International Journal of Independent Research and Studies - IJIRS
ISSN: 2226-4817
Vol. 1, No.2 (April, 2012) 80-88
Indexing and Abstracting: Ulrich's - Global Serials Directory

The Implementation of Total Quality Management in King Saud University

Muteb Rabh Alsuhaimi

Lecturer
AlJouf University, Saudi Arabia
Email: muteb1977@hotmail.com

Abstract

The purpose of this study is to explore the implementation of total quality management and its practices. This study investigates the most significant variables of the quality system. The study is quantitative in nature. The data was collected from 125 faculty members of the faculty of education, King Saud University. Inferential statistics analysis was used to interpret the data. The mean's analysis and ANOVA showed that the productivity of (TQM or ERM) old adopters is more than new adopters. Results support the hypothesis presented in the study. The correlation of technological resources management and strategic quality is significantly high with ERM and TQM practices. The findings showed that the implementation of TQM and ERM practices enhance the value of the faculty. Moreover, study found a strong correlation between ERM practices and productivity, and technological and material resource management. This study suggested that companies who have implemented TQM and ERM practices for a longer period may perform better than their counterparts.

Keywords: TQM, ERM, technology, resource management, productivity.

1.0. Introduction

Total Quality Management (TQM) has been the subject of many studies in recent years. The TQM wave is not restricted merely to the industry but has seeped into all sectors. It has been a central element in many efforts directed towards organizational change. It requires firms to coordinate a wide range of behavioral, tacit, intangible resources and its dissemination stands as both support and a challenge to top management. Moreover, some claim that the successful implementation of TQM could generate improved products and services, reduced costs, more satisfied customers and employees, and improved financial performance (Walton, 1986). Many research questions pose a significant challenge to the researchers. Integrating theory and research findings into prescriptive recommendations is a difficult task that requires the cross-fertilization of ideas.

The objectives of this research are to explore the implementation of TQM in the Faculty of Education in King Saud University and its relationship. Giving a picture of the present situation to investigate the most significant variables with respect to the application of the quality system test of some hypotheses is required. For this purpose a set of research questions has been formulated aligned with the main problem statement the questions are:

1. Does TQM increase the productivity of financial performance?
2. Does the manager have the knowledge and ability to use ERP to increase the productivity?
3. Does the manager have good understanding of TQM and ERM in order to increase the productivity?

2. Literature Review

Most of the companies who have implemented TQM are large multinational corporations (MNCs) such as IBM, British Airways, Hewlett-Packard, Motorola, etc (Yusof & Aspinwall, 2000). Despite TQM's perceived importance, examination of the published material reveals that little attention has been devoted to examining the TQM implementation process (Ghobadian & Gallear, 2001). Improving quality is stimulated by systematic monitoring and feedback of data, concrete quality improvement projects. different instruments have been developed by researchers and institutions like Malcolm Baldridge National Quality Award (MBNQA), Tata Business Excellence Model (TBEM) among the Tata Group companies in India, based on the American Model for Business Excellence (MBNQA), the European Foundation for Quality Management (EFQM), the Japanese Model, the Deming Prize by Japanese Union of Scientist and Engineers (JUSE) and the Confederation of Indian Industry and Exim Bank (CII- Exim) Business Excellence Award in India, based on EFQM (Jha & Joshi, 2007).

Several studies on TQM had indicated that TQM implementation would bring improvement to a company's productivity. Few researchers who had tried-investigating the relationship between TQM and bottom line results are failed to prove significant relationships (Davis, 1997). The researcher realized one of the major shortcomings of these studies is the failure to relate the economic relationship over a certain period of time. Some of these researchers had only investigated the relationship between the lengths of implementation of TQM with current financial performance of the companies surveyed. A central notion in TQM training and literature concerns the need to adopt longer time horizons, and the expectation that TQM programmers will not produce short-term bottom-line results (Deming 1986). Most TQM advocates agree that TQM cannot produce consistent performance advantages until after the third year of implementation, at which point most organizations have had sufficient time to adapt, assimilate, and stabilize under the new approach (Schmidt & Finnegan 1992).

