

ISO 9000 Adoption in Algeria: An Examination of the Implementation Experiences of Certified Companies

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Abstract

Purpose – *Quality management systems are a very new trend in Algeria. The main objective of this article is to study the implementation of ISO 9000 systems in Algerian organizations and report on their experiences with the goal of improving the implementation process in terms of time and cost for the upcoming companies.*

Methodology – *A questionnaire consisting of 30 questions was developed and tested. It covered the profile of the company, the certification process, the structural changes and training for certification, the reasons for ISO 9000 adoption, the sources of assistance obtained before and during implementation, the satisfaction level with auditing agencies, the benefits obtained from certification, the difficulties encountered during implementation, the lessons learned and future quality management systems plans. The questionnaire was sent to all the 132 certified companies listed in the Ministry of Industry directory. Most of the questionnaires were filled out through a one on one interview with managers. 87 usable questionnaires were returned representing a 66% response rate.*

Findings – *The main findings indicated that the firms benefited from certification and had plans to continue implementing quality management systems beyond ISO 9000; however they reported problems with sources of information and lack of assistance from government agencies before and during the implementation process.*

Moreover, problems with motivating employees and staff and interesting them in quality management systems were encountered, resulting in a strong resistance for change

Originality/Value – *Quality management systems in general and ISO 9000 systems are a new phenomenon in Algeria. To our knowledge, this is the first wide-ranging study of ISO 9000 certified companies in Algeria. The results provide an insight into quality management adoption and practices of Algerian companies, which are trying to learn how to compete in the global market. Furthermore, the study shows that awareness and interest in quality management systems by Algerian managers are growing rapidly.*

Keywords – Quality management systems, ISO 9000, Emerging markets.

Introduction

ISO 9000 certification is by now widespread among organizations in the industrialized world. ISO 9000 standards are fast becoming an unavoidable market requirement around the world (Vloeberghs et al., 1996; Lee and Palmer, 1999; Beatie and Sohal, 1999; Ismail, M.Y. et al., 1999; Djerdjouri et al., 2005). This has led, in the past few years, to a quality awareness of companies in the emerging markets, which resulted in many of these organizations seeking ISO 9000 certification in droves (Gupta, A., 2000; Acharya and Ray, 2000; A. Bestkese and U. Cebeci, 2001). Algeria, a North African country, once a socialist centralized economy, has embarked in the last decade, on a large scale restructuring of its economy. The private sector has flourished and the public sector is adopting new management philosophies and methods. Having realized that quality is not a luxury but a key to competitiveness in the global market, many Algerian companies have sought ISO 9000 certification in a big way since 2000.

In fact of the total 132 certified firms listed in the Ministry of Industry directory, all except two have received their certification in late 2000 or on and after 2001. Little was known about the motives for certification, the implementation processes in practice, the problems encountered during implementation, the impact of certification on the performance of the firms, the profile of the auditing agency used for certification, the benefits of ISO 9000 in Algerian firms, the type of assistance available, and many others issues. It is mainly to answer these questions and to develop a profile of the auditing firms and the implementation process that this study has been undertaken. Many such surveys have been conducted in different parts of the world (Calisir & al., 2001; Ismail and Hashmi ,1999; Gupta, A., 2000; Djerdjouri and Patel, 2000). However, we do not know of any published such wide ranging study done in Algeria, an emerging market economy in full transition. We feel that the consideration of ISO 9000 registered companies will provide us with a very good insight into the quality management practices of Algerian organizations, which intend to compete in the global market. The main objective of this paper is to present the results of such a study conducted in 2005. In the remainder of the paper, the data collection procedure is presented, then, the preliminary findings of the study are also presented, followed by a discussion of the results and few recommendations.

Data Collection

The questionnaire was constructed based on an extensive review of the literature of ISO 9000 implementations. Many of the survey questions were adopted from previous studies. The questionnaire consists of 30 questions that covers the following aspects: - the profile of the company, the certification process, the structural changes and training for certification, the reasons for ISO 9000 adoption, the sources of assistance obtained before and during implementation, the satisfaction level with auditing agencies, the benefits obtained from certification, the difficulties encountered during implementation, the lessons learned and future quality management systems plans. A preliminary test was performed and the suggestions made were taken into account when designing the final version of the questionnaire. A five point Likert scale was used to answer many questions in the survey (1 being the lowest score (Least important) and 5 the highest score (extremely important)).

