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The Effects of Total Quality Management Practices on Firm's Performance

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Abstract:

Purpose: *This research paper investigated the effects of Total Quality Management practices on different performance measures across firms in the United States.*
Design/Methodology/Approach: *The paper used a cross-sectional survey methodology, and the uniting of the sample was indicated as a plant level. The sample for the study was selected from the members of the United States' top 100 best employers' companies. Two hundred forty-two questionnaires were obtained from the respondents, which was about 56% response rate. Exploratory analysis and regression analysis were then performed in the data.*
Findings: *The study found that different Total Quality Management practices significantly affect a firm's performance outcomes. Results also revealed a need for firms to improve the Total Quality Management practices' involvement, enhance their structure, and provide the necessary resources to the employees to improve service delivery.*
Practical Implications: *The research results may be useful in economic practice to increase the effectiveness of productive employment and to improve service delivery.*
Originality/Value: *The original contribution of the paper is the clear identification of the positive relationship between Total Quality Management and the analyzed performance measures based on a set of different statistical analysis.*

Keywords: *Strategic management, operational management, total quality management, service delivery, employees.*

JEL Codes: *C46, D24, L25, M11.*

Paper type: *Research article.*

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1. Introduction

Total Quality Management is a philosophy in firms and companies that emphasizes continuous improvement of the quality of the services, products, or processes in a company by focusing on customers' needs and expectations. This system aims to enhance the satisfaction of a customer and the performance of a firm. Different conclusions have been drawn from previous studies on the relationship between Total Quality Management practices and firms' performances. This research paper will analyze the relationship between Total Quality Management practices and firms' performances (Alzoubi *et al.*, 2019). The objective is to establish the effect that Total Quality Management practices have on performance and how they can benefit the firm and its stakeholders.

2. Materials and Methods

2.1 Measurement Instruments

The study chose several instruments of measurement that would help in understanding the effects of Total Quality Management on firm performance. These instruments are:

1. Leadership - In quality management, the belief is that every staff member in an organization must be a leader in their capacity as employees. Hence, they must be ready to make daily decisions to see the organization grow and head in the right direction. Consequently, leadership is one of the instruments used to establish the effects of total quality management in an organization (Brah *et al.*, 2002). Additionally, the type of leaders on the control influences the performance of an organization (Harter *et al.*, 2011). The leadership style that a management team employs in its daily directives and endeavors determines whether a company will get to a desired level. It also affects an employee's reaction to his or her role in an organization.
2. Knowledge Management - The knowledge that a manager has on an organization is crucial in setting strategy. It involves the tactical meeting and the strategic requirements of creating value in any organization (Calantone *et al.*, 2002). Therefore, this concept was one of the tools of measurements that were chosen for analysis to improve the comprehension of the effects of total quality management on firm performance.
3. Training - In any organization, training is a crucial aspect of improvement and growth. When staff members receive training on different concepts, it is expected that the same shall be mirrored in their performance (Aminbeidokhti *et al.*, 2016). Therefore, it is crucial to establish how training affects an employee’s performance in a firm. It is also essential to develop a place of training in an organization that is continuously growing and in one that has stalled. The difference that training has had on an organization determines its total quality management practices and performance.

4. Employee Involvement - In some organizations, employee involvement in making management decisions is an alien idea. Firms should involve their employees before making crucial choices that will positively or negatively affect their input (Zhang and Xia, 2013). In situations where the employees may feel left out during decision-making, they could become unmotivated and unproductive. On the contrary, when they feel motivated, they will become productive because they feel they are part of an organization.
5. Strategic quality planning - Planning is always part of the organization; any decisions made by management involve planning. The process and the level of planning differ from one organization to another. The difference is always reflected in the performance and results obtained in the organization (Cavusgil *et al.,* 2003). Therefore, it is essential to establish how quality planning affects total quality management and its influence on the performance of the organization.

Apart from the measurement instruments discussed here, others were also selected as part of the mechanisms. They included supplier quality management, continuous improvement, and process management. The other instruments mainly involved multiple performance factors. They were operational and employee performance, inventory and customer management, social responsibility, and financial performance. The total quality management also used the TQM index developed by Sadikoglu and Zehir as the total quality management compromise variable (Cole and Matsumiya, 2008).

To collect primary data for the respondents who, in this case, involved different organizations, management, and employees, questioners were used. The questionnaires were divided into different sections depending on the questions and common research areas (Fotopoulos and Psomas, 2010). The sections included performance measurements, performance items, and total quality practices. Arguably, 51 items were selected for Total Quality Management. Twenty-nine subjects were inserted for the performance management, while 27 subjects were considered for the performance measures. Then, exploratory factor analysis (EFA) was performed for all the items to establish the correct number and set of items in each area (Shun-Hsing Chen *et al.,* 2014).

