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Assessment of total quality management implementation in Indian service industries

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Email: nishat786@qu.edu.qa**ABSTRACT**

The purpose of this paper is to examine the extent to which total quality management (TQM) practices have been implemented in Indian service industries. The research reports the findings of an empirical study conducted with a sample of 172 top and middle managers in Indian service industries. The results reveals that six TQM practices i.e. top-management commitment; customer focus; process management; quality systems; teamwork; and communication are effectively implemented across the Indian service industries while eleven practices are partially implemented. The proposed framework would be helpful for the managers and practitioners in implementing an effective TQM program.

**KEYWORDS:** Total quality management (TQM), TQM practices, service industries, performance, India.

**INTRODUCTION**

In the present era of global and increased competitive environment, industries have been experiencing rapid changes in the business performance propelled by phenomena like increased customer awareness of quality, adoption of new and advanced technology, globalization, cost effectiveness, efficient utilization of resources and achieving customer satisfaction (Kristianto *et al.*, 2012; Psomas *et al.*, 2014; Kumar *et al.*, 2011). In response to these challenges, many business practitioners and industry managers have started to adopt different quality improvement approaches for enhance competitiveness and sustainable business performance (Arumugam *et al.*, 2009) such as total quality management (TQM), Six Sigma, ISO 9000 and Quality Models (EFQM, MBNQA, Deming Award) (Talib *et al.*, 2011a,b&c; Talib *et al.*, 2013a). Among them, TQM is widely accepted approach that uses a set of management practices focusing on customer satisfaction, industry development, product and service quality and continuous improved performance (Kristianto *et al.*, 2012; Yusof and Aspinwal, 2000; Talib *et al.*, 2011c; Talib *et al.*, 2013b, Talib and Rahman, 2010). Through TQM practices, both the industries i.e. manufacturing and service have been trying to upgrade their quality standards and improve product and service design to fulfill customer expectations along with overall business performance (Bhat and Rajashekhar, 2009). Further, for successful implementation of TQM, there is a need to identify a set of TQM practices applicable to service industry (Talib *et al.*, 2011c) and make assure the proper implementation of the same for earning maximum benefits. A considerable amount of literature is present on the implementation of TQM program in manufacturing industries. These studies have showed

several benefits of successful implementation of TQM and still they are being benefited in some way (Mahmood *et al.*, 2014; Belay *et al.*, 2014; Talib and Rahman, 2012; Abusa and Gibson, 2013).

Following the success of TQM in manufacturing industry, practitioners and managers have started to explore the potential of transferring and applying the TQM principles and practices to the service industries and suggested its applicability as there are not enough studies conducted in this sector especially in Indian context (Talib and Rahman, 2012; Prajogo, 2005). Based on this, the present research study tries to fill this gap by reviewing the literature on TQM implementation in the service sector and conducting a survey based research for implementing the previously identified and validated set of TQM practices in Indian service industries (Talib *et al.*, 2011a,b,c; Talib *et al.*, 2013b). Considering the benefits of TQM in manufacturing industries and lack of research studies on implementation of TQM in service industries, the present study aims:

- To examine the extent or degree to which TQM practices are practiced or implemented in Indian service industries.

This study involves a survey-based empirical research on assessment of TQM implementation program in Indian service industries with the aim of achieving greater benefits and performance. The scope of the study will focus on four service industries chosen namely healthcare, banking, hospitality, and information and communication technology (ICT). Reliability and validity tests, and One-way analysis of variance (ANOVA) has been used to empirically investigate the TQM implementation in these industries. After successfully implementing the TQM program using the identified set of TQM practices, the Indian service managers and practitioners would be able to achieve enhanced business performance and increased competitiveness in the marketplace. The rest of the paper has been structured as follows: It begins with a review of the existing literature on TQM implementation. Next section describes the research framework, question and hypothesis formulation followed by detailed research methodology used in the study. In the subsequent section, results and discussion were presented. Finally, last section highlights the main conclusions of the research study along with some managerial implications and scope for future research.

