

The effect of total quality management practices on quality performance: The case of Ethiopia leather industry

Tewahdo T.¹ & Teferi M.²

¹ Ethiopian Construction Design and Supervision Works Corporation, Addis Ababa, Ethiopia. Corresponding email: tewateshe@yahoo.com

² Ethiopian Agricultural Transformation Institute (EATI) Addis Ababa, Ethiopia. Email: tefmeq@yahoo.com

ABSTRACT

This study is intended to identify The Effect of Total Quality Management Practices on Quality Performance: The Case of Ethiopia Leather Industry (ELICO). Previous empirical studies revealed that successful implementation of Total Quality Management benefited organization through improving organizational performance in many dimensions. However, there is a lack of study on the effect of total quality management on quality performance in Ethiopia as well as globally which in turn result knowledge gap. Therefore, this study aims to bridge this gap in literature and knowledge. The study employs an explanatory and descriptive research design and uses quantitative and qualitative approach. A survey is conducted by using structured close-end questionnaires and interview questions. 86 employees have participated, and 75 questionnaires were collected. Descriptive and ordered logistic regression statistical tools were used to examine the relationship between Total Quality Management practices and quality Performance. The result of this study revealed that there is positive and significant relationship between Total Quality Management and overall quality performance and among Total Quality Management Practices, Information analysis, Top management commitment and employee encouragement have a positive coefficient with significant p value. Training and education resulted with negative coefficient but with significant P-value at 1%, 5%, 10%, level. The result implies that among the eight TQM dimensions TMC, IAS, EE and TE have an impact on Overall quality performance and are revealed to be best predictors to explain the overall quality Performance. Thus, this study recommended that managers of ELICO have to give more attention in their managerial activities to effective implementation of TQM practices to successful quality performance for higher levels of customer satisfaction in their industry.

Keywords:

Total quality management (TQM), Effectiveness of the firm (EF), Customer satisfaction (CS), ordered logistic regression, critical success factors.

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1. INTRODUCTION

Total Quality Management (TQM) has been the overall popular managerial approach and system since the 1980s. Following the private sector organizations, public sector organizations utilized quality management as a modern management approach for reforming their management. Total quality management is an integration of all the functions and process within an organization in order to achieve continuous improvement in goods and services (Singh, B., 2014). TQM first implemented in the developed countries, particularly in USA, Japan and Western Europe countries as a means of maximizing customer satisfaction, gaining better product quality, and obtaining higher productivity through the systematic removal of waste and the reduction of non-productive activities (Yusuf, Gunasekaran & Dan, 2007). In the last two decades, especially in the 1990s, a significant volume of research was performed to investigate the relationship between practices of total quality management and organizational performance; TQM appears to be a well-accepted system of management (Gupta, McDaniel, & Kanthi, 2005; Yusuf et al., 2007). TQM is just one of many acronyms used to label management systems that focus on quality. TQM provides a framework for implementing effective quality and productivity initiatives that can increase the profitability and competitiveness of organizations. Total Quality Management (TQM) refers to all aspects of quality services rendered by an organization to their customers and these include quality of goods, delivery, price, or services. It therefore differs from the traditional quality concepts of quality control and Quality assurance, which are the current aspect of quality within the manufacturing industry (Oakland, 2004). Total Quality Management involves preventing errors at the very point where services are rendered. As a result, it implies that every person from the Managing director to the lowest staff in the structure of an organization is involved in Total Quality Management as it plays a great impact on operational excellence, customer intimacy and product leadership. Total quality management is also to make the executives learn new rules, methods and lifestyles. It includes the participation of the entire personnel in seven perspectives: the leading of the business and the

operational philosophy, the innovation and the strategy management, the customers and the market development, the human resource and the professional skill management, the information strategy, the application and management, and the procedural management (Marcel and Ayankeng, 2015).

The objective of this study is to examine how total quality management practices affect organizational performance in the ELICO leather manufacturing sector. Firm organizational performance is understood here as financial performance as well as performance in terms of satisfying the customer, corporate social satisfaction, and efficiency and employee satisfaction. The importance of this study is two-fold: first, studies of TQM practices in the mentioned organization are inexistent. The present paper intends to fill the vacuum by making a contribution to the extremely scarce existing literature. Second, the result of the study could motivate more organizations to engage in TQM practices. Thus this study aimed to examine the effect of total quality management practices on quality performance of an organization.

1.1 Problem Statement

The concept of total quality management become very familiar and many organizations are implementing TQM for continuous improvement. Numerous empirical studies revealed that successful implementation of TQM benefited organization through improving organizational performance in many dimensions like customer satisfaction, financial performance, operational performance (Irfan & Kee, 2013; Samat, Ramayah and Saad (2006)). As the society becomes advanced economically, matured culturally, and knowledgeable educationally, the society demands for increased quality services to implement TQM (Lakhe & Mohanty, 1995; Boshoff & Allen, 2000; Al-Sabi et al., 2017). Although all manufacturing companies has to operate as per the common management Practice to ensure the quality of products, little or no information is available as to why these industries are not opting to implement and practice TQMS and what were benefits obtained and challenges faced by those companies which have undergone the implementation and practice processes. This research basically tries to answer the above mentioned

questions. Daniel (2010) identified major problems that challenged the implementation of Quality management system to be lack of top management commitment to support the system, lack of employee experience on implementation of such systems in the country due to its recent introduction, size of firms and the old mentality of doing things and the belief that this system by itself is a change initiative. There is a need for more studies in practices of TQM in Ethio Leather Industry Share Company (ELICO). Hence this study intend to examine the TQM practices, challenges and possible strategies in implementation of TQM in ELICO and its effect on quality performance to develop a model for applying TQM practices for better performance; and it therefore bridge a gap in the literature and knowledge regarding total quality management practice and its effect towards quality performance. Furthermore, this research will clearly contribute to the discipline of total quality management system of the ELICO and other similar industry firms.

1.2 Research questions

In order to achieve the purpose of the study, from the statement of the problem the following research questions are raised. Therefore, the research questions for this study are as follows:

- What does the practice of total quality management system looks like at ELICO-universal leather products industry?
- What are the effects of total quality management practices on overall quality performance aspects in the ELICO -Universal leather products industry?
- What is the best possible strategy for strengthening and promoting the implementation of total quality management system in the ELICO-Universal leather products industry?