Then a directory of all the certified companies was obtained from the Ministry of Industry. As of October 2005, the end of the data collection phase of this study, the directory contained a list of 132 companies that had obtained ISO 9000 certification. All the companies were contacted and told about the objectives of the survey and then they were invited to participate in it. A group of students¹ from the Institut National de Commerce (INC) were selected to administer the survey. Prof. Boukhatem and Prof. Mesbah held a workshop where they told the students about the objectives of the study and familiarized them with the questionnaire. Then, the students conducted mock interviews. Each team of two to three students was assigned a group of companies. Over a period of two weeks in April 2005, the students visited the companies to interview the manager or the designated person. In fact, a large number of questionnaires were filled through personal interviews with the quality manager of the organization, while few others decided to take the questionnaire, fill it out themselves and then return it to us by mail or fax. Out of the 132 questionnaires, eighty-seven usable questionnaires were received, which represents a of 66% response rate.

Survey Results

The collected data were analyzed using the SPSS statistical package. In this section the main findings of the study are presented. This includes descriptive statistics as well as results based on means and standard deviations of responses together with t-tests and independent t-tests to compare means. The fact that the response rate was high (66%), the results will present a good insight about the experiences of the certified companies as a whole in their quest for ISO 9000 certification.

Companies' profile

Out of the total number of respondents, 80% were manufacturing organizations, while 20% were service providers (Table 1). About 14% employed less than 100 persons, 44% had between 100 and 500 employees and 42 % employed more than 500 people (Figure 1)

¹ The authors would like to thank the group of EHEC students who helped administer the survey

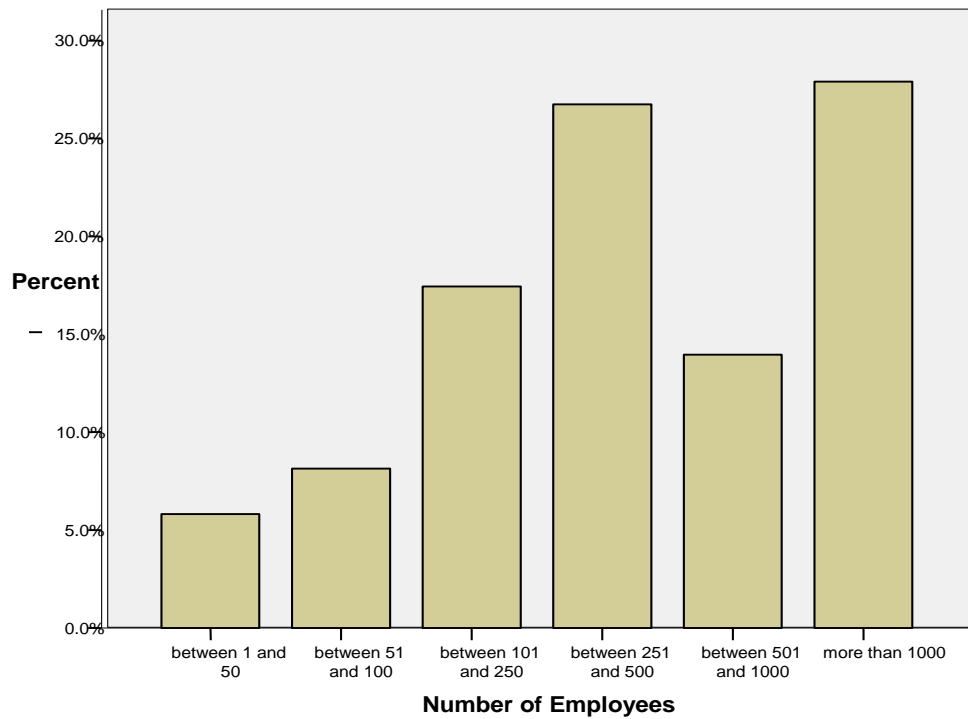


Figure 1. Size of the firms (# of employees)

Only 77 out of the 87 respondents (88.5%) reported on their revenues for year 2004. Among these firms, 6.5% had revenues less than 50 million dinars, 14.3% between 50 and 250 million dinars. Moreover, 16.9% reported revenues between 250 and 500 million dinars and 62.3% had revenues higher than 500 million dinars (Figure 2).

