Analysis of Total Quality Management Practices in the Construction Sector Performance

Nabihahkameltawfiq abdulmalek[1];Amiruddin Bin Ahamat[2]
Niena20101@gmail.com; Amiruddin@utem.edu.my

Abstract

The architectural business has grown considerably more challenging globally, and for a company to win in its fight for survival, it must focus on increasing its operational efficiency. The scarcity of empirical research into the use of Total Quality Management (TQM) in the architectural sector in Yemen is one of the main motivations for doing this study.

Quantitative research methods were employed in this investigation. In the quantitative approach, the questionnaire was used to collect primary data from the research participants. 335 Yemeni construction project managers, engineers, and workers were interviewed for the study.

This study found that there are positive and significant relationships between top management commitment, human resources, and customer focus and the architecture organization's performance in Yemen.

Current research recommends that the owners and managers of construction projects must implement policies and strategies that include the application of total quality management in all stages of the establishment of architectural projects.

Keywords:-Total quality management ,Construction sector performance,Top management commitment, Human resources Customer focus

1. Introduction

TQM is the most often used strategy for staying in business by architecture firms looking to improve efficiency across all activities and processes. The most common strategy used by architecture firms to stay in business is TQM (Pambreni et al., 2019; Gaikar& Cherian, 2020; Lau, et al., 2019).Total Quality Management (TQM) can help an organisation improve and better serve the demands of its community and its own people in the process (Abdullahi et al., 2020). Despite their fundamental differences in nature, the manufacturing and service industries face the same set of problems when it comes to reaping the full benefits of Total Quality Management (Abbas, 2020). The multiple benefits of implementing Total Quality Management (TQM) across a range of

business sectors have been extensively researched and reported on, including financial rewards, internal and external customer satisfaction, and company-specific benefits (Al-Saffar&Obeidat, 2020; Pham, 2020; Parsamand, 2021). Total quality management (TQM) has been proven to be an efficient and effective management method in all parts of a firm, including processes, products, workers, and relevant customer and shareholder satisfaction (Al-Dhaafri&Alosani, 2021). This positive strategy to generate high-quality outcomes in both management and product development should be considered by companies or organisations in Yemen. To pursue Total Quality Management as a competitive strategy, it must first be recognised by a large number of researchers; second, TQM values must be consistent with Islamic cultural and ethical principles; and, finally, it must be implemented across a large number of architecture firms in Yemen, which has already happened in many cases (Dahmas& Ahmad, 2020).

In many countries, particularly emerging nations, the construction sector makes a sizable contribution to a country's gross domestic product (GDP), socioeconomic growth, and employment creation. However, the construction sector can have both short-term and long-term harmful effects on the environment (Burciaga, 2020). According to STEC (2020), American structures account for 38% of total CO2 emissions. Additionally, it is seen as a critical industry that promotes sustainable development (Heerwagen, 2000). Thus, sustainability is gaining traction in the construction sector and must be incorporated into the management of a building's full lifecycle. Efficient management of the building lifespan, which begins with design and construction and continues through operation and maintenance until demolition, enables users to gain greater control and improve project performance (Muller et al. 2019). Sustainability in the building business is critical to attaining the United Nations' Agenda 2030's 17 sustainable development goals (SDGs) (Goel, 2019). Sustainable construction can bring together the construction industry's environmental stewardship, social awareness, and economic profitability aims, while also facilitating the wider community's objectives for ultimate sustainable building (Athapaththu and Karunasena, 2018). While the relevance of sustainability in the construction industry is well established, the present body of knowledge is fragmented and fails to pinpoint the precise determinants of construction business performance. This scattered study precludes the formation of a comprehensive picture of the factors influencing the building industry's sustainability (Caldera, Desha, and Dawes, 2018). The current literature sheds light on several determinants affecting the construction industry's sustainability, including total quality management (Babalola, Ibem, and Ezema, 2019), continuous improvement (Khodeir& Othman, 2018), industry management (Meng, Xue, Liu, and Fang, 2015), and green building (Lu et al., 2019; Saieg et al., 2018).