1.3 Objectives of the Study

The general objective of this study is to examine the effect of total quality management practices on quality performance in the Ethio- leather Industry share company (ELICO).

- To identify the effect of total quality management practices on Effectiveness of the firm
- To identify the effect of total quality management practices on Customer satisfaction
- To identify the practice of total quality management system looks like at Ethio- leather Industry share company (ELICO)
- To come up with important strategic directions to be further researchable by the company on the topic of total quality management system.

1.4 Hypothesis

Ha1: There is positive and significant relationship between total quality management dimensions and effectiveness of the firm.

Ha2: There is positive and significant relationship between total quality management dimensions and customer satisfaction

Ha3: There is positive and significant relationship between total quality management dimensions and overall quality performance.

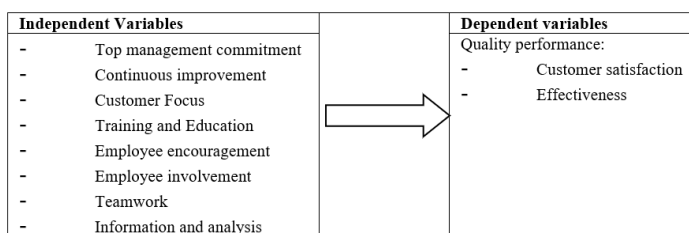


Figure 1. Conceptual frame work

2. RESEARCH DESIGN AND METHODOLOGY

2.1 Research Design

The aim of this study is to examine the effect of Total quality practices on the quality performance in the case of Ethio-Leather Industry Share Company (ELICO). This study will be conducted by using quantitative research approach; the approach is best suited for looking at cause and effect, and testing of theories and hypothesis (Muijs, 2010, p.9). The method uses to explain relationships or phenomena by collecting numerical data and analyzing based on mathematical method. The objective of the study is to examine the causal relationship between the TQM practices; quantitative research approach is choices to this study since it is an appropriate method to create quantifiable cause and effect relationship between the variables of the study. Qualitative data collected from different sources were analyzed using content analysis method where key themes were reviewed and deductive arguments were made based concepts of the already existing theories in relation to objectives of the

study. Quantitative data was analyzed using Stata (STATA 14) software based on the items of the questionnaires.

2.2 Data Collection

Primary data was collected through survey method by using close ended questionnaires and structured interview questions. Secondary data was also sourced from quality assurance reports, customer satisfactory survey reports and related academic research papers. This study hypothesizes that there is positive and significant effect of TQM and quality performance. Closed ended questionnaires were developed based on tested previous empirical literatures. The likert scale which was developed by Rensis Likert had been utilized in order to simplify the questions to respondents and enhance their cooperation. The questionnaire statements were developed and evaluated on a 5 point likert scale, where "1" indicates "strongly disagree" with the statement, "2" "disagree", "3" neutral, "4" "agree" and "5" refers to "strongly agree"

Former studies including Baye and Raju R., (2016), Duh et.al (2012) examine the role of TQM on quality performance using questionnaire to collect data. Other researchers like Abusa (2011) used questionnaire and interview as an instrument for data collection in their studies related to determinants of TQM. By assessing all these studies and their relevance and considering similar TQM study categories in the above-mentioned, it is best to use mixed instruments like self-administered questionnaire and interview for the data collection. The primary information was collected from the selected firms using a questionnaire survey followed by in-person interview questions. The primary data supported by secondary data collected from reports, different journals, articles and selected literature. The researcher uses secondary data sources from the Ministry of Industry and Online sources to characterize the Leather industry.

A closed ended questionnaire was designed based on the literature review and research objective and distributed and collected from the chosen sample. The questionnaire contains three components: general information on the firm, features of TQM and questions measuring the competitive advantage and performance of the firm.

Semi-structured interview questions were developed to validate the information collected through questionnaire and get additional information, which was not covered, in the questionnaire. The researcher conducts the interview with the top management. The purpose is to justify the reliability of responses collected from the questionnaire by focusing on those responses that the researcher believes needs further clarification.

2.3 Sampling Methods

A total of 110 employees were the target populations included in the study were the target populations included in the study. The research instrument used was a well-structured self-administered questionnaire distributed to people at various levels in the organization. Data obtained from the questionnaire was analyzed and the findings evaluated using mean, frequency standard deviation and other statistical tools.

The sample size determination is based on Slovin's formula, which was developed by Robert Slovin, with confidence level 95% and confidence interval (error margin) 5%. The derivations above show that Slovin's formula is applicable only when estimating a population proportion using a confidence coefficient of 95% (Tejada & Punzalan, 2012).

$$n = \frac{N}{1 + Ne^2}$$

Where, n = is the sample size
N = is the population size (110)
e = error tolerance (0.05)

Based on Slovin's formula, the sample of 86 respondents was drawn from target population of 110 employees of ELICO.

2.4 Specifications of the Research Model

To examine the effect of total quality management practices on quality performance, ordered logistic regression techniques employed to analyze the relationships among two or more variables and estimate the β 's in the equation. Sample regression model equation for relationship among variables is;

$$y_j = \beta_0 + \beta_1 x_{1j} + \beta_2 x_{2j} + \dots + \beta_p x_{pj} + e_j$$

Where

Y_j 's represents dependent variable for observation j.

X_j 's represents the independent variables (IVs) for observation j

β_0 is the intercept

β 's is the unknown regression coefficients.

e_j is the error (residual) of observation j.

Based on the above, the model is modified based on the research variables that described in the conceptual framework in chapter two, to examine the effect of total quality management practices on quality performance.

2.5 Techniques of Data Analysis

The data was analyzed and presented in the form of diagrams, charts, and tables by using STATA software version 14. Various statistical tools such as descriptive arithmetic mean of constructs, and ordered logistic regressions were used to analyze the effect of the independent variables on the dependent variables. Finally, conclusions were made based on the findings/results of the study and recommendations were forwarded on the basis of the data analyzed.

3. DATA ANALYSIS AND INTERPRETATION

3.1 Demographic Characteristics of the respondents

Demographic characteristics including: gender, age, educational background, work experience and responsibility are summarized using frequencies and percentages.

