



The Role of TQM in Enhancing Organisational Performance: The case of Algerian SMEs

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Abstract:

The aim of this research is to examine the relationship between the implementation of total quality management (TQM) dimensions and organizational performance (OP) in Algerian service and manufacturing small and medium sized enterprises (SMEs). Questionnaire yielding 150 respondent and covers five fundamental TQM dimensions namely organizational leadership (OL), customer satisfaction (CS), human resources focus (HRF), strategic planning and development (SPD), supplier quality management (SQM), while organizational performance (OP) was measured through two critical dimensions are satisfaction results (SR) and business result (BR). The collected data were processed by using Smart PLS4, the results indicated that all TQM dimensions were significantly related to organisational performance

Key words: total quality management, organizational performance, small and medium sized enterprises, Algeria.

Jel Classification Codes: L15,

Introduction:

Kenett and Baker (2010) stated that quality management has been implemented in a wide range of application domains such as health care, education, software development, and pharmaceutical applications. Due to globalization, customers' needs have been developed. Customers require a suitable product with high quality and suitable cost. Any organization would like to compete in recent hyper-market should match with the mentioned customers' requirements. To fulfill these requirements, organizations should improve all their activities and processes. The concept of quality differs for different stakeholders, consumers view quality as consistency of accurate information and reporting, TQM must evolve to include defining performance targets, designing processes to deliver target performance, and improving suboptimal processes quickly using methodologies such as Six Sigma and Lean with innovative thinking, TQM must include innovation for developing breakthrough designs and improvement results (Praveen, 2009). So, TQM management is a system that improves all activities. In addition, Implementing TQM can be a source of competitive advantages which lead to better overall organizational performance.

Research questions:

This research attempts to answer the following questions:

- What are the main dimensions of quality management applied in Algerian service and manufacturing enterprises?
- How do these dimensions interact to raise the organizational performance of these enterprises?
- To what extent TQM impacts organizational performance in Algerian service and manufacturing enterprises?

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The aim of this study is to:

- Demonstrate the conceptual framework and research model for both TQM implementation and company organizational performance.
- Analyze the crucial TQM dimensions in the context of Algerian service and manufacturing SMEs.
- Finally, to explore the impact and relevance of total quality management (TQM) dimensions on organizational performance dimensions.

To achieve these goals, the paper is structured as follow: after the introduction, the first section reviews the literature on the TQM elements such as organizational leadership, customer satisfaction and relationships, human resource focus, strategic planning and development and supplier management. In addition to review the relationship between total quality management and organizational performance, this part is followed by the methodology section then the study results; finally in the conclusion this paper provides several suggestions, recommendations and empirical implementation to managers.

1. Literature review

According to Kanwal et al., (2019) total quality management was applied first in the manufacturing industries. For Barrie et al., (2016) TQM still in great demand due to the competition in global markets. It is considered the key to success in international competition. It was agreed that quality management is a comprehensive and coherent process involving all employees and managers of the organization. Gregory (2014) asserts that quality management sets consistent work system standards for desired behavior, and the organization plans on the basis of performance gaps between the planned and actual performance state, and improves work by changing the routine working method and setting performance standards. Total quality as a strategy can bring better quality, price, delivery, sales, growth and profitability, leading to economic prosperity. According to Irani et al., (2004) Singh and Smith (2004) TQM is a source of innovation, an integral part of corporate culture, and an important contributor to the competitive advantage of an organization over competitors. Ron (2015) added the ultimate objective of quality management is to raise the organizational maturity up using scientific method and teamwork, and focusing on removal of all forms of waste. Therefore, it continually serves customers better and economically. Carlos et al. (2009) explained, through a defined framework include social and technical dimensions, TQM achieves excellent results. Eriksson and Garvare (2005) represent guiding principles by which the organization operates, and linking these principles effectively improve performance.

