

The Impact of Total Quality Management on the Saudi Manufacturing SMEs Performance

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ABSTRACT

The Saudi SMEs manufacturing sector suffered a low performance. This study aimed to investigate the impact of total quality management on Saudi SMEs' manufacturing performance and identify which practice of total quality management has the highest impact on Saudi SMEs' manufacturing performance. This study relied mainly on the total quality management indicators suggested by Crosby's model. The data for this study was collected based on a cross-sectional time horizon of 327 staff members belonging to the managerial levels. The findings of this study revealed that both training and employee involvement governance doesn't influence Saudi manufacturing SMEs. However, the rest of the total quality management dimension, namely continuous quality improvement, management leadership, and organizational innovation, have a significant and positive impact on Saudi manufacturing SMEs' performance. It is strongly advised that the TQM model produced via the current study—which consists of TQM characteristics and benefits—be validated across all business sectors.

Keywords: total quality management, manufacturing industry, SMEs performance, Saudi Arabia

INTRODUCTION

The concept of quality evolves towards total quality management as a new philosophy. Quality is considered as something global present in all departments of the company, led by senior management and with the participation and involvement of all human resources. This new philosophy encompasses and integrates techniques that have been practiced, such as statistical process control [1].

At present, all agree in recognizing the need to improve the quality of products or services to be competitive and stay in business. What is often not agreed is in the way to achieve it. Some think that the improvement will come with the mere fact of demanding quality in the work

performed by each of the members of the organization, that is, they think that it is a matter of imposing discipline on the workers [2]. In reality, the concept and vocabulary of quality are elusive. Different people interpret quality in terms that can be measured and translated into operations. In less formal terms, it can say that quality is defined by the customer, it is the judgment that he has about a product or service and generally results in the approval or rejection of the product [3].

The Small and Medium Enterprises (SMEs) in Saudi Arabia represents more than 90% of the total established business. The Saudi Arabia aims to increase the contribution of Saudi SMEs to reach 35% to the Gross Domestic Production (GDP) by 2030. The Saudi SMEs witnessed a low growth and long-term sustainability, which is due to the lower performance achieved, specifically within the manufacturing SMEs. According to Alkhoraif and McLaughlin [4] the manufacturing SMEs industry in Saudi Arabia recorded a downtrend of performance compared to other SMEs industries. The Saudi manufacturing SMEs should pay much attention on revising its long-term strategies that will help overcoming the current expansion and growth [5]. Abdulrab, Alwaheeb [6] attributed the low performance of Saudi SMEs to the lack of either Total Quality Management (TQM) implementation, or to the ineffective implementation of TQM.

It is necessary for manufacturing SMEs to have a feasible TQM framework to assist SMEs to successfully improve their performance and long-term sustainability [7]. In addition, the main challenge faced by SMEs in Saudi Arabia was changing managers and employees' mindsets toward the importance of TQM. Studies such as Ali, Hilman [8], Eniola, Olorunleke [9], and Abbas [10] have shown that many researchers are in agreement that the implementation of TQM effectively has a significant impact on their performance.

LITERATURE REVIEW

Theoretical Foundation of the Study

Models of quality arise due to the needs of organizations to have a structure that allows them to establish their activities, these Models promote quality awards which are recognitions for having better management, they are instruments that allow to accelerate processes and that constitute a guide to achieve Continuous quality Improvement of companies, assimilating them to ISO 9001 [11]. The current economic evolution towards an increasingly competitive environment, with fewer economic borders, and increasing globalization, has made companies and organizations rethink the terms of Quality and Quality, which beyond their historical origins and recent evolution, today They are used to introduce innovation and Continuous quality Improvement in management, to improve the overall results of the organization and especially economic results [12].

The term quality, as a synonym for good business management, was coined with the appearance of the Great Models in the West. The Malcolm Baldrige, which appeared in the United States in 1987, the European Model published in 1991 and the Ibero-American Model in 1999, not only include the name of Quality in their title, but their criteria and the values on which they are based constitute the benchmark of management and "excellent results [12]."

In the short term, they are a recognition of those who had the vision and perseverance necessary to advance on the path of quality: in addition to rewarding effort, disseminating their successes and pointing out role models. In the medium and long term, the awards become the

main objective of the national effort to improve quality. Total Quality is the most evolved stage within the successive transformations that the term quality has undergone over time. At first it talks about quality control, the first stage in quality management that is based on inspection techniques applied to Production. Later, quality assurance is born, a phase that seeks to guarantee a continuous level of quality of the product or service provided [13].

