

Exploring TQM and SCM Practices Influence On Oil Pipelines Company's Performance.

RAMI H. FOUAD

Department of Industrial Engineering, The University of Jordan, Amman, Jordan

Email: rhfouad@ju.edu.jo

ZEYAD M. HAMED

Business Administration Department, Al-Iraqia University, Baghdad, Iraq.

Email: zeyadkhawka@gmail.com

OMER A. ABDULWAHHAB

Statistics Department, Diyala University, Diyala, Iraq.

Abstract

Many researchers during the 21st century believe that both Total Quality Management (TQM) and Supply Chain Management (SCM) as a vital strategy for manufacturing, and services and its implications covered all small, medium and large scale enterprises. The purpose of this an analytical study was Measure the impact of Total Quality Management and Supply Chain Management practices on the Firm's Performance in Oil Pipelines Company (OPC) in Baghdad, Iraq. The study utilized primary Data was collected through questioners survey conducted during August 2015, questioners was distributed among the managers of Oil Pipelines Company in Iraq which is expected to has a best knowledge about the TQM & SCM and its impact on the firm's performance. This study supports the main hypothesis, that (TQMP) & (SCMP) positively impact the firm performance, and tested using Path Analysis performed by AMOS software package. The main finding proves that there is a strong relationship between TQM and SCM practices and dimensions on firm's performance. The main conclusion shows that (TQMP) & (SCMP) have positive and significant effect on Firm Performance, and this is clarified through the extrusive Firm Performance change whenever the TQM and the SCM Practices change .

Key Words: Quality Management (QM), Total Quality Management Practices (TQMP), Supply Chain Management Practices (SCMP), Firm Performance (FP), Oil Pipelines Company (OPC).

Introduction

Changes in dynamic business environment followed by intense competition require companies to thrive for existence and survival. Manufacturing companies efforts to win the competition not only directed towards quality, but seek ways to make the product reach the customer faster. The global marketplace is constantly changing, offers quality products is not enough, but nowadays a new challenge is focused on the timing and delivery place for the product. TQM and SCM become a prerequisite for success in the global marketplace. The higher the intensity of competition in a global context has prompted many organizations to implement SCM as a strategy to meet customer needs and satisfaction. In accordance with this opinion Gunasekaran and Mc Gaughey (2003); Gunasekaran et al. (2001), Mills et al, 2004, in the Lamey (1996), agreed that

TQM and SCM aim to achieve customer satisfaction. (Ardianto and Natsir, 2014, 1) SCM and TQM are more than simple tools or techniques. They are management Philosophies implemented as large-scale management systems that consist of various sets of practices. Both SCM and TQM aim to achieve customer satisfaction as the ultimate goal basically, customers require better product quality, faster delivery and lower cost. However, traditional QM focuses on specification-based performance. It emphasizes inspection to prevent delivering defect products to the customer (Vanichchinchai and Igel, 2011, 3407).

TQM is an approach for continuously improving the quality of goods and services delivered through the participation of individuals at all levels and functions of an organization. In the last two decades, numerous literatures have been devoted to analyzing the essences of TQM and how it should be implemented in organizations. Especially in the 1990s, several researches was performed to investigate the relationship between practices of TQM and organizational performance, (Malik et al., 2012, 20).

The importance of SCM practices attracted the attention of well reputed educational institutions around the globe as a business necessity due to the growing demand of the business world (Ballou, Gilbert & Mukherjee, 2000). Donlon (1996) stated SCM practices as practices that contain supplier partnership, outsourcing, cycle-time compression, process flow and information sharing. Otto and Kotzab (2003) labeled SCM practice as a distinct form of strategic partnership amongst sellers and suppliers, (Hussain et al., 2014, 352). This study will investigate the possible relationship between TQM practices and performance on one hand, and the relationship between SCM practices and performance on the other hand. Similar studies have been undertaken abroad but in Iraq there are very few studies been carried out related to TQM and SCM practices, but there is no study explores the impact of TQM and SCM practices on firm's performance.

Literature Review

The study focused on recent articles related to TQM and SCM practices, aiming to understands which practices are better for companies striving to achieve higher performance.

Total Quality Management Practices

During the last couple of decades, a number of studies demonstrate that TQM has benefited organizations through improving quality of products and services, thus offering superior quality products to their customers and enhancing firm's performance (Al-Ettayem, Rawan and Al-Zu'bi, Zu'bi, 2015, 79). In recent years, the level of awareness towards TQM has increased considerably due to intense global competition, increasing consumer consciousness of quality, rapid technology transfer, and trends towards achieving world class status. In response to these challenges and to facilitate the organizations in achieving higher quality levels, many companies are implementing TQM approach and quality initiatives for achieving sustainable competitive advantage and enhanced company performance, (Kheni and Ackon, 2015, 37).