It appears that examination and discussion of TQM implementation is dominated by single case evidence (Williams, 1993). TQM generally quantifiable quality tools and techniques, such as total quality control, just-in-time production, six-sigma and zero defect performance measurement, and task-based team working (Ali et al., 2006). Shea & Gobeli (1995) presented some motives of implementing TQM:

1. Promotion of growth, it is easier to convince the company's bankers to invest in them if there is evidence that the organization is running well.
2. Management belief in the principle of customer satisfaction and employee empowerment which reflects the management style supporting TQM.
3. Changing customer expectations even for organizations seen to be doing well.
4. Making work more enjoyable.
5. To improve poor company performance if the company is not doing well

Mann & Kehoe (2001) examined the process of TQM implementation in 21 UK based organizations with at least two years experience of TQM and concluded that the implementation processes used were largely diverse and there appeared to be no one dominant approach, and they identified six phases: awareness; education and training; consolidation; planning, problem identification and problem solving; implementation of quality improvement plans; and assessment (Ghobadian & Gallear, 2001). According to Raj (2000), TQM interventions or activities must be guided by four change principles, namely work processes, variability, analysis, and continuous improvement. Product design and production processes must be improved; variance must be controlled to ensure high quality; data must be systematically collected and analyzed in a problem-solving cycle; and commitment made to continuous learning by the employees about their work (Jha & Joshi, 2007).

The ERM system is a decision-making tool, which makes integrated financial/production trade-off planning and optimization in the supply chain management. It is particularly different to the predecessors planning systems (MRP II, MRP II + DCS, MES, or "type ERMs"). One of the most important features of ERM is that not only production is scheduled and optimized. Cash inflows/outflows, business purchase/sales operations, commercial credits, bank loans, inflows/outflows of cash during R&D and many other activities as maintenance preventive plans, payroll, overhead costs, etc. can be planned, scheduled, taken into account during the trade-off overall optimization and represented graphically in interactive electronic Gantt charts. The new technology is supported by the creation of an original type of flexible recipe. A new calculation structure based on the use of certain directed graphs called event-operation networks (EON). It is also supported by new objective functions transformed from performance measures of system to economic measures of system (Shaikh & Khan, 2011), as hourly contributions to profit, and the simulation of the fictitious processing units. The consideration of financial and production planning as an entire unbroken process appears to be the key that closes the loop of the business-operation regulation cycle (Ghouri et al., 2012). In practice, the plan ignores the financial objectives since it is a result of the production delivery dates, firstly decided. The difficulty lies in the fact that improving cash planning affects production scheduling by altering payments for final products and billing for raw materials (Badell & Puigjaner, 1998).

On the other hand, the high-level staff lacks time to frequently prepare or update short-term cash plans. The financial decisions relative to production plans many times are not formulated with a precise knowledge of the real economic resources available and the consequences that these decisions could provoke (Khan et al., 2011). However, this inconvenience can be avoided by applying scheduling viewpoints not only to equipment, resources and utilities, but also to cash-flow balances. Financial and production viewpoints of the production scenario can be included in a single optimization objective function.

3. Research Methodology

This section describes and explains the sampling process, sample design, research instruments and statistical methods used in this study to test the developed hypotheses. The methodology of this study employs extensive statistical procedures in order to maximize the validity and scope of the findings. One hundred twenty five faculty members were selected on the basis of stratified random sampling .The sample size was considered sufficient and represented. The proportion of the sample size to the population was sufficient for the researcher to make statistical inferences about the sample.

The instrument to measure critical factors of TQM and ERP was adapted from Deming (1986) and Feigenbaum (1991). The process used by Saraph et al. (1989) in their study was to develop measures of the critical factors of quality management which was based on generally accepted principles of instrument design. Powell (1995), on the other hand, examined TQM as a potential source of sustainable competitive advantage, reviews existing empirical evidence, and reports findings from a new empirical study of TQM performance consequences.

The data for this study were collected through a structured questionnaire. Based on the responses several modifications were made to the questionnaire. Some poor performing items were deleted as their low correlation with other items suggested potential problems of construct validity.

The data obtained from the survey questionnaire were analyzed by using SPSS. For each TQM and ERM, the actual level of constructs is represented by the median of measurement item ratings for the variables since the data for these constructs were considered ordinal (Zikmund, 1991). Results of the study were obtained by performing statistical tests including reliability test, analysis of variance, correlation, and regression analysis.

4. Reliability of the construct

In this section, reliability and detailed item analyses were used to refine the measures of scales of each construct. The measurement items were evaluated and, if shown to detract from the reliability of the instrument, were eliminated. The internal consistency of a set of measurement items refers to the degree to which items in the set are homogeneous. Internal consistency can be estimated using a reliability coefficient such as Cronbach's alpha (Sekaran, 2005). Cronbach's alpha is computed for a scale based on a given set of items. It can also be calculated for any subset of the items. It is, therefore, possible to identify the subset that has the highest reliability coefficient. The scale constructed from that subset is likely to be the best with regard to internal consistency (Saraph et al. 1989).

