



An investigation of ISO 9000 adoption in Saudi Arabia

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Abstract

Purpose – The purpose of this paper is to evaluate the results from a survey on ISO 9000 certified manufacturing companies in Saudi Arabia.

Design/methodology/approach – An empirical survey of 175 certified manufacturing firms in Saudi Arabia. This study is focused on the benefits achieved from ISO 9000 implementation, level of satisfaction with the standard, the anticipated steps after ISO 9000 implementation, factors influencing the choice of registration agencies and the associated problems with registration agencies.

Findings – Certified firms in Saudi Arabia have performed well in their registration process and have benefited from ISO implementation. This could be due to the high level of interest in the area of quality, as most customers request quality or a certificate to prove existence of quality products/services.

Research limitations/implications – For effective implementation of the standard in other organizations, the study recommended that organizations should plan carefully, measuring internal as well as external aspects and performing cost-effective analysis of the implementation process. Also they should use gap analysis to assess their actual abilities against ISO requirements. When this study was performed, the number of certified organizations was still small, constraining more in depth research in this area.

Originality/value – Adds to the body of knowledge concerning the ISO 9000 with particular interest on Saudi Arabia.

Keywords Saudi Arabia, ISO 9000 series, Manufacturing industries

Paper type Research paper

Introduction

Internationalization has radically changed the competitive landscape and process flows of business across the world. In order to maintain competitive advantage among organizations, it has been identified that there are many factors involved in achieving a competitive advantage. It has been suggested that the delivery of quality products and services is an important dimension of competition and management of quality that could provide the means for gaining and sustaining competitive advantage (Tripathi, 2005; Sun, 2000; Krasachol and Guh, 2001; Farquhar, 1991). Moreover, organizations have discovered that the key to competitive success lies in emphasizing product and service quality as a strategic weapon in conducting business (Hansen, 2001; Ho, 2002; Lai *et al.*, 2002; Tripathi, 2005; Wiele *et al.*, 2005). Therefore, Chow-Chua *et al.* (2003) suggested the need for shrewder investment in infrastructure and process standardization for business success in achieving competitive advantage. In this regard, the International Organization of Standardization (ISO), a global federation of 130 national standard bodies, seeks to promote standardization and the development of related activities worldwide in order to help organizations in the international exchange of goods and services through the introduction of the ISO 9000 series of standards. The ISO 9000 series of standards has formalized systems for evaluating the ability of any firm to



consistently design, produce, and deliver quality products/services (Fuentes *et al.*, 2000; Curkovic and Pagell, 1999).

