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The Impact of Implementing Total Quality Management on Sustainable Development / Field Study in the Iraqi Northern Oil Refineries Company

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Abstract

This research aimed to demonstrate the impact of implementing total quality management (TQM) in promoting sustainable development through a field study of the opinions of all members of the research community, including technical and administrative leaders at the Iraqi Northern Oil Refineries Company, with a total of 308 employees. The researchers used a comprehensive enumeration approach and a questionnaire as a research tool to collect the required data. The researchers reached a number of conclusions, the most important of which are:

1. *Senior management's awareness of the importance of TQM and the dimensions of sustainable development for the organization will contribute to the possibility of finding the relationship between quality requirements and development dimensions, and thus helping the researched organization to survive and grow by meeting customer requirements and improving environmental aspects.*
2. *The individuals working in the researched organization confirmed that a change in work methods is essential, from leaving work in the traditional way and moving towards TQM systems in order to achieve quality in performance.*

Based on the conclusions reached by the study, the researcher provided a number of recommendations, the most important of which are:

1. *The need to focus on implementing TQM in the researched organization, which leads to the activation of sustainable development in line with the activities of the organization.*
2. *The need to focus on human resources within the researched organization, as it has a major role in the implementation of TQM systems. The management of the researched organization should increase the participation of individuals within the organization through training and development courses on how to implement quality management systems, motivate them, and involve them in decision-making in order to reach the possibility of applying these systems in the completion of their work.*

Keywords: *Total quality management, sustainable development, Northern Oil Company.*

Introduction

In the context of the great development in the world, the enormous oil industrial revolution, and due to the fierce competition, this has led to the emergence of many environmental problems in many parts of the world, with multiple and intertwined causes. With the emergence of the scientific renaissance in the field of communication and telecommunications and the expansion of new concepts, this led to the intensification of competition between oil

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companies, which requires the reliance on clean products, a clean environment, green manufacturing, and other concepts that have been mentioned in many literatures, and all of them revolve around expressing the relationship between industries, consumers, and the environment, which contributes to providing products that do not harm the environment or the health of the consumer.

The issue of quality is not the only issue of interest in the years of this century, but it came simultaneously with another issue, which is the issue of sustainable development, as they have become two sides of the same coin. The challenges that the world has faced and the environmental problems it has raised, from here came the interest in the topic of total quality and sustainable development as they are two approaches that are relied upon to reduce the negative effects of industrial companies towards protecting the environment from various pollutants, seeking to improve industries and their environment on the one hand, and working to rationalize the use of natural resources to preserve the rights of future generations on the other hand. The practices of total quality management achieve flexibility in performance (Phan *et al.*, 2019), and sustainability is an expression of a simple idea to ensure a better quality of life for us today and for future generations. This idea becomes possible when modern systems are designed to work more like natural systems, which are balanced and self-renewable (Ali, 2018). The modern concept of sustainable development and its adoption by the United Nations is an important part of the Universal Declaration of Human Rights, and its official inclusion of these concepts has made social studies move from the crucible of theoretical studies to economic and demographic studies (Karim, 2021; King, 2023; Stedman et al., 2023).

Methodology

This section provides a clear presentation of the methodology adopted in the light of the problem of the study, its importance, objectives, plan, and hypotheses, as follows:

First: The Problem of the Study: This study refers to one of the major problems that Iraqi industrial companies, especially oil refining, suffer from, which is the lack of attention to environmental aspects and their preservation, represented by pollutants and their negative consequences on the level of their environmental performance. Therefore, this study tries to answer the following questions:

1. What is the level of application of total quality management system in promoting sustainable development in the company under study?
2. What is the level of impact of the quality management system on promoting sustainable development?
3. Is there a correlation between the study variables (total quality management system, sustainable development)?
4. What is the level of awareness of the studied sample of the concepts of total quality management and sustainable development?

Second: The Importance of the Study: The importance of the research is evident in the following points:

- The study sought to choose the most important productive sector, which is the oil refining sector.
- To provide a general field framework around the concept and role of total quality management system on the one hand, and to clarify the concept of sustainable development indicators on the other hand.

- To improve the developmental reality of the company under study in a more organized way.
- To form a theoretical and practical knowledge about the concept of sustainable development.