The reliability test was conducted to determine the internal consistency of the measurements. The analysis revealed that maximization of the alpha coefficient would require eliminating of some items from each scale. Typically, the coefficients usually fall within a range of 0.70 to 0.90 for narrow constructs such as those defined here, and 0.55 to 0.70 for moderately broad constructs (Van deVen & Ferry 1979). The alpha coefficients for the all TQM scales ranged between 0.7801 and 0.9229. This indicated that some items are more reliable than others. However, all scales will be used for further analysis in this study. The critical variables and summary of statistics of the TQM practices construct are summarized in table 1.

The reliability score of ERM ranged between 0.8185 and 0.9143 presented in table 3. Hence after the reliability analysis four variables were considered for further analysis in the study. The critical variables and summary of statistics of the ERP is presented in table 4.

5. Findings

H_1 a: Old TQM adopters have significantly higher total productivity than short-term TQM adopters.

T- Test suggests that there are statistical differences for productivity. According to Levine's test score, presented in table 6, the second assumption is not valid which means equal variances are not assumed. The test was significance for t = 5.11, P-value = 0.000. It can be noted that from Table. 5, the old adopters have higher mean values (6.19) which mean old adopters have higher productivity. This conclusion supports our hypothesis. ANOVA was also performed to determine whether the group means are equal. In fact, ANOVA and T-test leads to the same results when we were comparing two groups. However, for ANOVA analysis one should check the same assumptions of the t-test. Tables 7 showed the results of ANOVA for Productivity. The analysis of variance (ANOVA) support the stated hypothesis since the F-value between productivity and the years of TQM implementation is significant (significant F = 30.616 and p-value = 0.000).

The results presented in table 8 provide general support for our notion regarding the relationships between the length of TQM implementation and quality management practices. These results clearly showed that old TQM adopters have higher means in all critical variables of TQM practices. Moreover, there are statistical significant mean differences in four varieties of total quality management practices. Lastly, there are no significant differences between the two groups for design quality, strategic quality planning and continuous improvement. Hence, the tests fail to show significant statistical evidence to support our proposition that old adopters have higher level of practices for these practices.

H_1 a: Old ERM adopters have significantly higher total productivity than short-term ERM adopters.

T- Test suggests that there are statistical differences for productivity. According to Levine's test score, presented in table 10 the second assumption is invalid which means equal variance is not assumed. The test was significance with t = 5.266, P-value = 0.000 in table 9 (less than 0.001). It can be noted that from table 9, the old adopters have higher meant values (5.92) which mean old adopters have higher productivity. This conclusion supports our hypothesis. Moreover, we perform ANOVA analysis the results of this analysis in table 11. The analysis of variance (ANOVA) supports the stated hypothesis since the F-value between productivity and the years of ERM implementation is significant (significant F = 30.616 and p-value = 0.000 (less than 0.001)). The same conclusion can be obtain for the total assets with F-value 30.892 and P-value = 0.000 (less than 0.001). The results presented in table 12 and table 13 provides general support for our notion regarding the relationships between the length of ERM implementation and productivity. These results show that old ERM adopters have higher means in all critical variables of ERM practices. Moreover, there are statistically significant mean differences in HRM and MRM. Hence, the tests show significant statistical evidence to support the proposition that new adopters have higher level of practices for these practices. Lastly, there are no significant differences between the two groups for information resources management and technological resources management. Hence, the tests fail to show significant statistical evidence to support our proposition that old adopters have higher level of practices for these practices.

The correlation between measures of TQM and ERM practices and the faculty performance indicators offers evidence of criterion-related relationships. This study shows that TQM practices and ERM practices can enhance the value of faculty. The correlation analysis indicated that TRM and strategic quality planning are highly correlated with all of ERM practices and TQM practices. Further, TQM practices are correlated significantly with productivity. The correlation analysis showed that customer focus, design quality and people participant have the stronger correlation's with productivity. Lastly, correlation indicated that ERM practices are correlated significantly with productivity. The correlation analysis further showed that technological and material resource management has the stronger correlation with productivity.

