Structural Equation Model of Total Quality Management Practice with Organisational Performance of UAE Service Industry

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ABSTRACT

This paper presents a structural equation model analysis of TQM practices which influenced the organizational performance for UAE service industry. The data for the model was collected from questionnaire survey amongst respondents that involved in total quality management practice in service organizations in UAE. The model was developed and analysed in AMOS SEM software. The model was initially analysed at measurement stage using CFA. The analysis was conducted individually for each measurement model until it achieved the model fitness criteria. After that the structural model was analysed for it fitness index achievement and path analysis for hypothesis confirmation. The results found that all the measurement models and structural model achieved the criteria fitness. In term of path analysis of the structural model, it was found that all the six TQM practices which are Quality *oriented leadership; Customer focus; Strategic planning; Organizational culture; Continuous improvement; Supplier partnership* support the organisational performance. Unfortunately *Knowledge management* seems not able to have significant level of relationship to support the organisational performance. This is because the data collected from the questionnaire survey is not strong enough to make the knowledge management path significant.

Keywords

TQM practices, organisational service performance

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1. Introduction

TOM has become one of the terms of management that have not been understood fully. That is why different researchers defined TQM differently. TQM is defined as a "structured and comprehensive approach that organizations use to improve the quality of products and services" (Obaid, Ali, Saleh, Thami, & Minhas, 2015). Besides, TQM is viewed as a mechanism in which companies actively work to enhance their products or services through involving both the management approach and the expertise of workers. It is an integration of quality and management resources with a view to reducing losses and improving the market share of the company (Hashmi, 2012; Kathaara, 2014). Other researchers view TQM as a philosophy that stresses the quality of products or services through addressing the satisfaction of consumers by predicting their needs and desires (Kathaara, 2014). The implementation of TQM requires making comprehensive changes in the culture of the company to focus on the client, which needs thorough the participation and engagement of all management resources as a policy of the company to enhance products or services of the company in a way that meets the satisfaction of its customers (Kathaara, 2014; Talib et al., 2013).

In most cases, TQM is used by professionals and academics as an approach to change management with a view to enhancing the quality of products and services of a company in a way that helps it to improve its competitiveness (Arumugam, Chang, Ooi, & Teh, 2009). It is important to remember, however, that TQM can contribute significantly to the improvement of the management strategies of companies for the sake of revamping their quality of value distribution. Consequently, to ensure continual improvement of their service delivery so as to promote the longevity of companies, it is necessary that companies apply TQM. In fact, at the present time, not only competitiveness, but also the continuous changes and alteration in which companies contexts in work has necessitated the need for TQM (Talib et al., 2011). Researchers and scholars have identified a variety of TQP activities that have been deemed to have generated value in companies as well as improving their competitiveness at various levels.

2. Application of TQM in UAE Service Industry

In relation to UAE, the service industry constitutes nearly 55% of the total GDP of the seven emirates (HKTDC-Research, 2017). The UAE diversification policy makes it one of the region's most prosperous nations, particularly by

improving activities in the services sectors, such as tourism and financial services. The report of HSBC showed that the contribution of services to the country's overall exports grew from (16%) in 2000 to (23%) in 2015 (Augustine, 2016). The service industry is considered the tertiary sector of the world's economies. The service sector outputs are distinct resources that make life or things appropriate. The service industry, which serves other economic industries, is an important part of the economy. Besides, service organizations can also offer resources for people or for their assets. Additionally, the service could be tangible such as services of installation, maintenance, and repair after buying products, or intangible, such as insurance, ICT, and education (Talib et al., 2012). At the present time, quality has been recognized as the primary element in business success and has been highly encouraged across sectors (Masejane, 2012). Similarly, the service quality can improve the competition potential for companies in the services sector and companies can enhance their competitiveness by enhancing their service quality (Hasan & Kerr, 2003). TQM has been primarily used as an efficient management technique for different services sectors with the key goal of optimizing the efficiency of companies by successful inclusion of various models. policies, staff, and communication and management systems to respond to all the needs of customers (AbdulAziz et al., 2015; Gharakhani et al., 2013; Van Ho, 2011).

3. Conceptual Model

A conceptual framework/model is the apparent flow of relationship among the studied variables representing in a diagrammatic form. The conceptual framework is a deduction made from the research theoretical framework which is generated from reviewed literature on the subject matter under investigation. It provides a clear explanation on the linkages or relationship that shows the hypothesis postulated for readers understanding without being bordered to read through the whole document. It is also a summary of how the variables of the study are connected to each other.