TQM is a management strategy aimed at embedding awareness of quality in all organizational processes. Customer focus, process improvement and total involvement are the three fundamental principles of TQM. At organization level, however (House1998) suggests that empowerment could be achieved through employee selection and training programs designed to provide required technical skills together with a culture that encourage self-determination and collaboration instead of competition. Schlesinger et al., (1991a, b) found that employee's perception of service quality positively relates to job satisfaction, job commitment, and pride of workmanship. Related finding reported by (Tornow and Wiley, 1991) are employee attitudes-measured by feelings about reward for performance, work itself, management practices, satisfaction with the company, work group climate, and a culture for success are related to customer

satisfaction, (Siddiqui et al., 2012, 14). Leaching the literature, six important dimensions to measure the impact of TQM practices are selected as follows: (1) Top -management commitment, (2) customer focus, (3) Training and education; (4) Continuous improvement and innovation; (5) Supplier management; (6) Employee involvement. (Ardianto and Natsir, 2014, 2).

Supply Chain Management Practices

The challenge for firms today is not just to take up a SCM initiative but also to implement it successfully as the future shall look for competition among supply chains. (Ellaram and Cooper, 1990) defined that SCM is an integrative philosophy to manage the total flow of distribution channel from supplier to ultimate user, (Siddiqui et al., 2012, 13). SCM practices have been defined as the collection of activities undertaken in a firm to endorse effective management of its supply chain (Li et al., 2006). (Tan et al., 2002) include supply chain integration, information sharing, establishment of customer relations and quality in identification of SCM practices, (Konstantinou et al., 2010, 3). The latest evolution of SCM practices, which includes supplier partnership, outsourcing, continuous flow, and information technology sharing. The concept of SCM practices include agreed vision and goal, information sharing, cooperation, long term relationship and agreed supply chain leadership, The three main strategic imperatives that emerged in this century are low cost, high quality and improved responsiveness (both delivery time and flexibility of product delivery) (Siddiqui et al., 2012, 13). Refining the literature, six important dimensions to measure the impact of SCM practices are selected as follows: (1) Customer relationship; (2) Materials management, (3) Strategic supplier partnerships; (4) Information and communication Technologies; (5) Corporate culture; (6) Close the supplier partnership. (Ardianto and Natsir, 2014, 3).

(Talib et al., 2011) worked on a project that links the TQM practices to SCM practices as shown by Table (1) a set of 12 practices applicable to different organization were identify around 50 TQM practices and 90 SCM practices. The study revealed that implementation of these TQM and SCM practices in the organization will result in many desirable outcomes and benefits such as customer satisfaction; JIT delivery and reduced cycle time, (Frederico and Souza, 2014, 2).

Table (1) TQM & SCM Practices

| TQM practices | SCM practices |
|---------------------------------------|--|
| Top-management commitment | Customer relationship |
| Customer focus | Material management |
| Training and education | Strategic supplier partnership |
| Continuous improvement and innovation | Information and communication technologies |
| Supplier management | Corporate culture |
| Employee involvement. | Close supplier partnership |

Source: Frederico, Guilherme and Souza, Thamires, "Supply chain management practices: a classification based on the literature review", 2014, 2

Firm Performance

The concept of firm performance needs to be distinguished from the broader construct of organizational effectiveness. (Venkatraman and Ramanujan, 1986) offered an enlightening figure of three overlapping concentric circles with the largest representing organizational effectiveness. This broadest domain of organizational effectiveness includes the medium circle representing business performance, which includes the inner circle representing financial performance. Organizational effectiveness covers other aspects related to the functioning of the organization as absence of internal strain and faults, engagement in legitimate activities, resource acquisition and accomplishment of stated goals (Cameron, 1986a). Business performance, or firm performance as mentioned in this study, is a subset of organizational effectiveness

