

Factors Affecting TQM Implementation: An Empirical Study In Tunisian Firms

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Abstract

The level of awareness of TQM has increased considerably over the last few years. Different sets of organizational requirements are prescribed by quality management academics and practitioners for the effective practice of TQM. However, these requirements do not seem to have been formulated on the basis of systematic empirical research. The relationships between the extent of TQM implementation and organizational factors are investigated on the basis of data collected from 81 quality managers at ISO-registered Tunisian companies. The results of logistic regression indicate that joint-venture, ownership, leadership styles and quality experience are the most influential factors that contribute in the TQM implementation. This suggests that knowledge of organizational context is useful for explaining and predicting quality management practices.

Keywords: TQM implementation, internal factors, external factors

Introduction

The economic liberalization process, market globalization and rapid change lead to a shorter product life-cycle and a more demanding customer. As a result, firms tend to be more innovative to survive in this context. Over the last decade, total quality management (TQM) was one of the administrative and radical innovations (Smith et al., 1998) in the 20 century. Dale (1997) defines it as the mutual cooperation of every one in an organization associated business processes, in order to produce products and services which meet, and hopefully, exceed the needs and expectations of customers. It formed the pivot around which many of the firms that surround us organize their activity. It also provides the frame of reference that enables them to progress along the road towards continuous improvement.

The competitive edge achieved by Japanese companies, which mainly results from their high quality products, triggered the previously unheard of curiosity of western companies, anxious to learn about the ideas and management tools or practices being used by the Japanese to achieve such results. Crosby (1979, 1984), Deming (1986), Feigenbaum (1983) and Juran (1986) proposed various organizational approaches and techniques for the management of quality. But, none of these prescriptions is derived from an organizational theory. They are based on the author's judgment and experiences in quality field in different firms as consultants, managers, or researchers. Prior to 1990s, most research in this area was conceptual or case studies (Kujala, 2002). Recently, the first examples of empirical research appear, focuses specifically on quality management practices. Moreover, A great number of these studies focus on the analysis of the relationship between QM and results (Hendricks & singhal, 1997; Chenhall, 1997; Sim & Killough ; 1998, Easton & Jarrel, 1998; Samson & Terziowski, 2000), with few of them addressing the link between the adoption of QM and various other factors.

In addition, while TQM, Total Quality Control (TQC), quality circles and other quality systems are relatively well- established management techniques in developed countries such as Japan, Singapore, United Kingdom and the US, these systems have recently become popular in developing countries such as Qatar and the Arab Gulf (Pun, 2001). These countries started to be conscious of the importance of the reinforcement of their competitiveness by improving their product or service's at both national and international levels. Many Tunisian firms are aware of the delicate situation; they prepared and applied the 1995's upgrade program. This intangible investment in quality allows being more sophisticated and competitive. However, researches in quality management and TQM's field are limited. Accordingly, the studies carried out in these countries concluded that the firms that tried to implement TQM program failed to achieve desired outcomes (Pun, 2001). The question to be answered is whether there is any relationship between certain internal and external factors and the degree to which the firm has implemented TQM.

The primary aim of this study, therefore, is to test the effect of a set of factors on the degree to which TQM techniques and practices are applied in Tunisian firms. The literature partially tackles this question, while a more integrated focus for the analysis that includes structural, external and internal factors is proposed.

This paper begins with a review of studies which directly or indirectly dealt with this issue. Other factors, not as yet considered in the literature, but which are deemed, a priori, to have some bearing on the adoption of QM practices, are also introduced. In each case, a line of argument is set up that finally leads to the establishment of a series of hypotheses. Then, the methodology of the study is described. Finally, a logistic regression was carried out to test the established hypotheses and the results were interpreted.

Literature review and hypothesis formulation

Although the last few years have seen a considerable increase in the publication of research work dealing with TQM, there is very little literature that explores the relationship between various factors, either endogenous or exogenous, and the adoption of QM practices by firms. In addition, the controversy about the importance of TQM in improving the corporate performance leads various researchers to identify factors behind this controversy.