Table 1 below shows that the majority of the respondents 45(60%) are females while the remaining 30(40%) are males. This shows that the majority of the ELICO Universal leather products industry staffs are females. The above data indicates that, the proportion of female employees in the sample organization is significantly higher to that of male counterparts. This could be an indicator of high participation rate of female workers at the sector. We could conclude that gender equality is also observed in the sample organization and the attention given to females in all aspects of the activities as long as the role of women's are concerned and their contribution to the total quality management is vital.

Table 1: Characteristics of respondents

		Frequency	Percent	Valid (%)	Cumulative (%)
Sex	Male	30	40	40	40
	Female	45	60	60	60
Educational Level	Certificate	44	58.7	58.7	58.7
	Diploma	22	29.3	29.3	88
	Degree	9	12	12	100
	MA/MSc	-	-	-	-
Responsibility	Customer	12	16	16	16
	Admin	9	12	12	28
	Technical	54	72	72	100
Service year	<2 years	20	26.7	26.7	26.7
	2-5 years	16	21.3	21.3	48
	5-10 yrs	11	14.7	14.7	62.7
	11-20 yrs	2	2.7	2.7	65.3
	above 20	26	34.7	34.7	100
		75	100	100	100

Source: Analysis of own data using STATA V14, 2020

The respondents were asked to indicate their level of education they had achieved and 9(12%) of the respondents have bachelor degree, 12(12.6%) have Masters Degree and 22(29.3%) of the respondents have Diploma and majority 44(58.7%) of the respondents are certificate holders. It can be seen from the table that most of the respondents i.e. 58.7% are certificate holders. Surely the educational level of the employees positively affects the organization in implementing QMS quickly and effectively. Educated employees are quick to receive new ideas and incorporate and implement them as well. This in return benefits the organization in terms of return on investment and higher profitability in short period of time. In this aspect the organization is expected to upgrade the educational level of its staff to understand the benefits of QMS at all organization and endeavor more to come up on how to improve and also anticipate and predict customers need effortlessly. Regarding current working units (responsibility) of the respondents, 16% were from customer service, 12% from administration and 72% were from technical 26.7% sampled respondents stayed in the organization less than two years while 21.3% were between 3-5 years, 11.7% were between 6-10 years, 2.7% were between 11-20 years and 34.7% of respondents stayed more than 20 years in the organization. In this demographic profile majority of respondents stayed in the organization above 20 years and majority of them were from technical staffs ensures that validity of questionnaire responses that respondents to know about the organization and to give valid response on the items described on the questionnaire.

4. DATA ANALYSIS

Based on the table 6 below the result of STATA, V14 descriptive statistics on the TQM practices all of constructs of TQM got a score above

the mean score 3 which is above the mid-point. This result implies the majority of ELICO employees were believed that they have been implemented TQM practices.

Based on the result, continuous improvement (CI) has the highest mean (3.94) with Standard deviation (SD) of 0.56, while Training and Education has relatively the lowest mean (3.19) with SD of (0.63). The mean and SD of the remaining TQM practices were; TMC, CF, IAS, EI, TW, and EE are found to be 3.69, 3.85, 3.58, 3.84, 3.92 and 3.27 and SD. 0.17, 0.59, 0.63, 0.57, 0.48, 0.35, respectively. The likert scale was converted to scale to interpret mean level of agreement of the respondents. The limits of the scale were 1.00 to 1.49 = strongly disagree, 1.50 to 2.49 = disagree, 2.50 to 3.49 = neutral, 3.50 to 4.49 = agree, and 4.50 to 5.00 = strongly agree.

Table 2. Mean of Individual Constructs

	N	Mean	SD
Top Management commitment (TMC)	75	3.69	0.2
Customer focus (CF)	75	3.85	0.6
Continuous improvement (CI)	75	3.94	0.6
Training and Education (TE)	75	3.19	0.6
Information analysis system (IAS)	75	3.58	0.6
Employee involvement (EI)	75	3.84	0.6
Team work (TW)	75	3.92	0.5
Employee encouragement (EE)	75	3.27	0.4
Effectiveness of the firm (EF)	75	3.76	0.5
Customer satisfaction (CS)	75	3.89	0.5
Valid N (list wise)	75		

Source: Analysis of own data using STATA 14

Regarding the quality performance factors the two constructs Effectiveness of the firm and customer satisfaction had a mean of 3.76 and 3.89, respectively and SD of 0.51 and 0.46, respectively which is above the cut point of three. Thus, this indicates employees of ELICO believe that their quality performance is improved due to TQM practices. Table 6 indicates that the standard deviation (SD) of TQM constructs is less than one; this implies the variations in respondents' opinion/view concerning TQM practice and quality performance of ELICO is small.

4.1 Test for Normality and outliers

Ordered logistic regression analysis was used to identify the significance influence of each independent variable on the status of dependent variable. The analysis was done using STATA version 14. Figure 2 below show the normally distribution chart, indicating that assumption of normality is met and Table 6 shows the result of Skewness and Kurtosis implies there is no outliers in which the Skewness lies between -3 & 3, and the kurtosis is between 0 & 6, respectively.

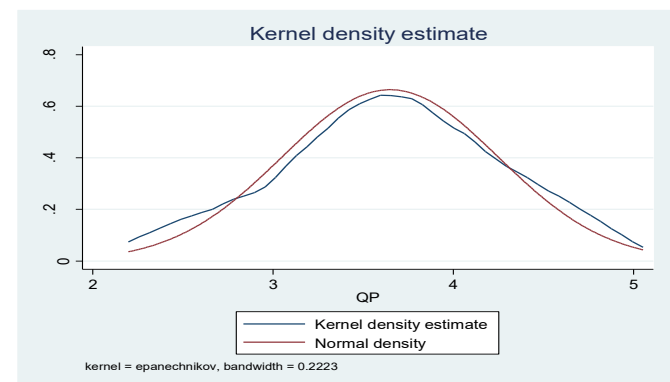


Figure 2. Normality test

Table 3. Skewness and Kurtosis

Variable	Skewness	Kurtosis
QP	-.1285429	2.474012

4.2 Hypothesis Testing

To test hypothesis of this research, multiple linear regression technique is performed. Ordered logistic regression analysis is a statistical technique that can be used to analyze and measure a relationship between two or more variables (Saunders et al., 2009, p.461). This technique implemented to explore the most sophisticated interrelationship among variables, for instance the technique uses to identify which total quality management element is the best predictor of quality performance and the amount of variance explained in quality performance variable by all TQM

practices. Generally this method enables the researcher to make stronger causal inferences from observed interrelationships among variables and to predict a dependent variable based on values of a number of independent variables.