Delays in the construction industry are a global phenomenon and are widely regarded as one of the world's most chronic challenges. Its persistence is due to the fact that it is a primary cause of cost overruns, which frequently result in the project being abandoned. While this is more widespread in some nations than others, the building business in Yemen is no exception (Najib et al. 2018). Yemen's construction industry is confronted with significant economic and technological challenges. Additionally, political instability and civil conflict have had a detrimental direct influence on the national economy and social growth of the country (Sultan &Alaghbari, 2017). This industry reported that the primary impediments to development in Yemen's construction industry were institutional and administrative weaknesses, which resulted in low productivity, insufficient quality, inadequate safety, and time and cost overruns, all of which reduced the final product's value (Alaghbari et al., 2019; Gamil& Rahman, 2019; Najib et al., 2018; Sultan &Alaghbari, 2018). Thus, the purpose of this study is to analysis the effect of overall quality management on the performance of the Yemeni construction sector. This research will conduct a detailed review of the available literature on the research variables. The following sections will detail the methods employed in this study, as well as the exams and examinations administered during the course of the study. Additionally, this article will analyse the research's findings and conclude with a conclusion.

2. Literature Review

Total Quality Management (TQM) was first used by the US Department of Defense (Evans & Lindsay, 2019). Developed in the 1980s to help American businesses compete with their Japanese counterparts, it is the fourth level of quality development in the United States (Talha, 2016). In the 1980s, Japan's advanced technology, lower labour costs than in the US, and, most importantly, its work ethic made it a major competitor. Thanks to labour regulations and regulatory restrictions (Mele &Colurcio, 2016), Japan was able to establish a solid foothold in the American market. Due to its more sophisticated procedures and consideration of all corporate stakeholders, including both internal and external consumers, the TQM concept was widely welcomed in Japan when it came to competitiveness. In addition to manufacturing processes and service delivery, TQM was used to improve supplier relationships and provide customers with high-quality service (Dale et al., 2015). Total Quality Management emerged in the 1990s as a new management approach to deal with the challenges posed by the then-dominant competition in the market place. In order to meet customer expectations, many modern companies have turned to total quality management, according to Lau and Tang (2019). In order to implement a change in management style, it is necessary to move away from the previous approach and recognise the importance of the organization's culture. TQM

has become critical to the long-term viability and survival of businesses because it requires the commitment of everyone at every level of the organisation.

According to Deming's theory of deep knowledge, an organisation needs management since it can't manage itself unless it's supervised by someone else (Deming, 1993). As a result, the Yemen Authority's department of architecture requires effective management. The senior executives in Yemen of the Architecture Authority must work hard to gain a thorough understanding of the business they are tasked with managing in order to do this. In the Ministry of Public Works and Urban Development in Yemen, the system cannot be successfully controlled without this knowledge, and bad performance will be seen. In some cases, it may not be essential to optimise the entire organization's architecture and performance in Yemen. There must be a strong leader in order to achieve system optimization, which involves the cooperation and coordination of various components.

The Kanter Model for Managing Change: In order for the Yemen architecture authority to attain exceptional architectural and organisational performance, transformation is inevitable. Exploration, planning, action, and implementation are the four main processes that must be completed in order for the project to be considered a success. As part of the Yemen Architecture Authority's exploration phase, the agency is determining which issues are most critical to the organisation and addressing them. Significant changes will have to be made to the collection of information for the most successful problem-solving process. Changes in the evaluation and implementation processes are expected to be made during the action phase, which will result in enhanced performance.

3. Research Model and Hypotheses

The commitment of the organization's senior executives is essential to its quality of performance and long-term success. Deming (1982) asserts that the success and long-term viability of high-quality projects are dependent on dedicated and effective leadership. The firm's ability to assist quality management programs for successful architectural performance is made possible by top-level management support (Abusa and Gibson, 2017). In order to lead the architectural organization toward better overall performance, senior management commitment is required. According to Wang, Zhang, Zhu, & Wang, (2020), effective leadership has a beneficial impact on business performance. All efforts are directed by senior management toward quality-related goals. The support of senior management in a quality management system creates the necessary conditions for improving performance in an architectural company. Wang (2015) suggests that top-level management assistance is a broad strategy for improving the overall performance and quality of

architectural organizations in general. As a result, the following hypothesis is proposed in this study:

H1: There is a positive and significant relationship between top management commitment and construction sector performance in Yemen.