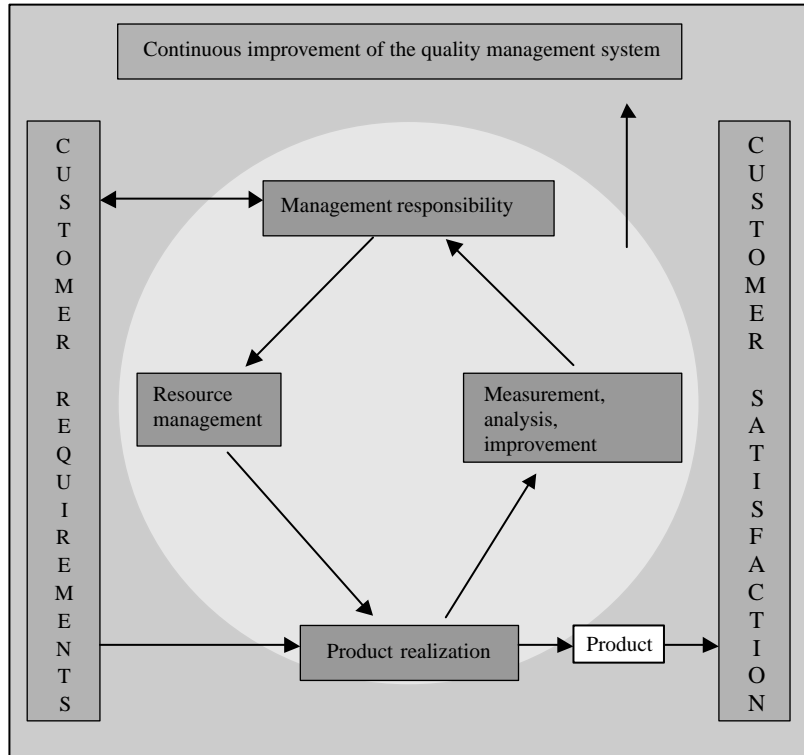
The ISO introduced the ISO 9000 series of standards in 1987 which attempted to provide evidence of quality through an internationally acceptable framework (Najmi and Kehoe, 2001; Abraham *et al.*, 2000). It is widely accepted as a minimum standard for a quality system for organizations across the globe (Tsim *et al.*, 2001; Sun, 2000). The ISO 9000 standards are based on the concept that certain minimum characteristics of a quality management system could be usefully standardized, giving mutual benefit to suppliers and customers, and focusing on process rather than product/service quality (Casadesus and Karapetrovic, 2005; Dick *et al.*, 2002). ISO 9000 is a management control procedure (Stein and Hitchcock, 1997), which involves business in documenting the processes of design, production and distribution to ensure that the quality of products and services meets the needs of customers (Withers and Ebrahimpour, 2001). The ISO 9000 series is actually made up of five separate standards: ISO 9001, 9002, and 9003 are conformance standards for quality assurance systems and relate to supplier-customer relationships. ISO 9000 and 9004 are guidelines and relate to the development of quality systems within the company (Buttle, 1996). However, ISO 9000 standards were simplified in December 2000 (Table I).

The introduction of the new revised standard (ISO 9000, 2000) encourages the adoption of the “process approach” for the management of the organization and its processes, and as a means of identifying and managing opportunities for improvement. Figure 1 shows the model of the process-based quality management system approach recommended by ISO 9001 (2000). The utilization-of-process approach emphasizes the importance of understanding and fulfillment of requirements, the need to consider processes in terms of added values, obtaining results of processes and continual improvement of process based on objective measures (Wiele *et al.*, 2005; Tan *et al.*, 2003). Moreover, the generic requirements of the new revised standard are depicted as linked processes (Janas and Luczak, 2002).

Standard	Focus
<i>Original standard (ISO 9000)</i>	
ISO 9000	Quality management and assurance standards for selection and use
ISO 9001	Quality systems model for quality assurance in organizations whose processes include design, development, production, installation and servicing
ISO 9002	Quality systems model for quality assurance in organizations whose processes include production and installation, but not design and development
ISO 9003	Quality systems model for quality assurance in organizations whose processes use final inspection and testing to meet product and service quality requirements
ISO 9004	Quality management and quality system element guidelines
<i>Revised standards (ISO 9000, 2000)</i>	
ISO 9000 (2000)	Quality management system fundamentals and vocabulary-defines terminology and standards
ISO 9001 (2000)	Quality management systems requirements-used to assess compliance with requirements (consolidates the former ISO 9001/9002/9003 into a single document)
ISO 9004: 2000	Quality management systems guidelines for performance improvement-offers guidance for continual management system improvement

Source: Stevenson and Barnes (2002, p. 969)

Table I.
The ISO 9000 1994/2000
series



Source: Biazzo and Bernardi (2003, p. 156)

Figure 1.
ISO 9001 (2000) model of a
process-based quality
management system

To illustrate the process approach, Biazzo and Bernardi (2003, p. 156) explained the four key elements as follow:

- (1) The management responsibility element comprises the requirements for developing and improving the quality, system, listening to customers, formulating quality policy and planning, and defining responsibilities, authorities and communication processes to facilitate effective quality management.
- (2) The resource management element comprises the requirements for managing both human and infrastructural resources in order to implement and improve the quality management system and to address customer satisfaction.
- (3) The product realization element includes the specific requirements for the product realization processes, which involve identifying customer requirements, reviewing product requirements, communicating with customers, designing and developing products, purchasing, producing (and/or delivering) services, and controlling measurement and monitoring devices.
- (4) The measurement, analysis and improvement element features the requirement for monitoring information on customer satisfaction, measuring and monitoring products and processes, and managing internal audits, non-conformity detection and improvement actions.