H₀₁: There is positive and significant relationship between total quality management dimensions and effectiveness of the firm.

The table 4 below shows the result regarding to total quality management dimensions such as TMC, CF, CI, TE, IAS, EI, TW and EE on effectiveness of the firm.

Log likelihood: is the log likelihood of the fitted model. It is used in the likelihood Ratio chi square test of whether all predictor's regression coefficients in the model are simultaneously zero. There are 75 numbers of observations in the dataset for which all of the response and predictor variables are no missing.

LR $\chi^2(8)$: this is likelihood Ratio(LR) chi-square test that at least one of the predictors regression coefficient is not equal to zero. The number in parenthesis indicates the degree of freedom of chi-square distribution used to test the LR chi-square statistic and is defined by the number of predictor in the model (8).

Table 4. Ordered logistic Regression result of TQM dimensions on Effectiveness of the firm

EF	Coef	Stad. Err. Z.	P>Z	95% Conf.	Interval
TMC	2.169673	0.693642	3.13	0.002	8101588 3.529187
CF	0.32933	0.443	0.74	0.457	-0.539 1.198
CI	-0.422	0.467	-0.9	0.366	1.338 0.493
TE	-0.83727	0.322568	-2.6	0.009	-1.469487 -0.20504
IAS	2.09831	0.473424	4.43	0	1.170416 3.026203
EI	0.169792	0.484025	0.35	0.726	-0.7788806 1.118464
TW	-0.0002	0.437679	0	1	-0.8580318 0.857637
EE	0.264313	0.261328	1.01	0.312	-0.2478808 0.776507

Source: Analysis of own data using STATA V14, 2020

Prob > χ^2 - This is the probability of getting a LR test statistic as extreme as, or more so, than the observed under the null hypothesis; the null hypothesis is that all of the regression coefficients across both models are simultaneously equal to zero. In other words, this is the probability of obtaining this chi-square statistic (52.22) if there is in fact no effect of the predictor variables. This p-value is compared to a specified alpha level, our willingness to accept a type I error, which is typically set at 0.10 or 0.05 or 0.01. The small p-value from the LR test, <0.0000, would lead us to conclude that at least one of the regression coefficients in the model is not equal to zero. In this case, the model is statistically significant because the p-value is 0.000 which is less than the alpha value 0.05. In this model the likelihood ratio chi-square of 52.22 with a p value of 0.000 tell us that the model is statistically significant.

Pseudo $R^2 = 0.1462(14.62\%)$ – this is the Mcfadden's Pseudo R-square. Logistic regression does not have an equivalent to the R-squared that is found in OLS regression.

Interpretation of coefficients in ordered logistic regression is not as straight forward as the interpretation of coefficients in linear regression model. The increase in probability attributed to a one unit increase in a given predictor is dependent on both the values of other predictors and the starting value of the given predictors. However, there are a limited ways in which we can interpret the individual regression coefficients. A positive coefficient means an increase in the predictor leads to an increase in the predicted probability. A negative coefficient means that an increase in the predictor leads to a decrease in predicted probability. Marginal effect can also be used in interpreting the effect of predictors on predicted probability. From the determining of predictor interval which shows Top management commitment (TMC) tend to have positive impact on Effectiveness of the firm. In fact the result depicts TMC have p value significant at 1%, 5%, 10%, level with positive coefficient. Increase in the Top management commitment tends to increase the predicted probability of Effectiveness of the firm. If TMC increases by one unit, the probability of Effectiveness of the firm increases by 2.1697 assuming other factors being constant. Customer focus (CF) tends to have positive effect on Effectiveness of the firm. Indeed the result from ordered logistic regression depicts CF have p value not significant at 1%, 5%, 10%, level with positive coefficient. Increase in the customer focus tends to increase the predicted probability of Effectiveness of the firm. If CF increases by one unit, the probability of Effectiveness of the firm increases by .322 assuming other factors being constant.

Information analysis (IAS) tends to have positive impact on Effectiveness of the firm. The result depicts IAS have p value significant at 1%, 5%, 10%, level with positive coefficient. Increase in the IAS tends to increase the predicted probability of Effectiveness of the firm. If IAS increases by one unit, the probability of Effectiveness of the firm increases by 2.098 assuming other factors being constant. Employee involvement (EI) tends to have positive effect on Effectiveness of the firm. The result from Ordered logistic regression depicts EI have p value not significant at 1%, 5%, 10%, level with positive coefficient. Increase in the EI tends to increase the predicted probability of Effectiveness of the firm. If EI increases by one unit, the probability of Effectiveness of the firm increases by .1697 assuming other factors being constant. Employee encouragement (EE) tends to have positive effect on Effectiveness of the firm. The result from Ordered logistic regression depicts EE have p value not significant at 1%, 5%, 10%, level with positive coefficient. Increase in the EE tends to increase the predicted probability of Effectiveness of the firm. If EE increases by one unit, the probability of Effectiveness of the firm increases by .2643 assuming other factors being constant.

Continuous improvement (CI) tends to have negative impact on Effectiveness of the firm. The result from ordered logistic model depicts this fact. Continuous improvement have negative coefficient a P- value with not significant at 1%, 5%, 10%, level. CI has 41.6 % lower the probability of attaining effectiveness of the firm. Training and education (TE) tends to have negative impact on Effectiveness of the firm. The result from ordered logistic model depicts this fact. TE have negative coefficient with a P-value significant at 1%, 5%, 10%, level. TE has 42.25% lower probability of attaining effectiveness of the firm. Team work (TW) tends to have negative impact on Effectiveness of the firm. The result from ordered logistic model depicts this fact. Team work have negative coefficient with a P –value not significant at 1%, 5%, 10%, level. TW has 0.019% lower probability of attaining effectiveness of the firm. From above statement of findings regarding to the total quality management dimensions on the effectiveness of the firm, TMC and Information analysis have a positive coefficient with p-value significant at 1%, 5%, 10%, level. But TE has a negative coefficient but it resulted with a significant at 1%, 5%, 10%, level. The result implies among the eight TQM dimensions, TMC, IAS and TE have an impact on Effectiveness of the firm.