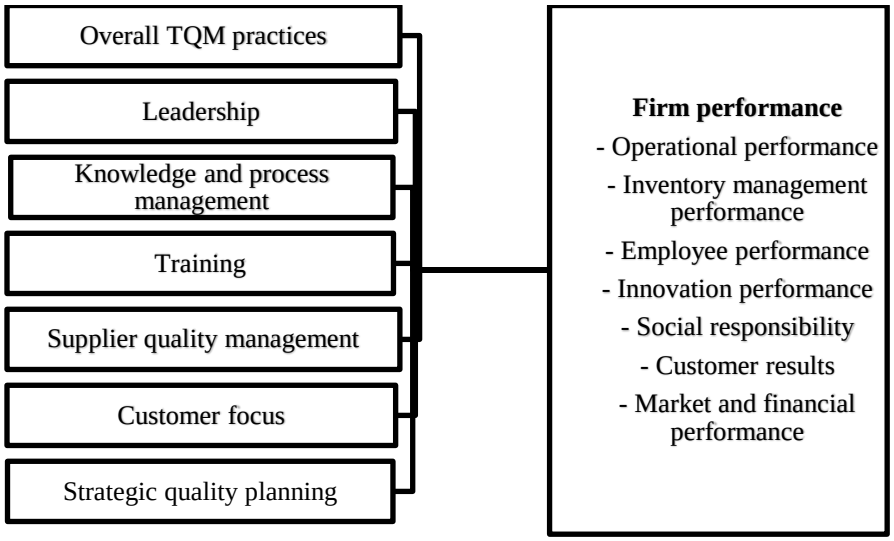
This step was followed by the reliability analysis, which enhanced the ability of the scale to reflect the goals of the measurement consistently. Likert scale was used on the items from 1 to 5, where one represented strongly disagrees, and five strongly agree.

However, the questions on the causes of the challenges of the total quality management and the total quality management practices were open-ended in nature, which means that the employees were given the freedom to provide their answers without restrictions (Gunasekaram *et al.,* 1998). All the other questions were close ended to ensure that the answers provided by the respondents were guided.

2.2 Population and Sample

A cross-sectional survey method was applied to the study where the samples were level-plant. The study sample was selected from the United States firms in the top 100 as the best employers in the country in 2019. The members of these companies were expected to be more likely to excel in Total Quality Management since they lead companies that are among the best in the world. Figure 1 below shows the proposed model of research that was employed in this study. It captures the relationship between Total Quality Management and the performance measures used in the study.

Figure 1. *Proposed research model on the relationship between Total Quality Management Practices and the Performance Measures*



Source: *Own creation.*

2.3 Data Collection Process

After selecting the questions for the questionnaires, the next step of the research was the data collection process. The questionnaires were refined based on every comment received from the companies' representatives, who were the respondents in this case. A pilot study was undertaken from which the questioners were refined (Green, 2014). The experimental study aimed to get feedback to enhance the questions to be asked in the primary survey by making them simple and straightforward. Respondents could find it challenging to fill a complex questionnaire. It is also hard to follow the logic behind such a questionnaire or order of answers (Sin and Jusoh, 2019). Apart from that, it is vital to arrange the questions in an order that is simple for the respondents. For example, the questions that come first should be about the individual rather than about the company. Therefore, the questionnaire was simplified for the benefit of the respondents.

The questions included in the questionnaire involved the data performance of the companies under research for the last three years. The questionnaires included an exemption that stated the confidentiality promise for the respondents to gain their trust and confidence. Additionally, the questionnaires did not have anywhere a respondent was supposed to give their details, such as the names. This move aimed to increase the quality and the rate of the responses (Talib *et al.,* 2011). When a respondent knows that their details will not be revealed because they have not given them, they tend to be more accurate, honest, and open in their answers. Additionally, for the firms participating in the survey to allow their employees to be part of the study, a promise was made that a final document of the research would be sent back to them to help them in planning on Total Quality Management.

The questions were administered with follow-up guidelines to ensure that the employees felt part and parcel of the research. The questionnaires were administered as follows:

1. The first step was to inform the respondents about the survey (García *et al.*, 2014). This process was done through a phone conversation, email address, and face-to-face, depending on the most convenient manner for each respondent.
2. The next step was to send the survey to the employees as a guide for answering the questions. The surveys were sent on a Monday morning because it is the best day most employees check their emails (Thapa, 2011).
3. The last step was to send the questioners. They were sent to every respondent in different companies one week to increase the rate of responses. The one-week duration was aimed at giving the study team a chance to remind the non-respondents about the survey (Jackson *et al.*, 2016). The early respondents were thanked for their excellent work. The responses were sent to each firm via the emails that they had provided once the analysis was done. In total, there were 242 questionnaires that were obtained from respondents with a response rate of 56 percent.