The concepts and values that are inserted in the model are known as "Total Quality". However, no model gives the framework to be used, practices to follow, or the action plan to take in the organization, thus giving the organization the decision of how to execute the model and what tools to use to develop it, even so, the critical evaluation of the management works as a reference so that managers know how to proceed and how to restructure the organization [13]. The business quality models (Deming model, Malcolm model, and Joseph Juran model) are applied in any type of company or organization, but unlike ISO standards, they do not say what to do. These models are based on measurement scoring systems and different stamps are obtained depending on the organization's emphasis on the system, including the ISO 9001 International Standard, benefits, costs of the organization, among other points. Finally, it can say that the quality models are oriented to the application of any type of company, where its global approach is equivalent to total quality management, this not only applies to customers but also to shareholders and other parts of the company. organization, which leads to constant improvement and self-criticism, this leads to a third-party verification which is not based on audits of the organizations, but is based on helping to guide the organization to improve. Thus, obtaining awards, which does not lead to a certification of the organization, but only to recognition, due to this recognition, points or areas in which improvement should be recognized are recognized, as well as the strengths of the organizations [13].

The use of models in organizations is to create a description that seeks or tries to understand, analyze, and in some cases even modify the approach that the organization has taken to carry out management within it, as well as its vision of the environment where it is located. The models that are implemented are references for the organizations, in which it can establish a reference approach or objectives, which can be rigorous and structured in order to obtain a diagnosis in the different organizations, and therefore have lines of Continuous quality Improvement to have an emphasis, on which the orientation and efforts of any organization should focus [14].

The evolution of TQM started with the quality revolution in manufacturing, which focused on producing quality products. This evolution has resulted in the definition of quality in three different ways. These are process quality, product quality and conformance to customer requirements. Although each of these definitions is important, compliance with customer requests is more important for businesses than others. Because the other two types of quality will not make sense without conforming to customer requests. In this context, it is accepted that quality should be an enterprise-wide initiative that encompasses all functions of an enterprise and includes all employees [15].

It is observed that TQM is handled in various ways in business management. TQM is discussed as a new way of thinking, a comparative management style that increases business performance and quality, a strategy that increases business performance, a tool to achieve success in global markets, an alternative to control-based management, and recently a paradigm shift.

Regardless of how it is handled, in many studies it is directly or indirectly emphasized that TQM improves business performance [16].

TQM and SMEs performance

There are three different levels of performance between organizations: financial performance, business performance and organizational effectiveness, also known as organizational performance. When an analysis of the literature regarding ISO certification and its impact on the performance of organizations is made, various results are found. Some research shows positive relationships, while in others it appears that ISO certification has no effect. For example, Ruiz, Pablo [17] conclude that ISO certification does not guarantee better performance in the organization, but that the innovation to achieve certification influences the results; Saleh, Sweis [18] establish that the benefits achieved by the organizations, as a result of ISO certification, are basically linked to greater internal efficiency.

The study by Samawi, Abu-Tayeh [19] applied to 502 SMEs, concludes that 65% of the managers surveyed declare improvements, both internally and externally due to ISO certification and that organizations involved in quality management for internal reasons obtain better results. The work of Teoman and Ulengin [20] applied to 85 large companies, concludes that the ISO contributes to improving the operating results and the internal organization of the company. However, it should be noted that comparison in this field is difficult, since it is the result of different factors for performance analysis. Furthermore, the studies have been carried out in different cities, which could also explain the difference obtained in the results of the relationship between ISO certification and performance. Regarding TQM, in general the results suggest that the implementation of this philosophy results in an improvement in organizational efficiency, through the formation of work teams, personal responsibility, customer orientation and an open organization.

According to the research by Zaidin, Diah [21], the relationship between TQM practice and organizational performance is also strengthened with the size of the company. Several studies conclude that the implementation of TQM leads to better results in more aspects than ISO certification. While some researchers have analyzed the impact of the implementation of TQM on organizational performance, only a minority group has compared the joint effect of TQM and ISO.

Al-Najjar and Jawad [22] found that the integrated quality strategy involving TQM and ISO certification is the most effective competitive strategy to sustain organizational performance, particularly for companies with more than 100 employees. There is no doubt that the new ISO version published in December 2000 incorporates some TQM principles that were not included in the previous one, such as the involvement of human resources and the organization's focus on the client, which are clearly more related to positive results. and it seems to be a better link for the integration of ISO standards with TQM [3].