6. Conclusion

Quality organizations maintain the process for continuous improvement. Choice and decisions in organizations are influenced by past history, values and environment. It helps in determining organization's priorities regarding current actions or plan towards continuous improvement. The study determines the relationship among TQM practices, ERM practices, productivity, and performance. The results posited that these practices should be implemented in educational institution to increase its faculty performance and institution progress. Policy makers should look after the possibility of practices TQM and ERM. It may influence on the achievement of the faculty, which in return increase the level of education and research in university, and in the country as a whole.

References

Ali, N. A., Zairi, M. & Mahat, F. (2006). *Quality HR-TQM Model in Service Context*, Staff Paper.

Badell, M. & Puigjaner, L. (1998). A New Conceptual Approach for Enterprise Resource Management Systems, *FOCAPO AIChE Symposium Series No.320.* (Eds. Joseph F. Pekny and Gary E. Blau), American Institute of Chemical Engineers (AIChE), New York, 94, pp 217- 223.

Davis, T R V. (1997). Breakdowns in Total Quality Management: An Analysis with Recommendations, *International Journal of Management*, 14(1), pp. 13-22.

Deming, W. E. (1986). *Out of the Crisis*. USA, Massachusetts.

Feigenbaum, A. V. (1991). *Total Quality Control*, New York, McGraw-Hill, Inc.

Ghobadian, A. & Gallear, D. (2001). TQM Implementation: An Empirical Examination and Proposed Generic Model, *Omega – International Journal of Management Science,* 29(4), pp. 343-359.

Ghouri, A. M, Saleem, F and Malik, A. (2012). Business Owners' Preferences in Marketing Practices and their Impact on Firm Performance. *International Journal of Economics Business and Management Studies*, 1(1), pp. 30-35.

Grol, R. (2000). Between Evidence-Based Practice and Total Quality Management: The Implementation of Cost Effective Care, *International Journal for Quality in Health Care*, 12(4), pp. 297-304.

Jha, V. S. & Joshi, H. (2007). Relevance of Total Quality Management (TQM) or Business Excellence Strategy Implementation for Enterprise Resource Planning (ERP)-A Conceptual Study, *12th International Conference on Information Quality (ICIQ-2007)*, MIT, Cambridge, Massachusetts, USA, Nov 9-11.

Khan, N. R., Taha, S. M. and Ghouri, A. M. (2011). Bridging the Gap through E-Recruitment: Evidences from Private Employment Sector in Karachi. *Indian Journal of Commerce & Management Studies*, 2(6), p. 40-48.

Mann, R. S. & Kehoe, D. F. (1994). The Implementation of Total Quality Management, *Quality World Technical Supplement*, March, pp. 57-66.

Powell, T. C. (1995). Total Quality Management as Competitive Advantage: A Review and Empirical Study, *Strategic Management Journal*, 16, pp. 15-37.

Raj, S. (2000) A Look at Total Quality Management's (TQM) Effectiveness, *Proceedings of the Eleventh Annual Conference of the Production and Operations Management Society,* POM-2000, April 1-4, 2000, San Antonio, TX, USA

Saraph, J. V., Benson, G. & Schroeder, R. G., (1989), An Instrument for Measuring the Critical Factors of Fuality Management, *Decision Sciences*, 20, pp. 810-829.

Schmidt, W. H. & Finnigan, J. P. (1992), The race without a Finish Line. San Francisco, Jossey Bass.

Sekaran, U. (2005), *Research Methods for Business – A Skill Building Approach* (4th edition). John Wiley & Sons, New York

Shaikh, U. A. A., Khan, N. R. (2011). Impact of Service Quality on Customer Satisfaction: Evidences from the Restaurant Industry in Pakistan. *Management & Marketing*, 9(2), 343-355.

Shea, J. & Gobeli, D. (1995). TQM: The Experiences of Ten Small Businesses, *Business Horizons*, January/February, pp. 71-77.

Williams, M. (1993). Cottoning on to the Need for Change, Total Quality Management, 5(1), pp. 35-38.

Walton, M. (1986). *The Deming Management Method*. New York, NY, Perigee.

Yusof, S. M. & Aspinwall, E. (2000). TQM Implementation Issues: Review and Case Study, *International Journal of Operations & Production Management*, 20(6), pp. 634-655.