## LITERATURE REVIEW

### TQM implementation

Despite the growing body of literature concerning issues with TQM implementation, there are some mixed studies that have examined the structure, impact and organization performance of TQM implementation in different organizations either theoretically or empirically or through case studies (Nasim *et al.*, 2014; Boateng-Okrah and Fening, 2012; Mahmood *et al.*, 2014; Talib, 2013; Abusa and Gibson, 2013). The implementation of TQM in organizations has a positive impact on organization's customer satisfaction, employee satisfaction and quality performance (Kristianto *et al.*, 2012; Jayaram *et al.*, 2010; Andrews *et al.*, 2011; Talib *et al.*, 2010; Talib *et al.*, 2013b; Mahmood *et al.*, 2014). Similarly, many studies have looked other issues of TQM like human resource management, supplier relationship, strategic planning, leadership, quality culture and have concluded with a positive outcome in the form of business performance. TQM also contributes to benchmarking of critical success factors for an organization (Ahmad and Elhuni, 2014).

In a study by Martinez-Costa and Jimenez-Jimenez (2008), presented evidence about TQM which promotes organization learning and improves performance in the form of profitability, customer satisfaction and product/services quality. Boateng-Okrah and Fening (2012) examines the level of TQM implementation in a mining sector and revealed positive outcome. Abusa and Gibson (2013) conducted a case study in Libyan industrial sector and found that there were no

differences between TQM elements across ISO and non-ISO certified companies as well as in case of small and medium enterprises (SMEs), and large companies. Mahmood *et al.* (2014) measured the performance of Pakistan aviation manufacturing industry (PAMI) empirically and observed that the proposed model of measuring organizational performance in PAMI was in general agreement with the TQM model of renowned researchers. A study by Yapa (2012) reported the results of an investigation on the use of TQM tools, techniques and concept among Sri Lankan service organizations and found the positive response of adopting TQM by managers in their organizations. Kristianto *et al.* (2012) presented the results of a survey of customer satisfaction after adopting TQM in a wheat flour milling company. The findings supported the company to achieve customer satisfaction by focusing on TQM implementation efforts.

Past studies on TQM literature suggest that different TQM practices are identified and used in the literature by the researchers and academicians. It was observed that these studies have provided different sets of TQM practices but no common set of practices were identified, though identification of a set of TQM practices should be given special consideration for ensuring successful implementation of TQM program in any industry (Talib *et al.*, 2011c; Jha and Kumar, 2010). Until recently, Talib *et al.* (2011a,b&c) in their studies on the identification of TQM practices in the service industries, their frequency of occurrence in the TQM literature and developing contextual relationship between them, on their implementation have been published. Hence, present study utilizes a set of 17 TQM practices as identified and proposed by Talib *et al.* (2011a,b&c) for service industries and through a comprehensive review of TQM literature. These practices are depicted in Table 1. The detailed description of each TQM practice can be found in Talib *et al.* (2011a).

Table 1: Set of TQM Practices for Service Industries

TQM PRACTICE NO.	TQM PRACTICE
1.	Top-management commitment
2.	Customer focus
3.	Training and education
4.	Continuous improvement and innovation
5.	Supplier management
6.	Employee involvement
7.	Information and analysis
8.	Process management
9.	Quality systems
10.	Benchmarking
11.	Quality culture
12.	Human resource management
13.	Strategic planning
14.	Employee encouragement
15.	Teamwork
16.	Product and service design
17.	Communication

(Source: Talib *et al.*, 2011a,b&c)

## RESEARCH FRAMEWORK, QUESTION AND HYPOTHESIS FORMULATION

Based on the above literature review, a conceptual framework is developed and a research model has been proposed 'to examine the extent or degree to which TQM practices are practiced or implemented in Indian service industries'. The proposed TQM research framework is depicted in Figure 1. This research model suggests that the greater the extent to which these TQM practices are present, the better the quality oriented results are achieved in Indian service industries. To carry out work to achieve the study objective as presented in the introduction section, a research question (RQ1) was articulated as follows:

*RQ1: To what extent the TQM practices are practiced or implemented in the Indian service companies?*

The main purpose of this study is to examine the extent or degree to which TQM practices are practiced or implemented in Indian service industries. Based on extensive literature review on TQM by Talib *et al.* (2010); Talib *et al.* (2011a,b,c); Talib *et al.* (2013b), this research utilizes 17 TQM practices that are necessary for successful TQM implementation in the Indian service industries. Further, the literature review indicated that these TQM practices are frequently used by majority of the service industries. This lead to the following hypothesis:

*H1: There should not be any significant difference in the 17 TQM practices as practiced or implemented by Indian service industries.*

## RESEARCH METHODOLOGY

To accomplish the present research objective, a survey of select Indian service industries was conducted using self-administered questionnaire. The research methodology used in this study is discussed as follows.