2.4 Statistical Analysis

Quality Management Exploratory Factor Analysis was the first statistical analysis that was conducted. The aim of the analysis was to find out whether factorial validity had been achieved and whether there was theorizing of emergence dimensions (Issac *et al.*, 2004). The objective of factor analysis was to reduce the data variables to workable size. In factor analysis, the underlying principle is usually that variables have a relationship due to the shared components. Therefore, the correlation that exists among more than one variable in factor analysis can be explained through the underlying factors. In the case of the Total Quality Management, the variables were the measures of performance. Therefore, factor analysis that was performed in this scenario can be represented in the equation as follows:

$$V_1=L_1*F_1+E \qquad V_2=L_2*F_2+E \qquad V_3=L_3*F_3+E \qquad (1)$$

In the above equations, 'V' represents the variables of the performance measures, 'F' represents the factors that help explain the correlation among the performance measures, and 'E' is a random error. The EFA (exploratory factor analysis) that was undertaken revealed that the factors were logical and reflected the study's intended measurements accurately (Jong *et al.*, 2019). Then, there was the use of principal components extraction joined with varimax rotation. The aim was to identify factors with eigenvalues of at least 1 (Mishra and Suar, 2010). Additionally, there was conducting of bivariate correlation analysis. The aim was to establish which relationship existed between the Total (TQM) and the performance measures used. In this analysis, Total Quality Management (TQM) was the dependent variable, while the measures of the firms were the predictors. One of the correlation analyses that was conducted was Pearson's correlation. It was performed to establish the relationship between the variables used (performance measures). The fowling equation was used in the Pearson's Correlation analysis:

$$r_{xy} = \frac{n\sum x_i y_i \ldots k_i - \sum x_i \sum y_i \ldots \sum k_i}{\sqrt{n\sum {x_i}^2 - (\sum x_i)^2}\sqrt{n\sum {y_i}^2 - (\sum y_i)^2}\ldots\sqrt{n\sum {k_i}^2 - (\sum k_i)^2}} \quad (2)$$

In the above person's equation used in this study:

- rxy represents the Pearson's correlation coefficient between the variables. Leadership, Knowledge and Process, Training, Supplier Quality, Customer Focus, Strategic, Planning, Operational Performance, Inventory Performance, Employee Performance, Social Responsibility, Social Responsibility, Innovational, Customer management, and Market Performance;
- n is the number of observations;
- xi is the value of variable 1 (which was leadership) in the analysis;
- yi is the value of variable 2(which in this case was Knowledge and Process performance) in the analysis;
- ki is the value of variable k in the analysis. Variable k was the last variable, and it was a Market performance.

The results of Pearson's Correlation analysis are tabulated in the results section of this study. The other correlation analysis performed was Cronbach's alpha. It was carried out to measure the internal consistency in variables and how closely related they were (Zehir *et al.*, 2012). Therefore, in this case, it was used as the measure of scale reliability. The function that was used to test Cronbach's alpha is shown below:

$$\propto = \frac{\mathrm{N}c\prime}{v\prime + (\mathrm{N}-1)c\prime} \quad (3)$$

In the Cronbach's alpha measure of reliability or consistency above, N is the number of items used in this case, the number of observations (242), C' represents the average covariance of the items while V' is the average variance. Therefore, when the number of observations was increased, Cronbach's alpha would also increase. Moreover,

when the covariance correlation was low, alpha was also found below. The values of the analysis are shown in the tabulation in the Results section.

There were multiple regressions on the performance measures to determine the correlation with TQM (Motwani, 2001). The following are the multiple regression analysis equations that were used in this study.

$$Y'_i = b_0 + b_1X_{1i} + b_2X_{2i} + ... + b_kX_{ki} \quad (4)$$

In the above equation, Y'i is the independent variable that was the performance of the firms. On the other hand, 'b' values are the regression weights, while x1…xki are the performance measures used as the independent valuables or the predictors (Jong *et al.,* 2019). In this regression equation, the 'b' values were computed in a method that helped minimize the sum of all the squared deviations. The equation in minimizing the 'b' values was performed as follows:

$$\sum_{i-1}^{N}(\mathbf{Yi} - \mathbf{y'i})^2 \quad (5)$$

The aim of the equation is to estimate the predictors which were used in the regression. The Total Quality Management index is equal to the factors of the aggregate functions of Total Quality Management. The last step in the statistical analysis was to classify the practices of Total Quality Management of the USA's firms according to the research distribution sample.

3. Results

3.1 Sample Demographics

From Table 1, the numbers in parentheses show the percentage of occupancy in the field selected. They demonstrate that 217 firms were private, which represented 90.7%. Additionally, 42.6% of the firms were international, 32.9% global, and 73.7% were from manufacturing. More than 54% of the firms had more than 250 employees, representing large firms, and from the respondents, the highest number of those who took part in the survey was quality managers (43.7%). Apart from that, more than 91% of the firms were ISO certified, while more than 63% had taken part in an award and won in quality service. Furthermore, 17.1% of the firms had company awards where they awarded the best employee or department in the company.