For this study, the conceptual framework/model is based on the relationship between TQM practices and the organisational performance. Previous research works have

identified some TQM practices such as *customer* focus, strategic quality planning, leadership, human resource focus, supplier quality management, knowledge and process, information analysis, training and education, resource management, strategic planning, staff selection and deployment, competent staff, teamwork spirit, recognition and motivation, and innovation and creativity (e.g., Ali et al., 2010; Ang, et al., 2011; Green & Zelbst, 2019; Ooi, 2015; Sadikoglu & Olcay, 2014). Phan et al., (2011) suggested that it is important for organizations to adopt a comprehensive approach in TQM in order to be able to address any changes in the working area. In fact, although organizations are required to adopt a comprehensive and systematic approach to be able to respond to the needs of customers, it is equally important for organizations to recognize their key inputs and organizational aspects that should be enhanced to be able to perform their key deliverables. This concurred which also with the suggestion by Smith & Rees, (2014) that said it is important for companies to identify the key competitive areas in their business in order to focus inclusively on them. As it is difficult if impossible for organizations to adopt all these practices simultaneously, they are suggested to prioritize these practices according to the competitive areas to be improved. Therefore, in order to identify the potential of each practice of TQM to the organisational performance especially in service industry in UAE, the following conceptual model is proposed as figure 1.



Figure 1 the conceptual model

Based on this conceptual mode, the hypotheses that can be derived from it are that all the seven constructs of TQM practices are positive and significant toward the organisational performance of the service industry.

4. Methodology

The methodological framework used in this study was based on positivist paradigm where it adopted quantitative research approach. The data was collected through questionnaire survey and analysed statistically to deduce the research hypotheses. The population of this study is employees of private service organizations in the United Arab Emirates. The organizations provide service to the customers in a direct or indirect way, focusing on the practices of the total quality management. Besides, the scope of the study involve in measuring the implementation of TQM practice toward organizational performance. The questionnaire consisted items in the domains of TOM practices which are Knowledge *leadership;* management; Quality oriented planning: Customer focus; Strategy Organizational culture; Continuous improvement; Supplier partnership and also items in the domain of Organizational Performance. The study has identified the total population which is around 715 employees. Then the determined sample size was 248 respondents based on Krejcie and Morgan table. The respondents were selected through simple random sampling technique. However a total of 300 questionnaire forms were distributed amongst the population of the service organizations of UAE. The returned questionnaire was 250 sets but after analysed the collected data only 283 sets had completed the survey form. This indicates about 94% response rate of the survey which considerably satisfactory.

5. Evaluation of Measurement Model

Confirmatory Factor Analysis (CFA) is to evaluate measurement model. In CFA, any item that does not fit the measurement model due to low factor loading should be removed from the model. Fitness of a measurement model is indicated through certain Fitness Indexes. If the items deletion exceed 20% of total items in a model then the particular construct is deemed to be invalid [failed confirmatory]. CFA could be run for every measurement model separately or run the pooled measurement models at once. CFA validating procedure involved three assessments which are Uni-dimensionality, Validity and Reliability of all the latent construct.

Below is the results of the measurement model assessment.

3.1 Assessment of Constructs Uni-Dimensionality

The construct of every measurement model in the research assessment model was verified for its uni-dimensionality and reliability. To identify the uni-dimensionality of the constructs under investigation, the Comparative Fix Index (CFI) was employed. Table 1 shows the CFI values for all the constructs of the research assessment model.

results							
Code	Research constructs	CFI scores (uni- dimensionality)					
1	Knowledge management	0.986					
2	Quality oriented leadership	1.000					
3	Customer focus	1.000					
4	Strategy planning	1.000					
5	Organizational culture	0.999					
6	Continuous improvement	0.957					
7	Supplier partnership	1.000					
8	Organizational Performance	0.994					

Fable 1:	Constructs'	Uni-Dimensional	ity

Table 1 show the calculated CFI values for all the constructs were above the recommended value of This means that uni-dimensionality is 0.90. acceptable (Awang, 2014; Hair et al., 2011). According to Awang (2015), the unidimensionality is obtained when the measuring items in constructs under investigation have acceptable factor loadings. In this study, all the items of the latent constructs under investigation obtained acceptable factor loading greater than the recommended value of 0.6, indicating that the unidimensionality is not violated.

3.2 Convergent Validity of Measurement Model

Convergent validity is defined as the factor loading scores obtained from the items of a measurement scale in a latent construct. These scores should be correlated and significant. Actually, the items of a measurement scale are supposed to measure the same construct. According to Awang (2014; 2015), if the factor loading scores of the items on a measurement scale are greater than 0.5 and their NFI values are greater than 0.9, then the convergent requirement is retained. In this study, the factor loading of all constructs in the final measurement model, and the Bentler-Bonett coefficient (NFI) was utilized to measure the convergent validity as table 2.

