

The Effect of Quality Management Practices on Operational and Financial Performance

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Abstract This empirical study aims to explore the correlation between quality management practices and operational and financial performance. Data was collected from 122 firms based in Tunisia and the results were analyzed using structural equation modeling precisely Partial Least Square methodology in order to leverage the approach of Preacher and Hayes to highlight the mediating role of operational performance in the relationship between quality management practices and financial performance. The current study aims to broaden the field of research on the application of quality management practices to Tunisian-based businesses in various industries that have received ISO 9001 certification and to apply structural equation modeling advances using SMART PLS software for a quality management practice study case. This paper shows practitioners the importance of the convenient implementation of quality management practices to support operational and financial performance. This paper presents an advanced approach as it takes into consideration the coherent selection of quality management practices and studies their effect on operational and financial performances of SME in different fields. The results showed that the internal process mediates both relationships between management practices and information management with financial results. Moreover, operational performance acts as a partial mediator between research and development and financial results.

Keywords Quality Management Practices (QMP), Operational Performance, Financial Performance, Partial Least Square (PLS)

1. Introduction

Over the years, the need to adhere to a standard approach that ensures the company to win the duel of resource optimization and customer satisfaction is increasing. Hence, quality prices appear at the international scale. These awards, like the Japanese Deming Prize (1951), the American Malcolm Baldrige (1987) and the European Award (1992) have standardized the approach of quality management. In fact, companies that are members of one of these awards are distinguished from their competitors. Hendricks and Singhal [1] consider the certification impact of a quality award as a booster of the company's value on the market. In parallel with the increased importance of the quality approach standardization, the International Standardization Organization (ISO) has launched a series of quality management standards, to which international companies adhere to demonstrate their commitment to the international standards dedication. In other words, all the manufacturing processes have been optimized in order to ensure better management of the production process resources and satisfaction of stakeholders including staff, supplier and final customer.

The concern was always to ask to what extent the adaptation of certain quality management practices (PMQ) acts on the company performance.

At the national level, the Tunisian company was never immune against fluctuations and international technological advances, given the sheer volume of the commercial transactions either with the European Union or with China and the United States that are considered the moderators of the global economy. The fierce competition

with countries developed to conquer markets has persuaded local companies to focus on the optimization of the delivered product quality and at the same time minimize costs since the use of ISO certification to adhere to international standards for quality management. Several studies have been carried out to measure the adoption impact of the approach quality in Tunisian companies. Hamama [2] conducted a study focusing on the quality approaches specificities undertaken in relation to the Tunisian context so as to contribute to knowledge enrichment about the Tunisian quality management and to better understand the processes involved in the evolution of the quality concept set up. Zorgati and Lakhali [3] have highlighted the relationship between the product quality and the financial performance to deduce that the dimensions of the product quality have a positive effect on financial performance indicators. Unfortunately, the research on the nature of the relationship between the different quality and performance management practices in companies remains insufficient. The study conducted in 2006 and carried out with 109 companies, shows that the prerequisites required for the implementation of a quality approach are not satisfied in the case of Tunisian companies and an enormous effort is required [4]. Indeed, this is the area, in which this current study is being developed.

2. Literature Review and Hypotheses

The ultimate goal of quality was and will always be the contribution to the company competitiveness in order to ensure its sustainability. In fact, many companies recognize the success of the quality management system implementation and its fruitful contribution to their results. This has led the researchers to study the relationship between quality management practices as well as the company performance. Several studies (empirical and theoretical), were mainly carried out to distinguish between soft and hard management practices as well as to associate success to certain practices such as command and personnel management [5-7].

2.1. Review of Quality Management Practices

In fact, soft quality management practices encourage employees to analyze the environment of new trends, approaches and technologies by focusing on leadership, accountability and training [8, 9]. Similarly, they promote the developmental aspects of the quality system enabling the company to adapt to its changing environment and also to promote continuous improvement. While hard quality management practices are related to process and product control to maintain consistency, the compliance with quality standards is always aiming to satisfy manufacturing specifications [10].

The presentation of the practices adopted in this research

paper took into consideration their classification out of 3 categories; Firstly, management practice or the commitment and support of the management. Weidman [11] has tried to redefine the role that must be played by the leaders of the 21st century when insisting on his duty as an agent of change. That is to say, the person charged of showing his commitment to all the staff and carrying out any change implementation. The Second category is the infrastructure practices, in particular, the organization for quality. Therefore, Lakhali and Limam [12] point out that during the implementation of the quality strategy in Tunisian enterprises, various transformations at the level of the organizational structure appear such as training and participation of employees, customer orientation. The third category includes fundamental practices, to note the improvement of the quality system, information and analysis. Furthermore, the current study referred to the literature review conducted in 2012 to present the summary of quality management practices classification over the years [13]. The choice of quality management practices, which is the subject of this study, was based on different researches given its important contribution in the field of quality management in Tunisia as well as for the timeliness and also the relevance of those researches in the recent literature [14-16].