### Research Design

A descriptive cross-sectional study design was adopted. It is in line with the studies on TQM performed by Salaheldin (2009); Wardhani *et al.*, (2009); Ooi *et al.* (2012). In this study, electronic mail (e-mail) survey method was adopted as the means of data collection which is commonly used in similar kind of research (Talib *et al.*, 2013b; Kureshi *et al.*, 2010; Zu, 2009).

### Research Instrument

A self-administered structured instrument was designed in this research based on the works of Antony *et al.* (2002); Brah *et al.* (2000); Sureshchandar *et al.* (2001); Issac *et al.* (2004). The instrument was initially validated through a pilot survey before it was actually used for primary data collection. The instrument developed was divided into two sections. The first section comprises the demographic information of the respondents including profession, gender, years of experience as well as the general background of the company and the second section collects information on implementation of TQM practices in the industry by listing 17 TQM practices measured by 110 items. The instrument used a 5-point Likert scale, with 1= very low, 3= moderate, and 5= very high. This is in line with those suggested by Brah *et al.* (2000); Salaheldin (2009).

### Sampling Method and Data Collection Procedure

The target population of this study is the list of select Indian service industries published by the i<sup>3</sup> (i-cube, Information Infrastructure for Institutions), Centre for Monitoring Indian Economy Private Limited, India (i<sup>3</sup>, CMIE, 2010). The four service industries mainly included in this study

are healthcare, banking, hospitality (hotel and tourism), and information and communication technology (ICT) which includes telecommunication services, information technology enabled services (ITeS) and computer software services. The reasons for choosing these four sectors are their high Gross Domestic Product (GDP) share in Indian economy (about 56 percent) (i<sup>3</sup>, CMIE, 2010); highly labor intensive industries and provides substantial employment (MoL&E, 2010); and there ever increasing net annual income to the Indian service sector. (i<sup>3</sup>, CMIE, 2010). The list contains a total of 1781 industries at the time of research period covering all the four categories.

A stratified sampling method (a probability sampling technique) was chosen for this study. This method was thought to be appropriate to collect sufficient information from the total population to make statistical inferences. A minimum sample size was calculated according to the GDP contribution of each service industry from the total contribution of GDP in the service sector. The minimum sample size needed for this study comes out to be 591. This sample was increased to 600 to reduce the probability of Type II error (Burgess *et al.*, 2006). This minimum sample size was stratified into four strata. The sample size drawn from each stratum i.e. healthcare, banking, hospitality, and ICT industries based on proportionate stratified sampling technique were found to be 40, 67, 118, and 375 respectively. These samples were drawn using a simple random sample approach.