Third: The Objectives of the Study: The most prominent objectives of the study are as follows:

- To diagnose the reality of the researched organization in terms of total quality management and sustainable development.
- To identify the nature of the relationships of correlation and influence and their significance between the study variables.
- To reach a set of conclusions that can be used to provide a set of necessary recommendations.
- To identify the level of awareness of the studied sample of the concepts of total quality management and sustainable development.

Fourth: The Study Plan: The literature has indicated that the study plan is a simplified embodiment of two main variables, the first is the total quality management system, and the second is represented in sustainable development. This is evident from Figure (1).

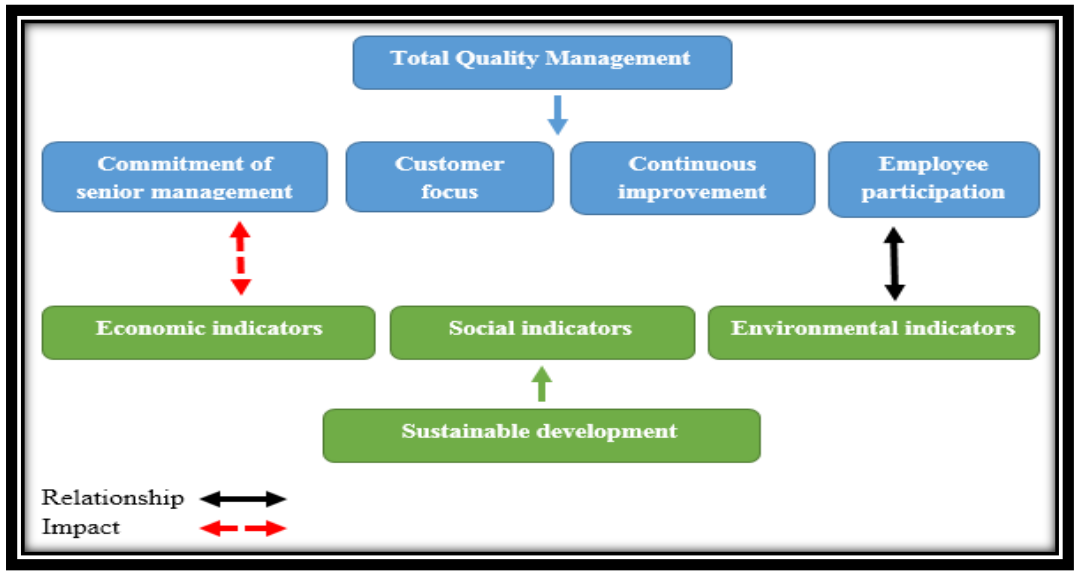

Figure (1): Hypothetical Diagram of the Study.

Fifth: Study Hypotheses: In light of the study's hypothetical plan, the following hypotheses were formulated:

Main Hypothesis 1: There is no statistically significant correlation between total quality management and sustainable development.

Main Hypothesis 2: There is no statistically significant effect between total quality management and sustainable development.

Sixth: Type and Nature of the Study: The study is considered one of the diagnostic or explanatory studies, which will study the application of total quality management and environmental sustainability in the Iraqi Northern Oil Refineries Company.

Seventh: Study Population: The study population is represented by all managers, heads of departments, and units working in the Iraqi Northern Oil Refineries Company.

Eighth: Study Sample: The researcher will rely on the comprehensive enumeration method in selecting the sample due to the limited number of sample members.

Total Quality Management

First: The Concept of Total Quality Management: Total Quality Management (TQM) is one of the most contemporary concepts that has gained wide attention from most researchers. It is a contemporary administrative approach that organizations concerned with survival, growth, and competition seek to achieve and address the various difficulties they face in the rapidly changing and volatile work environment. It has been defined by Al-Amiri and Al-Mumari (2019) as an integrated administrative approach that aims to continue the improvement processes on the quality of the product and processes, and works to satisfy the customers. On the other hand, from the perspective of Al-Saffar and Obeidat (2020), it is an administrative approach based on stimulating a culture of involving all employees in the organization in order to meet the needs and desires of customers with the least cost, time, and effort. The researchers believe that TQM is an administrative philosophy and continuous improvement for all aspects of life that the organization derives and applies starting from the top management to the executive management.