The adoption of QMP improves the business process. Moreover, customers can perceive a better overall service which could influence their satisfaction [17]. Alonso-Almeida & al. [18] believe that the adoption of QMPs is likely to have a direct and positive impact on operating performance where the latter is considered to be one of the main pillars of the company's competitiveness. Lu & al. [19] consider quality management practices such as commitment of the top management, customer orientation, customer service added to the employee participation and training or practices related to the human factor. On the other hand, process management and strategic quality planning depend, in turn, on the technical factor within the organization

In fact, the presentation of the practices adopted will take into consideration the contributions of the above-mentioned researches; mainly their classification out of 3 categories: management practices, infrastructure practices and fundamental practices. Certainly, this classification will allow to highlight the relationships among the different categories of quality management practices, operational performance, and financial performance. In this sense, the similarities in these classifications definitions were considered as important in order to create their new presentations. An overview of the literature dealing with the classification of practices reveals that the practice of coaching and supervision is the commitment of top management [14]. The fundamental practices are tools and quality techniques, more specifically improvement of the quality system, Information & Analysis and Research & Development. Whereas other practices such as: employee participation, employee training, customer orientation, and

knowledge sharing are considered part of infrastructure practices [20, 21].

2.2. The Relationship between Quality Management Practices and Performance (Empirical Studies)

The quality is considered as a crucial element of competitive advantage [22-24]. Molina-Castillo & al. [25] recall the long-term deferred benefit of product improvement on performance. Besides, the implication of the gains from adopting any quality management practice can only occur in the long term [16]. Furthermore, some researchers consider that quality management practices can be related to essential activities that should lead, either directly or indirectly, to the fact of improving quality performance and competitive advantage [21]. Kaynak and Hartley [26] consider that quality management is a global management philosophy that supports all the functions of an organization through improvement and organizational change. The study conducted on 221 companies allows showing that companies that had implemented a quality in a rigorous manner obtained benefits in terms of operational and financial performance [27].

2.2.1. Quality Management Practices and Operational Performance

According to a study conducted on a set of 270 small garment companies in India, it was found that the commitment, dedication of management, communication within the company and the shared culture present a number of key factors for the successful implementation of quality management [28]. Its conclusions are consistent with other studies, especially since these companies have used fundamental practices such as cause-and-effect analysis as well as adjustment and monitoring for continuous improvement throughout the Plan Do Check Act cycle [29]. In fact, these practices serve to optimizing the various processes, including product innovation [30]. Other practices have been highlighted, such as management commitment, the communication and cultural exchange recognized by soft practices or also those related to the human dimension as one of the initiatives for the quality implementation approach [31-33].

A healthy quality environment can be achieved by implementing an interactive culture that encourages all the participants in the organization to go further a simple application of technical processes in force, encouraging management to take initiatives, autonomy and the staff involvement reduce the cost of – poor – quality (or non-quality). Therefore, the total cost of quality initiatives [29]. According to the same study, the researchers estimate that the cost of – poor – quality (or non-quality) varies between 5% and 30% of both service and product companies' gross income. They also add that companies that have developed a high quality culture spend approximately \$350 million less than companies with a relatively undeveloped culture. In the era of the future industry or 4.0, various studies,

which are mainly related to the role of quality in company performance economic aspects, the business models and the human facet of the process quality, have highlighted the quality management approach in the 21st century [34].

The adoption of QMPs is likely to have a direct and positive impact on operational performance because, the latter is considered to be one of the main pillars of the company's competitiveness [18]. For some researchers such as the relationship between quality management practices and performance is positive [35,36]. Whereas for others this positiveness is not evident [37,38]. More than that, for some authors this relationship is considered quite distinct [19] relatively to the above discussion, the following hypotheses have been suggested:

H1: Quality Management Practices have a significant, positive and direct effect on operational performance.

H1-1: Management practices, as part of Quality Management Practices, have a significant, positive and direct effect on operational performance.

H1-2: Infrastructure practices, as part of Quality Management Practices, have a significant, positive and direct effect on operational performance.

H1-3: Fundamental practices, as part of Quality Management Practices, have a significant, positive and direct effect on operational performance.

2.2.2. Operational Performance and Financial Performance

The study conducted by the U.S. General Accounting Office (1991) shows that the adoption of quality management practices by the company leads to a better customer satisfaction, an increase in market share, improved profitability, reduced costs and better correlations between staff [39]. Product quality has an indirect effect on the company's financial performance via customer and internal processes axes, which, thus, represent the intermediate variables [14]. That is to say, the mediation played by the customer focus and internal processes is complete as much as the correlation (quality of the product) – (financial performance axis) is statistically insignificant. Quality management practices have an effect on financial performance through several variables [40]. On the other hand, and for other researchers, Financial performance benefits indirectly from improved customer experience and competitiveness [41, 42, 17]. As a part of a study concerning the operational performance improvement of SMEs in the French aeronautics industry, researchers consider that the average operating performance is positively related to the improvement of the industrial maturity [43]. The literature discussed above leads to the following hypotheses:

H2: Operational performance has a significant, positive and direct effect on performance financial.

2.2.3. Quality Management Practices and Financial Performance

Economic and financial performance over the long term

is related to non-financial factors such as customer loyalty, dedication and employee satisfaction as well as internal processes and the innovation approach followed [44]. Barker and Cagwin [45] conducted a study of a 257 companies sample to analyze the effect of quality management practices on the company financial performance and the results show the existence of statistically significant correlations between quality management and the financial performance improvement of the company. Other researchers have observed the existence of mixed correlation between quality and financial performance of the company [46]. Several studies support the existence of a correlation between certain quality management practices and financial performance indicators [27,39,47-52]. This leads to the following hypotheses:

- H3*: Quality Management Practices have a significant, positive and direct effect on financial performance.
- H3-1*: Management practices, as part of Quality Management Practices, have a positive and direct effect on financial performance.
- H3-2*: Infrastructure practices, as part of Quality Management Practices, have a positive and direct effect on financial performance.
- H3-3*: Fundamental practices, as part of Quality Management Practices, have a positive and direct effect on the financial performance.