The new revised standard uses the Plan-Do-Check-Act (PDCA) improvement circle to enclose the four blocks of management responsibilities, resource management, process management, measurement, analysis and improvement (Ho, 2002).

The objective of ISO is to provide an effective quality system reflecting a company's practice for producing goods and services that conform to requirements (Wiele *et al.*, 2005; Quazi *et al.*, 2002). As Abraham *et al.* (2000, p. 182) have stated the objective of ISO is to promote the development of standardization and related activities in the world with a view to facilitating the international exchange of goods and services, and developing co-operation in the spheres of intellectual, scientific, technological and economic activity. ISO 9000 standards are generic in the way that they can be applied to all functions and all industries in different areas of human endeavor. They have been described as the one size fits all standards (Awan and Bhatti, 2003). ISO 9000 has been used more and more throughout Europe, the USA and worldwide. For example, in 1999 there were 271,966 certified organizations in the world (Poksinska *et al.*, 2002; ISO, 1999), and those numbers are continuing to grow. The widespread dissemination of ISO is due to the extension of the ISO certification to include a wide variety of sectors, products and services, and the intensive promotion of the certification carried out by some companies as if it were a product or service quality label (Heras *et al.*, 2001).

ISO certification is expected to help organizations to enhance quality and efficiency, improve communications, achieve competitive advantage, gain an increase in market share, reduce costs and achieve a higher stock price (Casadesus and Karapetrovic, 2005; Pheng, 2001; McAdam and Fulton, 2002; Laszlo, 2000; Tsim *et al.*, 2002; Zhang, 2000; Docking and Downen, 1999). ISO certification is seen as a way for organizations to achieve competitiveness in the market place (Rao *et al.*, 1997), continuous improvement, profit improvement, marketing benefits and better-run organizations (Beattie and Sohal, 1999; Aarts and Vos, 2001). Withers and Ebrahimpour (2001) and Heras *et al.* (2001) concluded that the increase in perceived quality as a result of ISO 9000 implementation should result in new customers, increased sales and reduced operating costs. However, the implementation and the impact of ISO standards can vary from organization to organization and from country to country. This is supported through the fact that ISO has been viewed in different ways: as a means to improve organizational quality (Singels *et al.*, 2001); as a way to achieve competitive advantage (Casadesus *et al.*, 2000); as a way to increase sales through a better quality image (Leung *et al.*, 1999); as a step forward towards customer satisfaction (Gano, 2001; Conti, 1999); as a way for organizations to enter the knowledge age of this century (Tsim *et al.*, 2002); and by fulfilling customers' requirements, and as a necessary response to competitive pressure (Lee, 1998; Lee and Palmer, 1999; Lee *et al.*, 1999a, b).

Research problem: ISO 9000 certification and Saudi Arabia

The literature review above offers many diverse opinions on ISO 9000 in different countries but little empirical research has been undertaken in developing countries (Magd and Curry, 2003). The developing nations have been striving to implement ISO 9000 in increasing numbers to access international markets. However, there is still a need for a credible infrastructure in such countries for ISO 9000 certification (Lai, 1996), and Saudi Arabia is no exception. Presently, there are 280 certified firms in Saudi Arabia which represented almost 9 percent of the total firms in the manufacturing industry (Ministry of Industry and Electricity, 1999). Saudi Arabia ranked in third place in the level of organizational certification after the United Arab Emirates and

Egypt. This percentage is generally small and this is because ISO is not mandatory and not many firms in Saudi Arabia are involved in international marketing. In addition, Saudi firms reflect the industrial and technological environment in the country, which is not as developed as in the western countries.