Human resource management practises and organisational performance have been the subject of extensive research by academics over the years. Evidence shows that effective human resource management can have a significant impact on a company's overall effectiveness, which in turn leads to improved performance. In spite of the lack of clarity about "what exactly causes what" in the relationship between human resource management and organisational performance, the importance of the relationship between the two cannot be overstated (Gould, 2014). Anecdotal evidence from the HRM-performance debate over the last decade or so shows that "HRM matters" (Guest et al., 2018; Boxall and Purcell, 2015). What differentiates human resource management, according to Guest and coworkers (2018), is that they believe an organization's people are the key to its success. Huselid (2014) found a strong correlation between his HR index and the gross rate of return on assets (a profitability metric) and Tobin Q in the financial sector (the ratio of the market value of a firm to its book value). This shows that an organization's performance can be significantly improved by implementing appropriate human resource policies, methods, and strategies. Human resource management policies can only be effective if they are in line with the company's overall goals. When Hyde et al. (2018) investigated the impact of HRM practises on firm profitability, they found little evidence of a positive link between HRM practises and business profitability. There is a new theory that comes from this investigation:

H2: There is a positive and significant relationship between human resources and construction sector performance in Yemen.

The degree to which an architectural organisation is dedicated to consistently meeting the needs and expectations of its clients is referred to as "customer focus" (Abusa and Gibson, 2017). For an organisation, this refers to its long-term architectural and organisational goals. TQM considers it to be a key component of quality management (Talha, 2016). Hackman and Wageman (1995) say that gathering information about customers and prospects is one of the most frequently used TQM procedures. According to authors such as Stec (2020), if a business is unable to meet its customers' needs in an efficient and effective manner on a regular basis, it will not be successful in the near future, according to Stec (2020). Total Quality Management is based on the belief that creating value for customers is the best way to achieve organisational success (Juran, 1988; Mele and

Colurcio, 2016). Adequate TQM implementation leads to improved organisational performance. Focusing on the customer is one of the most important indicators of performance improvement. According to Lee et al. (2017), TQM has been shown to improve customer satisfaction and organisational performance (Lee et al., 2017). A company's performance is monitored in relation to customer needs in quality management settings. Changing customer demands are recognised (Bullington et al., 2002; Deming, 1996). A company's performance is positively correlated with its focus on customers (Jim and Chen, 2017). As a result, the following hypothesis is put forth by this investigation:

H3: There is a positive and significant relationship between customer focus and construction sector performance in Yemen.

Based on the above arguments this research propse the following conceptual framework:

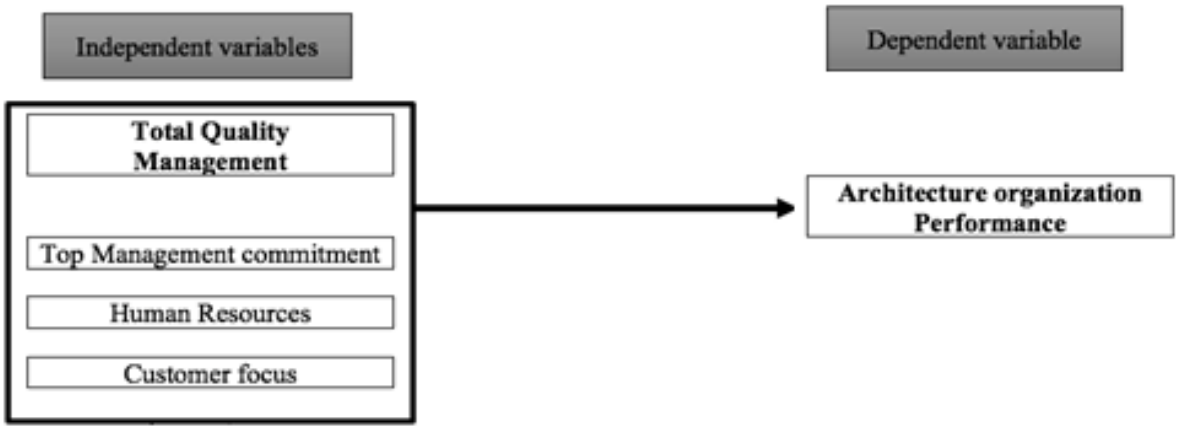

Fig. 1. Research conceptual model.

4. METHODOLOGY

Quantitative research was employed in this study since it is an effective way to present facts and events that can be observed, quantifiable expressed, and quantifiable expressed through objectification. Through experimentation and testing, individuals' social behaviour can be quantified and explained. The data for this study was gathered using a quantitative survey. In a cross-sectional study like this one, a quantitative survey is the best option for collecting data from the research population only once. The quantitative survey (questionnaire) is the only survey type commonly used (Sileyew, 2019).