3. Methodology

The literature review enabled to highlight the conceptual model and basic hypotheses used as a reference to study quality management practices and their and potential correlations with operational and financial performance. The current study considers justifying methodological choices and validating measuring instruments in order to guarantee the reliability of the measuring instruments and the results of data processing.

3.1. Data Collection

For the present study, the aim is to harmonize the findings of the above-mentioned studies by developing a model based on the study of quality management practices and their effect on operational and financial performance, taking into account company size, ISO certification and the multinational nature of the multinational nature of the organization. The correlation between the various concepts namely; QMPs, operational performance and financial performance has been evaluated in a predefined context which marks the originality and exclusivity of the current research; therefore the correlations between the different variables could be validated beforehand in a different context.

The theoretical model is proposed in Figure 1:

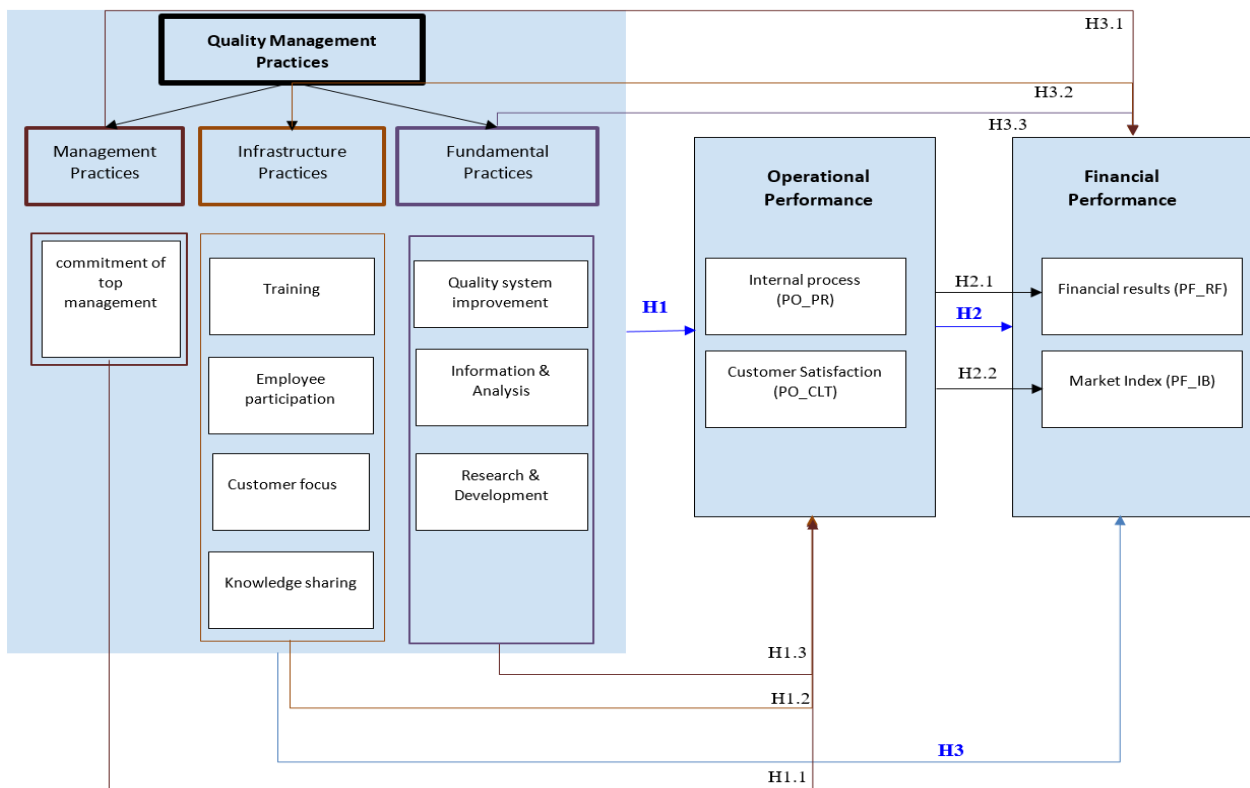


Figure 1. Theoretical model

In fact, the list of companies available on the portal of the Tunisian industry (<http://www.tunisieindustrie.nat.tn/fr/dbi.asp>) has been used to collect the contact details of companies in order to disseminate the questionnaire. The primary concern was the collection of data and the receipt of the valid answers while diversifying the type and nature of the companies contacted activities. An exhaustive list of 350 companies, from the close environment (family, friends and colleagues) has been added to the initial database.

Data was collected via combination of direct contacts with relevant managers and Internet-based survey methods. The invitation letter was sent by e-mail to participants. The mail contained the Internet address where the questionnaire was hosted.

In fact, the survey was sent to 2044 enterprises and a total of 251 surveys were returned. With regard to the eliminatory question concerning ISO 9001 certification, the responses collected show that only 49.3% of the sample represents certified ISO 9001. Hence, 122 valid participants have been left and therefore used in the current study.

For the current study, the principle of independence between the researcher and the object of study has been followed, in order to interpret facts measured by objective data. Similarly, the measuring instrument must guarantee the objectivity of the data by putting in place adequate information-gathering strategies to guarantee the non-subjectivity of the facts studied.

Moreover, the hypothetico-deductive approach was adopted to correlate the results of previous research and attempt to propose an alternative model that combines and reinforces the results by extending and diversifying the sample studied. So that the approach reveals one of theory-based model testing which consists of investigating observations that are subject to theory.

