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Importance of Human Factors to Organizational Performance

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Abstract

A growing need of investigating the total quality management practices in the Yemeni industrial market has led the way to conduct this study. In this study, we attempted to investigate the importance of human factors of total quality management to organisational performance through examine the importance of the human factors in organizational performance. Results show, an unequivocal relationship among the variables. Therefore, the findings revealed a direct relationship among the variables, in fact, almost %83.33 of the human factors have a significant relationship with organizational performance. The study also shows its significance to pave the road for future researchers as a first paper investigating the human side of total quality management in Yemen as well as Middle East region..

Keywords: Human factors; total quality management; organizational performance; Yemeni industrial companies.

1. Introduction

Quality management and its human factors play an important role in the implementation if improving the practice of quality and organisation performance. Quality management literature programme will not be successful unless concerted attention is paid to human factors (Lewis et al., 2006b; Motwani et al., 1994; Wilkinson, et al., 1994).

Most of the literatures about quality management divided total quality management practices into two groups; the first called technical factors and the second named human factors. The former group focuses on tools and work processes such as product design, process and statistical, benchmarking, just in time, continuous improvement and control/feedback. The latter group includes the human or behavioural side of quality management such as leadership, employee, involvement and education, customer focus, teamwork, communication, supplier relations, and rewards and recognition.

Research suggests that there is a considerable lack of studies emphasising that human side at total quality management as many studies were undertaken to contribute to the technical side only. That was due to the technical orientation at total quality management leaders who emphasised technical factors rather than human factors (Habtoor, 2016; Lau and Idris, 2001; Wilkinson, 1992)(Al-Mulla, Asma; Ameen, Ali; Isaac, Osama; Nusari, Mohammed; Hamoud Al-Shibami, 2019; Alhefiti et al., 2019a; Alkatheeri et al., 2020; Haddad et al., 2020; Isaac et al., 2019; Mohammad et al., 2019). According to Edwards and Sohal (2003), the lack of attention to human factors at total quality management may lead to limit the success of total quality management implementation.

Moreover, literature of quality management suggested that when the companies implement total quality management into their processes, there is more emphasis on the technical factors of quality management rather than human factors (Yang, 2006; Lewis et al., 2006b; Wilkinson et al., 1994). Hill (1991) noted that although the solution to the technical issues of designing appropriate systems and procedures are fully specified, there are lacunae in the treatment of social factors. Therefore, as a result of the significant impact of human factors of quality management on organisation performance and their contribution to the implementation of total quality management, human factors will require more in-depth attention when the organisation re-engineers its processes to implement total quality management.

Insufficient empirical studies have examined the impact of human factors of quality management on organisation performance. Also, to the knowledge of the researcher, no study has been conducted examining the impact of human factors on quality improvement practices except some studies examining the impact of human factors on technical factors of quality improvement practices. However, they provided evidence showing the existence of both direct significant impact of human factors on technical factors of quality improvement practices and organisation performance and indirect significant impact of human factors on organisation performance through their impact on technical factors of quality improvement practices (Habtoor. 2019; Habtooret al. 2016; Flynn et al., 1995; Rahman and Bullock, 2005; Abdullah et al., 2008; and Gadenne and Sharma, 2009).

In Yemen, as mentioned earlier, there is an increasing governmental interest in the industrial sector because of its fundamental role in leading economic changes in addition to its role in supporting the Yemeni economy. Furthermore, Yemeni industrial companies have taken total quality management programmes as a method to enhance their competitive advantage in order to face new challenges in the business environment. However, the implementation of total quality management is still below the anticipated level (Nashwan Saeed, 2008; Abdullatef Aeed, 2006).