When conducting research, it's important to know the total number of subjects or populations that the study is attempting to cover. All construction workers in Yemen are included in the current study's population. It is important to note that in statistics, a sample size is defined as the number of subjects or things that make up the sample drawn from a population. 335 managers, engineers, and construction workers in Yemen were selected as the sample size for this study based on Krejcie and Morgan's (1970) equation. Testing of the relationships between the independent and dependent variables was done using SPSS.

5.Data Analysis and Results

Additionally, a normality test and a reliability test were carried out in order to reach our research goal. While conducting the correlation test, the descriptive statistics analysis was also carried out.

5.1 Respondents Profile

The respondents' profile test was used in the current study for a variety of reasons, including determining the background of the study's diverse respondents. Additionally, this test is used to ensure that all members of the study population have an equal opportunity to participate in the study via the random sample technique used to distribute the questionnaires. The respondents' profile tests revealed various issues, including gender, age, educational attainment, and work experience. Table 1 shows that 335 participants of both sexes were enrolled in the study. During the gender test, 249 men and 86 women participated, accounting for 74.3 percent and 25.7 percent of the total number of responses, respectively.

According to table 1, there were four age groups represented: those aged 18–24, those aged 25–30, those aged 31–40, and those aged 41 and above. The age test found that 142 respondents were between the ages of 18 and 24, accounting for 42.4 percent of the total responses. There were 110 participants aged 25 to 30, accounting for 32.8 percent of all respondents. The participants aged 31–40 years old numbered 74, accounting for 22.1 percent of all respondents. There were nine respondents aged 41 and over, accounting for 2.7 percent of the total number of respondents.

According to table 1, four different sorts of qualifications were represented: diploma, bachelor's, master's, and doctoral. The education level test found that 30 respondents possessed diploma qualifications, accounting for 9.0 percent of all respondents. There were 239 participants with bachelor's degrees, accounting for 71.3 percent of all respondents. There were 53 participants with master's degrees, accounting for 15.8 percent of all respondents. There were 13 individuals with a Ph.D., accounting for 3.9 percent of all the respondents.

According to Table 1, participants had three degrees of job experience: less than two years, three to four years, and five years or more. The levels of work experience revealed that participants with less than two years of work experience accounted for 6.3 percent of all respondents (n = 21). There were 96 respondents with 3-6 years of work experience, accounting for 28.7 percent of all respondents. Finally, 218 respondents, or 65 percent of all respondents, had more than five years of job experience.

Table 1: Profile of Respondents (N = 335)

Category	**Frequency**	**%**	**Category**	**Frequency**	**%**
Gender			Education level		
Male	249	74.3	Diploma	30	9
Female	86	25.7	Bachelor	239	71.3
Age			Master	53	15.8
18-24 yrs	142	42.4	PhD	13	3.9
25-30 yrs	110	32.8	Working Experience (Yr)		
31- 40 yrs	74	22.1	Less than 2 yrs	21	6.3
> 41 years	9	2.7	3 to 4 yrs	96	28.7
			> 5 yrs	218	65.1

5.2 Normality Test

It was necessary to conduct a normality test to ensure that the questionnaire data was evenly distributed. This test used the skewness and Kurtosis values to determine whether the data was normal. Hair, 2012), says there are two recognised values for Skewness and Kurtosis: -1 and 1, according to Hair, Sarstedt, Ringle, and Mena (Hair, 2012). Skewness and Kurtosis values ranged from -1.784 to -0.456 for the variables (top management commitment, human resources, customer focus, and architectural organisational performance). This line had Kurtosis values that ranged from 0.653 all the way up to 2.762.

Table 2: Results of Skewness and Kurtosis for Normality Test

Constructs	**Skewness**	**Kurtosis Statistic**
Top management commitment	- 0.663	1.233
Human resources	- 0.456	2.762

Customer focus	- 0.903	0.653
Architecture orgnaization performance	- 1.784	1.109

5.3 Construct Reliability

The internal consistency of the variables' items was assessed using the construct reliability test. This test's internal consistency was assessed using Cronbach alpha (α) and composite reliability, both of which need to be greater than 0.7 to be considered acceptable. Table 3's data led us to the following conclusion:

- α and composite reliability for top management commitment items were 0.898 and 0.921, respectively.
- αand composite reliability for human resources items were 0.922 and 0.937, respectively.
- α and composite reliability for human resources items were 0.922 and 0.937, respectively.
- α and composite reliability for architecture organisation performance criteria were 0.834 and 0.709, respectively.