Lewis et al. (2006) pointed out that total quality management can be classified into the social and the technical dimension. Fisser and Nijhof (2005) explained both dimensions cannot operate in isolation in addition they must be interconnected and support each other. Kaynak (2003) confirmed the optimal management of these dimensions will ameliorate organizational performance nowadays.

For them (Flynn et al., 1994; Amc, 1994; Arthur, 1992, Powell, 1995) statically proved the concept of total quality management is determined by defining the relationship between quality practices and their superior outputs. TQM engages all employees in improving processes, products, services and culture through a variety of techniques, methods and core values (ASQ,

2017). Ching and King-Jang (2012), Genaidy and Karwowski (2003) emphasized the importance of the human aspect, and asserted that the inclusion of “human factor” along with TQM provides a more effective lean system, and has the potential to significantly increase the benefits for companies. Ethics in which they reward, value and care for people are what distinguishes organizations that adopt quality management (EFQM, 2017).

Wadsworth et al., (2002) point out benefits expected to be realized from TQ and TQM:

- improving the quality of products and services to meet customer needs;
- increasing the productivity of manufacturing processes and commercial businesses;
- reducing manufacturing and service costs;
- determining and improving the marketability of products and services;
- reducing consumer prices of products and services;
- ensuring on-time deliveries and availability;
- assisting in the management of an enterprise.

Whereas, Jayaram et al., (2010) state that scientific evidence has not found a universal positive association between TQM and organizational performance gains. Ebrahim and Adrian (2018) explained how the failure of performance management systems to adopt the basic principles of process improvement methods such as total quality management may be due to administrative and organizational forces. Sousa and Voss (2008) pointed out that many other contextual factors could govern the relationship between total quality management as well as organizational performance. Zatzick et al., (2012) many factors can play a mediating role in the positive combination of total quality management and organizational performance, among these factors: unionization, strategic orientation of the organization’s activity system and cost leadership activity system orientation.

2. Research methodology

- Data Collection:

A survey was used for relevant data collection from non probability sample consisted of Algerian service and manufacturing enterprises.

The questionnaire was developed based on the measurement of the previous studies in TQM and organizational performance such as: Vedant et al., (2018), Sweis et al., (2016), Zeng et al., (2015).

The questionnaire contained two basic sections, the first one dedicated to the demographic data of the sample, while the second section contained five axes related to the dimensions of total quality management (organizational leadership (OL), customer satisfaction and relationships (CS), human resources focus (HR), strategic planning and development (SPD), supplier quality management (SQM)) , and finally two axes fell within the main axis of organizational performance (satisfaction results and business results)

The first axis on organizational leadership focused on management participation in the communication process and in setting organizational goals, providing resources to improve and maintain quality... while the second axis revolved around focusing on the customer, determining his requirements, encouraging partnerships with him, taking feedback on customer satisfaction regularly, and granting concessions or privileges. Then the human resources axis dealt with

recruitment procedures, effective initial preparation, application of health and safety standards, and career path training. We moved to strategic planning and development to determine whether the enterprise encourages studies and plans in order to upgrade all its products and processes, periodically inspects the quality of products, employs quality tools in order to plan, control and improve operations. To investigate relationships with suppliers, we inquired about the importance of the quality of the supplied product compared to its price, conducting periodic visits to suppliers to inspect and evaluate products in order to improve quality, having accurate and detailed information about suppliers and their performance, and working with suppliers on a regular basis in order to maintain quality standards. We finally moved to organizational performance questions that measured satisfaction results and business results, for example, increased sales and profits.

A 5-point Likert scale with end points of “strongly disagree” and “strongly agree” was used to measure the items. Survey was translated into Arabic and distributed on 150 respondents.

To analyse the questionnaire, we presented the research sample, validity and reliability tests were conducted of all measurements, and then we tested and analysed the study hypotheses to answer the study questions, using **SMART PLS**.

- Study hypotheses:

H1. There is a statistical positive relationship between total quality management dimensions and organizational performance

H2. There is a statistical positive relationship between Organizational leadership (TQM practices) and organizational performance in Algerian service and manufacturing enterprises.