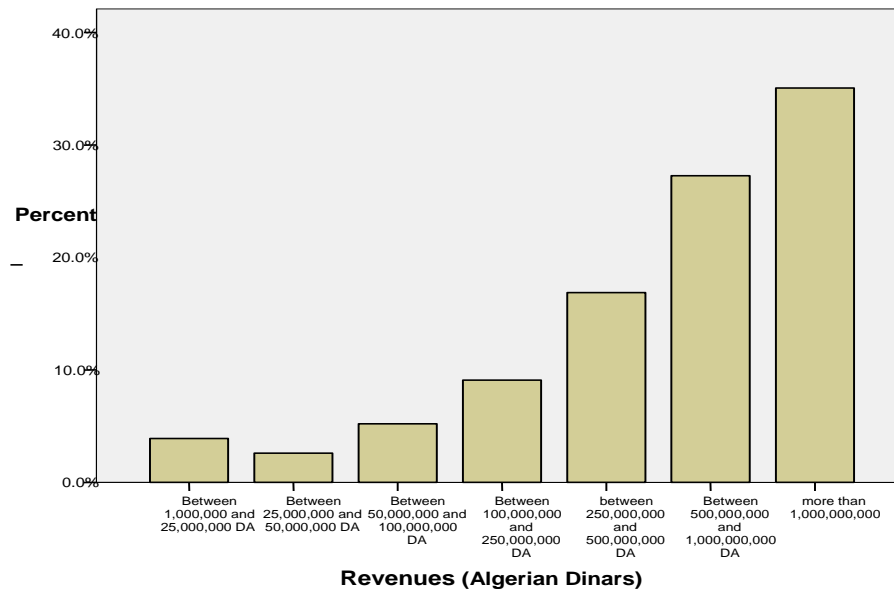


Figure 2. Size of revenues

100% of the certified firms operate in the local market. Out of these, about 14% export to the Maghreb (Morocco, Tunisia, Mauritania and Libya); 8% export their products to African countries; 10.3% export to the European Union; 8% export to the rest of Europe and only 4.6% export their products to other countries such as Mexico and Canada, other Arab countries and countries in Asia.

MARKET	Frequency	Percent
Local Market	87	100%
Maghreb	12	13.8 %
Africa	7	8%
European Union	9	10.3%
Rest of Europe	7	8%
Others	4	4.6%

Table 1. Market

Certification process

As a result of deciding to implement ISO 9000 certification, 65.5 % hired a consultant to help them with the process, while 34.5% did not. Also, only 24.1 % hired additional personnel. Most of those hired 1 to 5 people, depending on the size of the firm, mainly to staff the newly created quality department.

	Frequency	Percent
No	30	34.5
Yes	57	65.5
Total	87	100.0

Table 2. Hiring a consultant for ISO 9000 implementation

Time and cost of certification

Total time taken for certification varied from one year to as high as three years. Around 21.8 % of the firms obtained their certification within one year, 19.5% between one and one and a half years, and the majority (36.8%) took between 1.5 to 2 years to get certified. About 13.8% took 2.5 to 3 years and about 7% took more than 2.5 years. It took on average 20 months to complete the ISO 9000 certification process.

	Frequency	Percent
Less than 1 year	1	1.1
1 year	19	21.8
1 to 1.5 years	17	19.5
1.5 to 2 years	32	36.8
2 to 2.5 years	12	13.8
2.5 to 3 years	5	5.7
more than 3 years	1	1.1
Total	87	100.0

Table 3. Time taken for Certification

There was a great variation in the estimated cost of certification. It varied between about 3,000,000 DA to 6000000 DA, with a mean cost of 4700000 DA. 50% of the firms had a certification cost lower than 3100000 DA. The high variation is mainly due to the two main factors, the length of time for certification and the auditing agency used. Obviously the cost was lower if a local auditing agency was used and the time for certification was short (within a year).

Cost of Certification	Mean	4686270.58
N = 60	95% Confidence Interval for Mean	3179945.42
	Lower Bound	6192595.75
	Upper Bound	3873633.98
	5% Trimmed Mean	3128000.00
	Median	5831070.215
	Std. Deviation	0
	Minimum	4000000
	Maximum	4000000
	Range	4500000
	Interquartile Range	4.126
	Skewness	22.768

Table 4. Cost of certification

Auditing agencies

58.5 % of the firms used a French auditing agency. The most popular agency seems to be AFAC-ASCERT international with 28.7 %, closely followed by SGS – ICS with 21.8 % of the audits.

