Overcoming barriers to sustainable implementation of the ISO 9001 system

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Abstract

Purpose – This study aims to explore the barriers to implementation of ISO 9000 in China, and to identify how these barriers can be overcome.

Design/methodology/approach – Using a structural questionnaire survey, this paper examines the main barriers for enterprises in effective implementation of the ISO 9001 standard.

Findings – This paper highlights the problems in implementing the standard, which determines the sustainable implementation, including: short-sighted goal for "getting certified"; over-expectation on the ISO 9001 standard; mandatory requirement (not wholehearted commitment) in some industries; and following others (the trend) in certification. With regard to the effective audit of the ISO 9001 standard, the main problems were explored, including: lack of commitment from some certifying bodies; excessive competition between certifying bodies; and offering of a total packaged service from consultancy to certification by certifying bodies.

Practical implications – The ISO 9000 series have permeated into all industrial sectors. Although there are many stories of successful adoption of ISO 9001, problems in implementing the standards need to be explored, which may affect the sustainable implementation.

Originality/value – Based on the analysis, the paper proposes that the government should improve the legal framework and enforcement schemes to strengthen supervision and control for effective auditing of ISO 9000 standards.

Keywords ISO 9000 series, Quality management, Sustainable development, China

Paper type Technical paper

Introduction

Since, the issuance of ISO 9000 series in 1987 by the International Organization for Standardization (ISO), the standards have been widely accepted by many organizations across all industries, regardless of their size or products (Magd *et al.*, 2003; Magd, 2006; Naser *et al.*, 2004; Saraiva and Duatre, 2003). Research on the effects of implementing ISO 9000 series has been extensively reported. The majority of articles studying the positive side of ISO 9000 standards largely agree on the most important benefits that the standard provides. These include improvement of quality awareness and customer satisfaction (Cebeci and Beskese, 2002; Quazi *et al.*, 2002), reduction of waste and customer complaints (Dwyer, 2002; Ruzevicius *et al.*, 2004), standardization of work procedures and improvement in communication (Heras *et al.*, 2002), as well as

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enlargement of market shares (Arauz and Suzuki, 2004; Martínez-Costa and Martínez-Lorente, 2003).

Further, some researchers explore the sustainability of the effectiveness of the standards. Casadesus and Karapetrovic (2005) found that ISO 9001:2000 registered companies perceive less benefits from the implementation than do their ISO 9001/2/3:1994 peers. The ISO 9001/2/3:1994 standards had a higher score on any particular benefit than ISO 9001:2000 did. They also discovered that the level of reported benefits of ISO 9001/2/3:1994 decreases with time, which was evidenced by two empirical studies conducted in 1998 and 2002.

However, some researchers query on the effectiveness of the standards. They underscore the problems, such as applicability to different industries (Tam *et al.*, 2000), a high volume of paperwork (Chini and Valdez, 2003), lack of flexibility and poor compatibility with other management systems (Dick, 2000; Wilkinson and Dale, 2002). Terziovski *et al.* (2003) found that ISO 9000 certification did not have a significantly positive relationship with organizational performance. On the contrary, ISO 9000 had some adverse effect as it increased operation costs and reduced product quality.

The issue of improving sustainability of implementation of the ISO 9001 standard has engaged both practitioners and researchers for a long time. In fact, the sustainability of implementing the ISO 9001 standard depends not only on the company's benefits so gained from ISO 9001-certification, but also the effectiveness of the quality management audit. Recent highly publicized cases in both financial and quality auditing pointed to the need for further examining the effectiveness of audit, as well as the methods to improve it, specifically focusing on the audit reliability and associated risks (Beckmerhagen *et al.*, 2004).

Unfortunately, one cannot find many articles studying the barriers to sustainable implementation of the ISO 9001 standard from the viewpoints of both certified companies and system audit. This issue has led to the formulation of the objectives of this research:

- to identify the barriers to sustainable implementation of the ISO 9001 standard system; and
- to find a way to overcome the barriers for improvement of sustainability of the standard.

The following areas are focused on in the study:

- an examination of barriers to the implementation of the ISO 9001 standard;
- an exploration of effective methods for continuous quality improvement;
- an evaluation of audit effectiveness for ISO 9001 standard; and
- seeking of measures for the sustainable implementation of ISO 9001.