Zikmund, W. (1991). *Business Research Methods*, The Dryden Press, Chicago,

Table 1: Reliability Results of TQM

Critical variables	Original items	Items Deleted	Cranach's Alpha
Customer Focus	5	None	0.8412
Leadership	7	None	0.7801
Design Quality	4	None	0.8650
Strategic Quality Planning	4	None	0.9095
People participation	6	None	0.8812
Fact Based management	5	None	0.9077
Continuous Improvement	5	None	0.9229

Table 2: Descriptive Statistics of TQM practices

Variable	Mean	Median	SD
Customer Focus	5.7040	6.0000	0.9393
Leadership	5.4594	5.5000	0.8382
Design Quality	5.1180	5.5000	1.0821
Strategic Quality Planning	5.3180	5.5000	1.1037
People participation	5.0800	5.0000	1.1095
Fact Based management	5.3888	5.5000	1.0278
Continuous Improvement	5.8016	6.0000	0.9868

Table 3: Reliability Results of ERM

Critical variables	Original items	Items Deleted	Cranach's Alpha
Human Resources Management	8	None	0.9143
Information Resources Management	3	None	0.8946
Material Resources Management	3	None	0.8185
Technological Resources Management	5	None	0.9141

Table 4: Descriptive Statistics of ERM

Variable	Mean	Median	SD
Human Resources	4.3801	4.5000	1.2462

Management			
Information Resources Management	4.6038	5.0000	1.4585
Material Resources Management	4.9809	5.0000	1.2229
Technological Resources Management	5.0344	5.5000	1.2144

Table 5: T-Test of TQM

Report

	Mean	N	Std. Deviation
old	6.1905	63	.8203
new	4.9167	48	1.5688
Total	5.6396	111	1.3537

Table 6: Independent Sample t-test for Productivity with TQM

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	18.032	.000	5.533	109	.000
Equal variances not assumed			5.118	66.434	.000

Table 7: ANOVA for Productivity with TQM

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	44.205	1	44.205	30.616	.000
Within Groups	157.381	109	1.444		
Total	201.586	110			

Table 8: TQM implementation Results of t-tests between group 1 and 2

TQM Practices	Group^0	Mean	SD	t-value	Sig t
Customer Focus	1	5.4921	1.0679	-2.1542	0.033
	2	5.8792	0.7319		
Leadership	1	5.2177	0.9218	-3.535	0-001

	2	5.7619	0.6134		
Design Quality	1	5.1071	1.1542	0.4827	0.630
	2	5.0104	0.8827		
Strategic Quality Planning	1	5.2103	1.2502	-1.2615	0.210
	2	5.4740	0.8351		
People participation	1	4.8386	1.2440	-2.4119	0.018
	2	5.3264	0.7365		
Fact Based management	1	5.1651	1.0119	-3.2879	0.001
	2	5.7417	0.7696		
Continuous Improvement	1	5.6317	1.1269	-1.6828	0.095
	2	5.9625	0.8749		

°1 = new adopters; 2 = old adopters; * significant at p = 0.05; **significant at p = 0.01.

Table 9: T-Test and summary of statistics ERM

Group Statistics

ADOPTARS	N	Mean	Std. Deviation	Std. Error Mean
old	63	5.9206	.8482	.1069
new	48	4.7917	1.2876	.1858

Table 10: Independent sample t-test for productivity with ERM

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	9.139	.003	5.558	109	.000
Equal variances not assumed			5.266	76.849	.000

Table 11: ANOVA for Productivity with ERM

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	34.723	1	34.723	30.892	.000
Within Groups	122.520	109	1.124		
Total	157.243	110			

Table 12: Descriptive statistics for old and new ERM implementation

Group Statistics

	ADOPTARS	Mean	Std. Deviation
Human Resource Management	new	4.2738	1.3308
	old	4.6250	1.0426
Information Resource Management	new	4.5132	1.5191
	old	4.7986	1.3364
Material Resource Management	new	4.7725	1.2977
	old	5.2431	1.1418
Technological Resource Management	new	5.0000	1.3474
	old	5.0500	1.0841

Table 13: ERM implementation Results of t-tests between old and new adopters

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Human Resources Management	Equal variances assumed	.663	.417	-2.125	109	.036
	Equal variances not assumed			-2.204	109.000	.030
Information Resources Management	Equal variances assumed	.060	.807	-1.720	109	.088
	Equal variances not assumed			-1.748	106.433	.083
Material Resources Management	Equal variances assumed	.048	.826	-2.428	109	.017
	Equal variances not assumed			-2.482	107.600	.015
Technological Resources Management	Equal variances assumed	.343	.560	-.830	109	.408
	Equal variances not assumed			-.860	108.989	.392