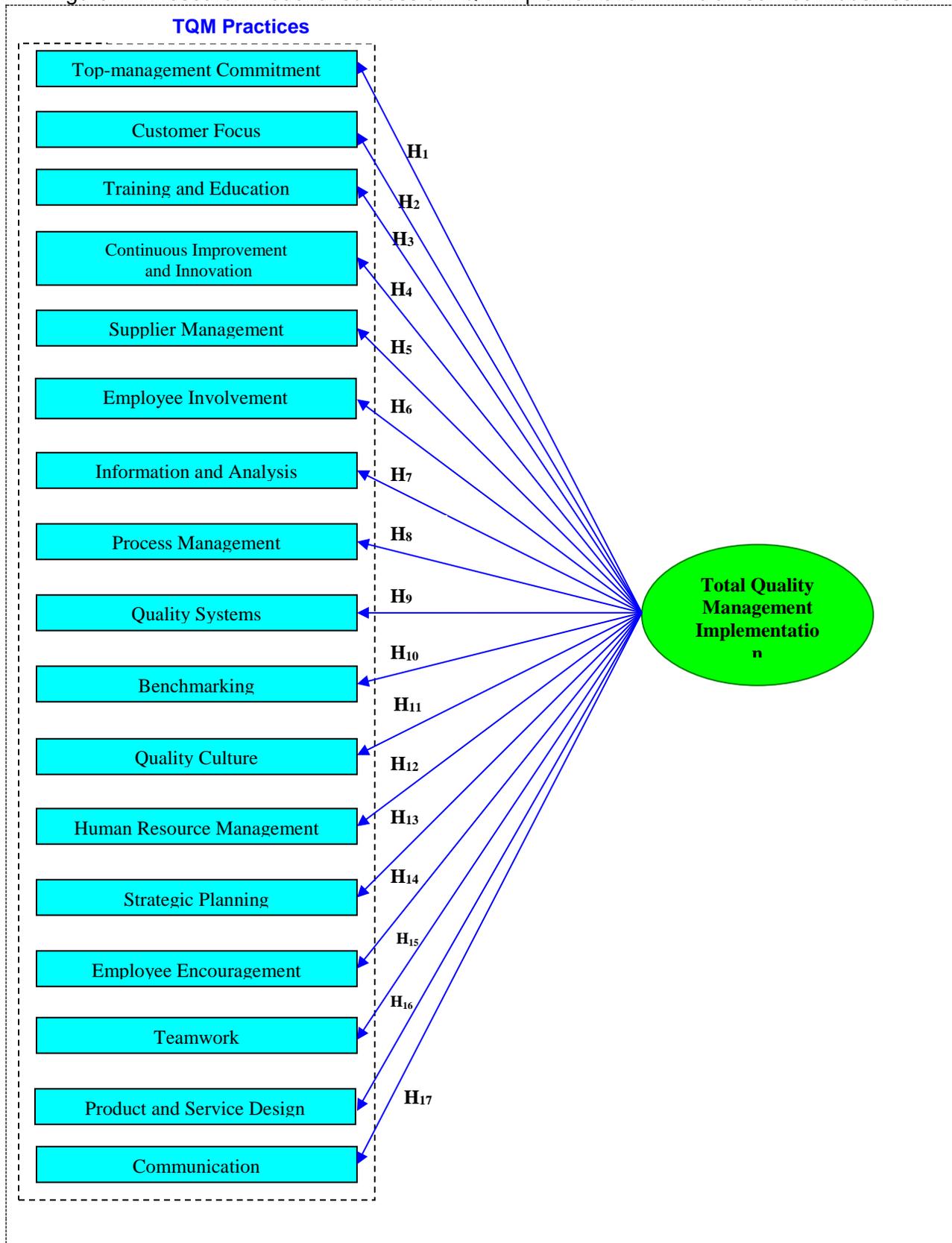
#### Instrument Administration

The target respondents for this study were top and middle level administrators/managers who have sufficient level of experience and qualification and therefore, they will be aware of the TQM practices and their implementation in respective service industries. Addressed to the top and middle level administrators/managers of the industries, the survey instruments were e-mailed to 600 industries. After several follow-ups and personal contacts, a total of 211 companies responded which are approximately 35.1 percent of the sample size, were selected for the study, however, only 172 useable survey instruments were included for the data analysis as 39 instruments were unusable, yielding a response rate of 28.6 percent. The main reasons for this are: 33 respondents (84.6 percent) did not complete the instrument or having the missing data and 6 instruments (15.4 percent) were undelivered.

### **RESULTS AND DISCUSSION**

To accomplish the research objective, a research instrument was framed comprising of 17 TQM practices measured by 110 items. Reliability and validity tests were deployed to check the internal consistency of the measuring items and the degree to which the instrument measures the constructs that the items are intended to measure, through the various validity tests like face validity and content validity. These validity tests were conducted to ensure the data collected was valid for further analysis. One-way Analysis of Variance (ANOVA) was performed to test the proposed hypothesis (H1) through SPSS 20.0 software.

Figure 1: A research model of successful TQM implementation in Indian service industries



POSITION/ROLE OF THE RESPONDENT	FREQUENCY	PERCENTAGE
Director/Managing Director/Executive Director/CEO/General Manager	8	4.7
Project Manager/Senior Engineer Manager/Senior Manager	32	18.6
Manager/Technical Manager/Operations Manager	38	22.1
Quality Manager/Human Resource Manager/Quality Engineer/Market Manager/Executive Manager	40	23.3
CMO/Medical Superintendent/Medical officer/Physicians	17	9.9
Others (Like Project Architect, Consultant; Customer Relation Officer; Service Manager; Assistant Manager)	37	21.5
<b>Total</b>	<b>n=172</b>	<b>100</b>
<b>Years of experience</b>	<b>Frequency</b>	<b>Percentage</b>
Less than 5 years	61	35.5
More than 5 years	111	64.5
<b>Total</b>	<b>n=172</b>	<b>100</b>
<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Male	144	83.7
Female	28	16.3
<b>Total</b>	<b>n=172</b>	<b>100</b>
<b>Department/Section</b>	<b>Frequency</b>	<b>Percentage</b>
Quality	16	9.3
Product and Services	35	20.3
Customer Relation	24	14.0
Marketing	34	19.8
Information Management Services	19	11.0
Others	44	25.6
<b>Total</b>	<b>n=172</b>	<b>100</b>
<b>Type of industry</b>	<b>Frequency</b>	<b>Percentage</b>
Healthcare	17	9.9
Banking	37	21.5
Hospitality (Tourism and Hotels)	34	19.8
ICT(Including ITeS and Computer Software Services)	84	48.8
<b>Total</b>	<b>n=172</b>	<b>100</b>