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Communication plays a key role in the TQM implementation. However, the quality goals must be the same at different organization level, and well wide-organization communicated. Kayis (1998), Kayis et al (2003) and Fitzgerald (2003) found that a power communication is a barrier to TQM implementation in the Australian context. Jaafari (1996) establishes that a true, equity and openness based communication make the prerequisite basis for the successful introduction of TQM in the construction projects. Nevertheless, communication is one of the important problems of current management. It seems to play a key role in the managerial and organizational effectiveness (Ghobadian & Gallea, 1996; Yvas, 1995). In contrast, Nelson et al (1999) conclude that communication has a non significant effect on the TQM implementation.

H₁: Firms with a good communication will achieve a higher scale of implementation of TQM practices.

When considering the effect of the level of competition faced by the firm, it might be expected that an industrial plant attempting to sell its products on a highly competitive market, will be urged to adopt TQM practices in order to improve the results of its productive system and thereby better position itself. Most of the studies that have tackled this question in more or less the same way fail to provide a support for this argument (Benson *et al.*, 1991; Powell, 1995). Yet, Premkumar and Roberts (1999) suggest that the perceived level of competition was supposed to affect positively innovations adoption. Djerdjour and Patel (2000) proved through 4 case studies that the main strength that makes firms implement TQM is the competition threat something which was also confirmed by Chong and Rundus (2004).

H₂: The higher is the level of competition faced by the firm, the higher is the implementation scale of TQM practices.

Jaafari (1996), Benson et al (1997) indicate that the previous experience with management practices considerably affects the future choices to adopt a managerial innovation. They suggest that a good previous experience with quality has a positive impact on the intentions to implement a TQM program.

H₃: firms with previous quality experience will achieve a higher scale of implementation of TQM practices.

The size of a company, measured in terms of the number of employees, is one of the most reliable predictions of whether that company is generally willing to accept and introduce innovations. Large companies are usually more demanding in terms of the resources needed for innovation, this includes groups of staff at corporate level to back up moves towards change and provide a framework for it to be implemented. Large companies also tend to be more complex and diverse, which means that they have a greater number of areas, or aspects, in which they need to introduce innovations (Lawler *et al.*, 1998). Considerably varied results have emerged from studies attempting to investigate the relationship between company size and the degree to which the company takes up TQM practices. Hendricks and Singhal (2001), Taylor and Wright (2003) found that firm size affects the extent to which TQM practices are implemented. Ghobadian and Lui (1992) make a comparison between the PME and large firms experience in the TQM field. They found that it is easier to the PME to make a cultural change and introduce TQM successfully. This result is confirmed by Ghobadian and Gallea (1996) through a deductive research in 4 firms with different size and activity. Taylor (1997) proved that the small organizations were much more likely to confuse TQM with quality assurance; they are also less knowledgeable about the TQM goals and about the TQM value as a strategic approach to attracting customers. These results were also confirmed by Lee and Palmer (1999), they found that the small organizations in NZ are more satisfied by ISO certification and do not seek to adopt TQM principles. Benson, Saraph and Schroder (1994) failed to find any relationship between plant size and the adoption of TQM practices. Subba et al. (1997) prove the same result at international level. Powell (1995), though a sample of 54 US firms, discovered a very slight negative correlation and failed to find any significant correlation between TQM implementation and firm size. These results were confirmed by Hongyi Sun (1999) in the Norwegian context and by Sadikoglu (2004).

H₄: The greater is the size of the firm, the higher is the implementation scale of TQM practices

Whether a firm is part of a multinational may lead it to behave differently when it comes to taking up new measures of this kind. Hongyi Sun (1999) reveals that the socio-economic characteristics of ownership structure affect the management system in business of organizations. That's why, it is reasonable to suppose that plants belonging to a multinational group will display a more open attitude towards change and innovation of organizational practices. The clear overall picture that can be seen from the head of one of these multinational groups makes it easier to gain knowledge of positive experiences in the application of these practices (either within or outside) and to transfer this to the rest of the plants belonging to the group. Although there is little empirical evidence with regard to TQM practices as a whole, Sun (1998) proved that organizations with mixed capital provide an opportunity for Norwegian firms to TQM adoption.