Evolution of the ISO 9001 standard

The ISO 9000 series originated from the military procurement standards developed during the Second World War, ultimately leading to the publication of the first commercial quality management standards: BS 5750 by the British Standards Institute in 1979. In 1987, the British Standards BS 5750 was adopted with a few changes as the international standards: ISO 9000 (Boulter and Bendell, 2002). The standards were

updated in 1994 with some minor changes. The ISO 9000:1994 standards contain three auditable certification standards, i.e. ISO 9001/2/3. They provide corresponding clauses for different types of business including companies that design their own products and services (20 clauses), companies that do everything except design (19 clauses), and companies whose products and services can be verified only by inspection and tests (16 clauses). Major changes were incorporated in the ISO 9001:2000 version.

The latest ISO 9001:2000 revision is based on the following eight quality management principles:

(1) customer-focused organizations;
(2) leadership;
(3) involvement of people;
(4) process approach;
(5) system approach to management;
(6) continual improvement;
(7) factual approach to decision-making; and
(8) mutually beneficial supplier relationships (Biazzo and Bernardi, 2003).

Based on these eight guiding principles, the 20 clauses of the ISO 9001:1994 were revised into the following five main management requirements:

(1) quality management system;
(2) management responsibility;
(3) resources management;
(4) product realization; and
(5) measurement, analysis, and improvement.

The ISO 9001:2000 standard integrates the three standards into one, which places emphasis on process management and resource management and has commonality of architecture with ISO 9004, so that quality assurance requirements and quality management can be aligned holistically (Tsim *et al.*, 2002).

In China, the ISO 9000 standards have been widely accepted. The number of companies certified has rapidly increased from 10,526 in June 1999 to 95,819 in December 2003 (CNAB, 2004). Table I lists the ten top sectors with ISO 9001 certification.

In Table I, it shows that the electrical and optical equipment and metals and fabricated metal products sectors are ranked first (15.74 percent) and second (13.02 percent), respectively. The number of companies certified in the construction industry is ranked third (11.79 percent).

Survey methodology

With the aim of investigating the barriers to sustainable implementation of the ISO 9001:2000 standard, a survey based on a comprehensive review of literature was designed and conducted. Before the survey, auditors of ISO 9001 standard and senior management representatives of ten certified companies had been interviewed and requested to provide information and verification to the

Rank	Sectors	Number of organizations certified	Proportion to total (percent)
1	Electrical and optical equipment	15,081	15.74
2	Metals and fabricated metal products	12,472	13.02
3	Construction	11,296	11.79
4	Machinery and equipment	10,291	10.74
5	Chemicals, chemical products and fibers	6,907	7.21
6	Rubber and plastic products	5,787	6.04
7	Transport equipment	5,002	5.22
8	Food products, beverages and tobacco	4,093	4.27
9	Textile products	3,871	4.04
10	Technical services	2,891	3.02

Source: CNAB (2004)

Table I.
Ten top sectors granted ISO 9001 certificates

questionnaire draft. The structured questionnaires were then sent to senior management representatives of 500 certified companies listed in the Directory of Quality System Certificated Enterprises of China National Accreditation Board for Certifiers (CNAB). Finally, 156 completed questionnaires were received – a response rate of 31 percent.

In the survey, the responding certified enterprises include 71 (46 percent) electrical and optical equipment companies, 68 (43 percent) construction companies, 11 (7 percent) machinery and equipment companies and 6 (4 percent) others. The 156 companies fall into four categories of ownership: 58 state-owned (37 percent), 46 share-holding (30 percent), 41 joint venture (26 percent), 11 private (7 percent). Table II summarizes the age of the respondent companies that had implemented the ISO 9001 standard.

In Table II, 80 percent of the respondent companies have implemented the ISO 9001 standard for more than three years, and 47 percent for more than five years. It reveals that most of the respondents have rich experience in the standard.

Results and analysis

Evaluation of implementation of ISO 9001 standard

The respondents were asked to make a general evaluation on the implementation of the ISO 9001 standard. Table III lists the results of the survey.