Next, Belgian agencies with 16% of the audits done in Algeria, with almost all of these done by one agency, namely AIB- VINCOTTE. Canadian agencies were equally used with about 16% of the audits done, and QMI was the agency with the biggest share (12.6%). Only 4.4 % of the auditing agencies were located in Algeria. The other agencies used are located in Lebanon (1) and Switzerland (1) (Table 5).

Auditing Agency	Country	Frequency	Percent
AFAQ - ASCERT International,	France	25	28.7
AIB - VINCOTTE International	Belgium	13	14.9
SGS	Belgium	1	1.1
QMI	Canada	11	12.6
SGS - ICS	France	19	21.8
MOODY	France	4	4.6
DET NORSKE VERITAS (DNV)	France	3	3.4
SGS - Geneve	Switzerland	1	1.1
SGS - Alger	Algeria	1	1.1
SGS – QUALITEST	Algeria	1	1.1
Deloitte and Touche	Canada	1	1.1
GENI	Canada	1	1.1
ITS	Canada	1	1.1
QMI	Lebanon	1	1.1
AFAQ – Alger	Algeria	1	1.1
QMC –Tizi Ouzou	Algeria	1	1.1
QMC – Alger	Algeria	1	1.1
CMM/PTL – Oran	Algeria	1	1.1

Table 5. Auditing Agencies

Around 77% of the companies reported that they selected their auditing agency because it had a good reputation, 26.4 % chose the agency because it was recommended to them and 42.5% made the selection based on the costs which, they felt were reasonable.

	Frequency	Percent
Good reputation	67	77
Recommendation	23	26.4
Reasonable Costs	37	42.5
The only choice	6	6.9
Other	4	4.6

Table 6. Reasons for selecting the auditing agency

When it came to the company's satisfaction with the auditing agency, 46% of the firms reported that they were very satisfied with the agency's auditing process and results, and 54% indicated that they were merely satisfied with the work done by the selected auditing agency.

	Frequency	Percent
Very satisfied	40	46.0
Satisfied	47	54.0
Total	87	100.0

Table 7. Satisfaction level with the auditing agency

Out of the 87 surveyed firms, 86 (or 98.9%) received their certification after the first audit; only one company failed the first audit and received the certification after the second audit. Unfortunately, even though the questionnaire asks for a reason, the firm declined to respond to this question. This may explain in part the long implementation times, where companies decided to take a longer time to prepare before the final audit.

	Frequency	Percent
No	1	1.1
Yes	86	98.9
Total	87	100.0

Table 8. Number of certifications obtained after the first audit

As a result of certification, 57.5 of the companies reported that they changed the structure of the firm. The majority of them added a quality management department, while some closed departments and few others merged them.

	Frequency	Percent
-No structural Change	36	41.4
-Establish New departments	12	13.8
-Merge Existing Department	1	1.1
-Establish a new Quality Department	40	46
-Closed existing departments	2	2.3

Table 9. Type of structural change

Training

All the surveyed companies reported that they conducted training sessions before the implementation of ISO 9000. However as indicated in the table below, top managers were the ones targeted by the training with an average training time of 2.5 months. Middle managers had one month of training on average and low level managers an average of 1.5 months. It is worth to note that the sessions were not offered continuously; rather the training consisted of many workshops of 1 to 2 days, lasting over the implementation period. The bad news is that only few companies reported having trained employees, except for few, which conducted one short 1 to 2 hours awareness session.

	N	Minimum	Maximum	Mean	Std. Deviation
Top managers	79	.1	30.0	2.581	5.5469
Middle managers	79	.0	12.0	1.109	2.6897
Low level managers	79	.0	24.0	1.457	3.6696

Table 10. Training time for each management level (in months)

Reasons for ISO 9000 certification

Table 11 shows the mean and standard deviation values associated with the reasons for seeking ISO 900 certification in descending order of their means. The mean values ranged from 1 to 4.65. Satisfying the customer needs, improving performance, installing a formal quality management system and, increasing market shares had an average score higher than 4 (out of a maximum of 5). This indicates that those were the main reasons for these firms to seek ISO certification. This result is in line with results obtained in other surveys reported in the literature. There were other less important reasons. The main reasons cited together with their importance score (Mean) are presented in the table below.