Table 1. *Presentation of the Demographic Sample*

Sector	**Percentage**
Private	217 - (90.7%)
Public	2 - (9.3%)
Scope of operation	**Percentage**
Regional	24 - (9.5%)
National	36 - (14.7%)
International	99 - (42.6%)
Global	78 - (32.9%)
Industry	**Percentage**

Manufacturing (73.7%)	
Electronics and metallurgy	58 (24.3%)
Automotive	47 (19.1%)
Construction	27 (11.8%)
Chemistry	17 (7.2%)
Textile	14 (4.8)
Plastics	6 (2.5%)
Food	7 (2.7%)
Service (24.6%)	
Logistics	15 (5.9%)
Municipality	8 (3.3%)
Healthcare	7 (3.1%)
Telecommunication	9 (4.1%)
Research and development	6 (3.5%)
Environment	4(2.2%)
Tourism	2(0.9%)
Finance	1 (0.6%)
Number of employees	
Small (Number less than 100)	57 (25.6%)
Medium (No. between 100 to 250)	47 (20.9%)
Large (No. more than 250)	119 (54.1%)
Job title	
Senior manager (top manager, vice manager)	26 (10.8%)
Middle manager	127(54.2%)
Quality manager	101 (43.7%)
Sales and marketing manager	5 (1.9%)
Production manager	4 (1.4%)
Human resources manager	2 (1.1%)
Finance and accounting Manager	1 (0.7%)
Other manager	13 (5.3%)
Low-level manager	61 (26.8%)
Non-manager (Either an engineer or a technician)	18 (8.2%)
Existence of ISO certification	
Yes	201 (91.9%)
No	18(7.9%)
Existence of quality awards	
Yes	143 (63.8%)
No	80 (36.2%)
Existence of firm awards	
Yes	37 (17.1%)
No	181(83.9%)

Source: *Own creation.*

Table 2. *Rotated Factor Matrices obtained from the analysis*

variables	**Item No. 1**	**Item No. 2**	**Item No. 3**	**Item No. 4**	**Item No. 5**	**Item No. 6**	**Item No. 7**	**Eigen Value**	**Variance Explained**	**Total Variance Explained**
Leadership	0.76	0.54	0.59	-	-	-	-	2.10	6.77	6.77
Process Mngm.	0.55	0.57	0.61	0.52	0.66	0.65	0.60	4.97	13.21	19.98
Trainings	0.56	0.81	0.67	0.61	0.53	-	-	3.02	9.74	29.68

Quality of Supplier	0.54	0.66	0.65	0.75	0.71	-	-	3.48	11.31	40.97
Customer Focus	0.83	0.78	0.62	0.56	0.61	0.53	-	3.79	12.19	53.27
Strategic Planning	0.62	0.57	0.68	0.78	0.71	-	-	3.61	11.87	65.23

Source: *Own creation.*

Table 3. *Rotated Factor Matrices in the performance of the firm as analyzed from the results obtained by the questionnaires from the respondents*

variables	**Item No. 1**	**Item No. 2**	**Item No. 3**	**Item No. 4**	**Item No. 5**	**Eigen Value**	**% Variance by Factor**	**% Variance Total**
Performance in Operation	0.88	0.84	0.64	-	-	2.45	9.44	9.44
Management of Inventory	0.84	0.87	-	-	-	2.03	7.43	16.87
Employee Performance	0.87	0.73	0.75	0.77	0.71	3.45	12.81	29.66
Innovation	0.77	0.78	0.81	0.75	0.77	3.55	13.16	42.79
Social Responsibility	0.81	0.78	0.82	0.74	0.72	3.74	13.84	56.64
Customer Responsibility	0.65	0.85	0.53	-	-	1.87	6.87	63.53
Financial and Market Performance	0.75	0.82	0.84	0.85	-	3.28	12.12	75.66

Source: *Own creation.*

3.2 Results of EFA, Descriptive Statistics, Correlations and Reliability

EFA was carried out on Total Quality Management practices and the measures of performance. Quality Management items and 27 measurements of performance items. As is evident from table 2 and table 3 above, Total Quality Management items explained 65.32% and 75.66% of the variance. Each of these tables, as shown, has an eigenvalue of more than one. It is crucial to note that leadership had three items, which explained more than 6.7% of the variance.

Moreover, knowledge and management of process had items that had 13.21% of the total variance. Training had five items that could explain around 9.7% of the total variance. Supplier management had five items, with more than 11% of the total variance. Customer focus had six items with an explanation of more than 21.20% of the variance. Strategic planning had five items, which also explained 11.9% of the total variance. After the performance of EFA, the analysis eliminated two items (Jong *et al.*, 2019). Specifically, the continuous improvement and the involvement of employees' items were removed. Additionally, the study considered knowledge management and process management, and after analysis, they were merged into one variable and referred to as knowledge and process management.

Table 3 reveals that in operational performance, three items explained 9.55% of the variance. Additionally, Table 3 shows that inventory management had two items that would explain 7.44% of the variance. The performance of employees, which is a crucial factor in the analysis, had five items. These items explained 12.83% of the total variance, while innovation had five performances also with 13.3% of the total variance explanation. Customer results were also crucial in the analysis. It had 6.87% of the total variance explanation (Papanthymou and Darra, 2017). When it comes to the firms' market and financial performance, four items explained the total variance with 12.13%. Since these factors had been studied with attention, they had validity, and the results were considered trustworthy and well analyzed.

Table 4 below is a descriptive analysis, Pearson correlation, and Cronbach's alpha values for the variables used in the study's research model. It is crucial to mention that all the factor loadings in the analysis had more than 0.5 thresholds. Therefore, it implies that un-dimensionality and the construct validity of all the measures were satisfied in analyzing the results.