that covers operational and financial outcomes, (Santos and Brito, 2012, 98). Performance measurement is very essential for the proper management of any organization. Scholars have used different performance types such as financial, business, innovative, operational and quality performance while examining the relation between TQM practices and performance (Zehir et al., 2012). Literature on TQM practices incorporates diversified measures of performance such as Corporate Performance (Easton and Jarrell, 1994), Business Performance (Brah et al., 2000), Organizational Performance (Sterman et al., 1997), Plant Performance (Choi and Eboch, 1998), Operational Performance (Terziovski and Samson, 1999), Financial Performance (Agus and Hassan, 2000) and Stock Price Performance (Hendricks and Singhal, 2001). However, the existing studies do not provide much evidence on how exactly TQM practices affect performance, i.e. they do not allow comparison with the level of improvement of different dimensions of performance due to TQM adoption (Kumar et al., 2009). Therefore, to measure the impact of TQM practices on various levels of improvement. (Ul Hassan et al., 2012, 237). Koh et al., (2007) and Petrovic - Lazarevic et al., (2007) examines organizational performance from the perspective of SCM. (Koh et al., 2007) rightly stated that although organizational performance measured by financial and market criteria, the short-term goal of SCM is to improve productivity and reduce inventory and lead times while the long term goal of SCM is to increase market share and integration of the supply chain. Other researches suggested that there is a direct link between the SCM practices and the organizational performance, some studies emphasized on operational measures, while others stressed on financial measures. Numerous studies have been used different indicators to measure the firm performance such as the growth of sales, the growth of market share and the profitability perceived value, customer loyalty, market performance and financial performance product quality, customer service, competitive position, market share, (Sabry, 2015, 263). This study the researchers will apply six indicators to measure organizational performance namely: (1) lead time, (2) inventory turnover, (3) product rejection / return, (4) sales level, (5) cost reduction and (6) meeting customers ' requirement, (Ardianto and Natsir, 2014, 3)

The Oil Pipelines Company in Iraq is using the six indicators mentioned above for TQM, SCM and Firm Performance in evaluating performance level. This is the reason behind focusing only these indicators. Moreover, this paper is targeting the measure of the interrelation strength between all three variables namely TQM, SCM and Firm Performance.

Related Work

- 1- Ardianto, & Natsir, (2014), "Hybrid Strategies Study: Total Quality Management Practices and Supply Chain Management as a New Antecedent to Improve the Performance of Manufacturing in East Java".

The purpose of this study was to examine the practice of TQM and SCM in improving the performance of manufacturing firms in East Java .The research methodology is quantitative (positivist) will be used to answer the research question Survey method used in this study. The sampling method used in this study is the probability sampling. Sampling techniques in this study using simple random sampling technique by means of the drawing (lottery). Analysis using multivariate statistical method (Structural Equation Modeling).Research shows that strong commitment from leadership, customer- oriented company, carrying out education and training, leadership has the initiative to make continuous improvements and innovative, managing suppliers and led efforts to encourage employees to participate fully in the development of the required quality in the Practice run TQM has an important role to improve Organizational Performance. The results of this experiment indicate that the management of materials is good, Customer relationship and corporate culture in the running SCM Practice has an important role to improve Organizational Performance. The research proves that the practice of TQM and SCM Practices proved to be a hybrid Strategy in improving Organizational Performance. This study also answered a question that has always been a debate in the international discussions, that the practice of TQM and SCM practices are something different. Research shows that strong commitment from leadership, customer- oriented company, carrying

out education and training, leadership has the initiative to make continuous improvements and innovative, managing suppliers and led efforts to encourage employees to participate fully in the development of the required quality in the Practice run TQM has an important role to improve Organizational Performance. The results of this experiment indicate that the management of materials is good, proximity to customers and corporate culture in the running SCM Practice has an important role to improve Organizational Performance. The research proves that the practice of total quality management and practice supply chain management proved to be a hybrid Strategy in improving Organizational Performance. This study also answered a question that has always been a debate in the international discussions, that the practice of TQM and SCM practices are something different. (Ardianto, and Natsir, 2014, 1)

- 2- Ul Hassan, Masood and et al., (2014), "An Empirical Assessment of TQM Dimensions and Their Relationship with Firm Performance: Evidence from the Textile Sector of Pakistan".

This study examines the association of TQM practices i.e. leadership, employee fulfillment, continuous improvement, process management, learning, cooperation and customer focus with firm performance in the Textile Sector of Pakistan. The quantitative data were obtained through a questionnaire survey from 175 executives of Pakistan's Textile Sector. With the help of SPSS, data were analyzed by factor, reliability, and correlation and regression analysis. The results reveal the positive and significant effects of TQM practices on firm performance. The study generates valuable findings for quality management and top management executives by highlighting the aspects of TQM which predicts operational efficiency, product & service quality, employee & customer satisfaction, public responsibility and financial performance. Hence, organizations may embrace the practice of TQM in search of business excellence. (Ul Hassan et al., 2014, 696).