Saudi Arabia experienced a rapid growth in ISO 9000 certification in the late 1990s as was the case in many other countries. Although the experiences of ISO 9000 implementation in different countries have been explored, little empirical research has been carried out in Saudi Arabia concerning ISO 9000 implementation issues. Therefore, this study is timely and is focused on the benefits achieved from ISO 9000 implementation, factors influencing the choice of the registration agency, and the associated problems with registration agencies in Saudi Arabia.

Research methodology and data collection

A postal survey questionnaire was mailed to all certified manufacturing organizations in Saudi Arabia. This method was utilized due to the advantage that the designed questionnaire could be sent to a large number of participants in a limited time. The research population consisted of the quality managers/directors/owners of all ISO 9000 certified manufacturing firms in Saudi Arabia. The total sample consisted of 175 manufacturing firms. A covering letter was included in the mailing, explaining the purpose of the study, along with the questionnaire and a stamped reply-paid envelop.

The survey questionnaire was developed through an extensive review of the literature in the area of ISO 9000 and total quality management (TQM) (Gill and Johnson, 1997). A substantial amount of care was taken in designing the questionnaire in order to achieve the required objectives and eliminate any bias. The questionnaire was long enough to cover the essential elements of the study but not too long so as to be overly time consuming. The questionnaire design relied on the use of a five-point Likert scale to enable respondents to ascertain the degree of agreement or the extent to which the participant evaluated or did something, and to establish numeric results for reliable and valid statistical analysis.

Having designed the questionnaire, a pilot study was performed using ten quality managers, directors and professionals in the city of Jeddah and Abha. The piloting was carried out using face-to-face interviews with respondents. Based on their responses, minor adjustments were made to the wording of the questionnaire, to improve clarity in the final version of the questionnaire. A usable response rate of 60 percent was achieved (Table II).

The response rate was satisfactory, as Saunders *et al.* (1997) have suggested that an appropriate response rate should be between 30 and 50 percent. Following the data collection, the responses were coded to enable them to be computer processed. The software package used for the analysis was statistical package for the social sciences (SPSS) for Windows.

Table II.
Details of the response
rate

Item	Number of questionnaires	Percentage of questionnaires
Total questionnaires sent	175	100
Total questionnaires returned	140	80
Incomplete questionnaires	35	20
Usable questionnaires (response rate)	105	60

Survey findings and discussion

Effectiveness and the future of ISO 9000 in Saudi Arabia

Benefits of ISO 9000 implementation. After ISO implementation, the degree of effectiveness must be tested in order to evaluate whether or not pre-established objectives and expectations have been met. Therefore, subjective assessments were performed to identify the benefits achieved from implementing ISO 9000 in the manufacturing organizations in Saudi Arabia. A number of benefits (Table III) were extracted from different studies[1] in the field of ISO 9000 for the purpose of this study. The respondents were asked to rate these benefits on a five-point scale from “strongly disagree” = 1 to “strongly agree” = 5. The reliability of the survey instrument comprising the 24 benefits items found in Table III was examined through the Cronbach’s α coefficient. The Cronbach’s α coefficient for the instrument is 0.9003, illustrating very high instrument reliability. Based on the data presented in Table III, it is clear that the majority of the benefits were found to be important in the manufacturing organizations resulting from the implementation of ISO 9000. Moreover, the most important three benefits achieved from implementing ISO 9000 in Saudi Arabia were as follows:

- (1) improved the efficiency of the quality system;
- (2) better documentation procedures; and
- (3) increased quality awareness in the firms.