Time of getting certification of ISO 9001 standard	Numbers of companies
<3 years	31 (20)[a]
$3 \sim 5$ years	52 (33)
>5 years	73 (47)
Total	156 (100)

Note: [a]The figure in parentheses indicates the percentage of total companies

Table II.
Time of getting certification of ISO 9001 standard

In Table III, 41 percent of the respondents reported that their companies had implemented the ISO 9001 standard seriously, while 52 percent of the respondents reported a more perfunctory implementation of the standard. Comparing the companies having accredited for different periods, it was found that there was an obvious difference between two groups: with more and less than three years of experience. For the companies having accredited for more than three years, only 31 percent claimed that they had implemented the ISO 9001 standard seriously. However, the proportion reached 84 percent for the companies having accredited for less than three years.

The results could reflect their perceived improvements after implementing the ISO 9001 certification, including internal operations, customer's relations, marketing share, and subcontractor relations (Table IV).

In Table IV, 31 percent of respondents ranked "Customer relations" and "Internal operations" first and second. "Market share" was ranked third and chosen by 19 percent of the respondents. Interestingly, there was an obvious difference in the perceived improvements of ISO 9001 certification between the two groups: more and less than three years of ISO 9001 experience. For the companies having accredited for less than three years, the main improvement is "Internal operations." This is due to the fact that ISO 9001 standard supplies a management model, which delineates the responsibility within an organization. The findings are comparable with some previous studies. Terziovski *et al.* (2003) demonstrated that benefits actually decreased with time since registration. There are also findings that the passage of time since registration does not have any significant effect on the perceived benefits (Casadesus and Karapetrovic, 2005).

Table III.
General evaluation on implementation of ISO 9001 standard

General evaluation	Numbers of companies	Numbers of companies getting certification more than 3 years	Numbers of companies getting certification less than 3 years
Seriously	64 (41)[a]	38 (31)	26 (84)
Perfunctorily	81 (52)	79 (63)	2 (6)
Others	11 (7)	8 (6)	3 (10)
Total	156 (100)	125 (100)	31 (100)

Note: [a]The figure in parentheses indicates the percentage of total companies

Table IV.
Improvements after gaining ISO 9001 certification

Improvements after gaining ISO 9001 certification	Numbers of companies	Numbers of companies getting certification more than 3 years	Numbers of companies getting certification less than 3 years
Internal operations	41 (26)	25 (20)	16 (52)
Customers relations	48 (31)	40 (32)	8 (26)
Marketing share	29 (19)	24 (19)	5 (16)
Subcontractor relations	16 (10)	16 (13)	0 (0)
Others	22 (14)	20 (16)	2 (6)
Total	156 (100)	125 (100)	31 (100)

Note: [a]The figure in parentheses indicates the percentage of total companies

Barriers to effective implementation of ISO 9001 standard

The respondents were asked to explore the main barriers to effective implementation of ISO 9001 standard. Table V lists the results.

In Table V, 42 percent of the respondents ranked "Short-sighted goal for 'getting certified'" first. Previous studies reveal that the certification of ISO 9001 enables certified-organizations to expand their business by gaining permission to tender for business from which they were otherwise excluded (Chin *et al.*, 2000). This barrier is closely related to the factor "mandatory requirement (not wholehearted commitment) in some industries" (13 percent). For example, in construction, there are various premium schemes for the ISO 9000 certified construction companies, such as in China (Zeng *et al.*, 2002), Singapore, and Hong Kong (Tam *et al.*, 2000). A premium score will be added to the certified companies in tendering for building projects in the public sector and construction companies can benefit directly from the ISO 9000 certification. Under this circumstance, construction companies focus on their direct benefit – to maintain their market share and survival in joining the "certification" exercise without the genuine intention to integrate the quality management system into the construction process. From Hong Kong's experience, although contractors tendering for public projects are required to administer ISO 9000, the actual quality achievements were far below the original expectations (Tam *et al.*, 2000).

About 21 percent of all respondents chose the factor of "Over-expectation on ISO 9001 standard." Some senior executives have unreasonable expectations of the ISO 9001 standard. They are enthusiastic about the benefits, including improvement in the productivity, efficiency, market share, and quality of final products, and pay no attention to the problems that arise, believing that certification will be a panacea for all. Once there were no obvious direct benefits, they began casting doubts on the standards (Conti, 2004). In fact, ISO 9001 is a system designed for continual improvement. Successful companies believe that ISO 9001 should be used to maintain the consistency of product quality and serve as a foundation for systematic management. An investigation by Yeung *et al.* (2003) revealed that senior executives' incorrect understanding of ISO 9000 and attitudes to the international standards are the main cause of the ineffectiveness of ISO 9000 implementation.