- 3- Hussain, Wajahat and et al., (2014), "The Effects of Supply Chain Management Practices (Strategic Suppliers Partnership, Information Sharing, and Postponement) On Organizational Performance in Consumer Goods Manufacturing Industry of Pakistan"

This research conceptualizes the effects of SCM practices (SSP, IS, and POS) and tests the relationships between SCM practices and OP in consumer goods manufacturing industry at Pakistan. A questionnaire of SCM practices as a multi-dimensional construct that encompasses upstream and downstream sides of supply chain (Li et al, 2006) was used to collect the data of 331 managers and employees from 83 consumer goods manufacturing companies. The supply chain practices at Pakistani environment are not that much practiced as the results depict that SSP is positively impacting OP while level of IS and POS are negatively correlated to SCM practices due to cultural and environmental circumstances and nature of the practices. (Gibson, Mentzer, & Cook, 2005) brightened the fact that SCM is in its initial/ early phases of progression. The expertise of, why and how SCM practices touches firms performance, which extents are predominantly/especially important is still incomplete. The above reasons also confirm that the supply chain practices are in its inception stage at Pakistan. (Hussain et al., 2014, 351)

Research Methodology

Research Aim & Problem

The aim of the present work is to understand and analyze TQM practices, SCM practices and their impact on (FP) firm performance in Oil Pipelines Company, in Baghdad, Iraq. This leads to the following research questions of this study:

- 1- Is there a relationship between TQM Practices, SCM Practices and Firm Performance in Oil Pipelines Company in Iraq?

- 2- Is there any impact of TQM practices on Firm Performance in Oil Pipelines Company in Iraq?
- 3- Is there any impact of SCM practices on Firm Performance in Oil Pipelines Company in Iraq?

Research Framework and Hypotheses

The figure (1) below is the research framework developed in this research. The framework shows that TQM practices and SCM practices can effect on the firm performance. The research framework could be seen as follows.

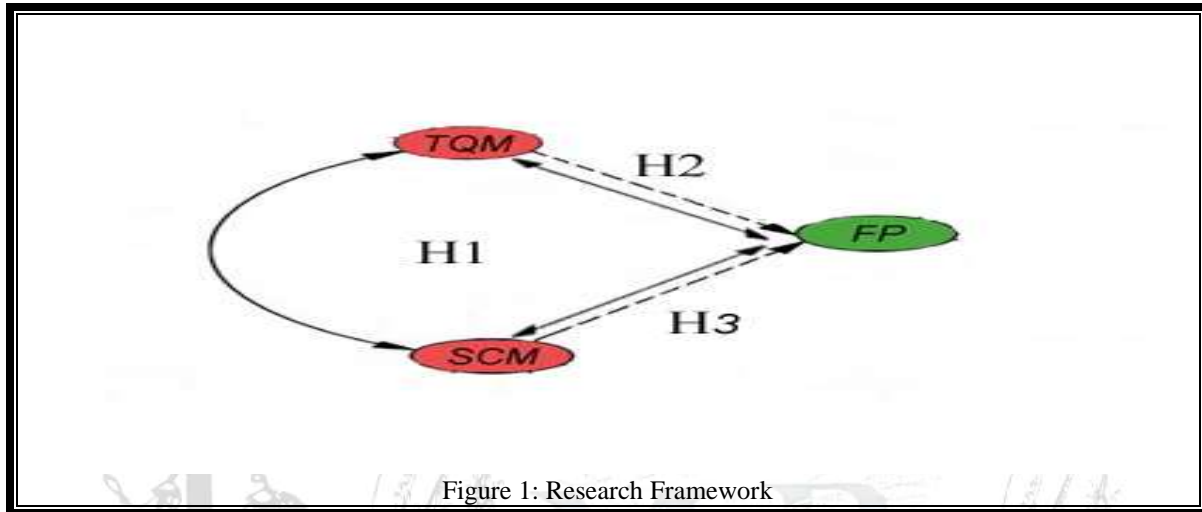


Figure 1: Research Framework

Research framework above generates three hypotheses will be tested in the study.

Therefore, the hypotheses could be formulated as follows:

H1: There is a significant correlation between (TQM) Practices, (SCM) Practices and the (FP) Firm Performance.

H2: There is a significant impact of (TQM) Practices on (FP) Firm Performance.

H3: There is a significant impact of (SCM) Practices on (FP) Firm Performance.