Literature considers human factors as vital players to lead the success of total quality management implementation through their direct contribution to the practices of quality improvement and companies' performance, besides an indirect contribution to organisation performance through creating a suitable environment for the implementation of quality improvement practices (Rahman and Bullock, 2005; Abdullah et al., 2008; and Gadenne and Sharma, 2009). Thus, the current study investigates the human factors of quality management in Yemeni industrial companies through examining the direct impact of human factors on organisation performance.. Thus, this study can contribute to the Yemeni Government and companies' efforts and enhance the industrial sector through improving the implementations of total quality management.

Finally, the framework of this study consists of six factors representing the human side of quality management; they are leadership, customer focus, supplier relation, employee involvement, training and education, and reward and recognition. and organisation performance which is represented by five dimensions. Therefore the research question is, “what is the importance of human factors to organisation performance?”

2. Literature Review

The total quality management literature identified a set of practices as critical successful factors for the implementation of total quality management. Oakland (2000) provided a general definition of these factors of quality management which influence the organisational or management system in a business environment. Oakland (2000) defined fundamental factors as the critical areas that the organisations should examine carefully and categorised their impacts on the system as well as on the entire organisation in order to manage them successfully and achieve the effective implementation of the system and the organisation’s mission. Saraph et al., (1989) pioneered an empirical approach to identify and measure the critical factors of total quality management implementation in the United States of America. They argued that no systematic attempt had been made in the literature to organise and synthesise the various sets of critical factors, the measures of overall organisational management or any of the individual critical factors identified by different quality gurus. Later, some authors developed a similar approach to identify and investigate the critical success factors for total quality management implementation (Salama, et al. 2019; THA Ismail et al. 2019; RMM Saleh et al. 2018; HMR Salah, & Habtoor, 2017; Al-Hammali et al 2017; Etlesh et al. 2016; Tabouli et al. 2016; Musbah A. et al, 2016; Mokhtar A. & Habtoor N. 215; Mohamed et al. 2015Alok and Sushil, 2013; Mandeep et al., 2013; Oprime et al., 2012; Sanjiv and Inderpreet, 2012; Evangelos and Christos, 2010; Guion, 2010; Fotopoulos et al., 2009; Salaheldin, 2009; Wahid and Corner, 2009; Sharma and Kodali, 2008; Antony et al., 2002; Zhang, 2000; Yusof and Aspinwall, 1998; Black and Porter, 1996; Tamimi and Gorshon, 1995; Badri et al., 1995; Flynn et al., 1994; and Porter and Parker, 1993).

Based on the ethos of "the quality is everyone", Wilkinson (1992) emphasised the human factors of quality management and divided quality management into two aspects, soft and hard, which examined the human side of quality management and work processes respectively. Wilkinson (1992) claimed that the hard aspect (technical side) may involve the arrangement of production techniques, including statistical processes control, quality function deployment, changes in the layout, design procedures of the organisation, and just-in-time inventory; while the human side is concerned with creating customer awareness within an organisation and, as such, may be seen as a form of internal marketing or employee communication.

According to Louise (1996) the culture change is a major reason for the reorientation of total quality towards the human factors of quality management. The culture change becomes a stumbling block for many companies involved in total quality management implementation (Louise, 1996; (Alameri et al., 2019; Albreiki et al., 2019; Alhefiti et al., 2019b; Alshamsi et al., 2019; Mohamed et al., 2019). Lau and Idris (2001) suggested that it is necessary to study the critical soft factors (human factors) of quality management due to their importance to total quality management implementations and thereby contributing in changing the mentality of managers and employees and permeating total quality management throughout the whole organisation. Yasuo (1980) said, "To make good use of personnel is difficult, but it is an issue that is required and must be overcome.” Tamimi and Sebastianelli (1998) identified 48 per cent barriers to total quality management due to human factors of quality.

Recently, researchers gave more emphasis on the dimension of human factors of quality management and their influences and relations with the hard factors and organisation performance (Habtoor, 2015; Assadej, 2012; Gadenne and Sharma, 2009; Fotopoulos and Psomas, 2009; Abdullah et al., 2008; Lewis et al., 2006a,b; Rahman and Bullock, 2005; Boon and Arumugam, 2005; Sila and Ebrahimour, 2002; Lau and Idris, 2001; Louise, 1996; Motwani et al., 1994; Wilkinson, 1992; Hill, 1991).