### Profile of respondents

The profile of the respondents can be clearly understood through Table 2. The industry variables consisted of position of respondent, years of experience, gender, department/section, and type of industry which are self explanatory as can be seen from Table 2.

### Reliability test

Reliability is the most commonly followed technique to measure internal consistency among a group of items combined to form a single scale and reflects the homogeneity of the scale. Using the SPSS 20.0 reliability analysis program software, an internal consistency analysis was performed separately for the items of each TQM practice. The alpha values of the study variables are summarized in Table 3. The reliability coefficients of the study variables exceeded

the minimum acceptable level of 0.70 (Nunnally and Bernstein, 1994). Further, after performing reliability test, 10 items were deleted to increase the reliability of the scale. Hence, the total items covering 17 TQM practices were reduced from 110 to 100. As can be seen in Table 3, the alpha values range from 0.784 to 0.932, thus, provides strong evidence that the scales developed are judged to be reliable.

Table 3: Internal Consistency (Scale Reliabilities) for 17 TQM Practices					
MEASURE	ORIGINAL NUMBER OF ITEMS	ORIGINAL ALPHA (RELIABILITY)	ITEMS DELETED	FINAL NUMBER OF ITEMS	FINAL ALPHA (RELIABILITY)
Top-management commitment	9	0.865	2	7	0.932
Customer focus	9	0.876	1	8	0.902
Training and education	6	0.860	1	5	0.902
Continuous improvement and innovation	7	0.793	1	6	0.882
Supplier management	8	0.910	None	8	0.910
Employee involvement	6	0.883	None	6	0.883
Information and analysis	5	0.874	None	5	0.874
Process management	6	0.775	1	5	0.833
Quality systems	5	0.667	1	4	0.784
Benchmarking	5	0.891	None	5	0.891
Quality culture	8	0.843	1	7	0.891
Human resource management	7	0.902	None	7	0.902
Strategic planning	6	0.821	1	5	0.866
Employee encouragement	6	0.904	None	6	0.904
Teamwork	4	0.871	None	4	0.871
Product and service design	8	0.874	1	7	0.902
Communication	5	0.900	None	5	0.900
<b>Total</b>	<b>110</b>		<b>10</b>	<b>100</b>	

**Note:** n=172

### Face and content validity

In this research, it was argued that the 17 TQM practices for measuring TQM implementation practices had face and content validity since the majority of scales/items used in this study are borrowed from established scales that have already been subjected to tests of face and content validity. Moreover, the content validity of the instrument was also ensured through an extensive review of the literature and detailed evaluation by academicians and practitioners. Items were deleted, added, or modified based on their reviews prior to the analysis.

### Implementation of TQM practices across Indian service industries

With regard to the implementation level of each TQM practice across the Indian service industries, the significant differences between each of the four categories of service industries have been examined with the help of one-way ANOVA (Mady, 2009; Selvaraj, 2009). Nevertheless, before conducting the ANOVA, the necessary assumptions must be met. The two assumptions of concern are population normality and homogeneity of variance (Coakes *et al.*, 2006). The population from which the samples have been drawn should be normal and this can be checked by using normality statistics such as skewness. On the other hand, the scores in each group should have homogeneous variance which is checked by Levene's test that determines whether variances are equal or unequal. Table 4 presents the skewness statistics, Levene statistics, and significance results of each TQM practice. From Table 4, the skewness values are generally close to zero indicating that the assumption of population normality appears not to be violated. Also, Levene's test for homogeneity of variances is not significant ( $p > 0.05$ ) and therefore, one can be confident that the population variances for each TQM practice are approximately equal. Accordingly, it is concluded that the ANOVA can be performed for further analysis.