3.2. Measurement of Constructs

The theoretical model is inspired by several works [12,13,18]. The scales used in this study were assessed and developed in previous studies. The quality management practices are selected based on redundancy and vulnerable input over prior researches. Also, the scale for management practice is taken from a study conducted in 2011[53]. Infrastructure practices include mainly Improvement of the quality system, Information & Analysis and Research & Development. The scale is taken from different studies [54,55]. Fundamental practices scale incorporates the items related to employee involvement, employee training, customer orientation and knowledge sharing [52,56-58]. The scales for operational and financial performances are inspired from a study conducted in 2016 [59]. Moreover, all the items related to QMP, operational performance and financial performance were developed from Likert-scale items; the respondents were asked to indicate the scope to which the items represented practices are presented in their

firms. More than that, the items were measured using 5-point Likert scale and the participants were asked to rate each item from 1 to 5 (1=strongly disagree, 5=strongly agree).

Given the volume of data collected, Principal Component Analysis (PCA) is been used to refine the reference dimensions of the phenomenon as a factorial analysis that produces principal axes. Variables that do not correlate with an axis or that correlate with the last axes are low-contribution variables and can be removed to simplify the overall analysis. Moreover, the construction of the study model is formative, and this type of construction is more assured by PLS rather than other estimation techniques (e.g. LISREL, AMOS) knowing that when the model is relatively complex and the phenomenon studied is relatively new, the PLS method is considered the most appropriate for providing a strong solution.

3.3. Evaluation of Structural Model

In order to test the model with the structural equation modeling via Smart PLS, various fit criteria should be verified mainly the evaluation indicators of the structural model: R^2 of each construction (structural prediction). Indeed, the determination coefficient R^2 for endogenous (dependent) constructs to evaluate the structural model has been used in the current study, since R^2 allows understanding the contribution of each explanatory variable to the dependent variable prediction.

On the other hand, researchers have focused on the communality index (which measures the performance of the external model) and R^2 (which measures the performance of the internal model) to validate the PLS model, more specifically, the GOF (Goodness of Fit) index [68]. In fact, this index measures the model quality, taking into consideration the quality of both the structural and measurement models of the PLS model. Also, this coefficient should be higher than 0.5, in order to retain the model.

The path coefficients indicators from the PLS algorithm have been used to analyze direct effects. These indicators mainly include the regression coefficient and the P-Values; the latter has a threshold that determines whether the result of a study can be considered statistically significant. Absolutely, this level of significance or α is most often defined as 5% (or 0.05).

Regarding the mediating effect, the aim is to analyze the effect of operational performance between the different QMPs and the company's financial results. In this case, it is necessary to highlight the role of operational performance in the correlation between QMPs and performance the company's financial results. Several studies have shown that the more satisfied employees are with their jobs, the more committed to the company and more customer-oriented, which can have a positive effect on customer satisfaction [18].

4. Results for the Measurement Model

The exploratory analysis will enable us to determine the dimensions to be retained for each of the variables in the model. As for the confirmatory analysis, it will allow to ensure that the dimensions estimated by the factors previously retained define effectively a broader and vaguer construct and to demonstrate the reliability and validity of the measuring instrument [60]. Measurement scales should reveal content validity, unidimensionality, reliability, convergent and discriminant validity analyses. The detailed statistical results are presented in Table 1.

4.1. Unidimensionality Analysis

As first step, principal component analysis (PCA) has been used to reduce the data dimensions by removing redundancy and identifying correlated variables to deduce the latent variable representativeness [61]. All the scales were treated as first-order factors with a variance percentage > 65%, KMO index > 0.5. The findings show that all latent variables are unidimensional.

4.2. Construct Reliability

Cronbach's alpha coefficient reflects the internal consistency of the different dimensions of the latent variable with a threshold greater than 0.7 [62]. Ahire and Al. [63] consider that the assessment of the scale reliability

can determine whether the identified dimensions have acceptable stability. Within the framework of the structural equation model, another index is highlighted, for the reliability (Composite Reliability), it is considered important to refer to the reliability of the measuring instrument. It is defined as the measure of the inner consistency of measurement, close to Cronbach's alpha [64]. This indicator is measured with the Dillon-Goldstein Rho coefficient of the exploratory factor analysis (D.G. Rho) which must be greater than 0.7 [65].

Loadings with the latent variables of all items are presented in table 1. Results show that loadings are all significant with values above 0.7 as recommended [66].

4.3. Convergent and Discriminant Validity

The convergent validity analysis was proved by examining the fit between the latent variable and the corresponding indicators, in particular, AVE (Average Variance Extracted) values which refer to the factorial contributions square mean of an indicators set taken separately. These values must be greater than 0.5 in order to decide that the latent variable is correlated with its own variables more than with the other items [65, 66]. In other words, each item shares more variance with its construct than with the others in the model [67]. The convergent validity was achieved and all the estimated coefficients of all the indicators were significant.