It is clear that ISO 9000 standards have been recognized in the manufacturing sector as a quality system which can be used to in achieving efficiency rather than achieving

Rank	Benefits	Mean	Standard deviation
1	Improved the efficiency of the quality system	4.93	0.74
2	Better documentation procedures	4.89	0.88
3	Increased quality awareness in the firms	4.76	0.91
4	Improved the quality of products and customer service	4.36	0.96
5	Clear working instructions or procedures	4.33	0.97
6	Effective communication among employees	4.23	0.97
7	Improved the quality of incoming materials	4.11	0.98
8	Reduced defective rate and wastes	4.09	0.99
9	Helped in continual improvement	4.04	1.03
10	Expansion to international market	3.95	1.07
11	Greater opportunity for export	3.87	1.11
12	Improved productivity	3.66	1.15
13	Reduced customer complaints	3.61	1.17
14	Increased market share	3.54	1.19
15	Improved process design	3.43	1.21
16	Greater competitive advantage	3.33	1.23
17	Decline in business costs	3.12	1.24
18	Improved profitability	3.08	1.27
19	Better corporate image	2.87	1.29
20	Increased sales	2.65	1.32
21	Improved supplier relations	2.61	1.39
22	Clear job responsibilities	2.45	1.41
23	Improved staff motivation	2.40	1.45
24	Positive cultural change	2.39	1.47

Table III.
Benefits of ISO 9000
implementation in
Saudi Arabia

quality products. ISO is not designed specifically to address the quality of product but rather the efficiency of the quality system. This finding is supported in the literature through various studies (Magd *et al.*, 2003; Goetsch and Davis, 1998; Dick, 2000; Quazi and Padibjo, 1998; Santos and Escanciano, 2002; Brown *et al.*, 1998), but it is quite an advanced finding for a developing country. This could be due to the increased level of education and organizations becoming interested in the area of quality in order to achieve and maintain success. It can be suggested that the implementation of ISO 9000 in Saudi Arabia has been seen as a tool to assist in the development of quality management. This is evident from the fact that, as firms improve documentation of products and processes, new potential for quality improvement may become apparent.

A comparison was made of the main positive outcomes of ISO 9000 implementation in Saudi Arabia to other studies by Dissanayaka *et al.* (2001), Escanciano *et al.* (2001), Leung *et al.* (1999), Calisir *et al.* (2001), McAdam and Fulton (2002) and Magd *et al.* (2003). These studies were similar to the present study and they suggested that the most important benefits achieved from ISO 9000 implementation were: increased quality awareness, improved efficiency of the quality system, better documentation procedures, the use of ISO as a promotional tool, better supplier selection, improved exports, improved image of the company, improved quality products and customer service. The order of these benefits varies within studies. However, Brown and Van der Wiele (1995), Vloeberghs and Bellens (1996) and Magd *et al.* (2003) concluded that improving the efficiency of the quality system was a very important benefit of ISO implementation, which is consistent with the present case.

In order to reduce the number of benefits into factors, they were factor analyzed and a Varimax rotation procedure with a criterion cut-off factor score of 0.5 was applied to select the benefits which are presented in Table III. The value of the overall Kaiser-Meyer-Olkin test (KMO)[2] statistic for this factor analysis is 0.815. The value of the KMO suggests that the data were suitable for factor analysis and, consequently, that the factor analysis was valid and reliable. The data presented in Table IV resulted in four factors and they are as follows:

- (1) internal focus;
- (2) external focus;
- (3) competitiveness; and
- (4) export perspective.