Table 2: Residual Number of Items and NFI Values

Code	Research constructs	NFI scores (Convergent validity)
1	Knowledge	0.971
1	management	
2	Quality oriented	0.997
4	leadership	
3	Customer focus	0.998
4	Strategy planning	0.973
5	Organizational culture	0.935
6	Continuous	0.999
U	improvement	
7	Supplier partnership	0.976
0	Organizational	0.990
0	Performance	

Table 2 shows that the NFI scores which are the convergent validity for all the constructs of the final measurement models were above 0.9.

3.3 Composite Reliability and Construct Validity of Measurement Model

Reliability assessment is the extent of how reliable is the said measurement model in measuring the intended latent construct. The Composite Reliability indicates the reliability and internal consistency of a latent construct. A value of CR > 0.6 is required in order to achieve composite reliability for a construct. According to Pallant, (2013), validity of a construct is identified by measuring its relationship with other constructs, namely *convergent validity* and *discriminant validity*. According to Hair et al. (2010);

- If the Average Variance Extracted (AVE) value is ≥ 0.5 then it is sufficient for *convergent validity*.
- If the values of the AVE for two variables should be greater than the square of the correlation between the two factors to indicate an acceptable level of *discriminant validity*.

According to Fornell and Larcker (1981), to achieve an acceptable level of discriminant validity, the values of AVE should be greater than the square of the correlation coefficient of the constructs. The results for this measurement model study on construct reliability (CR \geq 0.60) and AVE are shown in Table 3.

Code	Construct	CR (≥ 0.6)	AVE (≥ 0.5)	
1	Knowledge management	0.749	0.570	
2	Quality oriented leadership	0.826	0.636	
3	Customer focus	0.675	0.507	
4	Strategy planning	0.872	0.536	
5	Organizational culture	0.800	0.613	
6	Continuous improvement	0.736	0.555	
7	Supplier partnership	0.713	0.505	
8	Organizational Performance	0.745	0.632	

 Table 3: results of CR and AVE

The results from table 3 indicate that the measurement model has achieved it composite reliability and convergent validity. For discriminant validity, the results are as in Table 4.

Table	4:	res	sults	of	Dis	crimi	nant	Valid	ity

Con stru ct	1	2	3	4	5	6	7	8
1	(0. 65 5)							
2	0.1 22	(0. 79 7)						
3	0.2 91	0.2 95	(0. 75 4)					

4	0.2 71	0.0 98	0.2 18	(0. 71 2)				
5	0.1 82	0.0 85	0.1 54	0.1 52	(0. 74 4)			
6	0.0 53	0.5 16	0.1 89	0.1 28	0.1 64	(0. 78 2)		
7	0.1 20	0.1 45	0.1 48	0.1 14	0.0 09	0.0 69	(0. 73 2)	
8	0.1 54	0.1 72	0.2 71	0.0 98	0.2 91	0.0 85	0.1 54	(0. 75 4)

Table 4 shows the values of the square root of AVE (written in bold) as well as the values of the correlation of the respective constructs. When its value is greater than the values in its row and column, the discriminant validity is obtained (Fornell & Larcker, 1981).In brief, for all the constructs investigated in this study, the values of uni-dimensionality, reliability, and validity had achieved the required in the criteria.

6. Structural model Fitness

After all the measurement models achieved the acceptable level of fitness, the models are tied up to form the structural model according to the formation of the conceptual model as figure 1. Then the analysis of the structural model was conducted until it achieved the fitness level. After that the model was evaluated using path analysis to determine the achievement of the hypotheses that had been defined earlier [10, 11]. However for this paper it only show the structural model at the initial stage of the analysis as figure 3.



Figure 2: initial structural model

Figure 2 shows the first-round output of the initial structural model. It shows that not all the fitness indexes were achieved to meet the acceptable level. For that reason series of re-specification were conducted until the model achieved all the fitness indexes. The final model as figure 3 indicates that all the fitness indexes has been achieved



Figure 3: Final Structural Model

Figure 3 shows the final structural model. The model achieved the fitness indexes after a reiterative process of re-specification and examination of fitness indices. Seven items were deleted due to poor loading factor. Hence the final model fitness was accepted. The observed fitness indexes extracted from the final structural model are summarised in table 5.