Table 4. *Descriptive analysis*

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**Mean**	**S.D**
Leadership	0.78	-	-			-	-	-	-	-	-	-	-	-	4.19	0.73
Knowledge and Process	0.67	0.86	-	-	-	-	-	-	-	-	-	-	-	-	4.02	0.65
Trainings	0.54	o.64	0.82	0.85	-	-	-	-	-	-	-	-	-	-	4.06	0.65
Supplier Quality	0.55	0.65	0.67	0.43	0.79	-	-	-	-	-	-	-	-	-	3.55	0.85
Customer Focus	0.52	0.63	0.64	0.64	0.38	0.81	-	-	-	-	-	-	-	-	4.42	0.57
Strategic Planning	0.61	0.65	0.61	0.54	0.37	0.80	0.87	-	-	-	-	-	-	-	4.23	0.69
Operational Performance	0.42	0.42	0.65	0.77	0.35	0.77	0.88	0.89	-	-	-	-	-	-	4.44	0.52
Inventory Performance	0.22	0.51	0.43	0.54	0.42	0.78	0.87	0.91	0.84	-	-	-	-	-	4.02	0.84
Employee Performance	0.51	0.44	0.51	0.54	0.47	0.83	0.86	0.67	0.76	0.87	-	-	-	-	4.03	0.72
Innovational	0.28	0.45	0.44	0.41	0.48	0.87	0.89	0.89	0.72	0.69	0.78	-	-	-	4.09	0.73
Social Respons/ty	0.51	0.42	0.41	0.49	0.43	0.46	0.87	0.56	0.79	0.87	0.87	0.81	-	-	4.26	0.74
Customer management	0.41	0.61	0.59	0.53	0.64	0.52	0.38	0.91	0.79	0.78	0.83	0.65	0.81	-	4.39	0.57
Market Performance	0.37	0.47	0.75	0.66	0.43	0.43	0.45	0.35	0.85	0.89	0.81	0.65	0.42		4.15	0.73
TQM Index	0.79	00.52. 86	0.55	00.5 4.83	0.54	0.43	0.45	0.43	0.44	0.87	0.77	0.55	0.54	0.54	4.07	0.56

Note: *N = 242 and all the correlations are significant at the point where P < 0.01 level. The Values on the diagonal are all the Cronbach's alpha. Notably, the Cronbach's alpha variable factors in the table, as seen, are between 0.78 and 0.89. These values, therefore, surpass the 0.70 thresholds that had been set. Consequently, it reveals that all the Total Quality Management and the performance scales are considered reliable variables.*
Source: *Own creation.*

Additionally, as shown in the Table, the mean of the values of the Total Quality Management practices was more significant than 4, which indicates that the companies that had participated in this research have all implemented Total Quality Management well. The study also found that all the factors positively correlate at the significance level of P being less than 0.01. No factor has a negative relationship. The measures there have the needed validity since the questionnaires had been refined

according to the feedback obtained from the pilot test. The results show that the bivariate correlations are from 0.5 to 0.7. The correlation between Total Quality Management practices and the performance also ranges from 0.2 to 0.6. The correlation between the performances alone ranges from 0.3 to 0.7. To establish the availability of discriminant validity, it was established that the TQM practices had a lower correlation than the reliability coefficient. There is a clear, vital criterion related to the validated results because the bivariate correlations of the Total Quality Management practices with the performance measures were statistically significant. In the table above, the correlation coefficient is less than 0.9. Consequently, it reveals that their multi-collinearity does not affect the regression models sued in the study.

3.3 Results Obtained on the Regression Analysis among Total Quality Management and Performance

In Table 5, all regression models have been analyzed at a significant level of $P < 0.01$. Additionally, there is a positive and significant relationship between the Total Quality management index and the performance. It, therefore, shows that Total Quality management practices have an improvement effect on the firms.

Table 5. *Results of the regression analysis obtained between the Total Quality Management index and different performance measurements*

Dependent Variable in the Analysis(Performance)	β	**T**	**P**	**Results**	R^2_{adj}	**F**
Regression 1: Operation	0.52	9.439.43	0.0	Significant	0.27	89.35
Inventory	0.42	6.87	0.0	Significant	0.26	47.32
Regression3: Employee	0.61	11.53	0.0	Significant	0.16	132.44
Regression 4: Innovation	0.43	7.04	0.0	Significant	0.33	49.38
Regression 5: Social Responsibly	0.65	13.83	0.0	Significant	0.16	190.83
Regression6: Customer	0.54	10.10	0.0	Significant	0.31	102.27
Regression 7 Market performance	0.47	8.27	0.0	Significant	0.22	68.54

Source: *Own creation.*

The results obtained after regression analysis on the Total Quality Management practices and different performance measures are shown in the tables below. The regression model in the results arrived at in the tables with a P-value of less than 0.0001; the adjusted R2 shown in every table, which is between 0.15 and 0.35. The coefficient of multiple determination shows that the predictors determine the dependent variable.