Next steps after ISO 9000 implementation. ISO 9000 has been recognized as the first step on the way to TQM (Lee *et al.*, 1999a, b; Sun, 2000). A decision to introduce ISO 9000 entails the reliance on a solid foundation on which to base the firm's activity. However, most organizations which introduce ISO 9000 have continuous improvement in mind and once the certification has been obtained, many organizations merely direct their efforts towards maintaining the certificate (Escanciano *et al.*, 2001). This does not appear to be the case in the present study, as Figure 2 suggests that the majority of the researched sample were hoping to implement TQM in the near future. This could be due to the fact that, as the surveyed organizations had obtained the certification, they probably had established the foundation for the continual development of ISO 9000 on which it is based, and to introduce a tool to complement ISO 9000, such as TQM. These findings are supported further by Magd and Curry (2003) and Magd (2004). The data

Benefits	Varimax rotated loading (factors)			
	Internal focus	External focus	Competitiveness	Export perspective
Better documentation procedures	0.71			
Better corporate image	0.69			
Greater quality awareness	0.65			
Clear work procedures	0.59			
Clear job responsibilities	0.57			
Improved the quality of products and customer service		0.87		
Helped in continual improvement		0.78		
Greater competitive advantage		0.72		
Reduced defective rate and wastes		0.67		
Improved profitability			0.83	
Increased market share			0.74	
Greater opportunity for export				0.91
Expansion to international market				0.87
Eigenvalue	8.657	2.563	1.875	1.245
Cumulative variance explained	37.34	44.65	56.34	60.69

Table IV.
Factor analysis for the
benefits of ISO 9000 in
Saudi Arabia

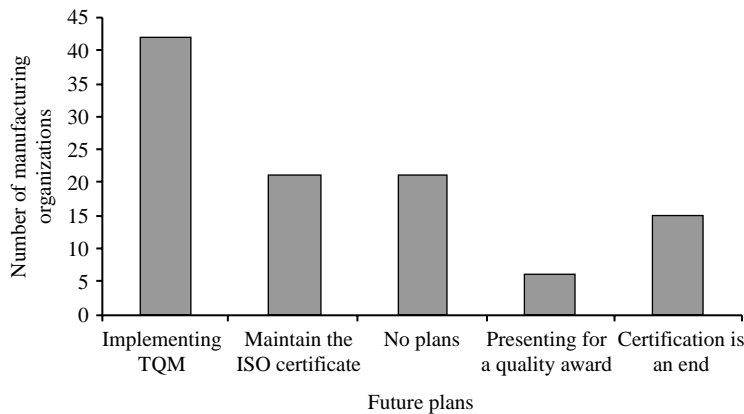


Figure 2.
The future after ISO 9000
certification in
Saudi Arabia

seems to confirm the assertion that ISO 9000 certification constitutes a base for, or is at least complementary to, TQM. The data also suggests that the certification in these manufacturing organizations has been successful and they want to go further than simply maintaining ISO 9000 in order to achieve long-term success.

ISO 9000 and registration agencies in Saudi Arabia

Factors influencing the choice of registration agencies. Subjective assessments were conducted in order to determine the factors which contributed to or influenced the choice of the registration agency among the certified manufacturing organizations in Saudi Arabia (Table V). The data presented in Table V reveals that the most important factors for choosing a registration agency in Saudi Arabia were as follows:

- reputation and image;
- experience in Saudi Arabia and industry; and
- simplicity of registration agencies audit procedures.

Reputation and image was seen as the most important contributing factor for manufacturing organizations in choosing a registration agency because it will provide the organization with a prestigious image with their current and future clients. Experience in Saudi Arabia and industry was recognized as the second most influential factor. This is important as each industry has its own special characteristics, which require the auditors to be aware of its operations. Therefore, the more knowledge the auditors have about the nature of the firm and their business, the better their execution of the auditing procedures. This experience is important as once the registration agency has established itself in the Saudi market, other new firms will choose the agency that has experience with similar organizations. The third most crucial factor was the simplicity of registration agencies audit procedures. This is significant as the standard has been criticized for the amount of paper it creates and creates problems. The cost of the registration process was not regarded to be very important since the fees of the agencies are competitive and there are a number of registration agencies operating in Saudi Arabia. The rest of the factors were regarded as being of less importance when choosing a registration agency in Saudi Arabia. Such factors include closeness to the firm after ISO 9000 implementation, demand/advice by a parent company or partner, recommended by another company or person, and personal relationship. Those findings in Saudi Arabia were similar to those of Carlsson and Carlsson (1996) in their study of Swedish industry and Magd (2004) in his study of registration agencies in the Hotel sector in Egypt. Reputation and image was recognized in those countries as the most important influential factor for choosing a registration agency. This indicates that companies in these countries are more concerned about the image they put forward to their clients, than they are concerned about which agency will give them the best organized standard.