Reasons	N	Minimum	Maximum	Mean	Std. Deviation
Satisfy customers' needs	87	1	5	4.61	.881
Improve performance	87	1	5	4.45	.899
Install a quality management system in the firm to insure the quality of products and services	87	1	5	4.36	1.131
Increase market shares	87	1	5	4.05	1.077
Improve work environment	87	1	5	3.60	1.271
Competitors have it	87	1	5	3.52	1.493
Remain operational in the activity	87	1	5	3.31	1.441
Improve relationships with suppliers	87	1	5	3.16	1.354
To be able to export	87	1	5	2.80	1.477
Personal initiative	87	1	5	2.63	1.533
Other	87	0	5	1.00	1.817
Valid N (listwise)	87				

Table 11. Reasons for deciding to adopt ISO 9000 certification (One-Sample Statistics)

A *t*-test was performed to find out which reasons for seeking ISO 9000 certification are statistically more important for the firms. A mean score of 3 (the center of the Likert scale) was used as a cut off point. The results in table 12 below show that the first five reasons (as listed in table 11 above) are significantly important at a 95% level confidence, whereas “improving relationships suppliers”, “being able to export”, “and personal initiative” are not the main significant reasons why the firms sought ISO 9000 certification. This clearly indicates, looking at the seven significant reasons that the Algerian managers are primarily looking inwards and want to use the ISO certification to first improve their internal processes and procedures. The non significant reasons “Improve relationships with suppliers” and “To be able to export” deal with external entities and they seem to be put on the back burner for now.

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval	
					Lower	Upper
Install a quality management system in the firm to insure the quality of products and services	11.188	86	.000	1.356	1.12	1.60
Remain operational in the activity	2.009	86	.048	.310	.00	.62
Personal initiative	-2.237	86	.280	-.368	-.69	-.04
Satisfy customers' needs	17.042	86	.000	1.609	1.42	1.80
Improve performance	15.025	86	.000	1.448	1.26	1.64
Improve relationships with suppliers	1.108	86	.271	.161	-.13	.45
Competitors have it	3.231	86	.002	.517	.20	.84
Increase market shares	9.056	86	.000	1.046	.82	1.28
To be able to export	-1.234	86	.221	-.195	-.51	.12
Improve work environment	4.386	86	.000	.598	.33	.87
Other	-10.265	86	.000	-2.000	-2.39	-1.61

Table 12. t-Test results

Sources of information and assistance

To gather information and learn about ISO 9000 standards and certification procedures before the implementation process, most firms (61%) searched and obtained the information themselves and 47% of the firms were provided the information by a local consultant, although some of the firms used both sources of information jointly. About 30% of the firms relied on a foreign consultant and 25% depended on government agencies (mainly the ministry of industry) to provide them with the needed information. However, some firms used a combination of these sources.

Source	Frequency	Percent
Personal	53	60.9
Government	22	25.3
Local Consultant	41	47.1
Foreign Consultant	26	29.9

Table 13. Primary information sources about ISO 9000 before implementation

For assistance during the implementation process, firms relied equally on themselves (57.5%) and on local consultants (56.3%). While 32.2 % obtained assistance from foreign consultants and only 13.6 % from government agencies.

	Frequency	Percent
Personal	50	57.5
Governmental	12	13.6
Local Consultant	49	56.3
Foreign Consultant	28	32.2

Table 14 Primary sources of assistance during implementation

Table 15 shows the mean and standard deviation values of the perceived level of achievement of ISO 9000 benefits by the firms.

Eighty-three out of eighty seven respondents indicated that their firms benefited from adopting ISO 9000 procedures and standards. The four other firms pointed out that they needed more time to assess the benefits of ISO 9000. The main benefits, in descending order of the mean value, are reported in table 15 below. Among these benefits, “improving overall efficiency” had the highest mean value while “reducing the number of employees” (and “others”) had the lowest score.