Controversial claims have been suggested by researchers regarding the most effective factors on total quality management implementation. For example, Black and Porter (1995) claimed that hard factors are concerned with tools and systems that lend to support the implementation of human factors, while Samson and Terziovski (1999) found that human factors of quality management such as executive commitment, employee empowerment and an open culture can make a competitive advantage stronger than the technical factors such as process improvement, benchmarking, information and analysis. Wilkinson (1992) suggested that the entire total quality management process would be progressively enhanced if these issues were brought to the fore, such as the dissection of department barriers and increasing employee involvement. Thus, it is difficult for quality tools to contribute in quality improvement, customer satisfaction, and consolidation of its market position without support and guidance by the human factors of quality management such as top management commitment and employee and supplier support (Fotopoulos and Psomas, 2009). Lewis et al. (2006b) found that hard criteria implementation has more attention than soft criteria (human factors) in small and medium enterprises. They defined the human factors of quality management which are largely related to the behavioural aspects of working life such as leadership, human resource management, supplier's relations and customer focus. Hill (1991) also suggested that there are lacunae in the implementation of social factors when the organisations reengineer their systems and procedures. Lau and Idris (2001) found that human factors such as culture, trust and teamwork have a strong influence on quality management. The importance of human factors of quality is based on their fundamental role on the implementation of total quality management and, as a programme, needs intense and continuous change in the culture of organisation. Motwani et al. (1994) considered the human factors of quality management, such as leadership, organisational skills and culture, as key players that act to achieve quality performance. It is easy to quantify the hard criteria (Lewis et al., 2006a; Oakland, 2000; and Louise, 1996), while the soft criteria are more open to interpretation; thus, it is more difficult to measure (Lewis et al., 2006a; Gotzamani and Tsiotras, 2001; Samson and Terziovski, 1999).

Lewis et al. (2006a) identified 13 soft factors and 12 hard factors as critical identifiers of quality management based on Sila and Ebrahimour (2002) study, who identified 25 criteria factors of quality management. They undertook an in-depth study to investigate total quality management practices based on the studies that were conducted between 1989 and 2000 in different countries and published in different journals within that period. In fact, Sila and Ebrahimour (2002) discovered in their survey that four out of seven practices received the highest coverage related to the human side of total quality management, namely customer focus and satisfaction, teamwork, training, and employee involvement.

More specifically, Abdullah et al. (2008), Rahman and Bullock (2005), Ho et al. (2001), and Flynn et al. (1995) attempted to explore and investigate the relationship between hard and soft factors and their impact on organisation performance. They divided quality management practices into two groups; the first group named as the hard factors (technical factors), and includes process flow management, product design process and statistical, control/feedback, JIT principles, and continuous improvement. The second group named as the soft factors (human factors), includes customer relationship, supplier relationship, training and education, workforce commitment, team work and top management support. They found a positive relationship between hard and soft factors and also a positive relationship between these factors and organisation performance. Both hard and soft factor significantly impact organisation performance. They also found that the hard factors act as a mediating factor for the relationship between the soft factors and organisation performance. These findings support the purpose of the present study.

3. Research Method

3.1 Framework

The framework of the current study connects the variables of human factors of quality management, and the dimensions of organisation performance. The framework shown in Figure 1 includes independent variables represented by six human factors of quality management: leadership, customer focus, supplier relations, employee involvement, training and education, and, finally, reward and recognition. Moreover, organisation performance is represented by five dimensions namely customer satisfaction, employee morale, productivity, defects, and delivery in full. Variables were measured using a Likert Scale which recommended in the previous studies (Isaac, Aldholay, Abdullah, & Ramayah, 2019; Isaac, Abdullah, Ramayah, & Mutahar, 2018; Isaac, Abdullah, Aldholay, & Ameen, 2019; Isaac, Abdullah, Ramayah, & Mutahar, 2017; Mutahar, Daud, Thurasamy, Isaac, & Abdulsalam, 2018).