About 11 percent of respondents ticked "Following the latest trend in certification." This is attributed to the fact that there is a misunderstanding for some people in China that the international standard is superior to other quality management methods including TQM. Extensive research reveals that understanding the purpose of the

Barriers to implementing ISO 9001 standard	Numbers of companies
Short-sighted goal for "getting certified"	66 (42)[a]
Over-expectation on ISO 9001 standard	33 (21)
Mandatory requirement (not wholehearted commitment) in some industries	20 (13)
Following others (the trend) in certification	17 (11)
Lack of necessary guidance for certification	12 (8)
Others	8 (5)
Total	156 (100)

Note: [a]The figure in parentheses indicates the percentage of total companies

Table V.
Barriers to effective implementation of ISO 9001 standard

standards is a very important step in the implementation process. Senior management who administer "ISO 9001," may not be clear about the purpose of the certification, but just aim to follow others' footsteps.

Barriers to effective audits of ISO 9001 standard

An effective audit is very important for the sustainable implementation of the ISO 9001 standard (Rajendran and Devadasan, 2005). As Pivka (2004) indicated, ISO 9000 auditing had a long-term economic value only if a compliance audit was integrated with the management system.

In the survey, the companies were asked to evaluate the problems in ISO 9000 certification. Table VI summarizes the results.

In Table VI, 40 percent of the respondents rated "lack of commitment from some certifying bodies" as the first main problem in certification. In China, there is a huge market demand for ISO 9001 certification. The number of companies certified has been rapidly increasing and grown from 10,526 in June 1999 to 95,819 in December 2003. To sustain quality improvement within such a huge market, all certifying bodies need to carry out periodic quality audits for their clients. However, some certifying bodies consider pursuing commercial benefits as their first and most important goal, which is reflected from the following phenomena:

- Documentation and site assessment are superficial.
- Some auditors are not competent in the assessment.
- Certifying bodies only focus on the quality management system without paying attention to the companies' management system after certification.
- Certifying bodies do not adopt any review or remedial measures when serious quality and safety violations occur in the certified companies.

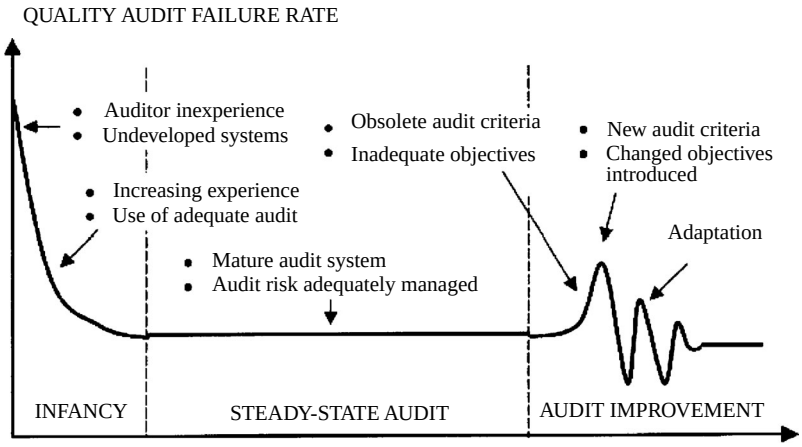
These phenomena have resulted in a high audit failure rate (i.e. the number of audit failure per unit of time), as shown in Figure 1.

As Beckmerhagen *et al.* (2004) indicated, an audit was a system in which various interrelated processes (e.g. planning, execution and follow up) and resources (auditors, checklists and methods) were directed towards achieving predetermined goals (e.g. compliance with requirements or identification of areas for improvement). In practice, the high audit failure rate affects the sustainability of ISO 9001 implementation. Hence,

Problem center	Numbers of companies
Lack of commitment from some certifying bodies	63 (40)[a]
Excessive competition between certifying bodies	42 (27)
Offering of a total packaged service from consultancy to certification by certifying bodies	28 (18)
Lack supervision system on certifying bodies	18 (12)
Others	5 (3)
Total	156 (100)

Note: [a]The figure in parentheses indicates the percentage of total companies

Table VI.
Problems on effective audit of ISO 9001 standard



Source: Beckmerhagen *et al* (2004)

Figure 1.
The bathtub curve in QMS auditing

auditors should plan the audit and identify the goal, purpose, scope, available resources, and other possible problems. Obviously, auditors must assess their own competence before accepting an auditing assignment. In addition, reviews of audit effectiveness should be conducted periodically as a matter of procedure or when requested by the auditors. The best time is shortly after a regular audit conducted and completed.