	N	Minimum	Maximum	Mean	Std. Deviation
Improving efficiency	83	1	5	3.51	1.097
Improving communication with staff	83	1	5	3.48	1.052
Using modern management techniques	83	1	5	3.46	1.192
Reducing defects in products	83	1	5	3.35	1.087
Increasing market share with existing customers	83	1	5	3.25	1.360
Reducing waste and recalls	83	1	5	3.22	1.048
Improving relationships with suppliers	83	1	5	3.20	1.276
Reducing the number of complaints from customers	83	1	5	3.18	1.507
Reducing conflicts in the firm	83	1	22	2.99	2.559
Increasing Motivation	83	1	5	2.96	1.098
Attract new customers	83	1	5	2.98	1.440
Reducing costs	83	1	5	2.84	1.357
Reducing the number of employees	83	1	5	1.83	1.091
Other	83	0	5	.78	1.675

Table 15. Benefits of ISO 9000 certification

A t-test was performed to check the statistical significance of the results obtained. As done earlier a test value of 3 (cut off point) is used. As indicated in table 16 below, “Using modern management techniques”, “Reducing defects in products”, “Improving efficiency”, “Improving communication with staff”, and “Improving communication with staff” all had a mean score significantly higher than 3 at a 95% confidence level, which means that the firms feel that believe these benefits are concretely achieved. Moreover “Reducing the number of employees” had a score significantly lower than 3 at a 95% confidence level, which means that ISO 9000 certification has not resulted in huge layoffs as was probably expected by employees and managers alike. However, the results show that “Increasing Motivation”, “Reducing waste and recalls”, “Increasing market share with existing customers”, “Attract new customers”, “Reducing the number of complaints from customers”, “Improving relationships with suppliers”, “Reducing conflicts in the firm” and “Reducing costs” are not significant. This indicates that the managers of the firms have not achieved all the expected benefits from ISO 9000 certification. This can be explained in part by the fact that, as mentioned in the introduction, the certification was obtained very recently (1 or 2 years for most firms), which indicates that not enough time has passed for the firms to successfully achieve most of the expected improvements yet.

	Test Value = 3					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval	
					Lower	Upper
Increasing Motivation	-.300	82	.765	-.036	-.28	.20
Using modern management techniques	3.498	82	.001	.458	.20	.72
Reducing defects in products	2.929	82	.004	.349	.11	.59
Reducing waste and recalls	1.885	82	.063	.217	-.01	.45
Improving efficiency	4.201	82	.000	.506	.27	.75
Increasing market share with existing customers	1.695	82	.094	.253	-.04	.55
Attract new customers	-.152	82	.879	-.024	-.34	.29
Reducing the number of complaints from customers	1.092	82	.278	.181	-.15	.51
Improving relationships with suppliers	1.462	82	.147	.205	-.07	.48
Improving communication with staff	4.174	82	.000	.482	.25	.71
Reducing conflicts in the firm	-.043	82	.966	-.012	-.57	.55
Reducing the number of employees	-9.757	82	.000	-1.169	-1.41	-.93
Reducing costs	-1.052	82	.296	-.157	-.45	.14
Other	-12.057	82	.000	-2.217	-2.58	-1.85

Table 16. t-Test results

Difficulties encountered during implementation

The majority of the firms (87.4%) reported that they have encountered difficulties and obstacles during the implementation process, while 11.5% of the companies surveyed claim that the implementation went smoothly and that they did not encounter any difficulties. The main problems they faced during implementation are employees and staff resistance to change (mean = 2.91), changing traditions and culture of the firm (mean = 2.80), lack of knowledge about ISO 9000 in general (mean = 2.69), motivating personnel (mean = 2.52), preparation of documents and forms (mean = 2.47) and explaining ISO 9000 objectives (mean = 2.22). The rest of the lower rated problems (nonetheless important problems to address before implementation) are found in the table below.

	N	Minimum	Maximum	Mean	Std. Deviation
Resistance to change	85	0	5	2.91	1.586
Changing traditions and culture of the firm	85	0	5	2.80	1.502
Lack of knowledge about ISO 9000	86	0	5	2.69	1.566
Motivating Personnel	85	0	5	2.52	1.517
Preparation of Documents and forms	85	0	5	2.47	1.493
Explaining ISO 9000 objectives	85	0	5	2.22	1.276
Long implementation process	86	0	5	2.12	1.350
Low interest in quality	86	0	5	2.07	1.225
Identifying and describing processes	85	0	5	1.95	1.272
Training of top and middle managers	85	0	5	1.87	1.252
High implementation costs	86	0	5	1.81	1.288
Other	85	0	3	.04	.325

Table 17. Problems encountered during implementation

A *t*-test was performed and the results show that all items except "Resistance to change" and "Lack of knowledge about ISO 9000", had scores significantly lower than the cut off point of 3 (the center of the Likert scale from 1 to 5) at a confidence level of 95%. This clearly indicates that the firms did not find that these difficulties were that important or very difficult to overcome. However, they mentioned that they found their lack of knowledge about ISO 9000 and the resistance to change from employees constituted somewhat serious problems encountered during the implementation process.