Research Design

The research approach is quantitative (positivist) will be used to answer the research question. Survey method used in this study. Data were collected through Questionnaire. Using a Likert scale of (1-5) as an approach to facilitate the measurement of perception Relationship latent variables and indicators are reflective. Independent variables reflected TQM six indicators, namely (1)Top-Management commitment, (2)customer focus,(3)Training and education; (4)Continuous improvement and innovation; (5)Supplier management, (6)Employee involvement and SCM practices reflected six indicators : (1) Customer relationship (2)Materials management, (3)Strategic supplier partnerships; (4)Information and communication Technologies; (5)Corporate culture; (6)Close the supplier partnership and performance variables. While the dependent variable, is the firm performance and also includes six indicators, namely (1)Lead time, (2)Inventory turnover, (3)Product rejection / return; (4)Sales level, (5)Cost reduction (6)meeting customers' requirements.

Analytical Framework of Research

Questionnaire surveys were distributed to the 60 staff of Oil Pipelines Company. Only 50 valid questionnaire surveys were utilized for analysis. The target sample is managers of Departments heads, division's managers, deputy managers, managerial offices directors and staff. The questionnaire distribution process took one week then followed by data validation and analysis on SPSS.

Table (2): The Demographic variables

| Position | | | | | |
|----------------|-----------------------------|-----------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Department Manager | 9 | 18.0 | 18.0 | 18.0 |
| | Division official | 14 | 28.0 | 28.0 | 46.0 |
| | Division official Assistant | 8 | 16.0 | 16.0 | 62.0 |
| | Unit official | 7 | 14.0 | 14.0 | 76.0 |
| | Employee | 12 | 24.0 | 24.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |
| Age | | | | | |
| Valid | -24 | 7 | 14.0 | 14.0 | 14.0 |
| | -30 | 5 | 10.0 | 10.0 | 24.0 |
| | -36 | 11 | 22.0 | 22.0 | 46.0 |
| | -42 | 15 | 30.0 | 30.0 | 76.0 |
| | 48 and more | 12 | 24.0 | 24.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |
| Sex | | | | | |
| Valid | male | 44 | 88.0 | 88.0 | 88.0 |
| | female | 6 | 12.0 | 12.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |
| Study | | | | | |
| Valid | B.Sc. in Engineering | 38 | 76.0 | 76.0 | 76.0 |
| | B.Sc. | 12 | 24.0 | 24.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |
| Service Period | | | | | |
| Valid | less than 20 years | 8 | 16.0 | 16.0 | 16.0 |
| | 10-5 | 6 | 12.0 | 12.0 | 28.0 |
| | 15-11 | 13 | 26.0 | 26.0 | 54.0 |
| | 20-16 | 14 | 28.0 | 28.0 | 82.0 |
| | 20 years and more | 9 | 18.0 | 18.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |

Table (2) shows that most of the respondents are the Division officials with 28%. Most of the respondents are within the age category of (42-48 years), gender is (male), BSc holders and experience between (16-20) years.

Description and Diagnosis of Research Variables

Table (3): The averages and standard deviations of the responses of the research sample

| Descriptive Statistics | | | |
|--|-----------|---------------|----------------|
| | N | Mean | Std. Deviation |
| X11:Top-management commitment | 50 | 3.8400 | 0.64326 |
| X12:Customer focus | 50 | 3.7667 | 0.59190 |
| X13:Training and education | 50 | 4.1867 | 0.49560 |
| X14:Continuous improvement and Innovation on product | 50 | 3.6933 | 0.59796 |
| X15:Supplier management | 50 | 3.7933 | 0.57099 |
| X16:Employee involvement | 50 | 3.9867 | 0.69321 |
| TQM Practices | 50 | 3.8778 | 0.46940 |
| X21:Customer Relationship | 50 | 3.9200 | 0.51534 |
| X22:Materials Management | 50 | 3.9733 | 0.55468 |
| X23:Strategic Supplier Partnership | 50 | 3.7267 | 0.76396 |
| X24:Information and Communication Technologies | 50 | 4.0933 | 0.72230 |
| X25:Corporate culture | 50 | 3.6733 | 0.88957 |
| X26:Close supplier partnership | 50 | 3.7267 | 0.57020 |
| SCM Practices | 50 | 3.8522 | 0.48075 |
| Y11:Lead time | 50 | 3.4733 | 0.57574 |
| Y12:Inventory turnover | 50 | 3.6600 | 0.56540 |
| Y13:Product rejection/return | 50 | 3.5267 | 0.53913 |
| Y14:Sales level | 50 | 3.5600 | 0.60774 |
| Y15:Cost reduction | 50 | 3.8933 | 0.49688 |
| Y16:Meeting customers' requirement | 50 | 3.9267 | 0.49161 |
| Firm Performance | 50 | 3.6733 | 0.42955 |

Table (3) clarifies that the averages and standard deviations of the responses to research sample. It was found that the (Firm Performance got higher Homogeneity than TQM Practices & SCM Practices with standard deviation 0.43 and average 3.7.