The extent of implementation of TQM practices across Indian service industries has been computed by the mean score of each TQM practice across each service industry as well as total mean score across overall Indian service industries separately. Table 5 reports the mean scores for 17 TQM practices in four categories of service industries as well as total mean score across the Indian service industries for each TQM practice. It also includes the ANOVA results.

TQM PRACTICE	SKEWNESS STATISTIC	LEVENE STATISTIC	SIGNIFICANCE (p-VALUE)
Top-management commitment (TMC)	-0.695	1.504	0.215
Customer focus (CF)	-0.314	0.290	0.832
Training and education (TE)	-0.288	2.466	0.064
Continuous improvement and innovation (CII)	-0.283	0.679	0.566
Supplier management (SM)	0.466	0.421	0.738
Employee involvement (EI)	0.443	0.481	0.696
Information and analysis (IA)	-0.077	2.380	0.071
Process management (PM)	-0.124	0.553	0.647
Quality systems (QS)	-0.397	1.394	0.246
Benchmarking (BM)	-0.436	1.441	0.233
Quality culture (QC)	-0.320	2.453	0.065
Human resource management (HRM)	0.576	2.535	0.055
Strategic planning (SP)	0.000	0.737	0.531
Employee encouragement (EE)	0.564	0.198	0.898
Teamwork (TW)	-0.009	1.100	0.351
Product and service design (PSD)	0.037	0.285	0.836
Communication (COM)	-0.083	2.641	0.053

n=172; \*p<0.05; df1=3; df2=168.

HYPOTHESIS	TQM PRACTICE	MEAN SCORE IN					ANOVA TEST RESULTS	
		HEALTHCARE	BANKS	HOSPITALITY	ICT	TOTAL	'F' VALUE	SIGNIFICANCE (P-VALUE)
$H_1$	Top-management commitment	3.77	3.55	4.04	3.70	3.74	2.062	0.107(NS)
$H_2$	Customer focus	3.35	3.56	3.92	3.58	3.62	2.284	0.081(NS)
$H_3$	Training and education	3.11	3.50	3.88	3.69	3.63	3.710	0.013*
$H_4$	Continuous improvement and innovation	3.56	3.60	4.09	3.75	3.77	3.181	0.025*
$H_5$	Supplier management	2.31	2.82	2.88	3.04	2.89	4.342	0.006**
$H_6$	Employee involvement	2.48	3.06	2.97	3.12	3.01	3.617	0.014*
$H_7$	Information and analysis	2.87	3.49	2.99	3.34	3.25	4.809	0.003**
$H_8$	Process management	2.96	3.44	3.31	3.47	3.38	2.428	0.067(NS)
$H_9$	Quality systems	3.73	3.60	3.94	3.66	3.71	1.107	0.348(NS)
$H_{10}$	Benchmarking	2.94	3.48	3.49	3.15	3.27	3.615	0.014*
$H_{11}$	Quality culture	3.55	3.61	4.10	3.61	3.70	4.423	0.005**
$H_{12}$	Human resource management	2.20	2.81	2.73	3.01	2.83	5.578	0.001**
$H_{13}$	Strategic planning	2.90	3.37	3.61	3.38	3.38	3.352	0.020*
$H_{14}$	Employee encouragement	2.35	2.84	2.85	3.04	2.89	3.696	0.013*
$H_{15}$	Teamwork	3.13	3.37	3.72	3.38	3.42	2.505	0.061(NS)

$H_{16}$	Product and service design	3.03	3.50	3.72	3.42	3.46	3.331	0.021*
$H_{17}$	Communication	2.77	3.16	3.35	3.24	3.20	1.998	0.116(NS)

Significant at \* $p < 0.05$ ; \*\* $p < 0.01$ ;  $df_1 = 3$ ;  $df_2 = 168$ ; NS=No Significant Difference.