	Test Value = 3					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval	
					Lower	Upper
Motivating Personnel	-2.932	84	.004	-.482	-.81	-.16
Resistance to change	-.547	84	.586	-.094	-.44	.25
Preparation of Documents and forms	-3.270	84	.002	-.529	-.85	-.21
Changing traditions and culture of the firm	-1.227	84	.223	-.200	-.52	.12
Identifying and describing processes	-7.592	84	.000	-1.047	-1.32	-.77
Training of top and middle managers	-8.320	84	.000	-1.129	-1.40	-.86
Explaining ISO 9000 objectives	-5.611	84	.000	-.776	-1.05	-.50
Lack of knowledge about ISO 9000	-1.859	85	.067	-.314	-.65	.02
Low interest in quality	-6.503	85	.000	-.930	-1.21	-.65
Long implementation process	-6.072	85	.000	-.884	-1.17	-.59
High implementation costs	-8.539	85	.000	-1.186	-1.46	-.91
Other	-84.000	84	.000	-2.965	-3.03	-2.89

Table 18. t-Test results

Future plans after certification

An overwhelming majority of the firms (97.7 %) pointed out that they will continue with the quality journey started with ISO 9000. The table below presents the mean scores and standard deviations associated with the different future quality plans. "Continuous improvement" had a mean score of 4.36 out of a maximum of 5.

This clearly indicates that the Algerian managers are keen to establishing a “continuous improvement” culture in their companies. It is also indicated that most of them seriously think about moving on, in the quest for quality, to the next level of excellence and implement TQM in their firms. This is a good sign that shows a high level of awareness about the importance of quality management systems in organizations. All the items in descending order of their mean scores are shown in the following table:

Future Plans	N	Minimum	Maximum	Mean	Std. Dev.
Maintaining ISO 9000 certification only	86	1	5	2.97	1.669
Obtain ISO14000 certification	86	1	5	2.88	1.537
Continuous improvement	86	1	5	4.36	.893
Establishing and using quality circles	86	1	5	2.67	1.410
Using statistical quality control tools	86	1	5	2.99	1.530
Implement TQM	86	1	5	3.29	1.548
Other	86	0	5	.65	1.600

Table 19. Future Plans with quality management systems

The *t*-test results in table 20 below show that the importance levels of “Continuous improvement” and establishing and using quality circles” were statistically significant at a confidence level of 95%. This confirms the importance of these future quality plans for the managers. Concerning the other items, even though they were not significant, their score are nonetheless very close to 3, the cut off point, which indicates that managers of the firms are interested in implementing these other programs in the future but their priority would be to start with continuous improvement and establishing quality circles in their companies.

	Test Value = 3					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval	
					Lower	Upper
Maintaining ISO 9000 certification only	-.194	85	.847	-.035	-.39	.32
Obtain ISO14000 certification	-.702	85	.485	-.116	-.45	.21
Continuous improvement	14.124	85	.000	1.360	1.17	1.55
Establishing and using quality circles	-2.142	85	.035	-.326	-.63	-.02
Using statistical quality control tools	-.070	85	.944	-.012	-.34	.32
Implement TQM	1.741	85	.085	.291	-.04	.62
Other	-13.616	85	.000	-2.349	-2.69	-2.01

Table 20. t-Test results

Lessons learned from the implementation

When asked if they would change anything in their implementation process if they had to be certified again, 27.9% of the respondents said that they would not, however 72.1% of the firms indicated that there are things they would have done differently. Table 21 below shows the main items in descending order of their mean value. The higher the mean the more emphasis the firm said it would put on if they had to do the implementation all over again. As indicated by the responses, firms said that, first and foremost, they would put more emphasis on training (mean = 3.08). Moreover, they find it to be also important to have more teamwork (mean = 2.87), to have a better involvement of staff from top to bottom (mean = 2.73) and to have more sharing of information (mean = 2.70). Finally, firms believe that they should have a better managerial process for the implementation (mean = 2.47) and a more appropriate documentation of the procedures (mean = 2.10).