Organizations are generally defined or classified according to quantifiable characteristics, such as the number of employees, sales volume, or asset value [11]. However, the classification based on the number of employees is the most used in management research. The reason for using this variable is that the number of people that an organization employs is generally proportional to the magnitude of its financial resources and these can play an important role in

the implementation of quality management systems. On the other hand, organizations are classified into two types: those that adopt a reactive or quality control approach, versus those that adopt a proactive or strategic orientation. The fundamental difference between the two is that, while the former use operational techniques with the sole purpose of controlling quality, without developing quality management plans; the proactive approach develops clear quality planning and perceives it as a source of sustainable competitive advantages that allows it to differentiate itself from the competition and thus improve business results. Organizations that take a proactive approach include those seeking ISO certification and those adopting TQM principles [23].

The main difference is that the first approach focuses to a greater extent on the technical regulation of processes, while TQM encompasses the entire company and involves all levels and areas, including senior management whose role as an active leader in innovation of people and achievement of objectives is essential [24].

Kazakis, Chalikakis [25] found that factors such as leadership, customer orientation, quality systems and the availability of information are important in the success of TQM in an empirical study to determine the important factors in the success of TQM in the Australian manufacturing industry. Kebede Adem and Viridi [26] investigated the factors that are important in the success of TQM in terms of small-scale manufacturing enterprises. In their study, they examined the prevalence of TQM practices used by manufacturing companies employing less than 350 employees in the USA and suggested comparing quality measures to be used as a guide in policy making. The results of the research revealed that small manufacturing enterprises can successfully fulfill TQM programs like larger enterprises, they focus on the control of processes, and they use problem solving methods relatively little [27]. Consequently, the hypotheses can be following:

H1: Training has a significant and positive effect on Saudi manufacturing SMEs' performance.

H2: Continuous quality improvement has a significant and positive impact on Saudi manufacturing SMEs' performance.

H3: Management leadership has a significant and positive impact on Saudi manufacturing SMEs' performance.

H4: Employee involvement has a significant and positive impact on Saudi manufacturing SMEs' performance.

H5: Organizational Innovation has a significant and positive impact on Saudi manufacturing SMEs' performance.