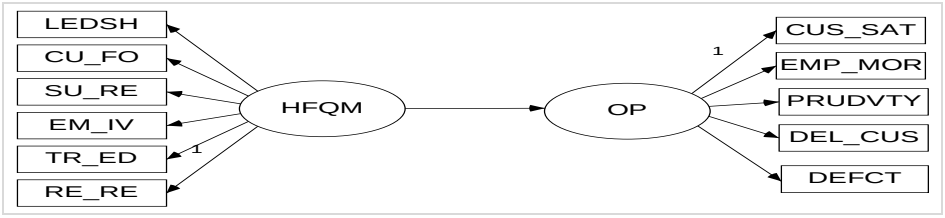

Figure 1: The framework of study

Note: HFQM=human factors of quality management, LEDSH = leadership, CU_FO = customer focus, SU_RE = supplier relations, EM_IN = employee involvement, TR_ED = training and education, RE_RE = reward and recognition, OP = organization performance, CUS_SAT = customer satisfaction, EMP_MOR = employee morale, PRUDVTY = productivity, DLE_CUS = delivery customer in full time, DEFCT = defects

3.2 Population and sample

The target population of this study is all Yemeni industrial companies, who have received local and international quality certificates due to their interest on total quality management implementations and also implicate international and local quality criteria in their operations. Eighty-seven Yemeni industrial companies have already taken local quality certificates, which were given by Yemen Standardization Metrology and Quality Control Organisation (YSMQCO), and also international quality certificates (such as European Business Excellence Model (EBEM), ISO 9000, and also other international quality awards). These companies are divided into five industrial cities; Sana'a, Aden, Alhudaidah, Hadramout, and Taiz.

This study emphasises on the industrial sector due to its importance to the Yemeni economy as well as supporting the government's effort to enhance this sector through improving total quality management implementation. It is essential to note that the researcher selected these types of companies due to their interest on the implementation of total quality management and using international and local criteria in their operations which gives them familiarity with the issues that are addressed in this study (Curry and Kadasah, 2002).

Selecting the appropriate sample is the most important element to answering the research questions and investigating the objectives of any study (Sekaran, 2000). Based on this logic, the participants of this study are the managers, who are familiar with the implementations of total quality management in their organisations and, at the same time, have knowledge about the performance.

Therefore, the respondents of this study are one top management manager and two quality managers of each Yemeni company of interest. Thus, a total of 261managers from 87 Yemeni industrial companies were listed as respondents of this study, and a questionnaire was sent to 87 industrial companies in Yemen. A total of 210 completed questionnaires were returned out of 261, giving a response rate of 80% which is considered acceptable.

3.3 Measurement

A questionnaire was designed to determine and clarify the relationship between the human factors, and organisation performance. To measure the human factors, the instrument developed by Zhang (2000) was used. Forty items included six factors; leadership, customer focus, employee involvement, supplier relations, training and education, and reward and recognition. To measure organisational performance, the instrument that was developed by Samson and Terziovski (1999) was used. Prior to conducting the present study, a pilot study was conducted among 30 quality managers in Yemeni industrial companies in order to test the clarity, comprehensiveness and acceptability of the questionnaire.