Table1. Measurement scale unidimensionality, construct reliability and validity results

		Factors	KMO	% of variance	Alpha de Cronbach	Rho de D.G.	Composite Reliability	Average Variance Extracted (AVE)
Management Practices	Top management Engagement	ENG_DU	0.845	81.381%	0.879	0.880	0.915	0.687
		ENG_MU	0.647	69.696%	0.780	0.791	0.873	0.697
		ENG_AU	0.745	76.348%	0.896	0.905	0.928	0.763
Infrastructure Practices	Employees Participation	PE_DU	0.793	67.255%	0.837	0.887	0.885	0.661
		PE_MU	0.827	71.045%	0.897	0.912	0.924	0.709
	Training	FE_DU	0.834	84.864%	0.940	0.948	0.957	0.848
		FE_DF	0.754	74.233%	0.912	0.926	0.934	0.738
	Customer Focus	OC_CR	0.737	69.620%	0.854	0.885	0.899	0.693
	Knowledge sharing	PC_IP	0.532	65.478%	0.731	0.799	0.839	0.638
Fundamental Practices	Quality System Improvement	ASQ_PA	0.738	84.122%	0.905	0.907	0.941	0.841
	Information & Analysis	IA_GI	0.690	74.292%	0.883	0.884	0.920	0.743
		IA_SI	0.785	69.465%	0.851	0.871	0.900	0.694
Research & Development	RD_SRD	0.5	83.837%	0.807	0.835	0.911	0.837	
Operational Performance		PO_PR	0.684	69.145%	0.776	0.796	0.870	0.691
		PO_CLT	0.5	76.423%	0.692	0.694	0.866	0.764
Financial Performance		PF_RF	0.681	76.015%	0.841	0.851	0.905	0.760
		PF_IB	0.599	76.359%	0.841	0.851	0.904	0.758

According to the PLS approach, the discriminant validity is confirmed in case the construct shares more variance with its indicators than with the other constructs of the model [60]. The results are shown in Table 1.

5. Results of the Structural Model

The model with the structural equation modeling results specified in the Smart PLS output is presented in Appendix 1. Fernandes [67] points out that 90.2% of the articles in management/strategy using the PLS approach refer to the evaluation indicators of the structural model. The results are summarized in Table 2.

Table 2. Evaluation of structural model

Latent Variables		Type	R ²
Operational Performance	PO_PR	Endogenous	0.716
	PO_CLT	Endogenous	0.709
Financial Performance	PF_RF	Endogenous	0.787
	PF_IB	Endogenous	0.624

R² values for all endogenous variables are greater than 0.1. Consequently, these results allow to conclude that the model has a predictive validity.

Furthermore, the result shows a considered quite good value of GoF= 0.720, which proves that the model can be retained allowing to test the suggested hypotheses.

5.1. Direct Effects

The following results were based on the Path coefficients indicators from the PLS algorithm. Generally, P-Values ≤ 0.05 are statistically significant with a 95% confidence level [69].

Relatively to the correlation between Quality Management practices and operational performance, moreover, the means used by the company to communicate the quality values to the employees is positively and significantly affecting the internal process quality with the P-values=0.000 and a regression coefficient of 0.547, while the approach used by the management to reinforcing quality within the company and the practices use degree such as the dissemination of quality objectives, the involvement of the general management in quality improvement, etc. are not significant in relation to the internal process. The degree of use of practices such as the dissemination of quality objectives, involvement in quality improvement, provision of the necessary resources for the adequate performance of activities and the encouragement of employees to take into account the needs and expectations of customers by top management, positively and significantly affects customer satisfaction (reg=0.574; p=0.001). So that (H1-1) management practices that have a positive and direct correlation to operational performance

are partially validated.

Relatively to the infrastructure practices, employee involvement in terms of empowering the employees and taking their suggestions into consideration has a significant direct and positive effect on customer satisfaction (reg=0.126; p=0.004). The degree, to which various training courses contribute to the company’s objectives in terms of staff training in the field, in an integrated center, intra/inter-company seminars positively and significantly influence customer satisfaction (reg=0.409; p=0.002). Added to that, customer orientation based on credibility, availability and after-sales service significantly and positively affects operational performance detailed as (reg=0.680;p=0.000) for internal process and (reg=0.680;p=0.000) for customer satisfaction. Finally, knowledge sharing has a statistically significant direct effect on the internal process (reg=0.164; p=0.002). As a result, (H1-2) infrastructure practices with a positive and direct correlation to operational performance are partially validated.

The improvement of the quality system has a significant and positive effect on the management of the internal process (reg=0.873; p=0.000) while it has no effect on customer satisfaction. The management of information related to the company’s activities and the communication of information through meetings and processes have a significant and positive effect on managing the internal process (reg=0.288; p=0.004). The practice of research and development positively and significantly affects operational performance detailed as (reg=0.224; p=0.043) for internal process and (reg=0.216; p=0.003) for customer satisfaction. As a result, (H1-3) fundamental practices having a positive and direct correlation to operational performance is partially validated. In conclusion, (H1) Quality management practices having a significant, positive and direct correlation to operational performance is partially supported.

Regarding the hypothesis (H2) suggesting operating performance has a significant, positive and direct correlation to financial performance, the results show that operational performance has a significant and positive impact on the financial results (reg=0.674, p=0.000) as per internal process side and (reg=0.327, p=0.000) for customer satisfaction affect. So, H2 is partially validated.

Relatively to the correlation between quality management practices and financial performance (H3), it has been noticed that top management engagement affects significantly and positively the financial results (reg >0, p <0.05). Subsequently, H3-1 is partially validated.

Besides, certain practices degree of use, such as training needs assessment, continuous training for both management and operational staff added to the validation of the-training courses through participant feedback, has a significant and positive effect on the financial results although employees’ participation, customer focus and knowledge sharing do not have a direct significant effect on financial performance (p>0.005). Therefore, H3-2 is partially validated.