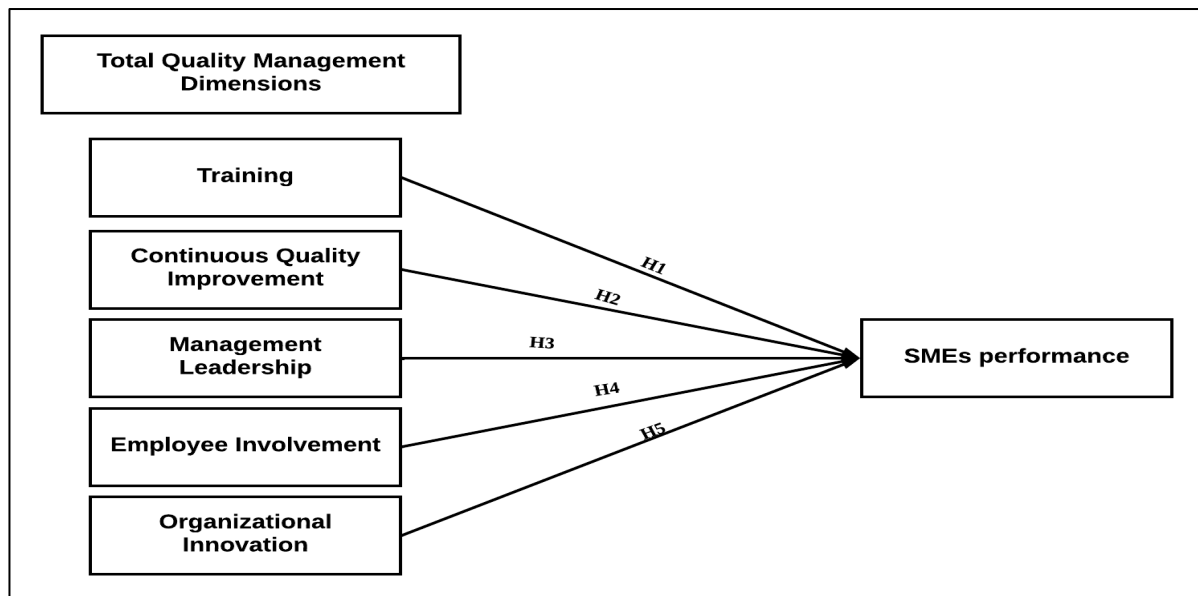


Figure 1: Research Framework

METHODOLOGY

This study has employed the quantitative research approach to collect primary data from the research sample. the population will be all the managers and employees of the small and medium enterprises industry in Saudi Arabia. By the end of Q3 2021, there were 103,700 small and medium-sized firms (SMEs) in Saudi Arabia, up 48% from the previous year, according to the Small & Medium Enterprises General Authority (Monsha'at). In this regard, the number of populations is very high, which makes it very difficult to collect the data from all of the population, so the research sample will take place for that. This study will use a survey questionnaire to collect data from 384 employees and managers working in the Saudi manufacturing SME sector. This study used the SPSS program to analyze the collected data. For the current research, the questionnaire instrument was employed in the study for the purpose of collecting data from the research sample. The questionnaire items adopted from previous studies that [28] for training factor, [29] for continuous quality improvement and management leadership factors, [28] for employee involvement, Kissi [30] for organizational innovation factor, and Bontis [31], Abdulsamad, Ali [32] for SME's performance factor. The research sample was asked to fill up the questionnaire with Likert scale measurement from 1-5 to measure their perceptions regarding the research item, as 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree. The following table 3.1 show the contents and the organization of the research questionnaire.

DATA ANALYSIS AND RESULTS

According to the following table 1, there were 223 male respondents participating in the study, representing 68.2% of the total number of respondents. There were also 104 female respondents participating in the study, representing 31.8% of the total number of respondents. It has been noted that the majority of the respondents were from the male categories. There were 76 respondents in the age range of 18–25 years old participating in the study, representing 23.2% of the total number of respondents. There were also 133 respondents in the age range of 26-34 years old who participated in the study, representing 40.7% of the total number of respondents. There were also 114 respondents in the age range of 35-44 years old

participating in the study, representing 34.9% of the total number of respondents. There were also 4 respondents in the age range of 45 years old and above who participated in the study, representing 1.2% of the total number of respondents. It has been shown that most of the respondents are aged 26–44 years old. The respondents were well-educated, as there were 189 respondents holding bachelor's degrees participating in the study, representing 57.8% of the total number of respondents. There were also 99 respondents holding master certificates participating in the study, representing 30.3% of the total number of respondents. There were also 35 respondents holding diploma certificates participating in the study, representing 10.7% of the total number of respondents. Finally, there were also four respondents holding PhD certificates participating in the study, representing 1.2% of the total number of respondents. There were 26 respondents with 1-3 years of experience, representing 8.0% of the total number of respondents. Also, there were 164 respondents with 4–7 years of experience, making up 50.2% of the total number of respondents. In addition, 137 respondents had 8 years or more of experience, accounting for 41.8% of all respondents.

Table 1: Profile of respondents

Gender	Frequency	Percent	Experience	Frequency	Percent
Male	223	68.2	1 to 3 Years	26	8
Female	104	31.8	4 to 7 Years	164	50.2
Total	327	100	8 Years and Above	137	41.8
Age	Frequency	Percent	Total	327	100
18-25	76	23.2	Education	Frequency	Percent
26-34 years	133	40.7	Diploma	35	10.7
35-44 years	114	34.9	Bachelor	189	57.8
45 and above	4	1.2	Master	99	30.3
Total	327	100	PhD	4	1.2
			Total	327	100

Cronbach alpha values were used to measure the reliability test. The research variables should have a result of Cronbach alpha to be greater than 0.70 [32, 33]. According to the following table 2 below, it can be observed that the Cronbach's alpha for each construct is more than the required threshold which indicates that the measurements are reliable, where the variables (training, continuous quality improvement, management leadership, employee involvement governance, organizational innovation, and SME's performance) have got acceptable results. The Cronbach's alpha for the variables ranged between 0.733 and 0.814. The current research used the Skewness and Kurtosis values to test the normality of the distribution. The accepted range of Skewness between -3 and +3 to be accepted, while the Kurtosis range should be between -5 and +5 [34, 35]. The following table 2 shows the result of the normality test for the construct, it found that all the variables (training, continuous quality improvement, management leadership, employee involvement governance, organizational innovation, and SME's performance) have got normal distribution within the accepted range, with Skewness range between -1.037 and -0.330, as well as the Kurtosis range was between -0.048 and 2.010. The descriptive statistics are used to reflect the perceptions of the respondents towards the questionnaire items based on the mean and standard deviation of the study's variables. According to table 2, the mean statistics for the variables (training, continuous quality