Fable 5: fitness indexes for th	he structural model
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Cat egor y	Parsi moni ous fit	Abs olut e fit	Incr eme ntal fit	Incr eme ntal fit	Absol ute fit	Co mm ent
Inde xes Acc epta ble leve 1	Chisq /df ≤ 30	GFI ≥0. 90	CFI ≥ 0.90	NFI ≥ 0.80	RMS EA≤0 .08	Mo del Fitn ess leve l
Initi al Stru ctur al Mod el	2.822	0.7 05	0.69 0	0.59 3	0.082	Not achi eve d
Fina 1 Stru	1.578	0.8 53	0.92 7	0.82 6	0.046	Ach ieve d

ctur al			
Mod			
el			

Figure 3 shows that the final SM enjoys perfect compliance in relation to the goodness-of-fitness. The final structural measurement model sheds light on the impact for the multiple constructs in the path diagram. Table 5 indicates that the fitness indexes for the proposed SM representing the fitness of the hypothesized model with the data at hand reached the acceptable level of fitness indexes. The standard regression weights showed the estimate of the beta coefficient, which measures the impacts of the main constructs; exogenous variables (TQM practices dimensions) and endogenous variable (organizational performance).

The standardized regression coefficients with R^2 equal to 0.69 are shown in Figure 3. In this study, the Analysis Moment of Structures (AMOS) used for structural equation modeling provided two types of text outputs: standardized weights of regression and unstandardized weights of regression for path analysis. However, to highlight the relationship among the constructs in the research framework and consequently, to test the formulated in this study, hypotheses the standardized regression weight was followed, since it is easier to interpret (Awang, 2015). To evaluate the proposed SM, two criteria were used, namely the squared multiple correlations (\mathbb{R}^2) and path co-efficient (β) of each path. The R² of endogenous is measured as substantial ($R^2 \ge 0.26$), moderate ($R^2 \ge 0.13$), or small ($R^2 \ge 0.02$) as Cohen (1988, 2003) indicated. It is viewed from Figure (4.13) that R^2 of the endogenous latent variable (performance of organizations) is 0.69, indicating that the proposed model has 69% considerable explaining capacity.

3.4 Testing of Hypotheses

Evaluation of path relationship of the structural model was conducted through bootstrapping technique to generate p-value for each of the paths in the model. The generated values are as Table 6.

Hypoth eses	Path relation	p- val ue	Status	
H1	Knowledg e manageme nt	Organizat ions Performa nce	0.1 70	Not Suppor ted
H2	Quality oriented leadership	Organizat ions Performa nce	0.0 31	Suppor ted
Н3	Customer focus	Organizat ions Performa nce	0.0 06	Suppor ted
H4	Strategic planning	Organizat ions Performa nce	0.0 16	Suppor ted
Н5	Organizati onal culture	Organizat ions Performa nce	0.0 37	Suppor ted
Н6	Continuou s improvem ent	Organizat ions Performa nce	***	Suppor ted
H7	Supplier partnershi p	Organizat ions Performa nce	***	Suppor ted

Table 6: Results of path relationship ofStructural Model

(Note: * p < 0.05; ** p < 0.01; *** P < 0.001.) In summary the results from table 6 indicate that the dimensions of TQM practices have direct impact on the performance of organisation in UAE service sector. This outcome has concurred to the hypotheses that TQM practices have significant impact to organisational performance. However only knowledge management construct seems not significant to the organisational performance. This could be the respondents not fully aware the important of knowledge management to their organisational performance.

7. Conclusion

This paper presented an analysis of structural equation model of TQM practices with the organizational performance for UAE service industry. The data used to develop the model was

generated from questionnaire survey conducted from respondents that involved in total quality management practice in government and private service organizations in UAE. The model was developed and analysed in AMOS SEM software. The model was initially analysed at measurement stage using CFA. The analysis was conducted individually for each measurement model until it achieved the model fitness criteria. After all the measurement models achieved the fitness level, these models were tied up according to the conceptual model to form the structural model. Then structural model was analysed for it fitness index achievement and after that its path analysis for hypothesis confirmation. The results of the analysis found that all the measurement models had achieved the criteria of model fitness. Structural model also achieved the fitness criteria. In term of path analysis of the model, it was found that all the six TQM practices which are Quality oriented leadership; Customer focus; Strategic planning; Organizational culture; Continuous improvement; Supplier partnership support the organisational performance. Unfortunately Knowledge management seems not able to have significant level of relationship to support the organisational performance. This is because the data collected from the questionnaire survey is not strong enough to make the knowledge significant. management Hence, path the dimensions of the practices of TQM are found to have an impact on the performance of companies. Thus this study can benefit researchers with the model development and also practitioners in the service industry which aligned with UAE inspiration to provide services to its customers satisfactorily.

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