Second: The Importance of Total Quality Management: Its importance is highlighted by the pursuit and emphasis on building a distinguished culture that relies on the concerted efforts of all employees in the organization to meet the needs and desires of customers with the least cost, effort, and time possible. It is a new philosophy for managing business organizations, as it works to stimulate the capabilities and skills of employees in the organization in order to achieve continuous improvement of processes and products, raise the efficiency and effectiveness of the organization, build a competitive advantage, and work to consolidate and sustain it (Shaker, 2018).

Third: The Objectives of Total Quality Management: Total quality management aims to provide the organization's management with data and comprehensive information about the aspects of activity in the organization, as well as developing the quality of its products and reducing their costs, which contributes to improving customer service and meeting their needs and desires (Al-Alaf, 2019).

Sustainable Development

First: The Concept of Sustainable Development: It is the organized principle for preserving the limited resources needed to provide the needs of future generations of life on planet Earth (Umar, 2017). It is also defined as "the development that gives future generations opportunities that are parallel to those that have been given and made available to the current generations, if not more than that," as capital and growth become the only ways to create and innovate opportunities that are available to future generations that are parallel to those available to the current generations (Klarin, 2018). The researchers believe that sustainable development is the process that meets the desires and needs of the current generation without compromising the capabilities of future generations without harming nature and the environment, and works to rationalize resource consumption, taking into account the environment, the economy, and society.

Second: The Importance of Sustainable Development: Sustainable development is based on the concepts of justice, fairness, tolerance, cooperation, self-sufficiency, and responsibility. It also promotes gender equality, social cohesion, and poverty reduction. It emphasizes the importance of the concepts of care, safety, and integrity, which are enshrined in the Earth Charter. It also helps all societies to address many challenges and problems, including the effects of disasters and their dangers, the loss of biodiversity, food crises, health risks, and insecurity, which is essential for the development of good economic thinking (Al-Rakabi, 2014).

Third: The Goals of Sustainable Development: A careful look at the Sustainable Development Goals reveals that they have gathered all economic, social, environmental, and institutional (technological) dimensions with the aim of protecting the current generation without causing any reduction in the rights of future generations.

Fourth: Dimensions of sustainable development:

Economic Dimension: The economic dimension of development is a social dimension at the level of the developed or developing world. It is a goal that all countries strive to achieve through maintaining an appropriate rate of development and increasing the rates of growth in real national income, so that society, in the future, employs all individuals without inflation or recession (Al-Jubouri, 2020).

Environmental Dimension: It means the extent to which natural and environmental resources can meet current needs without deterioration, pollution, or depletion, except to the extent that it does not threaten future generations, as environmental sustainability is composed of the idea of the Earth in good condition for future generations (Ibrahim, 2016).

Social Dimension: It aims to achieve a set of goals with human content, the most important of which are:

- Confirming the consolidation of moral values and distributing income in a fair manner between the children of the current generation and the subsequent generations.
- Increasing attention to health and education, reducing poverty, and respecting women's rights.
- Providing a democratic institutional system in which the law prevails, which helps to achieve these goals (Al-Janabi, 2017).

Description of the questionnaire and study variables:

Description of the questionnaire:

The questionnaire was designed to collect data from employees of the North Oil Refineries Company in Iraq. It consisted of four sections:

- Section 1: Demographic information, including gender, age, educational qualification, job title, and years of service.
- Section 2: Items related to the independent variable, total quality management (TQM). The items were distributed across the following four components of TQM:

  - Commitment of senior management (6 items)
  - Customer focus (6 items)
  - Continuous improvement (6 items)

- Employee participation (6 items)

- Section 3: Items related to the dependent variable, sustainable development. The items were distributed across the following three dimensions of sustainable development:

- Economic (7 items)
- Social (6 items)
- Environmental (6 items)

Methods and tools used in the study:

The Statistical Package for the Social Sciences (SPSS) was used to analyze the data and test the study hypotheses. The following statistical methods were used:

- Frequency distributions, percentages, means, and standard deviations to describe the demographic characteristics of the study participants.
- Pearson's correlation coefficient to measure the strength of the relationship between the study variables.
- Simple linear regression model to measure the significance of the effect of the independent variable on the dependent variable.
- R-squared to determine the strength of the effect of the independent variable on the dependent variable.

Description of the study participants: The study participants were selected from among employees of the North Oil Refineries Company in Iraq who had experience and knowledge of the company's activities. They included section heads, department managers, and some holders of advanced degrees. The researcher distributed 320 questionnaires to the study participants, and 308 of the questionnaires were returned and considered valid for analysis.