H₅: Firms that make part of a multinational will achieve a higher implementation scale of TQM practices.

Given that TQM is a revolution and a challenge to traditional management practices, managers are confronted to employee resistance to change due to new management practices adoption. That's why; managers tend to favor teamwork, to implement quality circles and to involve employees to make operational and strategic decisions (Kammoun, 1994; Nelson et al, 1999). Benson et al (1997), Sebastianelli and Tamimi (2003) found that management support is one of the contextual factors affecting the extent to which TQM practices are implemented in comparison with communication and work life quality.

H₆: The more managers adopt a participating leadership style of manger, the higher is the implementation scale of TQM.

The cultural and managerial style of partners establish in some cases the organization's attitudes facing to their management system (Sun, 2000). Some foreign partners insist that the organizations with which they work implement TQM. Hongyi Sun (2000) draws a comparison between the management quality systems of Shanghai and the Norwegian firms, he found that the Shanghai firms neglected the customer satisfaction and insisted on quality control. However, he failed to implement TQM. This is mainly due to the lack of partnership relations with foreign firms.

H₇: Plants having partnership relations will achieve a higher implementation scale of TQM practices.

Another factor assumed to have an effect on the application of QM practices, although the literature provides no supporting evidence for this, is the plants' reliance on export. It is reasonable to believe that plants whose products have to compete on the international market face fierce competition and therefore should, be even more concerned with improving their output. Therefore, it is assumed, that they will

show greater emphasis on the application of QM techniques. The only empirical evidence to support this is provided by Merino-Diaz (2003) who failed to find any link between TQM practices and exports.

H₈: Highly exporting plants will achieve a higher implementation scale of TQM practices.

The review of the available literature on factors determining the application of TQM practices show conflicting results in some cases and leads to formulate a series of hypotheses concerning the relationship between certain internal (communication, leadership style), external (level of competition, reliance on export, partnership) and structural (size, ownership structure) factors and the degree to which TQM practices are applied. These hypotheses will then be tested on the basis of the data obtained from this investigation.

RESEARCH DESIGN AND METHODOLOGY

The process of data collection

The data used in this study were obtained from a survey performed on certified Tunisian manufacturing firms. The purpose behind studying all types of sectors was to survey a larger number of situations and features of the environment, which would not be biased by the sectorial and economic features.

A total of 98 firms were selected taking as reference the firms that obtained a registration for their quality assurance system until September 2002 (about more than 250 firms). The questionnaires were either sent to the firms (94) or faxed (the remaining number). All the questionnaires were addressed to the quality managers who had responsible for quality. The administration and the collection of the questionnaires took 6 months. The final number of questionnaires received was 81, with 81 being valid. The response rate was 82.65%. Table 1 presents the descriptive statistics and the correlation matrix for the variables used in this study.

In 23 cases, ISO 9000 was implemented in order to improve quality. 19 firms seek to be more competitive through the implementation of ISO 9000. In 38 cases, ISO 9000 certification is a first step to implement TQM practices. One firm claimed that the implementation of ISO 9000 is an updating measure.

Table 1: Sample Characteristics

Characteristics	Description						
Activity sector	Agribusiness	Building & glass	Mechanism & Electronic	Clothing	Leather & shoes	Chemicals	Diverse Industry
	13.6%	6.2%	30.9%	6.2%	3.7%	24.7%	14.7%
Firm Age	Less than 10 years		Between 10 and 20 years		More than 20 years		
	17.3%		23.4%		59.3%		
Respondent Age	Between 20 and 30 years		Between 31 and 40 years		> 41 years		
	35.8%		46.9%		17.3%		
Firm size	Between 1 and 50 workers		Between 51 and 100 workers		Between 101 and 500 workers		More than 500 workers
	22.8%		17.7%		49.4%		10.1%
Respondent's educational level	Bac + 2		Bac + 4		Bac + 5 or more		
	11%		23.4%		65.6%		