improvement, management leadership, employee involvement governance, organizational innovation, and SME performance) were 3.927, 4.111, 4.054, 4.227, 3.949, and 3.952 respectively. These results ensure that respondents are in average agreement with the items stated for each variable in the questionnaire. Also, the results ensure the vital role that training, continuous quality improvement, management leadership, employee involvement governance, and organizational innovation play on the SME's performance. Furthermore, the standard deviation for the same variables were 0.862, 0.791, 0.746, 0.714, 0.824, and 0.957 respectively.

Table 2: Construct assessment

No	Constructs	N	Items	CA	Skewness	Kurtosis	Mean	SD
1	Training	327	8	0.81	-0.924	1.668	3.927	0.862
2	Continuous Quality Improvement	327	5	0.78	-1.037	2.01	4.111	0.791
3	Management Leadership	327	8	0.78	-0.33	-0.048	4.054	0.746
4	Employee Involvement Governance	327	8	0.73	-0.926	1.72	4.227	0.714
5	Organizational Innovation	327	9	0.77	-0.972	0.947	3.949	0.824
6	SME's Performance	327	6	0.76	-0.723	0.694	3.952	0.957

The correlation test was used for the purpose of identifying the type of relationship between the independent variables and the dependent variable. The following conclusions were drawn based on the results shown in the following table 3: there is a positive and significant relationship between training and Saudi manufacturing SMEs' performance with $r = 0.422$, and a significant level = 0.000. There is a positive and significant relationship between continuous quality improvement and Saudi manufacturing SMEs' performance with $r = 0.445$, and a significant level = 0.000. There is a positive and significant relationship between management leadership and Saudi manufacturing SMEs' performance with $r = 0.490$, and a significant level = 0.000. There is a positive and significant relationship between employee involvement governance and Saudi manufacturing SMEs' performance with $r = 0.345$, and a significant level = 0.000. There is a positive and significant relationship between organizational innovation and Saudi manufacturing SMEs' performance with $r = 0.398$, and a significant level = 0.000.

In a multiple linear regression model, multicollinearity is the presence of a significant correlation or link between two or more independent variables. If a multiple regression model has multicollinearity, adding or removing an independent variable from the model can have a significant impact on the beta coefficient value of that independent variable. Multicollinearity thereby impacts the predictive value of an independent variable rather than concurrently reducing the predictive power.

According to Kalnins [36] deducting a high correlation between the independent variables of the model, will affect the model predicting for the regression test. Multicollinearity exists when the independent variables are correlated. According to the suggestion of Kalnins [36], Jandab, Ali [37] VIF value higher than 4.0 considers a multicollinearity case. The following table 4.9 shows that all the VIF values for the independent variables (training, continuous quality improvement, management leadership, employee involvement governance, and organizational innovation) are within the acceptable range, as the VIF ranged between 2.296 and 4.579.

Chatfield and Collins [38], Jandab, Ali [39] indicated that tolerance value near to the zero would refer to a multicollinearity case. Table 4.9 also, shows that all the tolerance values for the independent variables (training, continuous quality improvement, management leadership, employee involvement governance, and organizational innovation) are far away from the zero value, which were ranged between 0.218 and 0.436.

Table 3: Linearity assessment

	Factors	T	CQI	ML	EI	OI
SP	Pearson Correlation	0.422**	0.445**	0.490**	0.345**	0.398**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000
	Tolerance	0.355	0.306	0.218	0.436	0.292
	VIF	2.815	3.268	4.579	2.296	3.429

Table 4 provides the regression test that was conducted to test the hypotheses of this study. Based on the result obtained from the regression test, the adjusted r-square was reported at 47.5%, which indicates to which extent the independent factors explain the variance within the dependent factor of this study. The multicollinearity assumption is met, as all the VIF values of the model construct were lower than the recommended value of 5. Table 4 showed that: training doesn't influence the Saudi manufacturing SMEs, continuous quality improvement influences the Saudi manufacturing SMEs' performance significantly and positively at ($\beta=0.158$, t-value = 2.586, and p-value = 0.006), management leadership influences the Saudi manufacturing SMEs' performance significantly and positively at ($\beta=0.933$, t-value = 3.401, and p-value = 0.001), employee involvement governance doesn't influence the Saudi manufacturing SMEs, and organizational innovation influences the Saudi manufacturing SMEs' performance significantly and positively at ($\beta=0.526$, t-value = 3.364, and p-value = 0.001).