Description and Diagnosis of Study Variables

A. Description of the Respondents' Answers to the Total Quality Management Variable

1. Senior Management Commitment: The table (1) indicates that the respondents' answers to this variable through its indicators (Q1-Q6) tend to agree by a percentage of (77.75%). This was reinforced by the average value of (4.043). While (2.87%) of the study sample indicated the weak reliance of their company on the commitment of senior management in the completion of its various activities and works. Among the most prominent indicators that enhanced the role of this variable is the indicator (Q1) which states that the management of the studied company applies a TQM management system. This came with an average of (4.311) and a standard deviation of (0.689). It was followed by the indicators (Q2-Q3) respectively, as well as the indicator (6Q) which states that the organization's management works to continuously increase the commitment of senior management. This is supported by an average of (4.123) and a standard deviation of (0.702). The weakest indicators were the indicators (Q4-Q5).

We conclude from this that there is commitment from the senior management in the studied organization to implement total quality management systems.

2. Customer Focus: The data in table (1) show that the respondents' answers to this variable through its indicators (Q7-Q12) tend to agree by a percentage of (79.02%). The percentage of disagreement was (3.18%). This is supported by an average of (4.061).

The most prominent indicators that contributed to enriching this variable are the indicator

(Q9) which states that the management of the studied company pays attention and focuses on the customer by testing its products in the laboratory before delivering them to its customers. This came with an average of (4.561) and a standard deviation of (0.598). It was followed by the indicator (Q12) which states that satisfying the customer is one of the company's priorities and objectives. This came with an average of (4.152) and a standard deviation of (0.810). Then come the indicators (Q10-Q11) in turn, with a close impact rate, as they indicated the management's interest in feedback and the way to define quality in the company. The weakest indicator was the indicator (Q8) with an average of (3.857) and a standard deviation of (0.798) about the extent to which the studied company responds to customer complaints.

We conclude from this that the company's management is seeking to address customer problems and provide appropriate solutions for them, taking into account customer wishes and achieving them on a regular basis.

3. Continuous Improvement: Based on Table (1), (85.02%) of the respondents agreed that the management of the studied company seeks to achieve TQM and continuous improvement through improving its administrative performance, constantly improving its production processes, and fully mastering work through continuous improvement, following up on these works, improving the performance of workers, and standing by them with guidance and follow-up to increase productivity. This is supported by an average of (4.149). In contrast, (1.24%) of the study sample do not agree that continuous improvement is part of total quality management.

Table (1): Frequency Distributions, Percentages, Arithmetic Means, and Standard Deviations for the Total Quality Management Variable.

variable	Indicator	Frequency distributions and percentages										Arithmetic mean	standard deviation
		I strongly disagree		I disagree		Neuter		Agree		Strongly agree			
		Frq.	%	Frq.	%	Frq.	%	Frq.	%	Frq.	%		
Commitment of senior management	Q1	0	0	3	1.0	32	11.4	141	45.8	129	41.9	4.311	0.689
	Q2	0	0	8	2.6	58	19.8	134	43.5	104	33.8	4.107	0.793
	Q3	0	0	9	2.9	68	23.2	133	43.2	94	30.5	4.032	0.806
	Q4	0	0	11	3.6	90	30.9	146	47.4	57	18.5	3.824	0.771
	Q5	3	0.9	13	4.2	49	16.7	200	64.9	41	13.3	3.863	0.727
	Q6	0	0	6	1.9	41	14.3	167	54.2	91	29.5	4.123	0.702
Indicator total		2.87				15.35			77.75			4.03	
Customer focus	Q7	0	0	10	3.2	82	26.6	141	45.8	72	23.4	3.909	0.793
	Q8	0	0	20	6.5	63	20.5	165	53.6	57	18.5	3.857	0.798
	Q9	0	0	5	1.6	2	0.6	116	37.7	182	59.1	4.561	0.598
	Q10	0	0	8	2.6	49	15.9	198	64.3	49	15.9	3.951	0.651
	Q11	0	0	11	3.6	62	20.1	166	53.9	65	21.1	3.941	0.746
	Q12	5	1.6	0	0	51	16.6	138	44.8	111	36.0	4.152	0.810
Indicator total		3.18				13.02			79.02			4.12	
continuous improvement	Q13	0	0	3	0.97	53	17.2	188	61	61	19.8	4.016	0.642
	Q14	0	0	3	0.97	25	8.1	180	58.4	97	31.5	4.230	0.626
	Q15	0	0	3	0.97	25	8.1	140	45.5	137	44.5	4.353	0.666
	Q16	0	0	3	0.97	28	9.1	202	65.6	72	23.4	4.133	0.591
	Q17	0	0	3	0.97	33	10.7	188	61	81	26.3	4.142	0.624
	Q18	0	0	8	2.6	71	23.1	132	42.9	93	30.2	4.025	0.802
Indicator total		1.24				9.61			85.02			4.13	
Employee participation	Q19	0	0	27	8.8	37	12	152	49.3	88	28.6	3.996	0.874
	Q20	0	0	22	7.1	76	24.7	138	44.8	69	22.4	3.844	0.862
	Q21	0	0	3	1	26	8.5	176	57.1	100	32.5	4.233	0.633
	Q22	0	0	0	0	52	16.9	179	58.1	73	23.7	4.074	0.638
	Q23	0	0	11	3.6	47	15.2	179	58.1	68	22.1	4.006	0.726
	Q24	0	0	5	1.6	40	13	181	58.8	80	26	4.103	0.672