Through the initial investigation of all the 17 TQM practices with respect to F-value, it can be seen that a significant difference was not found among the six TQM practices (top-management commitment, customer focus, process management, quality systems, teamwork, and communication) in the study. Seven practices (training and education, continuous improvement and innovation, employee involvement, benchmarking, strategic planning, employee encouragement, and product and service design) showed significant difference at the 0.05 level while the remaining four practices (supplier management, information and analysis, quality culture, and human resource management) showed significant difference at the 0.01 level. From these results it can be concluded that top-management commitment, customer focus, process management, quality systems, teamwork, and communication are not significantly different across Indian service industries. However, Indian service industries have better training and education, continuous improvement and innovation, and quality culture practices, as indicated by their total mean scores ( $> 3.50$ ). It can be further concluded that Indian service industries have better implementation of these TQM practices to improve continuous improvement culture, training and education program and emphasize the development of quality culture across the industry to enhance quality performance besides the implementation of top-management commitment, customer focus, process management, quality systems, teamwork, and communication. This in turn, will help service industries to achieve better quality over time. When comparing the implementation of different TQM practices across Indian service industries, the significant values of the ANOVA test statistics for 'training and education'  $\{F(3, 168) = 2.062, p < 0.05\}$ ; 'continuous improvement and innovation'  $\{F(3, 168) = 3.71, p < 0.05\}$ ; 'supplier management'  $\{F(3, 168) = 4.342, p < 0.01\}$ ; 'employee involvement'  $\{F(3, 168) = 3.617, p < 0.05\}$ ; 'information and analysis'  $\{F(3, 168) = 4.809, p < 0.01\}$ ; 'benchmarking'  $\{F(3, 168) = 3.615, p < 0.05\}$ ; 'quality culture'  $\{F(3, 168) = 4.423, p < 0.01\}$ ; 'human resource management'  $\{F(3, 168) = 5.578, p < 0.01\}$ ; 'strategic planning'  $\{F(3, 168) = 3.352, p < 0.05\}$ ; 'employee encouragement'  $\{F(3, 168) = 3.696, p < 0.05\}$ ; and 'product and service design'  $\{F(3, 168) = 3.331, p < 0.05\}$  practices in Table 5 supported the rejection of the hypothesis that level of implementation of these 11 TQM practices are equal across Indian service industries or in other words it can be concluded that significant differences exist amongst these 11 TQM practices across the Indian service industries. Thus, hypothesis H1 was rejected for these 11 TQM practices (i.e.  $H_3$ ;  $H_4$ ;  $H_5$ ;  $H_6$ ;  $H_7$ ;  $H_{10}$ ;  $H_{11}$ ;  $H_{12}$ ;  $H_{13}$ ;  $H_{14}$ ; and  $H_{16}$ ).

A close investigation of these 11 TQM practices with respect to their mean scores in each category of service industry and overall mean of each practice provides a better understanding of these reported significant differences at the two levels. For instance, concerning the 'supplier management' practice, the mean score obtained by ICT is 3.04 which indicates moderate implementation of supplier management practice while the same for healthcare (2.31), banking (2.82), and hospitality (2.88) indicate low implementation of supplier management practice. The overall mean score of 2.89 further supports the above argument that the level of implementation of supplier management across Indian service industries is low. This was also reported by Al-Khalifa and Aspinwall (2000); Tsang and Antony (2001); Talib and Rahman (2012). Similarly, the significant difference in the level of use of 'human resource management' practice was also found to be existing. The mean score obtained by ICT is 3.01 which again indicates moderate usage of human resource management practice while in healthcare, human resource

management is least practiced or implemented (mean score=2.20). Further, banks (2.81) and hospitals (2.73) also show low implementation of human resource management practice in these industries. The overall mean score of 2.83 further supports the above statement. This was also claimed by Issac *et al.* (2004). Similarly, other practices also showed wide variation in their mean scores across different service industries and hence, significant differences were found in these practices as can be seen from Table 5.

Further, rejecting the overall hypothesis of equal implementation level by the ANOVA does not indicate that every TQM practice mean differs significantly from every other industry mean as in case of training and education; employee involvement; quality culture; strategic planning; and product and service design. For that, Roscoe (1969) and Mady (2009) recommended the use of *Post-Hoc* Scheffe multiple comparison tests which can be utilized to test this proposition, which is beyond the scope of the present research study as it is confined to Indian service industries as a whole and not for a specific service industry.