Convergent validity is another test to ensure the validity of the data in order to ensure its reliability. The AVE values are used in this test. As stated by Hair et al. (2017), the average value should be more than 0. Achievable Average Values (AVEs) ranged from 0.593 to 0.702 for the variables (top management commitment, human resources, customer focus, and architecture organisation performance).

Table 3: Reliability and convergent validity

Constructs	**Cronbach's alpha (> 0.7)**	**Composite Reliability (> 0.7)**	**Average Variance Extracted (AVE) (> 0.5)**
Top management commitment	0.898	0.921	0.664
Human resources	0.922	0.937	0.681
Customer focus	0.790	0.945	0.593
Architecture orgnaization performance	0.834	0.709	0.702

5.4Descriptive Statistics

The descriptive statistic test is used to determine the mean score, standard deviation, and minimum and maximum values for all variables in the study. The scale was determined using the Likert scale. To facilitate interpretation, the ranges of five-point Likert scales were divided into equal-sized groups of strongly disagree, disagree, neutral, agree, and agree strongly.

The mean scores for the variables (top management commitment, human resources, customer focus, and architectural organisational performance) were correspondingly 3.98, 3.84, 3.723, and 4.057. The findings indicate that respondents strongly concur with assertions about top management commitment, human resources, customer focus, and organisational architecture performance. As a result, the study's samples demonstrated the critical importance of top management commitment, human resources, and a customer-centric approach to architectural organisation performance in Yemen. Additionally, the standard deviations for the subscale variables (top management commitment, human resources, customer focus, and organisational architecture performance) were 0.688, 0.826, 0.916, and 0.795, respectively.

Table 4: Descriptive Statistics for Study Variables

Factors	N	Minimum	Maximum	Mean	Std. Deviation
TMC	335	1.00	5.00	3.980	0.688
HR	335	1.00	5.00	3.842	0.826
CF	335	1.00	5.00	3.723	0.916
AOP	335	1.00	5.00	4.057	0.795

TMC; Top management commitment, HR; Human resources, CF; Customer focus, and AOP; Architecture orgnaization performance

5.5 Direct Effect Test

A correlation coefficient that fluctuates between -1 and +1, a test known as the direct effect test, is used to determine whether the two variables have any relationship at all. Coefficients that are positive show an association between the variables, while those that are negative show the other way around. It is the goal of this test to determine the relationship between the independent factors (top management commitment, human resources, and customer focus) and the dependent variable (architecture orgnaization performance in Yemen). Based on the information in Table 5, the following conclusions can be drawn:

- There is a positive and significant relationship between top management commitment and architecture organisation performance in Yemen, with r = 0.198, t-value = 4.613, and a 0.000 level of significance.

- In Yemen, there is a positive and significant relationship between human resources and organisational performance in architecture, with r = 0.237, t-value = 3.389, and a significance level of 0.001.
- Customer focus has a positive and significant relationship with architecture organisation performance in Yemen, with r = 0.362, t-value = 5.568, and a significance level of 0.000.

Table 5: Summary of the Direct Effect

Hypothesis	Relationship	Std Beta	Std Error	t-value	p-value	Decision
H1	TMC ->AOP	0.198	0.043	4.613	0.000	Supported
H2	HR -> AOP	0.237	0.064	3.389	0.001	Supported
H3	CF -> AOP	0.362	0.129	5.568	0.000	Supported

6. Discussion and implications

The conclusion of the findings' procedure is the discussion stage. A comparison of the findings and conclusions of previous studies is made in this section, based on the research hypotheses. The results showed a significant correlation between total quality management (top management commitment, human resources, and customer focus) and the architectural organization's performance in Yemen.

This study found that genuine leaders are able to make sense of opportunities, provide a long-term vision, and rewrite the business rules in their sectors. '" According to this study, top management commitment may have a beneficial impact on the performance of an architecture organisation. According to Wang et al. (2020), which found that top management commitment has a positive impact on business performance, the results of this study are in line with that finding. When a company's senior management commits to the implementation of a quality management system, it sets the stage for increased productivity. According to Wang (2015), providing top-level management assistance can improve the overall performance and quality of architectural organizations. As a result, it would be impossible to construct a proper strategic orientation or to expand business operations without top management's commitment. Indeed, Sajjad et al. (2020) assert that the industry's success is driven by the commitment and ethical ideals of the industry's senior management.