Indicator total	3.6	12.10	80.25	4.05

Reference: Prepared by the researcher based on the results of the SPSS program.

The indicator (Q15) is the most prominent indicator that has enhanced the role of this variable. It came with an average of (4.353) and a standard deviation of (0.666). This indicates that the company's management considers continuous improvement to be part of the requirements of total quality management. The indicators (Q16-Q17-Q14) were also close in level. They also state that the company's management is concerned with continuous improvement in order to achieve TQM. The indicators (Q18-Q13) had the lowest percentage of impact on this variable.

We conclude from this that the company's management seeks continuous improvement in order to accomplish its activities. It considers this variable to be part of the requirements of total quality management and continuously strives to provide the best possible quality.

4. Employee Participation: The results of Table (1) show that the answers of the respondents to the indicators of this variable, represented by (Q24-Q19), tend to agree by a percentage of (80.25%). The percentage of disagreement was (3.6%). This was supported by an average of (4.042).

The most prominent indicator that enhanced the role of this variable is the indicator (Q21) which states that the senior management of the company believes that teamwork is a fundamental pillar for the success of implementing total quality management. This came with an average of (4.233) and a standard deviation of (0.633). It was followed by the indicators (Q24-Q22) which state that employee participation and their responsibility for improving product quality and forming teams to discuss problems in order to solve them. The indicator (Q20) had the lowest percentage of impact with an average of (3.844) and a standard deviation of (0.862).

We conclude from this that the company's management is concerned with developing individuals within the company through participation in advanced training programs in order to develop their skills, and their participation in finding appropriate solutions to quality problems.

B- Description of the Respondents' Answers to the Sustainable Development Variable

1- Economic Indicators: The results of Table (2) show that 79.3% of the study participants agreed that the economic indicators (D1-D7) contribute to the development of sustainable development in the company. These indicators include the efficient use of the company's resources, the improvement of employee productivity, the support of the national product, and the optimal use of the company's resources to produce products that meet the needs of customers. This is supported by an average of 4.080. On the other hand, 2.9% of the sample indicated that the economic indicators are weak in achieving and improving their work.

2. Social Indicators: Table (2) shows that the answers of the respondents to this variable through its indicators (D8-D13) were in the direction of agreement by (71.9%) on the importance of the social indicator in terms of improving the physical working environment on an ongoing basis and providing safe job opportunities for all employees. This is supported by an average of 3.875. However, (3.831%) of the sample indicated that they do not agree with the social indicators in the company. The indicators that contributed to the high percentage of agreement are indicators (D8-D9-D10-D12), where the percentages between them were close and all of them state about caring for employees and providing the minimum standards of well-being by providing basic services to them.