Testing Hypotheses of Correlation

The significant of correlation between the TQM Practices & SCM Practices and the Firm Performance will be tested based upon null hypothesis that say: there is no correlation between TQM Practices & SCM Practices and the Firm Performance, against the alternative hypothesis that say :there is a correlation between TQM Practices SCM Practices and the Firm Performance.

Table (4): Correlation

| Correlations | | | | |
|--|---------------------|---------------|---------------|------------------|
| | | TQM Practices | SCM Practices | Firm Performance |
| TQM Practices | Pearson Correlation | 1 | .835** | .822** |
| | Sig. (2-tailed) | | .000 | .000 |
| | N | 50 | 50 | 50 |
| SCM Practices | Pearson Correlation | .835** | 1 | .860** |
| | Sig. (2-tailed) | .000 | | .000 |
| | N | 50 | 50 | 50 |
| Firm Performance | Pearson Correlation | .822** | .860** | 1 |
| | Sig. (2-tailed) | .000 | .000 | |
| | N | 50 | 50 | 50 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | |

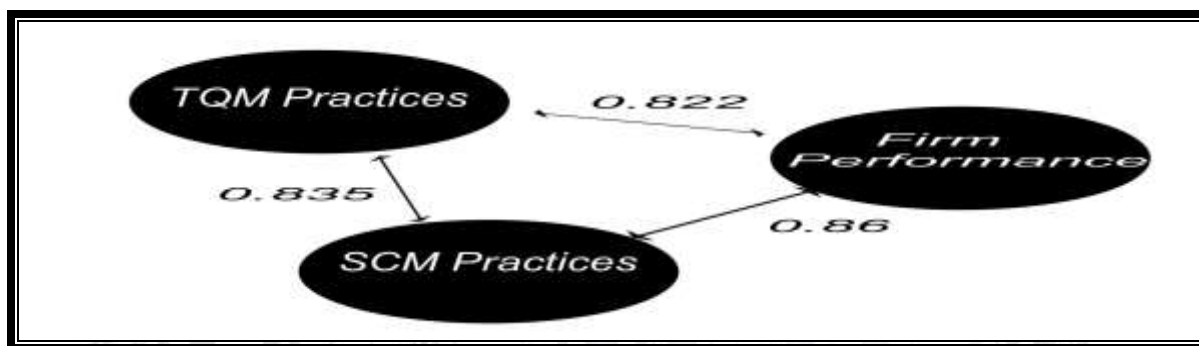


Figure 2: Relationships of variables by correlation

Table (4) illustrates the strength of correlation between SCM Practices & Firm Performance is 0.86. This correlation is considered strong and the power of correlation between Firm Performance and TQM Practices is 0.82 as well. as Shows in figure (2) above.

Testing Hypotheses of a Significant Impact

The significant of correlation between the impact of the TQM Practices & SCM Practices on the Firm Performance will be tested based upon null hypothesis: there is no impact of TQM Practices & SCM Practices on the Firm Performance, against the alternative hypothesis that say: there is an impact of TQM Practices & SCM Practices on the Firm Performance.

Table (5): Testing a significant impact

| ANOVA ^b | | | | | | |
|--------------------------------------|----------------|-------|-------------|-------|--------|-------------------|
| Model | Sum of Squares | df. | Mean Square | F | Sig. | |
| 1 | Regression | 7.006 | 2 | 3.503 | 80.917 | .000 ^a |
| | Residual | 2.035 | 47 | .043 | | |
| | Total | 9.041 | 49 | | | |
| a. Predictors: (Constant), TQM , SCM | | | | | | |
| b. Dependent Variable: Firm Performa | | | | | | |

Table (5) describes the value of significance test is equal to (0.000), if value is compared with probability of error at 0.05, found it less than (0.05). Therefore the null hypothesis will be rejected and the alternative hypothesis is accepted. In another words there is impact of TQM Practices SCM Practices on the Firm Performance.

Table (6): Model Summary

| Model Summary | | | | |
|-------------------------------------|-------------------|----------|-------------------|----------------------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .880 ^a | .775 | .765 | .20807 |
| a. Predictors: (Constant) TQM , SCM | | | | |

Table (6) shows the value of R2 equals (0.775). This means that the TQM Practices &SCM Practices may explains the percentage of (77.5%) of the changes in Firm Performance.