A long-term competitive advantage can be achieved through exploiting an organization's human resources, according to this study. This type of strategy focuses on human resources that can be used in a variety of situations and difficulties, and provides proof of the ability to use resources. Organizations that want to maintain a long-term competitive advantage must have unique resources that cannot be re-created (Amrutha & Geetha, 2020). According to this study, human resources may have a favourable impact on architectural organisational performance. Anwar & Abdullah (2021) and Huselid (2014) revealed that HR activities have a beneficial impact on profitability, corporate turnover, and market value in organisations. Furthermore, a study by Hyde et al. (2018) assessing the impact of HRM practises on firm profitability showed no evidence of a beneficial association between HRM practises and firm profitability. As long as human resources policies and practises are implemented correctly, they can have a significant impact on an organization's performance. In order for HR policies to be effective, they must be aligned with the rest of the company's strategy. Moreover, Guest et al. (2018) believe that HRM's distinctive trait is its notion that enhanced performance is delivered through the organization's employees.

According to the study, firms can enhance their performance by focusing on the wants or expectations of their customers, particularly by examining their perceptions of various products or services. Furthermore, these findings show that architecture organisations in Yemen might perform better if they focused on the needs of their customers. According to Zehir et al. (2012), customer satisfaction is heavily influenced by customers' thoughts or perceptions of a service or product. This study is consistent with these findings. Another common TQM technique is collecting information about customers and potential customers. (Akpulonu, 2017). According to Stec (2020), the future success of any firm will be decided by its capacity to address the needs of its customers in an efficient and effective manner on a regular basis. Traditional quality management (TQM) emphasises the importance of making customers happy as a means of achieving business success (Hoe &Mansori, 2018; Mele and Colurcio, 2016). The proper use of TQM components leads to higher levels of organisational performance. One of the most significant indicators of performance improvement is a customer-centric focus. TQM has been shown to improve customer satisfaction and organisational performance (Lee et al., 2017). (Lee et al., 2017). Client expectations are recognised and tracked in quality management settings, and the organization's performance is evaluated in accordance with the needs of the clients (Bullington et al., 2002; Deming, 1986). Customer orientation is linked to human resource management strategies and firm profitability by Jim and Chen (2017). Research found that focusing on customers and building better relationships had a major impact on organisational success. As a result, managers are better able to recognise and

respond to consumers' diverse expectations, wants, and demands in order to improve organisational performance.

7. Conclusion

Many sectors of the world's construction industry are plagued by issues such as weak performance, delays, and overruns in both time and money. Change is unavoidable in order to enhance the state of the construction business. As a result, the goal of this study is to investigate the impact of Yemen's construction industry on the quality of its work. It assesses the extent to which Yemeni businesses have adopted the three generally recognised TQM aspects, which are: Strategic objectives include top management commitment, customer focus, and human resources. Since Yemen has joined the global economy, it is critical to execute this management plan in order to attract both domestic and foreign customers. TQM appears to be a challenge for organizations, particularly in Yemen, and businesses have a history of being late adopters of quality programmes such as TQM. To conclude, this study contributes to the practical implication whereby an organisation can utilise leadership (top management commitment) strength in their organisation to develop their talents to improve the business activities. Furthermore, human resources in their organisation can be used to optimise the employees to perform the projects. Lastly, the organisation can utilise their customer feedback in order to improve their business activities. Therefore, to compete in the global economy, emerging countries must surely learn how to employ management development tactics that are now employed in developed countries. As a result, they will be able to increase the quality of their products and services and so become more competitive.

Moreover, the current research recommends that the owners and managers of construction projects implement policies and strategies that include the application of total quality management in all stages of the establishment of architectural projects.

References

1. Abbas, J. (2020). Impact of total quality management on corporate green performance through the mediating role of corporate social responsibility. Journal of Cleaner Production, 242, 118458.
2. Abdullahi, M.S., Shehu, U.R., Usman, B.M., &Gumawa, A.M. (2020). Relationship Between Total Quality Management And Organizational Performance: Empirical Evidence From Selected Airlines In Nigeria Aviation Industry. The Astrophysical Journal, 3, 30-44.
3. Abusa, F. M., & Gibson, P. (2017). TQM implementation in developing countries: a case study of the Libyan industrial sector. Benchmarking: An International Journal, 20(5), 693-

711.