H₀₂: There is positive and significant relationship between total quality management practices and customer satisfaction

Table 7 below shows the result of total quality management dimensions such as TMC, CF, CI, TE, IAS, EI, TW and EE on effectiveness of the firm. The result of the ordered logistic regression show that Log likelihood = -166.46616, LR $\chi^2(8) = 56.16$, Prob > $\chi^2 = 0.000$ and Pseudo $R^2 = 0.1443$. The small p-value from the LR χ^2 test, <0.000, would lead us to conclude that at least one of the regression coefficients in the model is not equal to zero. In this case, the model is statistically significant because the p-value is 0.000 which is less than the alpha value 0.05. In this model the likelihood ratio chi-square of 56.16 with a p value of 0.000 tell us that the model is statistically significant. From the table below, determining of predictor interval which shows Top management commitment (TMC) tend to have positive impact on Customer satisfaction. In fact the result depicts TMC have p value significant at 5%, 10%, level with positive coefficient. Increase in the Top management commitment tends to increase the predicted probability of Customer satisfaction. If TMC increases by one unit, the probability of Effectiveness of the firm increases by 1.4164 assuming other factors being constant.

Table 5. Ordered logistic Regression result of TQM dimensions on customer satisfaction (CS)

CS	Coef	Stad. Err. Z.	P>Z	95% Conf.	Interval
TMC	1.416	0.6751	2.1	0.036	0.0933 0.0933
CF	1.113	0.4508	2.47	0.014	0.22917 1.99632
CI	0.306	0.4227	0.72	0.469	-1.1343 0.52255
TE	-0.235	0.2895	-0.08	0.416	-0.8027 0.332
IAS	1.119	0.4241	2.64	0.008	0.28797 1.95031
EI	-0.306	0.4768	-0.06	0.521	-1.2406 0.62862
TW	0.305	0.4372	1.17	0.24	-0.3437 1.37022
EE	0.302	0.2587	1.4	0.162	-0.1454 0.86878

Source: Analysis of own data using STATA V14, 2020

Customer focus (CF) tends to have positive impact on Customer satisfaction. The result depicts CF have p value significant at 5%, 10%, level with positive coefficient. Increase in the CF tends to increase the predicted probability of Customer satisfaction. If CF increases by one unit, the probability of Customer satisfaction increases by 1.1128 assuming other factors being constant.

Continuous improvement (CI) tends to have positive effect on Customer satisfaction. Indeed the result from Ordered logistic regression depicts CI have p value not significant at 1%, 5%, 10%, level with positive coefficient. Increase in the continuous improvement tends to increase the predicted probability of Customer satisfaction. If CI increases by one unit, the probability of Customer satisfaction increases by .3059 assuming other factors being constant. Information analysis (IAS) tends to have positive impact on Customer satisfaction. The result depicts IAS have p value significant at 1%, 5%, 10%, level with positive coefficient. Increase in the IAS tends to increase the predicted probability of Customer satisfaction. If IAS increases by one unit, the probability of Customer satisfaction increases by 1.1191 assuming other factors being constant. Team work (TW) tends to have positive effect on Customer satisfaction. Indeed the result from Ordered logistic regression depicts TW have p value not significant at 1%, 5%, 10%, level with positive coefficient. TW tends to increase the predicted probability of Customer satisfaction. If TW increases by one unit, the probability of Customer satisfaction increases by .5132 assuming other factors being constant.

Employee encouragement (EE) tends to have positive effect on Customer satisfaction. The result from Ordered logistic regression depicts EE have p value not significant at 1%, 5%, 10%, level with positive coefficient. Increase in the EE tends to increase the predicted probability of Customer satisfaction. If EE increases by one unit, the probability of Customer satisfaction increases by .3616 assuming other factors being constant. Training and education (TE) tends to have negative impact on Customer satisfaction. The result from ordered logistic model depicts this fact. TE have negative coefficient with a P-value not significant at 1%, 5%, 10%, level. TE has 23.54% lower probability of attaining Customer satisfaction. Employee involvement (EI) tends to have negative impact on Customer satisfaction. The result from ordered logistic model depicts this fact. EE have negative coefficient with a P-value not significant at 1%, 5%, 10%, level. EE has 30.16% lower probability of attaining Customer satisfaction. From above statement of findings regarding to the effect total quality management dimensions on the Customer satisfaction, Top Management Commitment and Customer Focus have a positive coefficient with p-value significant at 5%, 10%, Information analysis have a positive coefficient with p-value significant at 1%, 5%, 10%, level. The result implies among the eight TQM dimensions TMC, CF and IAS have an impact on Customer satisfaction.

Ha3: There is positive and significant relationship between total quality management practices and overall quality performance.

Table 8 below shows the result of total quality management dimensions such as TMC, CF, CI, TE, IAS, EI, TW and EE on overall quality performance. The result of the ordered logistic regression show that Log likelihood = -191.6837, LR $\chi^2(8) = 71.04$, Prob > $\chi^2 = 0.000$ and Psudo $R^2 = 0.1563$. The small p-value from the LR χ^2 test, <0.000, would lead us to conclude that at least one of the regression coefficients in the model is not equal to zero. In this case, the model is statistically significant because the p-value is 0.000 which is less than the alpha value 0.05. In this model the likelihood ratio chi-square of 71.04 with a p value of 0.000 tell us that the model is statistically significant. From the table below, determining of predictor interval which shows Top management commitment (TMC) tend to have positive impact on Overall quality performance. In fact the result depicts TMC have p value significant at 5%, 10%, level with positive coefficient. Increase in the Top management commitment tends to increase the predicted probability of Overall quality performance. If TMC increases by one unit, the probability of Overall quality performance increases by 1.0443 assuming other factors being constant.