Factor analysis was carried out to evaluate the assignment of items to scale in developing the instrument of this study. According to Hair et al. (1998), the main purpose of factor analysis is to find a way of condensing or summarising the information into a smaller set of new composite dimensions (factors) with minimal loss of information. Factor analysis is a way of testing how well measured variables represent the constructs. Moreover, factor analysis results can provide evidence for the convergent and differentiate validity of theoretical constructs (Brown,2006). Factor analysis can assist to identify whether the selected items cluster on one or more than one factor. Factor loadings are used to present these relations. Hair et al. (1998) regarded factor loadings greater than 0.30 as significant factors, loadings of 0.40 as more important, and if the loadings are 0.50 or greater they are considered very significant. The previous field studies of total quality management such as Saraph et al. (1989), Flynn et al.(1994) and Zhang (2000) used factor analysis and they claimed in their studies that a factor loading of 0.50 is acceptable. Therefore, in the current study, a factor loading of 0.50 or greater is considered significant.

The results present factor loadings of human factors, and organisation performance, after removing the items with low factor loading or double loading. Regarding the variables of human factors, 4 out of 40 items were removed after factor analysis; one of which belongs to leadership factor, thus, seven items of leadership factor remained. Another two items were removed from employee involvement factors; thus six items of

employee involvement survived. The fourth item was removed out of the six items of reward and recognition factor. The findings of this technique show that the loading of the remaining items ranged from .510 to .904.The relative explanatory power (Eigen values) for each factor of human factors is 3.550 for leadership, 3.210 for customer focus, 3.193 for supplier relationship, 3.234 for employee involvement, 3.586 for training and education, and 3.266 for reward and recognition. The value of KMO for each factor of human factors of quality management is .814 for leadership, .822 for customer focus, .685 for supplier relationship, .707 for employee involvement, .799 for training and education and .817 for reward and recognition. Actually, these results indicate that sampling adequacy for factor analysis was appropriate. Bartlett's Test of Sphericity for each variable significantly supports the factorability of correlation matrix.

For organisation performance two of seven items were removed after factor analysis. The findings of this technique show that the loading of the remaining items ranged from .587 to .844. The relative explanatory power (Eigen values) for the factor of organisation performance was 3.004. The value of KMO for organisation performance was .781, which demonstrates that the sampling adequacy for factor analysis was appropriate. Bartlett's Test of Sphericity for each variable significantly supports the factorability of correlation matrix.

The reliability analysis was conducted to provide information about the relationship between individual items in the scale and their internal consistency, in addition to examining the properties of measurement scale and the questions that formulated it. Wuest et al. (2006), however, considered the calculating estimates of reliability as an essential prerequisite for the instrument's validation. In this research, internal consistency was adopted to estimate the reliability of instrument. Internal consistency was measured by Cronbach's coefficient alpha, and the higher the Alpha value or the closer reliability coefficient to 1.0 was considered the higher of the measurement items. Therefore, in this study, Cronbach's Alpha values exceed 0.7 and represent acceptable reliability, while any Alpha values over 0.8 are considered as entirely good (Nunnally, 1978; Cronbach, 1951).

The results of Cronbach's coefficient alpha of the six human factors of quality management are shown in Table 1. Measures of human factors were carried out based on five point Likert scale from 1= strongly disagree to 5= strongly agree. The instrument has an acceptable reliability for human factors of quality management, the Cronbach alpha ranged between 0.727 for employee involvement to 0.871 for reward and recognition. Moreover, Table 1. shows Cronbach's coefficient alpha of five dimensions of organisation performance (customer satisfaction, employee morale, productivity, defects, delivery in full) in this study. The instrument has an acceptable reliability for organisation performance, and the Cronbach alpha was 0.827.