4. Akpulonu, M. I. (2017). *The Implementation of Total Quality Management (TQM) in the Telecommunications Industry: Problems and Prospects (A Case Study of Globacom and Etisalat Limited, Enugu)* (Doctoral dissertation).
5. Al- Saffar, N.A., &Obeidat, A.M. (2020). The effect of total quality management practices on employee performance: The moderating role of knowledge sharing. Management Science Letters, 10, 77-90.
6. Alaghbari, W., Al-Sakkaf, A. A., & Sultan, B. (2019). Factors affecting construction labour productivity in Yemen. International Journal of Construction Management, 19(1), 79-91.
7. Al-Dhaafri, H., &Alosani, M. (2021). Integration of TQM and ERP to enhance organizational performance and excellence: empirical evidence from public sector using SEM. World Journal of Entrepreneurship, Management and Sustainable Development.
8. Amrutha, V. N., & Geetha, S. N. (2020). A systematic review on green human resource management: Implications for social sustainability. *Journal of Cleaner Production*, *247*, 119-131.
9. Anwar, G., & Abdullah, N. N. (2021). The impact of Human resource management practice on Organizational performance. *International journal of Engineering, Business and Management (IJEBM), 5(1),* 35-47.
10. Athapaththu, Kushani&Karunasena, Gayani& Ekanayake, E.M.A.C.. (2018). Sustainable construction practices of Sri Lankan contractors.
11. Babalola, O., Ibem, E. O., &Ezema, I. C. (2019). Implementation of total quality practices in the construction industry: A systematic review. Build Environ.
12. Boxall, P., and Purcell J. (2015). Strategy and Human Resource Management. Basingstoke, Palgrave Macmillan.
13. Bullington, S. F., Easley, J. Y. and Greenwood, A. G. (2002). Success factors in initiating versus maintaining a quality improvement process. Engineering Management Journal, 14(3), 8-14.
14. Burciaga, U.M. (2020). Sustainability Assessment in Housing Building Organizations for the Design of Strategies against Climate Change.
15. Caldera, H. T. S., Desha, C., Dawes, L. (2018). Exploring the characteristics of sustainable business practice in small and medium-sized industry: Experiences from the Australian manufacturing industry. Journal of Cleaner Production, 177, 338-349

16. Dahmas, S., Li, Z., & Ahmad, M. (2020). Evaluation of Implementation Preparation for CE based on BEACON model —Taking Construction Enterprises in Yemen as a Case of Illustration.
17. Dale, B. G.; Wiele, T. V. D. &Iwaarden, J. V. (2015). Managing quality. 5th ed., Blackwell Publishing.
18. Deming Prize (1996), Guide for Overseas Companies, Union of Japanese Scientists and Engineers, Tokyo, Japan.
19. Deming, W.E. (1982). QualiiyProilnclivity and Compclilive Position. Cambridge, MA: MIT Center for Advanced Engineering Study.
20. Evans ,J.R., & Lindsay, W. M. (2019). The Management and Control of Quality. 7th ed., New York: West Publishing.
21. Gaikar, V., & Cherian, J. (2020). An Empirical Study on Impact of Sustainability-Oriented Total Quality Management Practices on Organizational Performance in UAE Based Organization. ERN: Other Organizations & Markets: Formal & Informal Structures (Topic).
22. Gamil, Y., & Rahman, I. A. R. (2019). Awareness and challenges of building information modelling (BIM) implementation in the Yemen construction industry. Journal of Engineering, Design and Technology.
23. Goel, A. (2019). Performance in construction and built environment: a “wicked problem”?". Smart and Sustainable Built Environment, (8)1, 2-15
24. Gould-Williams, J. (2014). HR practices, organizational climate and employee outcomes: evaluation social exchange relationships in local government. International Journal of Human Resource Management, 18(9)1627-1647
25. Guest, D. (2018). Human Resource Management, Corporate Performance and Employee wellbeing: Building the worker into HRM. The Journal of Industrial Relations, 44:3 335-358
26. Heerwagen, J. (2000). Green buildings, organizational success and occupant productivity. Building Research & Information, 28, 353 - 367.
27. Huselid, M.A. (2014). The Impact of Human Resource Management Practices on Turnover, Productivity and Corporate Financial Performance.Academy of Management Journal,38: 635–670.
28. Hoe, L. C., &Mansori, S. (2018). The effects of product quality on customer satisfaction and loyalty: Evidence from Malaysian engineering industry. *International Journal of*

Industrial Marketing, *3*(1), 20-35.