Measurements

TQM dimensions were measured through the scales developed by Saraph, Benson and Schroeder (1989). They identify and propose eight critical factors of quality management. The factors were top management leadership, role of the quality department, training, product design, supplier quality management, process management, quality data reporting and employees' relations. These measurements are validated by Powell (1995) and Sun (1999). These scales were modified after a pilot study. Seven factors and a total of 41 items were retained. To assess the degree or extent of practice of each item, a five- point Likert scale (1 = strongly disagree; 5= strongly agree) was used.

In order to evaluate the leadership style, a five- item scale was used, that measures the degree of human resources participation in the process of decision making and the organizational climate. This concept of leadership style matches that proposed by Culpán and Kucukemiroglu (1993).

Quality experience was measured through a four- item scale based on those developed by Saraph, Benson and Schroeder (1991). This scale measures if the firm has good relations with professional organism.

Communication was measured in the manner proposed by Nobel and Birkinshaw (1998). Accordingly, the respondents have to estimate the frequency of face to face personal contact and the frequency of indirect contact between top management and different departments, between every department and the subordinate.

The firm size is measured by the number of employees (Hongyi Sun, 1999; Lee & Palmer, 1999). The firm's reliance on exports was measured by the percent of annual sales on foreign markets. The ownership structure was evaluated by the percentage of capital held by foreign firms. Finally, partnership was a dichotomy variable, Respondents were asked to indicate if the firm has partnership relations with foreign firms.

Reliability and validity tests

This section reports the results of the reliability tests and three components of construct validity-unidimensionality, convergent validity and discriminate validity. First, the reliability of each scale of TQM and the factors relating to its implementation was checked by calculating Cronbach's α (Cronbach, 1951). Several items in the TQM factors which did not contribute to α values of the scales were dropped. All TQM constructs have an acceptable reliability levels (Table 4 and 5), values of α were equal to or higher than 0.70 (Nunnally & Bernstein, 1994).

To establish the unidimensionality of factors, an exploratory factor analysis using principal component extraction with a varimax rotation was separately performed for TQM and factors affecting its implementation. The examination of eigenvalues and screen test results revealed seven factors of TQM. Process management emerged as two factors, showing the same pattern than Saraph et al. (1989) found in their study. This study confirms the existence of two separate scales, which I have called "inspection" and "process management." The other items made the expected factors. As a result of examining the loadings and communalities, several items were also dropped in this step. The inspection scale was not included in the additional data analyses discussed in the following sections because it proved to add little value to the content of quality management. With relation to factors of TQM implementation, they were the same as the proposed scales expected communication. However, communication divided in two factors, which I have called "formal communication" and "informal communication".

The content validity refers to whether the set of items that make up the scale are suitable for the evaluation of the construction (De Vellis, 1991). The items used to create the indexes have been borrowed from the literature on TQM and from interviews with experts in the field. The same approach has been followed with regard to the creation of these instruments. The content validity of this instrument is thus demonstrated.

Table 2: Correlation between independent variables

	Size	Partnership	Ownership	CA.export	Quality experien	Leadership	Informal Communi.	Formal Communic	Competition
Size	1.00	.205	.103	.184	.191	-.023	.082	.056	-.215
Partnership		1.000	.084	.205	-.115	.059	.082	.073	.092
Ownership			1.000	.012	-.008	.108	.019	.106	.021
CA.export				1.000	.286	.164	.084	-.012	.106
Quality experience					1.000	.558	.186	.016	-.058
Leadership						1.000	.289	.182	.053
Informal Communi							1.000	.559	-.023
Formal Communic								1.000	.147
Competition									1.000