Table 4: Regression test

Model construct	Beta	Std. Error	t-value	Sig.
(Constant)	-1.334	0.514	-2.592	0.010
Training	-0.236	0.200	-1.183	0.238
Continuous Quality Improvement	0.158	0.061	2.586	0.006
Management Leadership	0.933	0.274	3.401	0.001
Employee Involvement Governance	0.160	0.140	1.139	0.256
Organizational Innovation	0.526	0.156	3.364	0.001
Adjusted R²	47.5%			

DISCUSSION

The current research has applied the regression test and it found that training doesn't influence Saudi manufacturing SMEs. Continuous quality improvement influences the Saudi manufacturing SMEs' performance significantly and positively at ($\beta=0.158$, t-value = 2.586, and p-value = 0.006). Management leadership influences the Saudi manufacturing SMEs' performance significantly and positively at ($\beta=0.933$, t-value = 3.401, and p-value = 0.001). Employee involvement governance doesn't influence the Saudi manufacturing SMEs. Organizational innovation influences the Saudi manufacturing SMEs' performance significantly and positively at ($\beta=0.526$, t-value = 3.364, and p-value = 0.001).

These results are supported by the results in the previous studies, where Khanam, Talib [40] examined the effect of TQM on business performance. They compared the performances of companies that received quality awards and those that did not, based on indicators such as profitability, income, expense, cost, capital, total assets and number of employees, before and after the TQM implementation. They found strong evidence that firms that have received a quality award have higher "business performance" than firms that have not received a quality award. They concluded that firms that implement TQM programs effectively increase their business performance [41].

Another study examining the relationship between TQM and business performance is Kharub, Mor [42] study on 54 companies. In this study, TQM was considered as a source of sustainable competitive advantage and the effect of TQM on business performance was empirically tested. The findings revealed that there is a significant relationship between TQM and business performance, that TQM practices can add economic value to the firm, but this is not the case for all firms that implement TQM [13]. It has been stated that some elements related to TQM, such as quality training, process improvement and benchmarking, generally do not create competitive advantage, whereas the participation of senior management, open organization, empowerment of employees, and behavioral and some informal features can create more competitive advantage. Therefore, it has been concluded that intangible elements rather than TQM tools and techniques will direct the success of TQM, and that businesses that have these resources can perform with or without TQM against their competitors [13].

Khoja, Lemon [43] investigated the relationship between quality components and business performance in their empirical studies based on the perceptions of middle managers of manufacturing companies in the USA and Taiwan. They found that there is a causal relationship between quality components and business performance, and this relationship differs according to the size and age of the business [13]. They also revealed that there are some differences between countries in terms of quality components that affect business performance. For example, executives of businesses with longer operating years in Taiwan perceived customer satisfaction as the most important quality component in improving business performance, while executives in the USA perceived employee satisfaction as the most important factor. While managers of businesses with fewer operating years in the USA have a perception that customer satisfaction affects business performance, managers in Taiwan have perceptions that both customer satisfaction and employee satisfaction affect business performance [44].

CONCLUSION

This study aimed to investigate the impact of total quality management on Saudi SME's manufacturing performance. As well as to identify which practice of total quality management has the highest impact on Saudi SME's manufacturing performance. There are several restrictions on this study. Therefore, before generalizing, the results should be carefully taken into account. The use of more sophisticated statistical methods, such as structural equation modelling, is not possible given the limited size of the research sample of SMEs. The sample SMEs' membership in various industrial sub-sectors and their location within Saudi Arabia restrict the generalizability of the study's findings. It is also important to keep in mind that the statistics, which were gathered from the quality managers, are not objective but rather subjective business evidence. Future research investigations should be conducted globally to define the features of this study. This might support the conclusions of the current study in the

manufacturing sector of SMEs. Additionally, it is strongly advised that the TQM model produced via the current study—which consists of TQM characteristics and benefits—be validated across all business sectors. Employee involvement is essential for the implementation of any strategy successfully, as has become clear. Employee empowerment, which creates a work environment where people can take ownership of improving the process and initiating necessary steps to satisfy customer requirements within clearly defined boundaries in order to achieve organizational values and goals, is necessary for meaningful employee involvement.

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