About 27 percent of the respondents agreed that "excessive competition between certifying bodies" formed the major barrier. According to CNAB (2004), there were 65 certifying bodies for ISO 9001 standard in China. In this rapidly growing market, they focus their attention on increasing their market share but not on their audit quality. For example, the number of certified companies in the construction industry ranked third in China, which attracts many certifying bodies to compete for the business although some of them did not have any expertise in construction.

About 18 percent of respondents chose "offering of a total packaged service from consultancy to certification by certifying bodies." According to the ISO rules, the roles of consultant and certifier must be separated. As an effective audit is aimed at continuous improvement, the auditing report should include some carefully considered and validated recommendations for improvement, apart from the formal audit findings. Owing to the principle of independence in auditing, the certifying body and auditor should not serve as a consultant. However, in practice, there are many under-table dealings between the certifying bodies and the consulting agencies. These corrupt practices allow many companies to gain the ISO 9001 certification status without devoting any genuine effort to quality improvement. The consulting services provided range from in-service training prior to introducing a quality system to maintaining auditing of the system after certification. Currently, the consulting agencies would advise companies to adopt the standard documents and procedures without developing ones to suit their own needs. In order to acquire the ISO 9001-certificates in the shortest possible time, they may even help companies to set up some fraudulent activities to meet the needs of the auditors.

Measures to improve audit effectiveness for ISO 9001

In the survey, companies were asked to propose measures for improving the audit effectiveness in ISO 9001 certification. Table VII summarizes the results.

Overall, 60 percent of respondents proposed "strengthening government's supervision and control" as the major measure required. This is related to "establishing proper legal framework," which was chosen by 21 percent of the respondents. In fact, the government supervision and control is seen to be very important (Figure 2).

The government supervises certification bodies by establishing the legal framework. Certification bodies monitor certified organizations according to the ISO 9001 standard. Only based upon this relationship can a mature certification market be established.

Currently, the CNAB, the national accreditation body of China, is legally authorized by the Certification and Accreditation Administration of China to accredit bodies operating assessment and certification of management systems. Owing to the lack of a proper legal framework and regulations, organizations operating ISO 9001 certification illegally were not punished. In 2003, the registration of 12 illegally operating organizations which imitated foreign certification agencies was discontinued. However, they could continue their illegal operations simply by changing their company names. Therefore, stricter legal enforcement is needed to improve the legal framework.

Conclusions

The ISO 9000 international standards have been widely accepted by many organizations across all industrial sectors in China. The number of companies certified has been increasing. There are many stories of successful adoption of ISO 9001. However, the problems, which affect the sustainability for implementing the standards, need to be highlighted. Using a structured questionnaire survey, this paper has examined the main barriers for enterprises in effective implementation of ISO 9001 standards, which are as follows:

- short-sighted goal for "getting certified";
- over-expectation on ISO 9001 standard;

Measures	Numbers of companies
Strengthening government's supervision and control	93 (60)[a]
Establishing a proper legal framework	32 (21)
Enhancing certifying bodies' self-discipline	24 (15)
Others	7 (4)
Total	156 (100)

Note: [a]The figure in parentheses indicates the percentage of total companies

Table VII.
Measures for improving effective audit of ISO 9001 standard

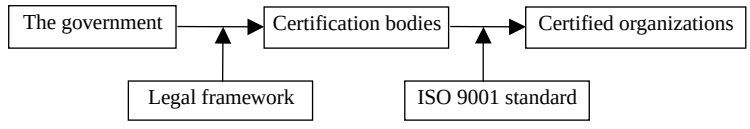


Figure 2.
Role of the government supervision

- mandatory requirement (not wholehearted commitment) in some industries; and
- following others (the trend) in certification.

With regard to effective audit of ISO 9001 standard, the main problems examined were:

- lack of commitment from some certifying bodies;
- excessive competition between certifying bodies; and
- offering of a total packaged service from consultancy to certification by certifying bodies.

Based on the analysis, the paper concludes that the government should strengthen supervision and control in order to improve effective audit of ISO 9001 standard, which is dependent on the establishment of a proper legal framework and enforcement schemes.

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