Table 6. *The results after the regression analysis performed between Total Quality Management practices and the operation*

Independent Variable	**Dependable Variable here is Operational Performance**			
	β	**T**	**P**	**Results**

Leadership	0.12	1.39	0.17	Insignificant
Knowledge management	0.04	0.40	0.71	Insignificant
Training	0.23	2.74	0.02	Significant
Supplier management	0.01	0.33	0.03	Insignificant
Customer Focus	0.27	3.24	0.76	Significant
Strategic Planning	0.01	0.17	0.00	Insignificant

Note: *The adjusted $R^2 = 0.28$, the value of $F = 16.39$ and P-Value is <0.0001.*
Source: *Own creation.*

Table 7. *Results of the regression analysis performed among the Total Quality Management practices and the Inventory Performance*

Independent Variable	**Dependable Variable here is Inventory Performance**			
	β	**T**	**P**	**Results**
Leadership	0.12	-2.39	0.04	Insignificant
Knowledge management	-0.14	5.40	0.00	significant
Training	-0.53	1.23	0.25	Insignificant
Supplier management	-0.19	2.33	0.03	Insignificant
Customer Focus	-0.02	-0.24	0.86	Insignificant
Strategic Planning	-0.12	-0.17	0.25	Insignificant

Source: *Own creation.*

Table 8. *Results of the regression performed between Total Quality Management Practices and the Employees Performance*

Independent Variable	**Dependable Variable here is Employees performance**			
	β	**T**	**P**	**Results**
Leadership	0.18	2.39	0.03	Insignificant
Knowledge management	-0.07	-1.17	0.26	Insignificant
Training	0.23	4.24	0.00	Significant
Supplier management	0.09	1.19	0.23	Insignificant
Customer Focus	-0.38	-0.47	0.63	Insignificant
Strategic Planning	0.31	3.94	0.00	Significant

Note: *The adjusted $R^2 = 0.39$, $F = 26.47$ and the P-value < 0.001.*
Source: *Own creation.*

Table 9. *Regression analysis results between Total Quality Management Practices and the Innovation Performance*

Independent Variable	**Dependable Variable here is Innovation Performance**			
	β	**T**	**P**	**Results**
Leadership	0.05	0.50	0.64	Insignificant
Knowledge management	0.23	2.59	0.02	Significant
Training	0.03	0.55	0.63	Insignificant
Supplier management	0.24	3.65	0.01	Significant
Customer Focus	002	0.08	0.95	Insignificant
Strategic Planning	0.31	3.70	0.00	Significant

Note: *The adjusted R^2 = 0.45, F = 34.17 and the P-value < 0.001.*
Source: *Own creation.*

Table 10. *Regression analysis results obtained between Total Quality Management practices and Social Responsibility*

Independent Variable	**Dependable Variable here is Social Responsibility**			
	β	**T**	**P**	**Results**
Leadership	-0.03	-0.50	0.64	Insignificant
Knowledge management	0.31	3.19	0.00	Significant
Training	0.03	0.49	0.63	Insignificant
Supplier management	0.12	1.27	0.23	Insignificant
Customer Focus	0.17	1.60	0.14	Insignificant
Strategic Planning	-0.05	-0.41	0.73	Insignificant

Note: *The adjusted R^2 = 0.45, F = 34.17 and the P-value < 0.001.*
Source: *Own creation.*

Table 11. *Representation of the regression analysis performed between the Total Quality Management practices and Customer Result Performance*

Independent Variable	**Dependable Variable here is Customer Results**			
	β	**T**	**P**	**Results**
Leadership	0.03	0.63	0.55	Insignificant
Knowledge management	0.19	0.90	0.44	Insignificant
Training	0.03	2.32	0.03	Significant
Supplier management	0.02	0.52	0.61	Insignificant
Customer Focus	0.27	3.21	0.00	Significant
Strategic Planning	0.10	1.06	0.29	Insignificant

Note: *The adjusted R^2 = 0.32, F = 18.3 and the P-value < 0.001.*
Source: *Own creation.*

Table 12. *Representation of regression analysis between Total Quality Management and Market Performance*

Independent Variable	**Dependable Variable here is Market Performance**			
	β	**T**	**P**	**Results**
Leadership	0.03	0.27	0.81	Insignificant
Knowledge management	0.37	4.41	0.01	Significant
Training	0.03	0.27	0.81	Insignificant
Supplier management	-0.05	-0.81	0.43	Insignificant
Customer Focus	0.41	5.15	0.00	Significant
Strategic Planning	-0.15	-2.07	0.05	Insignificant

Note: *The adjusted R^2 = 0.32, F = 19.14 and P-Value < 0.001.*
Source: *Own creation.*

4. Discussion

The study shows that the Total Quality Management index is related to all the performance measures. Consequently, Total Quality Management practices improve

the performance of the firm in which they are exercised. The study also reveals that different quality management practices have a significant effect on different outcomes in these firms (Papanthymou and Darra, 2017). The results show a positive relationship among different performance measures and leadership measures, as revealed in Tables 5-12. They include knowledge, inventory, innovation, and social responsibility. They also affect market performance positively, as Table 5 above shows. Interesting to note is that only knowledge and processes positively impact inventory and innovation (Tables 5-12).