29. Hyde, Jeffrey, Richard Stup, and Lisa Holden, (2018). The Effect of Human Resource Management Practices on Farm Profitability: An Initial Assessment. Economics Bulletin, Vol.17, No. 12 pp. 1-10
30. Jim, C., & Chen, W. (2017). Consumption preferences and environmental externalities: A hedonic analysis of the housing market in Guangzhou. Geoforum, 38(2), 414-431.
31. Khodeir, L. M. & Othman, R. (2018). Examining the interaction between total quality and performance principles in the management process of AEC industry. Ain Shams Engineering Journal, 9, 1627-1634
32. Lau, A. W., Li, Y. S., Tang, S. L., & Chau, K. W. (2019). TQM application by engineering consultants in Hong Kong. The TQM Journal, 28(4).
33. Lee, H., Kwak, W. and Han, I. (2017). Developing a business performance evaluation system: An analytic hierarchical model. The Engineering Economist , Vol. 40 No. 4, pp. 343-357.
34. Lu, W., Chi, B., Bao, Z. &Zetkulic, A. (2019). Evaluating the effects of green building on construction waste management: A comparative study of three green building rating systems. Building and Environment, doi: https://doi.org/10.1016/j.buildenv.2019.03.050
35. Mele, C. and Colurcio, M. (2016). The evolving path of TQM: towards business excellence and stakeholder value. International Journal of Quality and Reliability Management, 23(5), 464-489.
36. Meng, J., Xue, B., Liu, B. & Fang, N. (2015). Relationships between top managers' leadership and infrastructure performance: A Chinese urbanization perspective. Engineering, Construction and Architectural Management, (22)6, 692-714
37. Muller, M. F., Esmanioto, F., Huber, N., Loures, E. R. &Canciglieri Junior, O. (2019). A systematic literature review of interoperability in the green Building Information Modeling lifecycle. Journal of Cleaner Production, 223, 397-412
38. Najib, A. F., Soon, N. K., Zainal, R., &Hasaballah, A. H. A. (2018). Influential factors in construction industry of Yemen. In *Proceedings of the 21st international symposium on advancement of construction management and real estate* (pp. 927-943). Springer, Singapore.
39. Pambreni, Y., Khatibi, A., Azam, S.M., &Tham, J. (2019). The influence of total quality management toward organization performance. Management Science Letters.
40. Parsamand, A. (2021). Studying the Impact of Total Quality Management on

Entrepreneurial Organizations' Performance (Case Study: Insurance Companies in Iran).

41. Saieg, P., Sotelino, E. D., Nascimento, D., &Caiado, R. G. G. (2018). Interactions of Building Information Modeling, Total quality and Performance on the Architectural, Engineering and Construction industry: A systematic review. Journal of Cleaner Production, 174, 788-806.
42. Sajjad, A., Eweje, G., &Tappin, D. (2020). Managerial perspectives on drivers for and barriers to sustainable supply chain management implementation: Evidence from New Zealand. *Business Strategy and the Environment*, *29*(2), 592-604.
43. Stec, A. (2020). Sustainable Water Management in Buildings: Case Studies From Europe. Sustainable Water Management in Buildings.
44. Sultan, B., &Alaghbari, W. E. (2017). Priorities for sustainable construction industry development in Yemen. *International Journal of Applied Engineering Research*, *12*(6), 886-893.
45. Sultan, B., &Alaghbari, W. (2018). Political instability and the informal construction sector in Yemen. *International Journal of Civil Engineering and Technology*, *9*(11), 1228-1235.
46. Talha, M. (2016). Total quality management (TQM): An overview, the bottom line, Managing Library Finances, 17(1), 15-19.
47. Wang, Y., Zhang, Z., Zhu, M., & Wang, H. (2020). The Impact of Service Quality and Customer Satisfaction on Reuse Intention in Urban Rail Transit in Tianjin, China. SAGE Open, 10.
48. Wang, Z. M. (2015).Organizational effectiveness through technology innovation and HRM strategies. International Journal of Manpower, Vol.26, No.6, pp. 481-487.