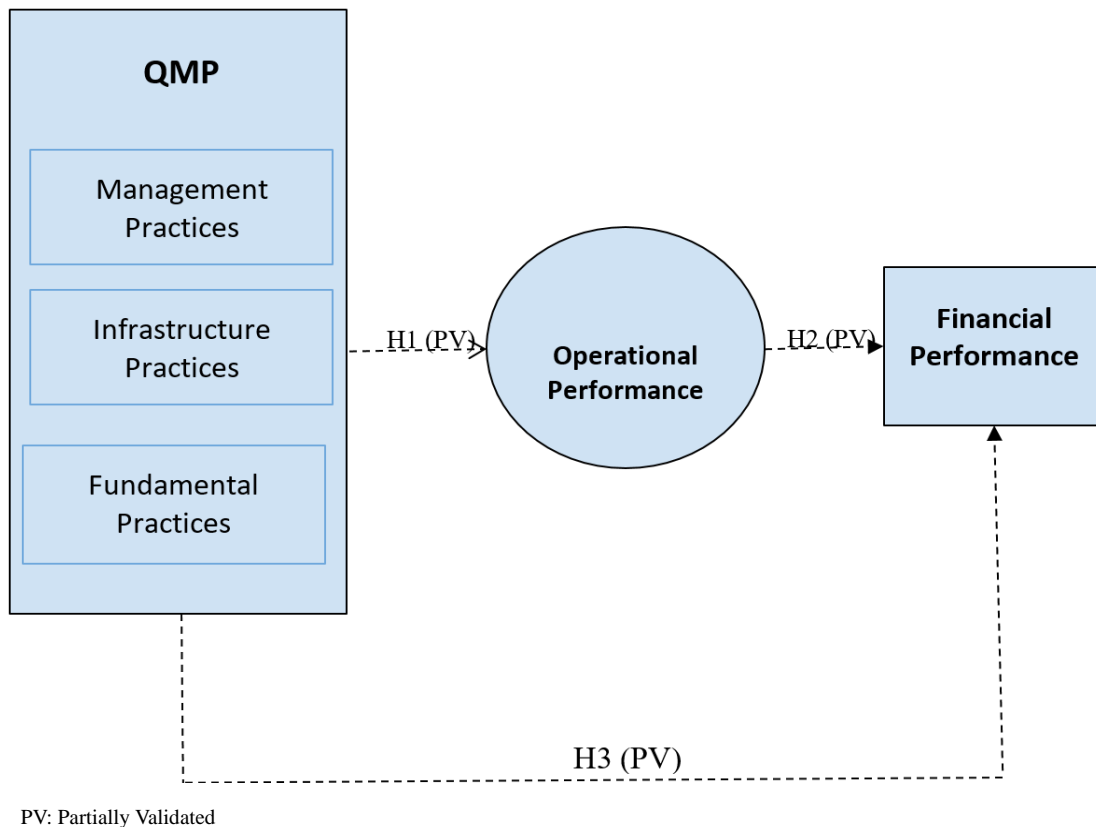


Figure 2. The correlations between quality management practices, operational performance and financial performance

On the other hand, the results show that quality system improvement added to research and development has a significant, direct and positive influence on financial performance ($reg > 0$, $p < 0.05$). As for Information & Analysis, it has been revealed that information management has a direct, significant and positive effect on the stock market indexation dimension. In conclusion, H3 is partially validated. Results are summarized in Figure 2.

5.2. Mediating Effect

In this model, the aim is to analyze the indirect effects of different quality management practices and the financial results via operational performance [69, 70].

The results showed that the internal process mediates the correlation between management practices and financial results. Besides, there is a significant effect of employee participation, customer focus and knowledge sharing on financial results through operational performance. Moreover, the internal process mediates the correlation between employee training practices and financial results. Relatively to fundamental practices, the findings show that operational performance mediates the correlation between research and development and also the financial results. Moreover, customer satisfaction mediates the correlation between the quality system improvement and the information sources diversification.

Likewise, internal process acts as a partial mediator in the correlation between information management and financial results.

6. Discussion

One of the objectives of the current research paper is to study the particularity of the correlation between QMPs and operational and financial performance. The objective was to explore this correlation in a granular way using samples of companies established in Tunisia (local and offshore) and belonging to distinct fields of activity. The aim was to unveil the effect of quality management practices (management practices, basic infrastructure practices and core practices) on performance: operational and financial, while highlighting the mediating effect of operational performance in the correlation between these practices and financial performance.

At the level of management commitment, the means used by top management to communicate quality values to employees positively and significantly affects operational performance and that the degree of use of practices by top management positively and significantly affects customer satisfaction, these conclusions are consistent with the findings of other researchers stating that management commitment significantly and positively affects the

financial results [29, 71].

In relation to the infrastructure practices, employee participation in terms of empowering employees and taking their suggestions into account has a significant direct and positive effect on customer satisfaction. This is consistent with previously mentioned works [31-33]. Moreover, the degree to which various training courses contribute to the company's objectives in terms of staff training in the field, in an integrated center, intra/inter-company seminars positively and significantly influences customer satisfaction and that knowledge sharing has a direct statistically significant effect on the internal process, which improves competitiveness criteria [72,73]. Following the example of Amancio Ortega (founder of the Zara clothing brand), employee participation in terms of employees' empowerment and taking their suggestions into consideration has a direct and positive significant effect on customer satisfaction. It has been noticed as well that customer orientation based on credibility, availability and after-sales service significantly and positively affects operational performance, these results are in line with marketing research that has highlighted the importance of perceived quality in determining customer satisfaction. Indeed, several studies have shown that quality is a key determinant of satisfaction as it promotes the development of a rewarding experience and a sense of satisfaction among customers [74-77].