H3. There is a statistical positive relationship between customer satisfaction and relationships (TQM practices) and between organizational performance in Algerian service and manufacturing enterprises.

H4. There is a statistical positive relationship between human resources focus (TQM practices) and organizational performance in Algerian service and manufacturing enterprises.

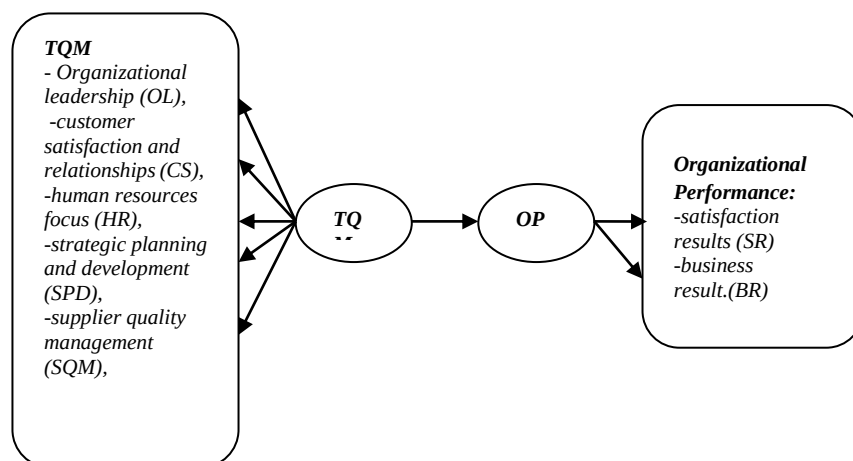
H5 There is a statistical positive relationship between strategic planning and development (TQM practices) and organizational performance in Algerian service and manufacturing enterprises.

H6 There is a statistical positive relationship between supplier quality management (TQM practices) and organizational performance in Algerian service and manufacturing enterprises.

H7 There is a statistical positive relationship between Business results (TQM practices) and organizational performance in Algerian service and manufacturing enterprises.

H8 There is a statistical positive relationship between satisfaction results (TQM practices) and organizational performance in Algerian service and manufacturing enterprises.

- Study Framework:



- Study sample and population

The study was conducted in manufacturing and service Algerian enterprises, from May to November 2022, only two small/ medium size manufacturing enterprises and three Service enterprises have taken part in the survey.

This sample consisted of 150 respondents. It can be described based on enterprise activity or type, designation and years of experience.

Table 1. Sample Characteristics

enterprise type		
Manufacturing enterprise	02	43%
Service enterprise	03	57%
Designation		
Manager, first manager, middle management manager, executive level manager, department supervisor.	62	41.33%
Worker	88	58.66%
Experience (years)		
0 to 6	51	34%
More than 6	99	66%

Source: Prepared by the researchers based on Smart PLS 4 outputs.

3. Interpretation of results

- Validity and reliability:

In order to reach an appropriate model to work on, we looked for a high validity and reliability, by using Smart PLS, we calculated: Cronbach's alpha, composite reliability and average variance extracted (AVE).

Table 2. Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
BR	0,916	0,920	0,947	0,851
CSR	0,902	0,907	0,926	0,630
HRF	0,900	0,903	0,932	0,771
OL	0,882	0,891	0,913	0,584
OP	0,944	0,946	0,961	0,740
SPD	0,893	0,893	0,928	0,754
SQM	0,915	0,916	0,940	0,742
SR	0,915	0,915	0,942	0,791
TQM	0,972	0,974	0,975	0,551