3. Environmental Indicators: It is clear from Table (2) that the answers of the respondents to this variable through its indicators (D14-D19) tend to agree by (75%) while the percentage of disagreement was (4.8%) and this was due to an average of (3.971). Of the indicators that

contributed to enhancing the percentage of environmental indicators that the company needs to achieve sustainable development, indicator (D14) is supported by the average that reached (4.074) and a standard deviation of (0.776). Indicator (D17) followed in the percentage of its impact in this variable, which states that the company monitors harmful emissions during production processes and takes measures to address the resulting burdens. This came with an average of (4.087) and a standard deviation of (0.741). The indicators (D16-D18) come after it in the same percentage of impact in this variable.

Table (2): Frequency Distributions, Percentages, Arithmetic Means, and Standard Deviations for the Sustainable Development Variable.

variable	Indicator	Frequency distributions and percentages										Arithmetic mean	standard deviation
		I strongly disagree		I disagree		Neuter		Agree		Strongly agree			
		Frq.	%	Frq.	%	Frq.	%	Frq.	%	Frq.	%		
Economic indicators	D1	0	0	13	4.2	23	7.5	151	49	114	37	4.603	3.889
	D 2	0	0	3	1	39	12.7	186	60.4	77	25	4.116	0.640
	D 3	5	1.6	11	23.6	102	33.1	137	44.5	51	16.6	3.707	0.838
	D 4	5	1.6	13	4.2	37	12	178	57.8	72	23.4	3.983	0.820
	D 5	0	0	5	1.6	36	11.7	179	58.1	85	27.6	4.133	0.669
	D 6	0	0	0	0	52	16.9	174	56.5	78	25.3	4.098	0.651
	D 7	0	0	8	2.6	69	22.4	167	54.2	61	19.8	3.922	0.726
Indicator total		2.9				16.6			79.3			4.080	
Social indicators	D8	0	0	6	1.9	79	25.6	134	43.5	85	27.6	3.987	0.786
	D9	0	0	11	3.6	61	19.8	193	62.7	40	13	3.857	0.674
	D10	0	0	5	1.6	75	24.4	191	62	34	11	3.837	0.630
	D11	3	1	15	4.9	78	25.3	147	47.7	63	20.5	3.831	0.845
	D12	0	0	23	7.5	59	19.1	154	50	69	22.4	3.886	0.840
	D13	0	0	21	6.8	63	20.5	159	51.6	61	19.8	3.857	0.814
Indicator total		4.5				22.4			71.9			3.875	
Environmental indicators	D14	0	0	10	3.2	52	16.8	149	48.3	93	30	4.074	0.776
	D15	0	0	8	2.6	85	27.5	120	38.9	92	29.8	3.970	0.828
	V16	0	0	18	5.8	41	13.3	174	56.5	72	23.4	3.990	0.780
	D17	0	0	3	0.9	64	20.7	145	47.1	94	30.5	4.087	0.741
	D18	5	1.6	5	1.6	54	17.5	168	54.5	75	24.3	3.990	0.796
	D19	5	1.6	36	11.6	69	22.4	126	40.9	71	23.1	3.720	0.998
Indicator total		4.8				19.7			75			3.971	

Reference: Prepared by the researcher based on the results of the SPSS program.

Correlation and Influence Relationships between the Study Variables

A. Discussion of Correlation Relationships

1. Discussion of the Results of the Correlation Relationships between Total Quality Management and Sustainable Development at the Macro Level: We note from Table (3) that there is a significant correlation between total quality management and sustainable development, as the value of the correlation coefficient reached (0.868) at a significance level of (0.01). This indicates that the more the organization uses total quality management, the more it helps to improve sustainable development. This result reflects a match with the theoretical logic. Based on this, the null hypothesis, the first main hypothesis, which states that "there is

no significant correlation between total quality management and sustainable development at the organizational level" is rejected and the alternative hypothesis is accepted.

Table (3): Results of the Correlation Between TQM and Sustainable Development at the Macro Level (N=308, P≤0.01).

Independent variable Dependent variable	Sustainable development
TQM	0.868**

Reference: Prepared by the researcher based on the results of the SPSS program.

2. Discussion of the Results of the Correlation Relationships between Total Quality Management and Sustainable Development at the Micro Level: We note from Table (4) that there is a significant correlation between senior management commitment and sustainable development, as the value of the correlation coefficient reached (0.879) at a significance level of (0.01). This indicates that the more senior management commitment in the organization increases, the more it leads to a significant improvement in sustainable development. As a result, the alternative hypothesis is accepted and the null hypothesis, the first sub-hypothesis derived from the first main hypothesis, which states that "there is no significant correlation between senior management commitment and sustainable development", is rejected.