Table 3: Correlation between TQM factors

	Top management commitment	Quality Service	Training	Relwith suppliers	Pro. Manag	Inspection	Quality information	Employees Relations
Top management commitment	1.00	.726**	.690**	.673**	.630**	.670**	.547**	.493**
Quality department		1.000	.727**	.718**	.662**	.740**	.640**	.645**
Training			1.000	.608**	.673**	.695**	.523**	.498**
Relations with suppliers				1.000	0.681**	.685**	.499**	.487**
Management process					1.000	.681*	.524**	.436**
Inspection						1.000	.676**	.675**
Quality information							1.000	.646**
Employees relations								1.000

** Correlation is significant at 0.01 level

Table 4: Exploratory factor analysis and reliability of « the extent of the implementation of TQM »

Factors	Top management commitment	Quality Service	Training	Relation with suppliers	Pro. Management	inspection	Employees Relations
VE%	75.18	72.45	68.16	52.94	49.69	14.42	62.27
KMO	0.829	0.785	0.895	0.808	0.836		0.787
Items number	4	4	7	5	4	4	5
Cronbuch α	0.855	0.858	0.921	0.808	0.844		0.842

Table 5: Exploratory factor analysis and factors reliability

Factors	Leadership style	Quality experience	Formal Communication	Informal Communication	Competition
VE %	66.966	70.422	27.926	39.995	70.35
KMO	0.824	0.733	0.699		0.875
Items number	5	3	2	2	4
Cronbuch α	0.876	0.702	0.719		0.655

Cluster analysis

The aim of cluster analysis is to examine clusters generated from values of the seven TQM factors. The notion of adopting a configurational perspective or logic when analysing issues relating to the operating of businesses appears quite frequently in the literature. The argument behind this perspective is that any given variable can only be understood in terms of the overall pattern of which it is part, because its effect may increase or decrease according to its interaction with other variables included in the design (MacDuffee, 1991).

This perspective is felt to be ideally suitable to analyzing the groups of practices, defined according to seven TQM factors, since the indices in question are interrelated and would, in isolation, have much less significant force. Cluster analysis is a useful way to tackle an investigation from the above-mentioned perspective. In the case at hand, the aim is to classify the firms to be studied into different groups, according to the level to which they have implemented the seven TQM practices, or, in other words, according to their scores on the variables, top management commitment, quality department, training, relations with suppliers, management process and inspection, quality information and employees' relations.

The procedure followed in applying Cluster Analysis in this study is the following. First, Ward's method (hierarchical procedure) was applied in order to determine the number of clusters and the centroids of those resulting. Second, discriminate analysis was applied on the number of clusters chosen in the previous step. Finally the interpretation of the resulting clusters was presented. After analyzing these results, it was decided to take the four-cluster option, since the centroids thus obtained behave in a logical manner on all the variables, making it possible to see very clearly defined groups (table 6). Moreover, for sake of simplicity, it is preferable to work with four groups.

The interpretation of these results was immediately clear (Table 7). The first group, labeled 'low level' includes the firms with the highest scores on each one of the TQM factors. The second group is made up of plants with an average level of application in all indices. The third group comprises those plants where the level of adoption of all the TQM indices is the highest. These are, those plants that have made an effort to take up a series of practices in different aspects of the productive area and who show serious commitment to improvement. Finally, the fourth group includes firms what do not implement TQM. The differences between the averages of the different groups are highly significant (0,000 in all cases). These results show that firms which have recently adopted the process, attempt to introduce all the different types of practices at once, in other words, there is some indication that TQM practices are complementary, as suggested by the reasoning behind the configurational perspective (MacDuffee, 1995) and the complementarities theory (Milgrom & Roberts, 1995; Ichniowski *et al.*, 1997; Salas, 1999).

Once the obtained results are interpreted, they must then be validated. Using the discriminate analysis, clusters were taken as dependant variable, and the TQM factors are independent or exogenous variables. The results provide further proof for the validity of this analysis. In addition, these last results also show that the TQM indices chosen prove to be highly effective in discriminating, in a completely logical manner, the elements of the domain.