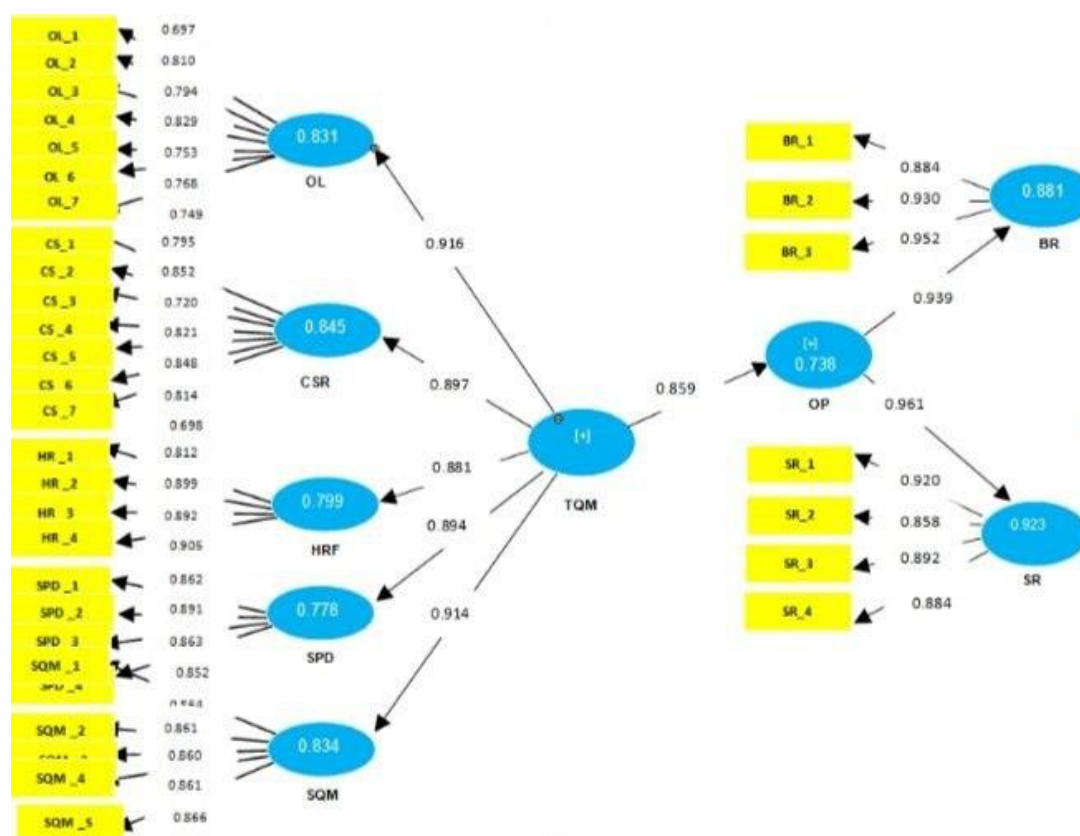
Source: Prepared by the researchers based on Smart PLS outputs.

From the table we notice that all the coefficients are statistically acceptable, as their values ranged between 0.882 and 0.972, which means a high general stability rate for the model and thus it can be relied upon in the study as it exceeded 70 % according to Hair et al (2017), Tenenhaus et al (2004).

In addition, all latent variables of the model achieved an acceptable level of real stability, as we note that the total rho coefficients are statistically significant, as the values ranged from 0.891 to 0.974, which must be consistent with the composite reliability index.

The CR composite reliability scale takes into account the various external loadings on the variables, where its value ranges between (0 and 1). Higher values indicate high levels of reliability and it is generally interpreted in the same way as the Cronbach's alpha.

Using the same logic used in the individual indicators, an AVE value of 0.5 and above indicates that the construct explains more than half of the variance in its indicators, meaning that the variance is due to the construct and not to measurement error. From the table (2) we notice that all values are significant and acceptable, as they exceeded the threshold of 0.5 which indicates that there is strong variance between the construct and its indicator, and thus the latent variables can be linked.

Figure (1) Standard model trajectories

Source: Smart PLS outputs.