Table 6. Ordered logistic Regression result of TQM dimensions on overall quality performance

OQP	Coef	Stand. Err. Z.	P>Z	95% Conf.	Interval	
TMC	1.044	0.6564	2.9	0.032	-0.1177	2.6909
CF	0.717	0.4711	1.6	0.106	-1.1005	0.74603
CI	-0.177	0.4438	-0.4	0.707	-0.1526	1.58736
TE	-0.235	0.3184	-3	0.003	-1.5842	-0.3362
IAS	2.235	0.4624	5	0	1.41851	3.23098
EI	0.255	0.4795	0.5	0.595	-0.6846	1.19489
TW	0.293	0.3953	0.7	0.459	-0.482	1.06748
EE	0.766	0.2578	3	0.003	0.26023	1.27084

Source: Analysis of own data using STATA V14, 2020

Customer focus (CF) tends to have positive effect on Overall quality performance. Indeed the result from Ordered logistic regression depicts CF have p value not significant at 1%, 5%, 10%, level with positive

coefficient. Increase in the continuous improvement tends to increase the predicted probability of Overall quality performance. If CF increases by one unit, the probability of Overall quality performance increases by .7174 assuming other factors being constant. Information analysis (IAS) tends to have positive impact on Overall quality performance. The result depicts IAS have p value significant at 1%, 5%, 10%, level with positive coefficient. Increase in the IAS tends to increase the predicted probability of Overall quality performance. If IAS increases by one unit, the probability of Overall quality performance increases by 2.3247 assuming other factors being constant.

Employee involvement (EI) tends to have positive effect on Overall quality performance. Indeed the result from Ordered logistic regression depicts EI have p value not significant at 1%, 5%, 10%, level with positive coefficient. Increase in the continuous improvement tends to increase the predicted probability of Overall quality performance. If EI increases by one unit, the probability of Overall quality performance increases by .2551 assuming other factors being constant. Team work (TW) tends to have positive effect on Overall quality performance. Indeed the result from Ordered logistic regression depicts EI have p value not significant at 1%, 5%, 10%, level with positive coefficient. Increase in the continuous improvement tends to increase the predicted probability of Overall quality performance. If TW increases by one unit, the probability of Overall quality performance increases by .2927 assuming other factors being constant. Employee encouragement (EE) tends to have positive effect on. Indeed the result from Ordered logistic regression depicts EI have p value significant at 1%, 5%, 10%, level with positive coefficient. Increase in the EE tends to increase the predicted probability of Overall quality performance. If EE increases by Overall quality performance one unit, the probability of Overall quality performance increases by .7655 assuming other factors being constant. Training and education (TE) tends to have negative impact on Overall quality performance. The result from ordered logistic model depicts this fact. TE have negative coefficient with a P-value significant at 1%, 5%, 10%, level. TE has 23.54% lower probability of attaining Customer satisfaction.

Continuous improvement (CI) tends to have negative impact on Overall quality performance. The result from ordered logistic model depicts this fact. Continuous improvement have negative coefficient with a P-value not significant at 1%, 5%, 10%, level. CI has 17.72% lower probability of attaining Overall quality performance. From above statement of findings regarding to the effect total quality management dimensions on Overall quality performance, Information analysis and employee encouragement have a positive coefficient with p-value significant at 1%, 5%, 10%, level, Top Management Commitment have a positive coefficient with p-value significant at 5% and 10%, level. Training and education resulted with negative coefficient but it is significant P-value at 1%, 5%, 10%, level. The result implies among the eight TQM dimensions TMC, IAS, EE and TE have an impact on Overall quality performance.

4.3 Analyses of Data Gathered from Interview

The respondents of the interview questions were a quality assurance head, administrator head, different technical section heads and general manager of the organization.

4.3.1 Firm's performance with respect to competitor and their profit

According to the respective respondents, the firm's performance against their major competitors is

at high capacity, but they deliver their product on time and excellent quality. Regarding the profit of the firms, the respondents stated they have significant increase ranges from 10-15 % of profit the past year because they deliver their work on time and with quality.

4.3.2 Major challenges the firm faced while practicing TQM or if the firm is not practicing TQM

According to the data gathered the challenges faced by the firm while implementing TQM in their firms are caused due to lack of top management commitment, an inadequacy of employee's competence to perform task and lack of educated manpower. Lack of skilled man power for specialist work. When we try innovate new ideas like TQM, the main challenges are lack of awareness of the concept, educated manpower, misconception of benefits of TQM and the belief that the practices of TQM comes at very high cost and therefore the firms are highly reluctant to the practice TQM.

4.3.3 Mechanisms to measure firm's effectiveness in relation to TQM

When it comes to effectively practicing TQM in the firms, most of the top management personnel stated that it moderately effective by adopting different approaches including training awareness, kaizen, continuous improvement techniques; PDCA (plan, do check and act) cycle

commitment. The other mechanism firm's management personnel stated they measure the effectiveness of TQM practice by performing QMS audit, monthly and annual evaluations. TQM practice implementation helps to identify the gaps with the company, this could be achieved by consecutively recording performance of the employees then revealing the results to them and discuss how to solve each problem.

4.3.4 Suggestion of TQM implementation and improvement for firms' effectiveness

Regarding the implementation of TQM and improvement of the firm's effectiveness and competitive advantage, many suggestions were made by both the respondents and the researcher.

- Continuous assessment based on its ISO standard 9001
- Employing a PDCA system (Plan- Do- Check-Act)
- Performing quality works within a short period of time, Goal setting
- Strongly working on improving skill and capacity of an employee
- Strategic and systematic approach formulation of internal quality assessments
- Improve top management commitment in the firm.
- Proper employees training should be conducted.
- Allocation of proper resources towards the application of TQM.
- Make TQM practices as standard rule/ or part of the organizational culture
- Properly implementing TQM practices such as developing good customer feedback system using technology (proper comment section designed in their websites).

The concept of TQM awareness in the sector should be created in a national capacity, by the proper organization like Ministry of industry or quality standard organization.