Empowering employees enables them to contribute adequately to product improvement processes by providing the appropriate structure that encourages and guides their initiatives to develop new products aimed at final customer satisfaction [63,78]. Moreover, Gutierrez-Gutierrez et al. [79] believe that the leaders must create a culture that develops and empowers all employees while emphasizing the importance of teamwork. Besides, the degree of certain practices used to mention training needs assessments, continuous training for management and line staff, as well as validation of such training success through participant debriefing has a significant and positive effect on financial results.

In relation to fundamental practices, improving the quality system has a significant and positive effect on internal process management according to the findings of other researchers [80,81]. The management of information related to the company's activities and the communication of information through meetings and processes significantly and positively affect the management of the internal process. Added to that, the practice related to research and development positively and significantly affects operational performance. Several studies have highlighted the contribution of research and development in maintaining the competitiveness of the company. Lakhil [14] considers that the practice of "information and analysis" has a statistically significant direct effect on operational and financial performance.

It is important to highlight that the current study revealed that operational performance has a significant and positive

impact on financial results.

Relatively to the mediating role of operational performance, the complementary mediation in the correlation between management commitment and financial results has been revealed. Secondly, operational performance partially mediates the correlation between employee participation and financial results. It is important to highlight that customer satisfaction fully mediates the correlation between the degrees of employee participation practices use and the financial results. Additional mediation is provided by the internal process in the correlation between the degree of use of employee training practices and financial results and that operational performance mediates the correlation between customer orientation and financial results.

Finally, customer satisfaction mediates the correlation between quality system improvement and financial results. The internal process mediates partially the correlation between information management and financial results and customer satisfaction mediates partially the correlation between diversification of information sources and financial results. Therefore, operational performance mediates partially the correlation between information and analysis and financial results. Finally, the complementary mediation or partial mediation role played by operational performance in the correlation between research and development and financial results has been confirmed.

7. Conclusions, Limitations and Future Research

During this study, the main objective was to investigate the particularity of the correlation between QMPs, operational and financial performance by exploring this correlation on a sample of companies established in Tunisia (local and offshore) and belonging to distinct fields of activity.

The aim was to reveal the effect of different QMPs [management practices, basic infrastructure practices and fundamental practices] on performance for both sides: operational and financial. Moreover, studying the mediating effect of operational performance in the correlation between these practices and financial performance was a major center of interests in this research.

The current section presents a synthesis of the main results of the current study, its contributions and its limitations and perspectives of future research.

7.1. Conclusions

Quality management in its extended concept aims to improve the company's performance by optimizing all its resources. Then, it is essential to question the degree to which the quality approach initiatives are implemented. From this perspective, international studies have been carried out in Great Britain, Australia and other

industrialized countries such as the United States and Japan. The aim of the current research paper is to justify the potential correlations between quality management practices, operational and financial performance in a Tunisian context and relatively to ISO 9001 certified companies. The correlations were presented through an advanced version of a theoretical framework. The results indicate that (1) management practice has a direct, significant and positive effect on both customer satisfaction and financial results, (2) infrastructure practices and fundamental practices affect partially and significantly, operational and financial performance and (3) operational performance mediates partially the correlation between quality management practices and financial results. More specifically, this empirical study allowed to verify the nature of the correlation between quality management practices and financial performance, the results showed that "Research and Development" and "Quality System Improvement" practices have a significant and positive impact on financial performance. Other quality management practices such as "Employee Involvement", "Customer Orientation" and "Knowledge Sharing" have no significant correlation with financial performance and QMPs such as "Engaging Top Management", "Employee Training" and "Information and Analysis" are partially significantly and positively related to financial performance.

In conclusion, this research allowed to sum up the correlation between quality management practices and performance within the company through a detailed literature review and also to improve the classification of quality management practices. Similarly, it allowed to enlarge the field of studies relating to the contribution of quality management practices to enterprises established in Tunisia (Large, Medium and Small enterprises were established on the Tunisian territory and certified ISO 9001, to deploy advances related to structural equation models using SMART PLS software for a quality management practice study case in order to leverage the approach of Preacher and Hayes to highlight the mediating role of operational performance in the correlation between quality management practices and financial performance.

7.2. Limitations and Future Research

From a methodological point of view, the sample size set at 122 companies is a limitation; a larger study sample could be more beneficial for generalizing the results of this study. However, it is mandatory to point out that collecting data from companies is quite tedious. Moreover, the choice of survey mode is also a function of time and means available. Therefore, conducting semi-directive interviews with quality management managers would be more advantageous given their in-depth knowledge of the subject.

On the other hand, it would be advisable to study the effect of contextual variables such as company size, ISO 9001 certification and the multinational nature of the company with reference to the present study results and to observe changes in causal correlations in future researches.

In a more advanced context, at the level of Total Quality Management or TQM, a concept that has been developed since 1949 with the formation of the Japanese Union of Scientists and Engineers (JUSE), quality management practices are equally divided between soft and hard, given that the driving force behind a successful TQM approach is the consideration of personnel and product construction [82]. In turn, researchers have classified TQM principles and practices according to two main groups: soft or social factors and hard or technical factors [75,83,84]. It is important to highlight that there is already some interesting work published on this topic.