The table (4) shows that the correlation between customer focus and sustainable development is (0.856) at a significance level of (0.01), which indicates a significant correlation between customer focus and sustainable development. As a result, the alternative hypothesis is accepted and the null hypothesis, the second sub-hypothesis derived from the first main hypothesis, which states that "there is no significant correlation between customer focus and sustainable development", is rejected. It is also clear from Table (4) that the correlation between continuous improvement and sustainable development is (0.906) at a significance level of (0.01), which indicates a significant correlation. As a result, the alternative hypothesis is accepted and the null hypothesis, the third sub-hypothesis derived from the first main hypothesis, which states that "there is no significant correlation between continuous improvement and sustainable development", is rejected.

The results of Table (4) indicate that there is a significant correlation between employee participation and sustainable development, as the value of the correlation coefficient reached (0.891) at a significance level of (0.01), which is a significant value that indicates a strong correlation between employee participation and sustainable development. As a result, the alternative hypothesis is accepted and the null hypothesis, the fourth sub-hypothesis derived from the first main hypothesis, which states that "there is no significant correlation between employee participation and sustainable development", is rejected.

Table (4): Results of the Correlation Between the Components of TQM and Sustainable Development at the Detailed Level (N=308, P≤0.01).

Independent variable Dependent variable	TQM			
	Commitment of senior management	Customer focus	Continuous improvement	Employee participation
Sustainable development	0.879**	0.856**	0.906**	0.891**

Reference: Prepared by the researcher based on the results of the SPSS program.

B. Discussion of the Results of the Influence Relationships

1. Discussion of the Results of the Influence Relationships of Total Quality

Management on Sustainable Development at the Macro Level: Table (5) shows that there is a significant effect of total quality management on sustainable development, as the total variation in the sustainable development dimension explained by total quality management reached (0.75). This indicates that total quality management explained (75%) of the change in sustainable development, while (25%) of the change in sustainable development is attributed to other random variables that cannot be controlled or that did not enter the regression model. This is supported by the value of the regression coefficient of (0.80), which indicates that a change in total quality management by one unit results in a change in sustainable development by (0.80). This is in accordance with the calculated F value of (0.02), which is smaller than its tabulated value of (12.27) at two degrees of freedom and within a significance level of (0.05). Based on this, the null hypothesis, the fourth main hypothesis, which states that "there is no significant effect of total quality management on sustainable development", is rejected and the alternative hypothesis is accepted.

Table (5): Results of the Impact of TQM on Sustainable Development at the Macro Level (N=308; p≤ 0.05; df= 1).

Dependent variable	**Sustainable development**						
Independent variable	β		T		R^2	F	
TQM	β0	β1	Calculated	Tabulated		Calculated	Tabulated
	0.85	0.80*	0.02	3.5	0.75*	0.02	12.27

Reference: Prepared by the researcher based on the results of the SPSS program.

2. Discussion of the Results of the Influence Relationships of Total Quality Management on Sustainable Development at the Micro Level: Table (6) shows that there is a significant effect of senior management commitment on sustainable development. The calculated F value was (0.02), which is not highly significant at a significance level of (0.05). The explanatory power of this variable was also (0.78), which indicates that senior management commitment explained (78%), while (22%) of the change in sustainable development is attributed to random variables that cannot be controlled or that did not enter the regression model. The results of the regression analysis also show that there is a significant effect, as the calculated T value of (0.02) is a significant value at a probability level of (0.05). Therefore, the null hypothesis, the first sub-hypothesis derived from the fourth main hypothesis, which states that "there is no effect of senior management commitment on sustainable development", will be rejected and the alternative hypothesis will be accepted.

Table (6) also indicates the significance of the impact of customer focus on sustainable development. This is supported by the calculated F value of (0.02), which is smaller than its tabulated value of (13.63) at a degree of freedom of (1) within a significance level of (0.05). The value of the determination coefficient (R2) was (0.73), which means that customer focus contributed and explained (73%) of the difference in sustainable development, while (27%) of the change in sustainable development is attributed to random variables that cannot be controlled or that are not included in the regression model. The results of the regression analysis also show that the value of (T) for the slope of the regression line was (0.03), which is a significant value at a probability level of (0.05). As a result, the null hypothesis, the second sub-hypothesis derived from the fourth main hypothesis, which states that "there is no significant effect of customer focus on sustainable development", will be rejected and the alternative hypothesis will be accepted.