Table 1: Reliability analysis

Factor	***No of items***	***Alpha***
Human factors		
Leadership	7	0.824
Customer focus	6	0.817
Supplier relations	6	0.777
Employee involvement	6	0.727
Training and education	6	0.860
Reward and recognition	5	0.871
Organisation performance	5	0.827

4. Statistical analysis

Pearson correlation coefficient test was used to evaluate the relationships between the variables of this study, and structural equation model by Amos program carried out to examine the hypothesis of this study. The correlation between the six human factors (leadership, customer focus, supplier relation, employee involvement, training and education and reward and recognition) and the five dimensions of organizational performance (customer satisfaction, employee morale, productivity, delivery to customer and defect) are shown in Table 2. The correlation results show that five out of the six human factors were significantly related to organization performance (leadership, customer focus, employee involvement, training and education and reward and recognition). While supplier relations has not any relation with any dimension of organizational performance. An in-depth analysis of the structural model establishes the existence of the causal relationship between the human factors and organizational performance. A significant coefficient would reveal the existed relationship among the variables, and the magnitude of this relationship can be observed from the value of this coefficient. The estimated model fit shows a good fit, as shown in Figure 2. The results of the goodness of fit test, indicates that the value of chi-square (94.118), degree of freedom d,f (36), CFI (.955), RMSEA (.088) and P- value (,000) are significant.

Table 2: Correlations analysis of human factors and oganizational performance

	CUS_SAT	*EMP_MOR*	*PRUDVTY*	*DEFCT*	*DLE_CUS*
LEDSH	.206**	.303**	.334**	-.013-	.139*
CU_FO	.224**	.249**	.345**	.014	.199**
SU_RE	-.038	-.063	-.027	-.116	-.074
EM_IN	.222**	.415**	.469**	.004	.216**
TR_ED	.236**	.332**	.423**	.000	.198**
RE_RE	.233**	.405**	.473**	.020	.178**

**. Correlation is significant at the 0.01 level (2-tailed), *. Correlation is significant at the 0.05 level (2-tailed).

As shown in Table 3 and Figure 2 below, the results indicate that the human factors have a positive relationship with organizational performance, and directly impact organizational performance (the standardized coefficient = .432, effect size (R2) = .186 and significant at .001 level (P = .000)). These results mean that 19% of organizational performance can be explained by the human factors, which considered as a large effect size.

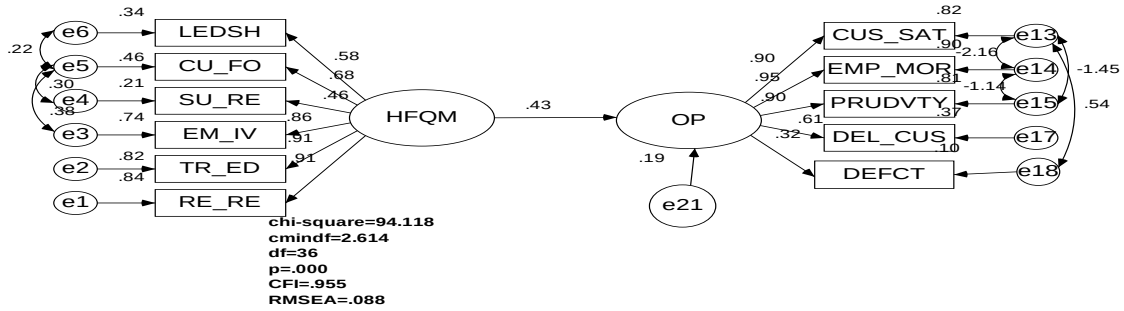

Figure 2: Structural model of relationship between human factors and organizational performance

Table 3: Fit indices

			Unstandardized	Standardized	S.E.	C.R.	R^2	P
Organizational Performance	<---	Human factors	.108	.432	.017	6.527	.186	000

5. Discussion

The results of this study reveal that the human factors of quality management have an important role in the implementations of total quality management and directly impact organizational performance (Dow et al., 1999). So, due to this importance, these factors must get enough attention when the companies reengineering their process to implement total quality program (Wilkinson, 1992).

Despite the fact that there is lack of studies emphasis on the human factors, many studies carried out to contribute the design development and application of the total quality system (Dow et al., 1999). Furthermore, in Middle East countries, actually, at the knowledge of the current researcher there is no research to date interested on the human side of quality management. Moreover, in the implementation of total quality management there is insufficient attention paid for the human factors. This may be due to the production orientation of total quality management leaders (Wilkinson, 1992; Louise, 1996; and Lau and Adris, 2001).