Table (7): Coefficients Model

| Coefficients ^a | | | | | | |
|--------------------------------------|---------------|-----------------------------|------------|---------------------------|-------|------|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .482 | .255 | | 1.893 | .065 |
| | TQM Practices | .316 | .115 | .345 | 2.747 | .009 |
| | SCM Practices | .510 | .112 | .571 | 4.542 | .000 |
| Dependent Variable: Firm Performance | | | | | | |

Table (7) clarifies that the coefficients of TQM & SCM is significant because it is less than 0.05. This means that the TQM & SCM has a tangible effect on Firm Performance.

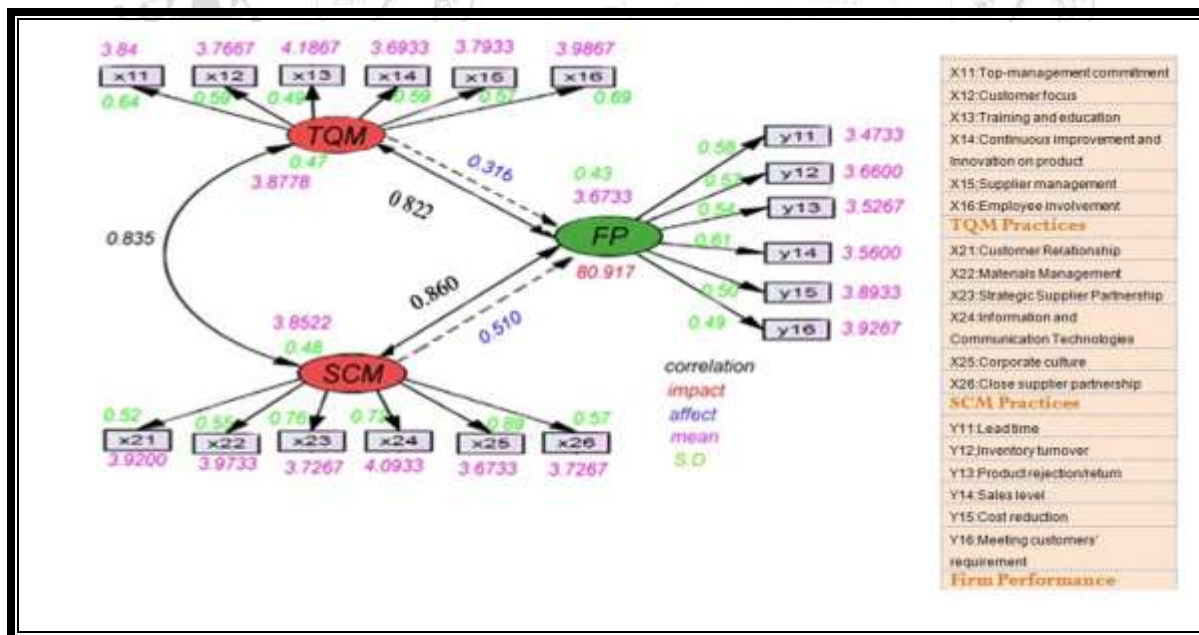


Figure 3: Relationships of variables presented in the Conceptual Model

The values shown in Figure (3) prove the relations between TQM & SCM and FP.

Testing hypotheses of a significant Homogeneity Average

To test the significant of differences between TQM Practices, SCM Practices and Firm Performance in this samples; one way ANOVA is used. Table depends on null hypothesis: there is no different between Practices, SCM Practices and Firm Performance in these samples. The opposite alternative hypothesis that says: there is a different between Practices, SCM Practices and Firm Performance in these samples.