From the above figure the Convergent validity indicators of the five dimensions (OL, CSR, HRF, SPD, SQM) of the TQM, and the two dimensions of organizational performance (SR, BR), we recorded lowest value (0.697) for OL_1. Thus the model achieved acceptable values, which indicated good coefficients of stability

- The relationship between latent variables:

This determines the extent of the relationship between latent variables, their relationship with themselves must be greater than their relationship with other latent variables in order to say that they are independent and non-interfering.

Table 3. discriminant validity test Using Fornell-Larcker Criterion

	BR	CSR	HRF	OL	OP	SPD	SQM	SR	TQM
BR	0,926								
CSR	0,738	0,790							
HRF	0,727	0,778	0,877						
OL	0,740	0,722	0,742	0,770					
OP	0,842	0,769	0,759	0,771	0,861				
SPD	0,717	0,756	0,718	0,759	0,779	0,870			
SQM	0,747	0,773	0,826	0,746	0,806	0,789	0,865		
SR	0,809	0,726	0,717	0,739	0,865	0,761	0,777	0,892	
TQM	0,816	0,920	0,898	0,899	0,862	0,885	0,917	0,825	0,744

Source: Prepared by the researchers based on Smart PLS outputs.

Using Fornell-Larcker Criterion (Variable Correlation - R^2 of AVE). It is clear from the table above that all latent variables have a relationship value with themselves greater than the value of the relationship with another latent variable, and therefore we say that these latent variables are independent and non-overlapping.

- **Testing heterogeneous correlations (Heterotrait- Monotrait Rati) :**

This test measures the true degree of association between two constructs; the differentiation condition is fulfilled if the value of HTMT does not exceed 0.9

Table 4. HTMT discriminant validity test.

	BR	CSR	HRF	OL	OP	SPD	SQM	SR	TQM
BR									
CSR	0,814								
HRF	0,805	0,869							
OL	0,812	0,868	0,817						
OP	0,897	0,835	0,824	0,849					
SPD	0,797	0,849	0,800	0,861	0,853				
SQM	0,821	0,856	0,897	0,827	0,870	0,875			
SR	0,883	0,799	0,788	0,826	0,894	0,845	0,853		
TQM	0,865	0,889	0,856	0,880	0,898	0,853	0,870	0,877	

Source: Prepared by the researchers based on Smart PLS outputs.

It is clear from the table above that all the values of the latent variables according to the HTMT test did not exceed the 90% threshold. It is confined between values 0.788 and 0,898

Therefore, we say that it fulfills the condition of differentiation and correlation between the constructs of the study model and the independence of the latent variables. Based on the achieved results, the goodness of fit of the measurement model was confirmed

- **Structural model:**

After measuring the credibility of the study model and ensuring its validity and reliability, we will evaluate the structural model, or what is called the construction of the measurement model.

Table 5. R Square

	R Square	R Square Adjusted
BR	0,885	0,884
CSR	0,842	0,841
HRF	0,802	0,800
OL	0,808	0,807
OP	0,740	0,739
SPD	0,779	0,777
SQM	0,837	0,836
SR	0,926	0,926

Source: Prepared by the researchers based on Smart PLS outputs.

The most common measure for evaluating the structural model is the R^2 , which is a measure of the predictive power of the model and is calculated through the squared correlation between the actual and predictive values of the internal construct. According to Chin (1998) we can classify its value to three levels:

The effect is strong if R^2 is greater than 0.67, the effect is medium if R^2 value ranges between 0.33 and 0.67, and if it is less than 0.33 the effect is weak.

This is what the table above shows, where we find all values greater than 0.67 and less than 1, therefore, the explanation values between the variables is generally good.

Table 6. f Square

	BR	CSR	HRF	OL	OP	SPD	SQM	SR
BR								
CSR								
HRF								
OL								
OP	7,341							11,851
SPD								
SQM								
SR								
TQM		5,171	3,928	4,092	2,803	3,455	5,006	

Source: Prepared by the researchers based on Smart PLS outputs.