Table 6: Difference between groups

Variables	Lambda de Wilks	F	Signification
Top management commitment	0.273	68.467	0.000
Quality department	0.283	65.001	0.000
Training	0.255	75.071	0.000
Relations with suppliers	0.513	24.405	0.000
Management process	0.307	58.014	0.000
Inspection	0.498	25.920	0.000
Quality information	0.237	82.410	0.000
Employees relations	0.373	43.191	0.000

Table 7: Description of groups

Variables	Low level		Intermediate level		High level		No TQM	
	Mean	Std.dev	Mean	Std.dev	Mean	Std.dev	Mean	Std.dev
Top management commitment	-0.236	0.403	0.383	0.706	0.936	0.410	-1.913	0.632
Quality department	-0.189	0.646	0.302	0.391	0.958	0.404	-1.918	0.697
Training	-0.5695	0.509	0.411	0.449	1.171	0.618	-1.419	0.439
Relation with suppliers	-0.494	0.678	0.210	0.641	1.053	0.648	-0.979	1.126
Management process	-0.254	0.535	0.320	0.616	0.984	0.412	-1.812	0.759
Inspection	-0.559	0.792	0.183	0.578	1.105	0.722	-0.826	0.757
Quality information	-0.533	0.525	0.407	0.438	1.167	0.486	-1.512	0.547
Employees relations	-0.528	0.615	0.160	0.515	1.232	0.691	-1.111	0.719

The development of the empirical model and its results

In order to test the hypotheses formulated above, an unvaried and a multivariate analysis were used to enable the researcher to test the simultaneous effect of the factors. For this purpose, first, an ANOVA test was carried out. Second, a logistic regression was selected, which is distinguished by the fact that the dependent variable is an ordered qualitative categorical variable. The decision to choose this approximation model as opposed to discriminate analysis was based on the greater reliability of this type of model withstanding the violation of the assumption of normality (Maddala, 1983). A further advantage of this model over traditional regression models is that with a single dependent variable (the fact of belonging to one of the four groups resulting from the cluster analysis), we achieve an overall evaluation of the adoption of the groups of TQM practices. In a standard regression model the dependent variables would be the TQM indices themselves. As these indices do not have a normal distribution pattern, therefore, they cannot be recommended for use as dependent variables.

The adopted model is based on the following specifications:

$$Z = \alpha + \beta X,$$

Where Z is function of vector of independent variables that must be estimated by β

The independent variables are the different factors already analysed on an individual basis in the previous section. The model was assessed through the use of the SPSS 9.0. The results obtained are shown in Tables 8 (ANOVA) and 9 (LOGIT).

Discussion of the results

First of all, only three variables are significantly linked to the level of adoption of TQM practices. These are ownership structure, leadership style and quality experience ($F > F_{tabulate} = 2.52$). However, the risk of rejecting H_0 (equality between means of groups) for these variables is equal to zero. Consequently, these three variables have a positive effect on different levels of TQM implementation. Firms with high experience in quality, a participating leadership and making part of a multinational group are more enthusiastic about developing TQM. Nevertheless, H_3 , H_5 and H_6 were accepted. Size, partnership and competition have variable effect on different levels of TQM implementation. Therefore, their mean values tend to go up and down. That's why H_2 , H_4 and H_7 were rejected. Similarly, H_1 and H_8 could not be accepted although the mean values of these factors increased with the degree of TQM implementation.

To validate the results obtained from the ANOVA test, the logistic regression was used. The results are presented in table 9.

The results obtained from the logistic regression confirm the results obtained from the ANOVA test. So, table 9 shows that leadership style, ownership structure and quality experience have a significant and positive effect on different levels of TQM implementation. These results lead us to believe that decisions regarding plans to develop TQM come as a consequence of the internal demands of quality policy followed up by general management in multinationals (Sun, 1999), or of specific participating leadership (Benson, Saraph & Schroder, 1997) rather than from the pressures of competition. As in the study of Sun (2000), the results show that partnership is another factor significantly affecting the level of adoption which leads us to accept H_3 , H_5 , H_6 and H_7 .