In contrast to the above analysis, the implementation level of 'top-management commitment' { $F(3,168)=2.062, p=0.107>0.05$ }; 'customer focus' { $F(3,168)=2.284, p=0.081>0.05$ }; 'process management' { $F(3,168)=2.428, p=0.067>0.05$ }; 'quality systems' { $F(3,168)=1.107, p=0.348>0.05$ }; 'teamwork' { $F(3,168)=2.505, p=0.061>0.05$ }; and 'communication' { $F(3,168)=1.998, p=0.116>0.05$ } practices in Table 5 do not differ significantly. Accordingly, hypothesis H1 was not rejected for these six TQM practices (i.e. H<sub>1</sub>; H<sub>2</sub>; H<sub>8</sub>; H<sub>9</sub>; H<sub>15</sub>; and H<sub>17</sub>). For better understanding of the above reported results, again all these six practices were verified with respect to their mean scores in each category of service industry and with the overall mean score. For instance, concerning the 'top-management commitment' practice, the mean score obtained by hospitality is 4.04 which indicated the high implementation of top-management commitment practice. Similarly, in other three industries the levels of implementation of top-management commitment practice were found to be moderately high to high (healthcare=3.77; banks=3.55; and ICT=3.70). The overall mean score of 3.74 further supports the above claim and hence, it can be argued that top-management commitment as a TQM practice is highly implemented across Indian service industries. Majority of the studies have supported this argument and claimed that top-management commitment is the key TQM practice for successful implementation of TQM (Issac *et al.*, 2004; Al-Khalifa and Aspinwall, 2000; Yusuf *et al.*, 2007; Lee *et al.*, 2001).

Similarly, a significant difference was not found among the various levels of use of 'customer focus' as a TQM practice. The mean score obtained by hospitality is 3.92 while for ICT, healthcare, and banks it is 3.58, 3.56, and 3.35 respectively, which are all above the moderate level of implementation. This means 'customer focus' is implemented equally across all the four categories of service industries. This was also true for 'process management'; 'quality systems'; 'teamwork'; and 'communication' as depicted in Table 5.

It is finally concluded that, out of the 17 TQM practices identified in the present research study, only six practices (top-management commitment; customer focus; process management; quality systems; teamwork; and communication) are effectively implemented in Indian service industries, while the remaining 11 are partially implemented and considered in different categories of service industries. Emphasis is to be given to other important TQM practices particularly to quality culture, benchmarking, continuous improvement and innovation, training and education, and strategic planning which can enhance the quality performance of the service industries and efforts should be made to properly implement these TQM practices for steady growth and in achieving sustainability in the organization.

## CONCLUSIONS

This research paper successfully accomplishes the objective of the study and assess the degree to which TQM practices are implemented in Indian service industries. It was hypothesized that there is no significant difference in the 17 TQM practices as practiced or implemented by Indian service industries. The purpose of this hypothesis was to examine the extent to which TQM practices are implemented in Indian service industries. Based on the empirical evidence obtained from one-way ANOVA, the results showed that only six practices i.e. top-management commitment; customer focus; process management; quality systems; teamwork; and communication are effectively implemented across the Indian service industries, while the remaining 11 are partially implemented and considered in different categories of service industries. Thus, no significant difference was found in above six practices while there was a significant difference observed among the remaining 11 practices across Indian service industries for their implementation potential. Thus, hypothesis H1 was accepted for top-management commitment, customer focus, process management, quality systems, teamwork, and communication, thereby meaning that these practices are significantly practiced or implemented in Indian service industries while the practices of training and education, continuous improvement and innovation, supplier management, employee involvement, information and analysis, benchmarking, strategic planning, employee encouragement, quality culture, human resource management, and product and service design are insignificant or there exists a significant difference among these 11 TQM practices. Thus, hypothesis H1 was rejected for these 11 practices. The uniqueness of this research work is that it provides a useful framework and research model for implementation of TQM program in Indian service industries. This kind of study has not been undertaken before in previous researches in Indian context. This work not only confirms that service industries can implement TQM program successfully but also suggests that it has a positive and significant impact on a industry performance. The findings of the present study provide some insights as to how the managers and practitioners of the service industries can improve their performance and how they can implement TQM program successfully in their industries. Researchers can adopt the present TQM model in their future work that can improve their research and academic performance significantly. Additionally, the proposed research model will allow managers to assess the level of industry quality management against other models proposed by various researchers. Furthermore, this paper focused particularly to four service industries namely healthcare; ICT; banking; and hospitality. The research can be extended to some emerging Indian service industries like aquaculture, airline, e-purchase, m-government, halal foods and many others. Finally, study can be extended to assess the impact of identified set of TQM practices on measures of sustainability such as business growth, competitive advantage and change management.

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