5. DISCUSSION

In this study the effects of total quality management practices on quality performance were examined; total quality management practices were selected from previous researches and its effect on quality performance was examined quantitatively. Based on the results of the regression analysis the following summaries of findings were drawn. Ordered logistic regression analysis was used to identify the significance influence of each independent variable on the status of dependent variable. The analysis was done using STATA version 14. To test Hypothesis 1 ordered logistic regression analysis was performed the overall model statistics is tested by Prob > chi2. In this case, the model is statistically significant because the p-value of chi2 is 0.000 which is less than the alpha value 0.05. From the coefficient of determining of predictors Top management commitment and Information analysis tend to have positive value (2.1696 and 2.0983) on Effectiveness of the firm and have p value (.002 and .000) significant relationship at 1%, 5%, 10% significant level. Training and education have negative value (-0.8373) but have a significant relationship (0.009) at 1%, 5%, 10% significant level. Customer focus, Employee involvement and employee encouragement have a positive coefficient value (.322, .169 and .264) but they do not have a significant relationship (.46, .73 and .31) at 1%, 5%, 10% significant level.

Continuous improvement and Team work have a negative coefficient value (-.4163 and -0.0092) and they do not have a significant relationship (.37 and 1.0) at 1%, 5%, 10% significant level. From above statement of findings regarding to the total quality management dimensions on the effectiveness of the firm, TMC and Information analysis have a positive coefficient with p-value significant at 1%, 5%, 10%, level. But TE have a negative coefficient but it resulted with a significant at 1%, 5%, 10%, level. The result implies among the eight TQM dimensions, TMC, IAS and TE have an impact on Effectiveness of the firm. Hence, a change in the above mentioned variables will result in a significant change on the dependent variable Effectiveness of the firm. To test Hypothesis 2 ordered logistic regression analysis was performed, the overall model statistics is tested by Prob > chi2. In this case, the model is statistically significant because the p-value of chi2 is 0.000 which is less than the alpha value 0.05. From the coefficient of determining of predictors Top management commitment, Customer focus and Information analysis tend to have positive coefficient value (1.4164, 1.1128 and 1.1191) on Effectiveness of the firm and have p value (.036, 0.014 and .008) significant relationship at 1%, 5%, 10% significant level. Continuous improvement, Team work and Employee encouragement have a positive coefficient value (.3059, .3052 and .3016) but they do not have a significant relationship (.469, .240 and .162) at 1%, 5%, 10% significant level.

Training and education and Employee involvement have a negative coefficient value (-.2354 and -0.3059) and they do not have a significant relationship (.41 and .52) at 1%, 5%, 10% significant level.

From above statement of findings regarding to the total quality

management dimensions on Customer satisfaction, Top management commitment, Customer focus and Information analysis have a positive coefficient with p-value significant at 1%, 5%, 10%, level. When we compare the individual contribution of independent variables to dependent variable CS, three out of eight TQM practices have positive and significant value. The result implies among the eight TQM dimensions, TMC, CF and IAS have an impact on Customer satisfaction. Hence, a change in the above mentioned variables will result in a significant change on the dependent variable Customer satisfaction. Model3 shows the effect of total quality management dimensions such as TMC, CF, CI, TE, IAS, EI, TW and EE on overall quality performance. The result of the ordered logistic regression show that

Log likelihood = -191.6837, LR chi²(8) = 71.04, Prob > chi2 = 0.000 and Psudo R² = 0.1563. The small p-value from the LR chi² test, <0.000, would lead us to conclude that at least one of the regression coefficients in the model is not equal to zero. In this case, the model is statistically significant because the p-value is 0.000 which is less than the alpha value 0.05. In this model the likelihood ratio chi-square of 71.04 with a p value of 0.000 tell us that the model is statistically significant.

In general, to examine the effect of total quality management practices on the overall quality performance (both EF & CS), The overall model 3 summary is examined; model 3 statistics of dependent variable of Overall quality performance (OQP) revealed that Top management commitment, Information analysis and employee encouragement tend to have positive coefficient value (1.0443, 2.2347 and 0.2578) on Effectiveness of the firm and have p value (.032, 0.000 and .003) significant relationship at 1%, 5%, 10% significant level. Customer focus, Team work and Employee involvement have a positive coefficient value (.7174, .2927 and .2551) but they do not have a significant relationship (.106, .595 and .459) at 1%, 5%, 10% significant level. Continuous improvement have a negative coefficient value (-.1772) and they do not have a significant relationship (.707) at 1%, 5%, 10% significant level. Individual independent variable with higher value has stronger effect on dependent variable Overall quality performance, thus Information analysis is the best predictor of quality performance followed by Employee encouragement and Top management commitment. Hence, an improvement on these TQM practices will highly contribute to the improvement of Overall quality performance.

6. CONCLUSION

This study examined the effect of total quality management practices on Effectiveness of the firm, Customer satisfaction and overall quality performance of ELICO. From this study finding, there is positive and significant relationship between TQM practices and EF, CS and overall Quality performance. Ordered logistic regression analysis was used to identify the significance influence of each independent variable on the status of dependent variable. The analysis was done using STATA version 14. From the descriptive statistics findings it is concluded that all TQM practices and quality performance dimensions have a mean value of greater than the cut-point three, which indicates the majority of ELICO employees were believed that they have been implemented TQM practices in the firm and their quality performance is improved due to TQM practices. Continuous improvement has a highest mean while Training and education and Employee encouragement has a lowest mean from all TQM practices. Ordered logistic regression analysis was done regarding the effects of TQM on Effectiveness of the firm. Top management commitment and Information analysis were positive and significant relationship but and Training and education was with negative coefficient but it was significant. Customer focus, Employee involvement and Employee encouragement were positive coefficient but they are insignificant. It is concluded that among the independent variables, Top management commitment, Information analysis and Training and education were the dominant variables in explaining Effectiveness of the firm.