This procedure is referred to as F^2 effect size, according to Cohen's (1998) criteria the effect is great if the F^2 value is greater than 0.35; This is what the table above shows, as all values exceed 2.

In other words F Square values from the table indicate an exogenous large effect on the indigenous construct

- Measuring Effects:

The following table shows path coefficients, the specific and total Effects:

Table 7. Bootstrapping test

Specific Indirect Effects

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
TQM -> OP -> BR	0,813	0,813	0,037	28,777	0,000
TQM -> OP -> SR	0,831	0,831	0,035	31,358	0,000

Total Effects

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
OP -> BR	0,942	0,942	0,016	80,403	0,000
OP -> SR	0,964	0,964	0,012	123,059	0,000
TQM -> BR	0,809	0,809	0,032	28,773	0,000
TQM -> CSR	0,919	0,919	0,019	62,352	0,000

TQM -> HRF	0,897	0,897	0,021	53,551	0,000
TQM -> OL	0,900	0,900	0,023	47,595	0,000
TQM -> OP	0,862	0,862	0,030	33,141	0,000
TQM -> SPD	0,884	0,886	0,030	33,811	0,000
TQM -> SQM	0,917	0,917	0,018	64,935	0,000
TQM -> SR	0,828	0,828	0,030	31,353	0,000

Source: Prepared by the researchers based on Smart PLS outputs.

At this stage, the study hypotheses are tested by estimating the strength and importance of the structural path coefficients. We notice that all values are greater than 0.4

In addition P Value is less than five as shown in the table (7) which means there is an influence between variables

From table (7), there is a statistically significant impact of TQM on organizational performance in the enterprises under study since the trajectory coefficient reaches 0.813 for business results and 0.831 for Satisfaction results, at the level of significance ($\alpha \leq 0.05$). The calculated value reaches 28.777 and 31.358 respectively, and this confirms the acceptance of the alternative hypothesis: there is a statistical positive relationship and a significant impact of the dimensions of TQM (organizational leadership, customer satisfaction and relationships, human resources focus, strategic planning and development, supplier quality management) on organizational performance with its two dimensions (business results, satisfaction results) in Algerian service and manufacturing small and medium enterprises.

Conclusion

At the beginning, we worked on the theoretical side, in order to address all aspects of the topic we based on major references as well as modern researches with a reference to previous studies results.

Through the empirical study, first of all we confirmed the appropriateness of the model, which is evaluated by different goodness-of-fit tests. So our findings are in concordance with (Ghorpade et al., (1995), Kaynak (2003) Gregory (2014), Sinha et al., (2016), Vedant et al., (2018))

The analysis proved the positive impact of TQM on organizational performance, Based on the data obtained using Bootstrapping method, all hypotheses were accepted and the paths were observed as they are significant and express relationships between the components of the structural model.

The study worked on a model that managers can adopt in order to raise the organizational performance by focusing on several points that were previously discussed, including dealing with customers, periodically analyzing their complaints, seeking their opinions by conducting survey methods as example, listening to their needs and expectations; or by working with suppliers to achieve the required quality; or through strategic planning without forgetting the human resource and its role in improving both quality and performance of the enterprise. Therefore, managers can work on these points and build a strategy, for each enterprise according to its capabilities, activity, work methods and procedures, in order to raise performance and to help managers facilitate work and determine strategies that can be adopted.

Given the limitations of the study, we suggest the following:

First, we suggest that a separation should be made between productive and service enterprises when studying the relationship between organizational performance and total quality management due to the different characteristics of each, at the same time a comparison could be made to achieve detailed, accurate and specific results.

In addition, there are many important points that can be integrated into such a study, including: the organization size, the organization income, the degree of competition in the activity or sector...

Finally, the study was also limited to small and medium enterprises, so we suggest applying the study to large Algerian enterprises, especially institutions that have ISO certificates. Therefore, the level of application of total quality management is greater, as work conditions vary, the degree of technology adoption, workers' skills and training, relationships with suppliers...

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