To investigate whether different sizes of organizations had significant differences in choosing registration agencies, the Kruskal-Wallis test was performed as an alternative to the One Way Anova since the data was on an ordinal scale. The results

Rank	Contributing factors	Mean ^a	Standard deviation
1	Reputation and image	4.65	0.64
2	Experience in Saudi Arabia and industry	4.61	0.67
3	Simplicity of registration agencies audit procedures	4.59	0.70
4	Costs	3.89	1.11
5	Closeness to firm after ISO 9000 implementation	3.35	1.33
6	Demand/advice by parent company or partner	3.25	1.40
7	Recommended by another company or person	2.78	1.35
8	Personal relationship	2.69	1.46

Table V.
Factors influencing the choice of registration agencies in the manufacturing sector

Notes: ^aThe mean score was based on participants level of agreement on the importance level on a scale of 5 = very important, 4 = fairly important, 3 = of average importance, 2 = of minor importance, and 1 = not important

show that only three factors showed significant differences based on the size of firms in choosing registration agencies. Those factors were costs, recommended by another company or person and personal relationship. The results suggest further that different sized firms varied significantly in performance on those three factors and small firms tended to be more concerned and put more emphasis on those three factors when choosing registration agencies than did large firms.

Problems with registration agencies in Saudi Arabia. In order to assess the associated problems with registration agencies operating[3] in Saudi Arabia, participants were asked about the problems that faced them from their registration agencies while implementing ISO 9000 certification. The results are presented in Table VI, in which the associated problems are presented in ranked numbers from the most important to the least important.

The most important problem facing manufacturing organizations with registration agencies in Saudi Arabia was the high costs associated with the auditing process, as some of these agencies charge substantial fees (Magd *et al.*, 2003). Perceptions that auditing procedures are complicated and auditing time is lengthy, and choosing the appropriate agency is difficult were seen as important problems. This is possibly due to the fact that the more time these registration agencies spent of developing or implementing the standard, the higher the cost to the organization, and the greater the potential for the loss of sales. Also difficulties in choosing the appropriate agency can lead to insufficient quality system and loss of potential customers. However, lack of knowledge about the industry, and skepticism about the ethics of the assessors were perceived to be of less importance with regard to the other problems faced by manufacturing organizations in Saudi Arabia.

Level of satisfaction with registration agencies. The respondents were asked to rate their overall satisfaction with their registration agencies on a scale of a five-point. The results are presented in Table VII. Table VII suggests that the majority (84 or 80 percent) of the surveyed sample were satisfied with their registration agencies.

Rank	Problems with registration agencies	Mean ^a	Standard deviation
1	Auditing fees are high	4.34	0.79
2	Auditing procedures are complicated and auditing time is lengthy	3.90	1.08
3	Choosing the appropriate agency is difficult	3.67	1.18
4	Lack of knowledge about the industry	2.65	1.26
5	Skepticism about the ethics of the assessors	2.56	1.35

Table VI.
Problems with the
registration agencies
operating in Saudi Arabia

Notes: ^aThe mean score is based on participants level of agreement with each statement on a scale of 5 = strongly agree, 4=agree, 3 = neither agree nor disagree, 2 = disagree, and 1 = strongly disagree

Satisfaction rate	Frequency	Percent of sample
Highly satisfied	63	60
Average satisfaction	21	20
Low satisfaction	21	20
Total	105	100