Hwang [85] predicts that TQM hard practices improve the level of employees' readiness for change, thereby increasing their organizational commitment and reducing their turnover intention. Their study recommends that the organization should support employees, manage them as a team, communicate important information to them so that they can be ready for TQM and finally have favorable work attitudes during the change process.

Added to that, the present research work can be marked as a continuation of the already initiated research work on quality management practices in Tunisia and also as a first step in discovering the effect of these practices on different types and forms of enterprises.

In the present circumstances, it would obviously be judicious to study the instantaneous and latent repercussions of the Covid-19 pandemic on the implementation of quality management practices, especially with the increased use of communication tools or virtual management.

Appendix

Path Coefficients

VI=>VD	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
ASQ_PA -> PF_IB	0,845	-0,833	0,259	3,262	0,001
ENG_AU -> PF_RF	0,491	0,496	0,195	2,516	0,012
ENG_DU -> PO_CLT	0,574	0,558	0,166	3,456	0,001
ENG_MU -> PF_RF	0,386	0,372	0,122	3,176	0,002
FE_DF -> PO_CLT	0,409	0,398	0,128	3,182	0,002
IA_GI -> PF_IB	1,266	1,242	0,182	6,954	0,000
IA_SI -> PO_CLT	-0,354	-0,348	0,129	2,737	0,006
OC -> PO_CLT	0,680	0,679	0,108	6,315	0,000
PC_IP -> PF_IB	-0,365	-0,339	0,141	2,592	0,110
PO_CLT -> PF_RF	0,327	-0,290	0,134	2,445	0,015
PO_PR -> PF_RF	0,674	0,663	0,153	4,392	0,000
RD_SRD -> PF_IB	0,360	0,356	0,128	2,818	0,005
ASQ_PA -> PO_CLT	0,065	0,039	0,260	0,250	0,802
ENG_AU -> PO_CLT	0,002	0,011	0,168	0,011	0,991
ENG_DU -> PF_IB	-0,300	-0,287	0,227	1,321	0,187
ENG_MU -> PO_CLT	0,140	0,148	0,154	0,906	0,365
FE_DF -> PF_IB	0,262	0,251	0,172	1,526	0,128
FE_DU -> PF_IB	-0,189	-0,213	0,193	0,976	0,330
FE_DU -> PO_CLT	0,107	0,118	0,187	0,572	0,567
IA_GI -> PO_CLT	-0,238	-0,233	0,186	1,279	0,201
IA_SI -> PF_IB	-0,250	-0,249	0,147	1,704	0,089
OC -> PF_IB	-0,128	-0,135	0,162	0,789	0,430
PC_IP -> PO_CLT	-0,154	-0,153	0,113	1,363	0,174
PE_DU -> PF_IB	-0,013	-0,020	0,187	0,068	0,946
PE_DU -> PO_CLT	0,126	-0,110	0,162	0,775	0,004
PE_MU -> PF_IB	-0,301	-0,302	0,206	1,457	0,146
PE_MU -> PO_CLT	0,132	0,004	0,196	0,325	0,003
RD_SRD -> PO_CLT	0,216	-0,220	0,118	1,822	0,003
ASQ_PA -> PF_RF	0,867	0,863	0,216	4,005	0,000
ASQ_PA -> PO_PR	0,873	0,831	0,233	3,752	0,000
ENG_DU -> PF_RF	0,491	0,501	0,171	2,864	0,004
ENG_MU -> PO_PR	0,547	-0,542	0,154	3,548	0,000
FE_DU -> PF_RF	0,393	-0,397	0,178	2,210	0,028
IA_GI -> PO_PR	0,826	-0,817	0,189	4,369	0,000
IA_SI -> PO_PR	0,288	0,292	0,100	2,867	0,004
OC -> PO_PR	0,684	0,677	0,114	5,990	0,000
RD_SRD -> PO_PR	0,224	-0,221	0,110	2,029	0,043
ENG_AU -> PF_IB	0,025	0,022	0,142	0,177	0,859
ENG_AU -> PO_PR	0,087	0,065	0,170	0,511	0,609

Table continued

ENG_DU -> PO_PR	0,323	0,321	0,194	1,664	0,097
ENG_MU -> PF_IB	-0,022	-0,018	0,114	0,190	0,849
FE_DF -> PF_RF	0,119	0,131	0,125	0,949	0,343
FE_DF -> PO_PR	-0,154	-0,148	0,102	1,502	0,134
FE_DU -> PO_PR	0,153	0,180	0,181	0,844	0,399
IA_GI -> PF_RF	-0,047	-0,053	0,267	0,175	0,861
IA_SI -> PF_RF	0,219	0,215	0,136	1,607	0,109
OC -> PF_RF	0,083	0,078	0,164	0,506	0,613
PC_IP -> PF_RF	-0,066	-0,051	0,079	0,835	0,404
PC_IP -> PO_PR	0,164	0,176	0,099	1,649	0,002
PE_DU -> PF_RF	-0,300	-0,314	0,181	1,661	0,097
PE_DU -> PO_PR	0,124	0,149	0,155	0,803	0,422
PE_MU -> PF_RF	-0,098	-0,091	0,174	0,565	0,572
PE_MU -> PO_PR	-0,310	-0,321	0,188	1,649	0,100
PO_CLT -> PF_IB	0,099	0,101	0,098	1,010	0,313
PO_PR -> PF_IB	0,011	0,007	0,078	0,138	0,890
RD_SRD -> PF_RF	0,137	-0,139	0,095	1,447	0,001

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