However, the level of competition and informal communication fails to record any link with the level of TQM implementation. Our results lead us to reject the hypothesis drawn up in this respect (H_1 and H_2). Also, size has no connexion with the different levels of implementation which confirms the results of Powell (1995), Subba, Ragu-Nathan and Solis (1997). H_4 is therefore rejected.

Surprisingly, formal communication and exports have a negative but not significant effect on the adoption of TQM practices because as we expected, TQM implementation requires open channels of communication and the firms which target international markets are more likely to adopt TQM programs. H_8 can not be accepted either.

Table 8: ANOVA results

	No TQM	Low level	Intermediate level	High level	F	Sig
Size	107.70	241.37	204.86	281.42	0.931	0.430
Partnership	0.50	0.73	0.59	0.84	1.699	0.174
Export	19.8	20	19.17	37.15	2.031	0.117
Ownership	0.000	7.83	7.99	9.05	20.434	0.000
Competition	3.30	-2.05E-02	7.26E-02	-0.21	0.646	0.588
Quality experience	-0.908	-0.468	0.184	1.003	19.700	0.000
Leadership Style	-1.116	-0.341	0.331	0.742	14.472	0.000
Informal Communication	-0.620	3.55E-02	-0.101	0.387	2.450	0.070
Formal Communication	-0.132	-1.984E-02	-0.130	0.252	0.582	0.629

Table 9: Logistic regression Results

	B	Erreur std.	Wald	Signif
Constant	-1.642	1.827	0.808	0.369
Size	-3.05E-04	0.001	0.053	0.818
Ownership	-6.535	0.617	19.199	0.000**
Competition	0.635	0.483	1.727	0.189
Quality experience	-1.414	0.447	10.008	0.002*
Leadership Style	-1.017	0.457	4.959	0.026*
Formal Communication	0.237	0.393	0.365	0.546
Informal Communication	-0.188	0.391	0.232	0.630
Partnership	-1.332	0.696	3.664	0.050*
Exportation	4.93E-03	0.013	0.151	0.698

$\chi^2 = 43.143$ sig = 0.000

Pseudo $R^2 = 0.400$

Percentage of correct classification = 78.2%

* $p < 0.05$, ** $p < 0.01$

Pseudo $R^2 = 1 - L1/L0$, $L0$ = log likelihood if a_i are equal to 0 (exception the constant)

Conclusion

The aim of this paper is to identify the factors relating to implementation of TQM practices in the Tunisian context. The content of this study, therefore, is of a fundamentally exploratory nature. After selecting eight factors that can, a priori, be reasonably expected to have some effect on the implementation of TQM practices, we found that the firms which implemented TQM are characterised by a participating leadership, they have a good experience in quality and partnership relations. In addition, firms belonging to a multinational group will display a more open attitude towards change and innovative organizational practices. This challenges the corporate culture in Tunisian firms characterised by employees' resistance to change. Consequently, these factors may be considered as a prerequisite to or motivations for TQM implementation. These conclusions allow us to determine a profile of the Tunisian firms which implement TQM and to identify some barriers to TQM implementation. In addition, Managers can use the items constituting TQM in this study to assess their companies' position with regard to the use of these TQM practices or as a guideline in implementing them.

One of the limitations of this study is the possibility of the existence of other factors that may influence TQM implementation and which were not included in this study like organizational culture and implementation costs. A further study can take these factors into account. Another limitation is the study's cross-sectional research design. Although the data showed a significant correlation between TQM implementation and some factors, they did not definitely prove that these factors caused an increase in the practices of TQM implementation; the data demonstrated only that an association exist.

In general, this study contributes to the discussion in the literature over whether a universal or a context dependent approach to TQM is needed by drawing on the contingency theory. So far, these discussions have been scant and mainly prescriptive. The use of organizational theory in this context has been especially rare. This empirical study will hopefully lay the ground for more similar studies.

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