Table VII.
Satisfaction level with
registration agencies in
Saudi Arabia

Therefore, it can be suggested that the level of satisfaction with registration agencies in Saudi Arabia was high in general and the disappointment level was minimal. In comparing this to other studies, such as for example, in Hong Kong, Lee (1998) found that the satisfaction level with auditors of three sectors under study was generally high, 79 percent in the service sector, 81 percent in the manufacturing sector, and 93 percent in the building sector. The average satisfaction level in Hong Kong was 85 percent with no scaling as to the degree of satisfaction. Moreover, in Turkey, Calisir *et al.* (2001) found a similar level of satisfaction with registration agencies in their study. These results are supportive of the present study.

Conclusions and recommendations

ISO 9000 has been used more and more throughout Europe, the USA and the rest of the world. There were 271,966 certified organizations in the world in 1999, and those numbers are continuing to grow. ISO 9000 has become a subject of focus in many developing countries, including Saudi Arabia. The literature review offers many diverse opinions on ISO 9000 in different countries but little empirical research has been carried out in Saudi Arabia concerning ISO 9000 implementation. Therefore, the present study based on a survey of 175 companies has highlighted some of the issues concerning ISO 9000 implementation in Saudi Arabia. The views and experiences of quality managers/representatives who responded to this survey on ISO 9000 were very positive and encouraging. Key findings from the survey include:

- The three most important benefits achieved from implementing ISO 9000 in Saudi Arabia are improved the efficiency of the quality system; better documentation procedures; and increased quality awareness in the firms. This suggests that the quality system (ISO 9000) can be used to in achieving efficiency rather than achieving quality products in Saudi Arabia.
- ISO 9000 certification constitutes a base, or at least a complement, for TQM, and suggests that the certification in these manufacturing organizations have been successful and they want to go further than maintaining ISO 9000 and achieve a long-term success.
- The most important factors for choosing a registration agency in Saudi Arabia were reputation and image; experience in Saudi Arabia and industry; and simplicity of registration agencies audit procedures.
- The most important problem faced manufacturing organizations with registration agencies in Saudi Arabia was the high costs associated with the auditing process.
- The level of satisfaction with registration agencies in Saudi Arabia was high in general and the disappointment level was minimal.

The present study has shown that ISO 9000 registered manufacturing firms in Saudi Arabia have performed well in their registration process and have benefited from ISO implementation. This could be due to the high level of interest in the area of quality, as most people request quality or a certificate to prove the existence of quality products/services. However, to ensure effective implementation of ISO in the future, it is recommended that firms should plan carefully, measuring internal as well as external aspects and performing cost-effective analysis of the implementation process.

Organizations should also use gap analysis to assess their actual abilities against ISO requirements. In addition, firms are encouraged to educate their employees about ISO before the implementation process to reduce their fear and resistance and to help ensure the realization of the importance of the certification. It also recommended that organizations in Saudi Arabia and other developing countries should evaluate the internal operations of registration agencies, their costs and their long-term financial capabilities before contacting them. In addition, small firms should avoid subjective judgment of their registration agencies.

Notes

1. The benefits used in this study were extracted from recent studies in the field of ISO 9000 which included Goetsch and Davis (1998), Dick (2000), Quazi and Padibjo (1998), Santos and Escanciano (2002), Brown *et al.* (1998), Gotzamani and Tsiotras (2002), Haversjo (2000) and Mo and Chan (1997).
2. KMO is an indicator of how well suited the sample data is for factor analysis.
3. Registration agencies operating in Saudi Arabia include British Standards Institute (BSI), Det Norske Veritas (DNV), Inspection Services Saudi Arabia Ltd (9SGS), Saudi Arabia Standards Organization (SASO), Lloyds Register Quality Assurance (LRQA). Integrated Services Inc (ABS), Moody International (AOQC), TUV Cert (TUV), Germanischer Lloyds (GL), American Petroleum Institute (API), Bureau Veritas, BVQI Middle East (BVQI).

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