Arguably, when there is effectiveness in the firm's performance, there is excellent monitoring of data on quality management. Additionally, inventory management is performed using the appropriate data (Pambreni *et al.,* 2019). Hence, it is possible to improve the turnover rate of materials in such a firm and find the errors. Moreover, it is possible to introduce various innovative measures in a company when there is sufficient knowledge of management processes. It also becomes possible to increase sales and product production (Pambreni *et al.,* 2019). Cause variation can be removed via successful monitoring of the data. The installed products that result from the practice are made through time. The performed actions may bring about new products or services in the company.

Knowledge about the environment and its impacts on it can also be used to monitor the services and improve them. Such monitoring can help avoid harmful results or remove parts that may cause injury or harm to society or the company. Consequently, a robust process in a firm's processes means an increase in profitability. The results also reveal a positive relationship between training and customer results, performances of employees, and operations (Peratec, 1994). When the company allocates resources to training, there are quality payoffs. Through training, workers are empowered by gaining skills that can help them build the company and advance quality concepts.

Furthermore, when the management treats employees as though they are available resources, it increases their loyalty to the company, makes them proud of their work, and motivates them to give more to the firm (Papanthymou and Darra, 2017). It also decreases absenteeism from work and reduces any intention from the employees of quitting their job. Additionally, educated employees show reliability and provision of quality services. When there is adequate training, the employees will have enough knowledge of the firm's industry and structures.

There is a positive correlation between supplier quality and social responsibility. Any company that intended to contribute to society effectively must collaborate with all its chain members. The partners in the supply chain must be notified of the impacts that the service s or products of the company have on society (Shahmohammadi, 2017). When there is quality management among suppliers, there will also be an evaluation concerning the quality of the delivery, and the suppliers will also participate in training.

Additionally, the study reveals a positive correlation between strategic quality planning and the performance of employees (Shafiq *et al.,* 2019). When a firm values its employees during its mission and objectives, they feel like part of the company and therefore work towards improving it. They will also feel a sense of belonging, making them want to make the company better than before. Consequently, the level of absentees and intention to leave the firm will reduce.

5. Conclusion and Implication of the Research

The identified positive relationship between Total Quality Management and the performance measures reveals how important each of the measures is in improving a company's performance. Hence, discovering the barriers of Total Quality Management practices is essential to any firm. Therefore, there is a need for continuous improvement and employee involvement in future studies. The factors that can also be included in future research are stated above. The role of employees in determining the success or failure of a firm is well developed in the results and discussion. It shows that when a firm recognizes the role that employees play and treats them with respect, the result for the firm will be positive. As seen in this study, workers in a company are part of the reasons why most firms do not meet their targets.

Most of those companies that have treated employees well have reaped the benefits of motivated employees who want to see the best in the firm. The place of training and innovation has also been well developed. As the advancement of technology continues, firms should embrace the art of constantly taking the staff through training to gain the required skills. In those companies where staffs do not go for training, the results are negative. The gaining of new skills must accompany growth. Additionally, innovation is essential in a company. There must be a hunger for new ideas and methods of doing things for any firm to grow.

The study has found that Total Quality Management should be performed by companies interested in seeing change and growth in all the areas of management since it is a holistic approach. The results show that Total Quality Management practices improve all the performance measures in a firm. It can be concluded that Total Quality Management practices can enhance different performance measures in a company. Therefore, all Total Quality Management practices should be effectively managed in any firm since they introduce notable performance improvements. However, a company needs to establish the area that best works for a specific scenario. For example, there are firms where social responsibly is essential.

On the other hand, firms would concentrate more on developing partnerships with like-minded companies. However, there are those performance measures and practices that are universal and must be exercised for success to be realized in all the firms. An example is a leadership. In any firm, the leader's method determines the level that such a company will go in terms of growth. Employees will follow the leaders. Consequently, such a firm is as visionary and committed as the leaders are.

The study, therefore, reveals the importance of performance measures and how they can be used to help a firm grow.

References:

Alzoubi, M.M., Hayati, K.S., Rosliza, A.M., Ahmad, A.A., Al-Hamdan, Z.M. 2019. Total quality management in the health-care context: integrating the literature and directing future research. Risk management and healthcare policy, 12, 167. DOI: 10.2147/RMHP.S197038.

Aminbeidokhti, A., Jamshidi, L., Mohammadi Hoseini, A. 2016. The effect of the total quality management on organizational innovation in higher education mediated by organizational learning. Studies in Higher Education, 41(7), 1153-1166. DOI: 10.1080/03075079.2014.966667.

Brah, S., Tee, S.S.L., Rao, B.M. 2002. Relationship between TQM and performance of Singapore companies. International Journal of Quality & Reliability Management, 19(4), 356-379. DOI: 10.1108/02656710210421553.

