of the coq models

Authors	Company	Country	Model	Outcomes
Star eviþ, et al. (2015).	Zagreb Stock Exchange	Croatia	PAF	Companies that set quality costs achieve high product quality reliability and performance
Grocock (1980)	ITT Europe	Belgium	PAF	\$ 150 million has been made in 5 years through CoQ control
Malchi and McGurk (2001)	pharmaceutical industry		PAF	a reduction in costs by 11% of the total quality costs
Hagan (1973). and Morse et al. (1987).	ITT New York	USA	PAF	Achieved huge savings through reduced CoQ.
Huckett (1985).	Rank Xerox	England	PAF	achieved an 83% reduction in CoQ and an increase in customer satisfaction.

In addition to obtaining the ISO certification, which is a preliminary step towards excellence, continuous improvement, leading to the comprehensive application of Total Quality Management.

The negative phenomena that Yemeni industries suffer:

The trade liberalization process is supposed to activate the free market system mechanism based on equal competition and then set prices according to supply and demand factors. However, the reality in the Yemeni domestic market is that there is a distortion of the free market system's working mechanism and thus the absence of equal and legitimate competition. In this, the following negative phenomena emerged: AL-Khamri, (2001). The emergence of the phenomenon of fraud:

This means the commercial and industrial imitation of local and foreign goods.

-) The spread of the phenomenon of smuggling results in the intensification of its adverse effects on the national economy and the industrial sector, particularly in light of the trade liberalization process.
-) Dumping phenomenon: It is the practice related to putting certain products, whether are goods or services, on the market at a price lower than the selling price of the commodity in the producing country. The dumping policy pursued by exporters from neighboring countries aims to control the Yemeni market, especially in food industries.

-) These phenomena have affected the industrialization process in Yemen in several ways, the most important of which are:
-) The emergence of goods that compete with the local product at a low price, whether because of the differences in taxes and customs imposed on the regional development and its inputs, or because of the dumping policy, or because of the low cost of fraudulent goods, which weakens the competitiveness of local products, leaves no room for developing and expanding the quality of their production.
-) These phenomena are considered among the factors that drive investment due to the high risk in the local market, thus wasting the opportunity to benefit from foreign investments, especially in raising production efficiency, increasing exports, and attracting advanced technology.
-) Contribution to the closure of many factories and the failure of others, which leads to a decrease in industrial production, and thus a reduction in its contribution to the GDP. On the other hand, layoffs, thus increasing unemployment, exacerbate the adverse effects on the national economy and society.

SUCCESSFUL USE OF THE QUALITY COST MODELS

Many studies provided actual evidence that dealt with CoQ models. It was emphasized that companies that implement CoQ programs, achieving savings from the production process, increased their profitability over their counterparts from

companies that are still not interested in using CoQ models. Below are some examples of studies that have confirmed the success of using CoQ models. An experimental framework was presented by (Star eviþ *et al.*, 2015), companies that trade securities in a regulated market in Croatia. It was confirmed that companies that set CoQ to achieve high-quality products in performance and reliability. Likewise, a study presented by (Groock1980) confirms the savings achieved through CoQ control through a case study on one of the European multinational companies headquartered in Belgium, where about \$ 150 million has been saved within five years. From CoQ control process. The United Technologies Corporation has improved its productivity by 26%, within five years, by applying quality cost measurement. Also, a quality cost model was implemented at Rank Xerox in England. It achieved great success, as it reduced quality costs by 83% and increased customer satisfaction (Huckett1985). By applying the quality cost measurement system in the American company Xerox, a decrease in quality costs amounted to 54 million dollars, was achieved during the first year in the company. In one of the industrial establishments for the pharmaceutical industry, quality cost programs were implemented, as the implementation of these programs led to a reduction in costs by 11% of the total quality costs (Malchi and McGurk 2001). Despite the examples provided in the literature by many authors about implementing quality programs, actual evidence of successful use is still limited and few in developed countries. A summary is described in Table II showing some tangible evidence of the successful use of firms implementing quality costing software. It is clear from Table II that the majority of companies that implemented their quality costing programs were according to the internationally accepted traditional cost structure (Feigenbaum 1956).

CONCLUSION

Despite the overall quality costs system in various developed countries, the least developed countries are still unaware and interested in applying quality costs systems. Most of the evidence presented by the literature confirms that quality improvement and cost measurement processes lead to an actual and significant reduction in quality costs for companies that implement quality cost programs, but this evidence is still few and limited to developed countries.

Therefore, for the least developed countries to improve the wheel of their economic growth, these least developed countries, including Yemen, must move towards applying quality cost systems because they are one of the most important pillars that work to improve the wheel of their economic growth. The ability of this system to create a balance between enhancing the quality and reducing cost at the same time.

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