Regarding the effects of TQM dimensions on Customer satisfaction, Top management commitment, Customer focus and Information analysis were positive and significant relationship. Continuous improvement, Team work and Employee encouragement were positive coefficient but they are insignificant. It is concluded that, Top management commitment, Customer focus and Information analysis were the dominant variables in explaining Customer satisfaction. From the findings of ordered logistic regression, regarding to the effect total quality management dimensions on overall quality performance, Top management commitment, Information analysis and Employee encouragement were positive and significant relationship. But training and education was with negative coefficient but it was significant. Customer focus, Team work and Employee involvement were positive coefficient but they are insignificant. It is concluded that, among the eight TQM dimensions, Top management

commitment, Training and education, Information analysis and Employee encouragement have an impact on Overall quality performance. Information analysis and Employee encouragement are the best predictors followed by Top management commitment and training and education. Therefore these variables are the dominant variables in explaining Overall quality performance of ELICO. The findings of this study support the results of prior study conducted by Samia, (2015) on Impact of Top Management Commitment on Quality Management. His study reveals a moderate relationship between top management commitments on success of quality performance is significant at 1% significance level. Hence top management commitment is reflected on success of quality management. The simple regression analysis describes that top management commitment has a positive impact on success of quality management with the strength of $B = 0.384$ ($F = 69.423$, $P = 0.000$). The top management commitment gives a measure of success of quality management and it has a 42% accuracy of predicting.

Many scholars (Ho et al, 2001, Choi and Eboch, 1998) have found that information and quality data analysis is significantly and positively related to quality performance. A study by Marinagi, Trivellas and Reklitis, (2015) reported that Information Quality and Supply Chain Performance: The Mediating Role of Information Sharing that the relationship between information analysis and individual performance and information quality and organizational performance. These results concluded that information analysis is a strong determinant of individual performance and as well as organizational performance. It is found out that system quality, information analysis and service quality affect individual performance positively and significantly. It is also found that the company's performance also affected positively and significantly by the information quality and service quality. The result of the study also can be used by users in an organization to develop high quality of information system that is supported by vendors to produce good quality of information. Another study conducted by Ngambi and Nkemkiafu, (2015) on The Impact of Total Quality Management on Firm's Organizational Performance in Cameroon show that although some measures of organizational performance could be significantly impacted by TQM practices, all elements of TQM do not contribute to enhanced performance. TQM practices that seem to play a major role in enhancing performance are employee training and empowerment, quality control and inspection, leadership commitment. Employee training and empowerment is a factor in improving quality performance and corporate social responsibility. Management Leadership is needed to boost cost reduction and plays a role in employee satisfaction. Overall, the findings clearly show that TQM can significantly improve the organizational performance of manufacturing enterprises in Cameroon.

The result of this study disagrees with Sadikoglu and Hilal (2014) on their study of The Effects of Total Quality Management Practices on Performance and the Reasons of and the Barriers to TQM Practices in Turkey. The results give that overall TQM practices improve all performance measures but Leadership does not affect quality performance of the firm it is also supported by the results of Choi and Eboch (1998) and Kannan and Tan (2005). In contrast to the above result, Sadikoglu and Hilal (2014) reported that successful training and education improves operational performance, employee performance, and customer results. It has been found that training and education positively related to operational performance of a firm. Allocating firm resources to training on quality pays off as professional employees know advanced statistical techniques, concepts of quality, basic characteristics of their industry, and the structure and processes of the firm, dramatically improve the performance of the firm. Other similar study was conducted by Kiprotich, Njuguna and Kilika, (2018) on Total Quality Management Practices and Operational performance of Kenya Revenue Authority. Based on the findings of the study, it can be concluded that, Training and education, continuous improvement and system automation had statistical significant effect on the dependent variable Operational performance. This was achieved by deriving a regression equation that indicated that the significance values of the employee training and education were less than 0.05. This indicates that Training and education has a relationship and positively affect total quality performance. It is concluded that each TQM practices has a positive correlation with the OQP (EF and CS). And in ordered logistic regression analysis of overall OQP is found to be due to some TQM practices. Hence, it can be concluded that there is positive and significant relationship between TQM practices and overall QP of ELICO.

Based on the brief interview conducted with the firm, it can be concluded as follows:

- The organization has been faced for different challenges while practicing TQM, caused due to lack of top management commitment,

lack of awareness or knowledge regarding TQM practices and inadequate skilled workers

- The company implement kaizen strategy of continuous improvement; PDCA (plan, do check and act) cycle in order to improve firms effectiveness.
- The organization measure the effectiveness of TQM practice by performing QMS audit, monthly and annual evaluations.
- The firm suggested that in order to effectively implement TQM, the firms should give proper training to their employees, improve their top management commitment, proper resources should be allocated for TQM practices.

6.1 Recommendations

This study is concerned on the effect of total quality management practices on Quality performance by taking evidence from ELICO. On the basis of the findings and conclusions mentioned, the following recommendations were forwarded.

- Appropriate resources should be allocated to create awareness about TQM practices for the employees in order to increase quality and the firm should give more attention to the adaptation of the business cultures and standards in order to easily implement TQM practices.
- More emphasis should be given to the role of top management. Top management should ensure all departments and employees are involved in quality management program. The internal and external audit should be conducted in order to ensure whether TQM is properly implemented or not.
- Management should earnestly consider devoting more on its employees in areas of training and education, employees should receive training before they come into contact with the assigned work and continuous training should be given to provide good service.
- Firms should give more attention to Customer focus which gives an emphasis to provide services as promised, effective use of customer feedback, quick respond to customer complaints and the overall customer focus system in quality management.
- Emphasis should be given to Top management commitment and responsibility to participate in the quality management system and quality policies that deal with an improvement of quality and satisfaction of internal and external customers' needs and customer focus in order to have substantial change on employees as well as overall quality performance without undermining other TQM practices.

In general, the findings of this study revealed that TQM practices have a positive and significant effect on overall quality performance of the firm. Thus it is recommended that managers of ELICO have to give more attention in their managerial function to successful implementation of TQM practices to successful quality performance for higher levels of customer satisfaction in their industry. TQM practices with negative coefficient values also need to be considered for effective quality performance.

6.2 Future research

In this study, the researcher has tried to analyze, the effect of Total quality management practices on quality performance with only the specific sample of ELICO. In future research, the sample should include more type of manufacturing industries and sectors at large in order to identify whether the same results and conclusions could be obtained. This study is conducted based on self-report measure in which respondents might have answered questions in the sense of biasness for the reputation of their working industry or for the sake of giving what they think as socially desirable answer for the questionnaire. Future research should incorporate actual quality performance which is measured by their supervisors or managers.

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