Calantone, R.J. Cavusgil, S.T., Zhao, Y. 2002. Learning orientation, firm innovation capability, and firm performance. Industrial Marketing Management, 31, 515-524. DOI: 10.1016/S0019-8501(01)00203-6.

Cavusgil, S.T., Calantone, R.J., Zhao, Y. 2003. Tacit knowledge transfer and firm innovation capability. Journal of Business & Industrial Marketing, 18(1), 6-21. DOI: 10.1108/08858620310458615.

Cole, R.E., Matsumiya, T. 2008. When the pursuit of quality risks innovation. The TQM Journal, 20(2), 130-142. DOI: 10.1108/17542730810857363.

Fotopoulos, C.V., Psomas, E.L. 2010. The structural relationships between TQM factors and organizational performance. The TQM Journal. DOI: 10.1108/17542731011072874.

Gunasekaram, A., Goyal, S.K., Martikainen, T., Yli-Olli, P. 1998. Total quality management: a new perspective for improving quality and productivity. International Journal of Quality & Reliability Management, 15(8-1), 947-968. DOI: 10.1108/02656719810199033.

Green, P. 2014. Measuring Service Quality in Higher Education: A South African Case Study. International Education Research, 10(2). https://doi.org/10.19030/jier.v10i2.8515

In'airat, M.H. Al-Kassem, A.H. 2014. Total Quality Management in Higher Education: A Review. International Journal of Human Resource Studies, 4(3), 294-307. DOI: 10.5296/ijhrs.v4i3.6368.

García, J.Á., Rama, M.D.L.C.D., Alonso, M. 2014. The Effects of Quality Management Practices on Key Results: questionnaires sample for the industry of tourist accommodation in Spain. Revista Brasileira de Gestão de Negócios, 16(52), 351-373. DOI: 10.7819/rbgn.v16i52.1614.

Hames, R.D. 1991. Total quality management: The strategic advantage. International Journal of Physical Distribution & Logistics Management. DOI: 10.1108/09600039110144255.

Issac, G., Rajendran, C., Anantharaman, R.N. 2004. A conceptual framework for total quality management in software organizations. Total Quality Management & Business Excellence, 15(3), 307-344. DOI: 10.1080/1478336042000183398.

Jong, C.Y., Sim, A.K., Lew, T.Y. 2019. The relationship between TQM and project performance: Empirical evidence from Malaysian construction industry. Cogent

Business & Management, 6(1), 1568655. DOI: 10.1080/23311975.2019.1568655.

Matta, K. 1996. Research questions on the implementation of total quality management. Total Quality Management, 7(1), 39-50. DOI: 10.1080/09544129650035034.

Papanthymou, A., Darra, M. 2017. Quality management in higher education: Review and perspectives. Higher Education Studies, 7(3), 132-147. DOI: 10.5539/hes.v7n3p132.

Pambreni, Y., Khatibi, A., Azam, S., Tham, J. 2019. The influence of total quality management toward organization performance. Management Science Letters, 9(9), 1397-1406. DOI: 0.5267/j.msl.2019.5.011.

Peratec Limited. 1994. Total quality management: the key to business improvement; a Peratec executive briefing. Chapman & Hall. DOI: 10.1007/978-94-011-1276-5.

Papanthymou, A., Darra, M. 2017. Quality management in higher education: Review and perspectives. Higher Education Studies, 7(3), 132-147. DOI: 10.5539/hes.v7n3p132.

Shahmohammadi, N. 2017. The Evaluation of Teachers' Job Performance Based on Total Quality Management (TQM). International Education Studies, 10(4), 58-64. DOI: 10.5539/ies.v10n4p58.

Shafiq, M., Lasrado, F., Hafeez, K. 2019. The effect of TQM on organisational performance: empirical evidence from the textile sector of a developing country using SEM. Total Quality Management & Business Excellence, 30(1-2), 31-52. DOI: 10.1080/14783363.2017.1283211.

Shun-Hsing, C., Yu-Da, I.P.W. 2014. An empirical study of TQM method practices for customer satisfaction and customer loyalty. International Journal of Academic Research in Business and Social Sciences, 5, 18-31. DOI: 10.6007/IJARBSS/v4-i5/820.

Sin, K.Y., Jusoh, M.S. 2019. Identifying and Prioritizing Research Gaps in Studies related to Total Quality Management on Competitive Advantage in Malaysian Hotel Industries. International Journal of Academic Research in Business and Social Sciences, 9(5). DOI: 10.6007/IJARBSS/v9-i5/5875.

Talib, F., Rahman, Z., Qureshi, M.N. 2011. A study of total quality management and supply chain management practices. International Journal of Productivity and Performance Management. DOI: 10.1108/17410401111111998.

Thapa, T.B. 2011. Total quality management in education. Academic Voices: A Multidisciplinary Journal, 1, 80-83. DOI: 10.3126/av.v1i0.5314.

Zehir, C., Ertosun, Ö.G., Zehir, S., Müceldilli, B. 2012. Total quality management practices' effects on quality performance and innovative performance. Procedia-Social and Behavioral Sciences, 41, 273-280. DOI: 10.1016/j.sbspro.2012.04.031.