Table (6) indicates the significance of the impact of continuous improvement on sustainable

development. The calculated F value was (0.013), which is a significant value at a probability level of (0.05). The explanatory power of this model was also high according to the value of (R2) of (0.82), which indicates that continuous improvement explains (82%) of the change in sustainable development, and the rest (18%) is due to other variables that did not enter the regression model. Based on this, the null hypothesis, the third sub-hypothesis derived from the fourth main hypothesis, which states that "there is no significant effect of continuous improvement on sustainable development", will be rejected and the alternative hypothesis will be accepted. The results of the regression analysis also show that the value of (T) was (0.013), which is a significant value at a probability level of (0.05).

Table (6): Results of the Impact of TQM Components on Sustainable Development at the Detailed Level (N=308; p≤ 0.05; df= 1).

Dependent variable / **Independent variables**		**Sustainable development**						
		β		T		R^2	F	
	Detailed	β0	β1	Calculated	Tabulated		Calculated	Tabulated
TQM components	Commitment of senior management	0.21	0.95*	0.02	3.7	0.78*	0.02	13.63
	Customer focus	1.91	0.52*	0.03		0.73*	0.03	
	continuous improvement	0.66	1.14*	0.013		0.82*	0.013	
	Employee participation	0.47	1.61*	0.017		0.79*	0.017	

Reference: Prepared by the researcher based on the results of the SPSS program.

The results of Table (6) show that there is a significant effect of employee participation on sustainable development, as indicated by the calculated F value of (0.017), which is smaller than its tabulated value of (13.63) at a significance level of (0.05) and two degrees of freedom. The value of the determination coefficient (R2) was (0.79), which means that this model explains (0.79*)* of the change in sustainable development. The results of the regression analysis also show that the value of (T) is significant at a level of (0.05). Based on this, the null hypothesis, the fourth sub-hypothesis derived from the fourth main hypothesis, which states that "there is no effect of employee participation on sustainable development", will be rejected and the alternative hypothesis will be accepted.

Conclusions and Recommendations

Here are the most important conclusions and recommendations that the study reached in its theoretical and practical framework, which were presented to the researched organization.

Conclusions

1. The awareness of senior management of the importance of total quality management and the dimensions of sustainable development for the organization will contribute to the possibility of finding the relationship between the requirements of quality and the dimensions of development, and thus helping the researched organization to survive and

grow by meeting the needs of the customer and improving the environmental aspects.
2. Total quality management is an important and vital concept, as it helps the organization to enhance its competitive ability and increase its market share by improving the quality of its products and processes at the same time.
3. There is a good level of quality culture among the individuals working in the researched organization, and this indicates that they are aware of the importance of quality and its effective role in achieving sustainable development at work.
4. Most of the researched individuals indicated that the economic indicator is considered the most important indicator of sustainable development, as it contributes to the development of sustainable development and helps to develop the company's capabilities to use this development.
5. The results of the correlation analysis between the study variables showed that there is a significant correlation between total quality management with its dimensions (senior management commitment, customer focus, continuous improvement, and employee participation), respectively, and sustainable development. This indicates that the more the researched organization is interested in total quality management and keeping pace with the developments taking place in it and updating it, the better the sustainable development will be improved.

Recommendations

Based on the conclusions reached by the researcher, the following recommendations are made:

1. The management of the researched organization should increase the participation of individuals inside and outside the organization in training and development courses on how to apply quality management systems, and motivate and involve them in decision-making in order to reach the possibility of applying these systems in carrying out their work.
2. Seeking the assistance of specialized experts and reputable global companies in order to apply the system correctly, which will work to reduce routine work procedures and thus enhance the performance of the organization.
3. Continuous and continuous support from senior management in the researched organization to face the difficulties associated with the application of total quality management and support efforts to implement the concept of total quality management.
4. Focusing on the needs and desires of customers and providing the best solutions for the problems facing the customer.
5. The current study recommends the importance of continuous improvement according to the PDCA principle based on scientific foundations to provide high-quality services.
6. Providing a comprehensive and interconnected database within the researched organization in order to provide comprehensive information that contributes to simplifying work procedures and instructions.

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