	N	Minimum	Maximum	Mean	Std. Dev.
Putting more emphasis on training	86	0	5	3.08	2.116
Having more team work	86	0	5	2.87	2.074
Having a better involvement of staff from top to bottom	86	0	5	2.73	2.106
Having more sharing of information flow	86	0	5	2.70	2.075
Having a better Managerial process	86	0	5	2.47	2.016
Having the appropriate documentation of the procedures	86	0	5	2.10	1.776
Other	86	0	5	.21	.959
Valid N (listwise)	86				

Table 21. Lessons learned from implementation

A *t*-test was performed to statistically compare the mean value scores to the cut off value of 3. Results in table 22 below show that “having the appropriate documentation” and “other” had mean scores significantly lower than the cut off point of 3. Whereas for the other items, though they were not significant, their mean score was above 2.5 and close to the cut off point of 3. This indicates that the firms in general believe that training, team and communication are essential to a good implementation process.

	Test Value = 3					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval	
					Lower	Upper
Putting more emphasis on training	.357	85	.722	.081	-.37	.53
Having the appropriate documentation of the procedures	-4.676	85	.000	-.895	-1.28	-.51
Having a better involvement of staff from top to bottom	-1.178	85	.242	-.267	-.72	.18
Having a better Managerial process	-2.461	85	.016	-.535	-.97	-.10
Having more team work	-.572	85	.569	-.128	-.57	.32
Having more sharing of information flow	-1.351	85	.180	-.302	-.75	.14
Other	-26.976	85	.000	-2.791	-3.00	-2.59

Table 22. t-Test results

Discussion and Conclusion

To our knowledge, this is the first wide-ranging study of ISO 9000 certified companies in Algeria. The results confirmed that there is awareness in the country about the importance of quality management systems. And looking at the future plans of the surveyed firms, the majority of them tend to not only maintain ISO 9000 certification but to go beyond it by implementing continuous improvement programs, establishing quality circles, using statistical quality control tools and even implementing TQM in the firm. Also, the results are not different from what other studies in other places have found when it comes to reasons why firms decided to seek ISO 9000 certification, namely to increase market share and because the customer wants it or that the competitors had it. Although these are important reasons, they should not be the driving force behind seeking the adoption of quality management systems. The motivating force should be to improve the quality of products and services offered by the company and to improve work environment for its employees, and what are actually cited as main reasons by companies will be natural outcomes if quality of products and services is really improved. The other main finding is that the certification time is somewhat long, with an average of almost two years. We believe that one of the reasons for this is the limited time reserved for training of staff and employees and the overall lack of preparation and knowledge about the ISO 9000 certification process before implementation. Training was limited to upper level management, and in most cases it consisted of familiarization workshops about ISO certification process. Most companies did not report having trained employees.

And this explains in part the main problems of resistance to change and motivating personnel and the lack of interest in the quality system. All the firms reported improvement and concrete benefits they feel they have achieved as a result of ISO 9000 certification. The main ones cited by firms are the improvement in efficiency and of communication within the firm, the reduction of defects, waste and customer complaints and the improvement of relationships with suppliers. Finally, another important finding of the study concerns assistance provided to firms by the government. The companies reported that just 25% used the government agencies as a source of information about ISO 9000 before implementation and only 12.5 % received any assistance during the implementation process. The Ministry of Industry has a mandate from the Government to spearhead the drive for the adoption of quality management systems by Algerian firms. The results indicate that it could do a better job of spreading “the news”. We recommend that the ministry develops awareness campaigns and documentation (including brochures and even a Web page) providing clear information about ISO 9000 procedures and standards and a clear (step by step) brochure that describes in detail the implementation process, and most importantly to use the findings of a study like ours to develop a list of “To Do” and “Not to DO” things before and during implementation. Workshops using this documentation should also be organized.

We believe that this will be extremely valuable to all the firms who will seek ISO 9000 certification in the future in that they will avoid most mistakes made by the firms, which obtained the certification before them. And as a result this will greatly improve the implementation process including time and cost of certification.

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