Lau & Idris (2001) suggested that it is necessary to study the critical soft factors (human factors) of quality management due to their important role to the implementations of total quality management in addition to their contribution in changing the thinking of the managers and employees, and permeating the total quality management throughout the whole organization. According to Tamimi & Sebastianelli (1998), 48% were identified as barriers to total quality management due to human side of quality management. Motwani et al., (1994) considered the human factors (such as leadership, organizational skills and culture) as a key player acting to achieve quality performance. Previous studies bring evidences that the human factors have important

role in the implementation of total quality management (Abdullah et al., 2008; Rahman & Bullock., 2005; Flynn et al., 1995). Following this same logic, this research established to examine the relationship between the human factors and organizational performance. However, the structural equation model was estimated to test this relationship.

One of the limitations of this study is that the data gathered was cross-sectional rather than longitudinal in nature. The longitudinal method might improve the understanding of the associations and the causality between variables (Isaac, Abdullah, Ramayah, Mutahar, & Alrajawy, 2017; Isaac, Abdullah, Ramayah, & Mutahar Ahmed, 2017). Future research should be conducted to investigate the relationship between variables by conducting cross-cultural studies as recommended by previous studies (Isaac, Abdullah, Ramayah, & Mutahar, 2017a; Isaac, Masoud, Samad, & Abdullah, 2016).

In general, the results of this study confirmed that there is a significant relationship between the human factors and organizational performance, in which the human factors directly impact organizational performance, and the standardized coefficient is .432, and significant at .001 level (P = .000). Five out of the six human factors have a significant relationship with organizational performance. These factors are leadership, customer focus, employee involvement, training and education and reward and recognition, which make this research consistent with previous studies such as Flynn et al. (1995), Rahman & Bullock (2005), Abdullah et al. (2008) and Ho et al. (2001) On the other hand, the results of this study didn't find any positive relationship between supplier relation and organizational performance. This result, however, agrees with the results obtained by Powel (1995) and Dow (1999) who suggested that a factor such as supplier relations could only be context-dependent. In sum, this research confirmed previous suggestion that claimed the important role of the human factors of quality management in the implementation of total quality management and organizational performance.

6. Conclusion

This study determined, described, and explored the contribution of the human side of quality management to the implementation of total quality management program through examine the direct impact of human factors on organizational performance. Organizations should increase spending on research and development in order to increase the organizational effectiveness (Osama Isaac, Abdullah, Ramayah, Mutahar, & Alrajawy, 2018; Isaac, Abdullah, Ramayah, & Mutahar, 2017b). The study carried out through 87 companies of Yemeni Industrial Sector by sample of three managers from each company (one of top managers and two quality managers). In methodology, this study used a quantitative approach by designed questionnaire. The study involved a sample of 87 companies; they were different sized population from small, medium and large. They were also different in terms of local and international certified. In term of analysis, this study used correlation analysis to examine the relationship among variables, and the structural equation model was used by Amos program to evaluate the direct impact of human factors on organizational performance. The analysis results found a positive relationship among the variables of this study; thus, it showed that human factors have a significant direct impact on organizational performance.

Although, this study was conducted successfully without problems, but it is like any other study; has some limitations. Firstly, in instrument, the employee morale and customer satisfaction were evaluated by the managers perception, which perhaps make it relatively weak. Secondly, other Middle East Countries such as Saudi Arabic, UIA, Qatar, Bahrain, Oman, Kuwait, Jordon, Egypt, Iran and Turkey could be included in order to make comparisons in terms of human side of quality management and organization performance. Finally, other human factors of quality management such as communication, empowerment, teamwork, quality culture, human resource management, and employee satisfaction could be included as well. However, this can be the issue of a future research.

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