Table (8) compare of means

| one way ANOVA (position) | | | | | | |
|---------------------------|----------------|----------------|----|-------------|-------|-------|
| | | Sum of Squares | df | Mean Square | F | Sig. |
| TQM Practices | Between Groups | 1.105 | 4 | .276 | 1.282 | .291 |
| | Within Groups | 9.691 | 45 | .215 | | |
| | Total | 10.796 | 49 | | | |
| SCM Practices | Between Groups | 2.562 | 4 | .641 | 3.290 | .019 |
| | Within Groups | 8.763 | 45 | .195 | | |
| | Total | 11.325 | 49 | | | |
| Firm Performance | Between Groups | 2.509 | 4 | .627 | 4.322 | .005 |
| | Within Groups | 6.532 | 45 | .145 | | |
| | Total | 9.041 | 49 | | | |
| one way ANOVA (age) | | | | | | |
| TQM Practices | Between Groups | 1.556 | 4 | 389. | 1.894 | 0.128 |
| | Within Groups | 9.241 | 45 | 205. | | |
| | Total | 10.796 | 49 | | | |
| SCM Practices | Between Groups | 1.860 | 4 | 465. | 2.211 | 0.083 |
| | Within Groups | 9.464 | 45 | 210. | | |
| | Total | 11.325 | 49 | | | |
| Firm Performance | Between Groups | 3.000 | 4 | 750. | 5.588 | 0.001 |
| | Within Groups | 6.041 | 45 | 134. | | |
| | Total | 9.041 | 49 | | | |
| one way ANOVA (sex) | | | | | | |
| TQM Practices | Between Groups | 1.450 | 1 | 1.450 | 7.445 | 0.009 |
| | Within Groups | 9.347 | 48 | 195. | | |
| | Total | 10.796 | 49 | | | |
| SCM Practices | Between Groups | 600. | 1 | 600. | 2.686 | 0.108 |
| | Within Groups | 10.725 | 48 | 223. | | |
| | Total | 11.325 | 49 | | | |
| Firm Performance | Between Groups | 1.388 | 1 | 1.388 | 8.702 | 0.005 |
| | Within Groups | 7.653 | 48 | 159. | | |
| | Total | 9.041 | 49 | | | |
| one way ANOV (study) | | | | | | |
| TQM Practices | Between Groups | 1.369 | 1 | 1.369 | 6.970 | 0.011 |
| | Within Groups | 9.427 | 48 | 196. | | |
| | Total | 10.796 | 49 | | | |
| SCM | Between Groups | 165. | 1 | 165. | 710. | 0.404 |

| | | | | | | |
|--------------------------------------|----------------|----------------|----|-------------|--------|-------|
| Practices | Within Groups | 11.160 | 48 | 232. | | |
| | Total | 11.325 | 49 | | | |
| Firm Performance | Between Groups | 425. | 1 | 425. | 2.368 | 0.130 |
| | Within Groups | 8.616 | 48 | 179. | | |
| | Total | 9.041 | 49 | | | |
| one way ANOV (service Period) | | | | | | |
| | | Sum of Squares | df | Mean Square | F | Sig. |
| TQM Practices | Between Groups | 5.264 | 4 | 1.316 | 10.706 | .000 |
| | Within Groups | 5.532 | 45 | .123 | | |
| | Total | 10.796 | 49 | | | |
| SCM Practices | Between Groups | 5.725 | 4 | 1.431 | 11.501 | .000 |
| | Within Groups | 5.600 | 45 | .124 | | |
| | Total | 11.325 | 49 | | | |
| Firm Performance | Between Groups | 5.095 | 4 | 1.274 | 14.527 | .000 |
| | Within Groups | 3.946 | 45 | .088 | | |
| | Total | 9.041 | 49 | | | |

Table (8) clarifies that there are differences in values for TQM of (position , age , sex) and no differences in (study , service Period) , concerning SCM there are differences in values for SCM of (age , sex , study) and no differences in (position, service Period, and for Firm Performance there is a difference in values of (study) and no differences in other demographic factors.

Conclusions

The actual study focuses on the main dimensions of TQM practices, SCM practices and firm performance. There are many conclusions drawn out of this research as follows:

- It is quite clear from questionnaire response that the largest percentage of the Division official are aged is (42-48), holding B.Sc. in engineering, and have experience of not less than 16 years in their field. This explains the high accuracy in answering the related questions.
- Training and education has the minimum standard deviation which is 0.49 with a mean of 4.2. This proves the homogeneity in the answers in TQM, and in SCM. The Customer Relationship came less standard deviation of 0.51 with a mean of 3.9, and finally the Firm Performance has less standard deviation which is 0.49 with a mean of 3.9. Again this proves the homogeneity in the answers.
- A strong positive correlation between the SCM Practices and the Firm Performance of 0.866. The correlation between the TQM Practices and Firm Performance is 0.822 which is considered positive as well.
- The existence of the impact of each of the TQM Practices and the SCM Practices on Firm Performance. This confirms that the Firm Performance will change whenever the TQM Practices and the SCM Practices changed in a positive correlation.
- The value of R^2 equal to (0.775) which means that the TQM Practices & SCM Practices may influence the value of (77.5%) represents the changes in Firm Performance.
- The coefficients of TQM & SCM are significant because a value less than 0.05 means the TQM & SCM has an effect on Firm's Performance.
- The existence of differences in the answers to TQM Practices & SCM Practices questions in terms of sex and age and the absence of differences in the answers to service period in TQM Practices & SCM Practices.

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