



The Implementation of ISO 9000 in Australian Organisations: a comparison between the 1994 and the 2000 versions

REPORT ON A STUDY CONDUCTED BY THE AUSTRALIAN SUPPLY CHAIN MANAGEMENT
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FOREWORD

Improving the quality of products and services remains high on the agenda of most organizations. Over the past two decades organizations in all types of industries have implemented quality improvement programs such as Total Quality Management and Six Sigma. The adoption of an appropriate quality management system is also recognized as an essential part of quality improvement efforts. The international quality standard, ISO 9001, has been a popular quality management system adopted by many organizations around the world.

The initial ISO 9000 series of standards was introduced in 1987. These were replaced with the ISO 9000:1994 version, an improvement on the previous version. And this was replaced with the current standard, ISO 9000: 2000, again an improvement on the previous version.

In order to develop an improved standard each of the new versions relied heavily on research, getting feedback from businesses on their experiences in implementing and operating the standard.

This research project "*The Implementation of ISO 9000 in Australian Organisations*" is particularly valuable as it reports the perceptions and experiences of Australian businesses that have implemented ISO 9000 and provides a detailed and comprehensive picture of ISO 9000: 2000 in Australia. This includes the motives of certification, the implementation process and the impacts of the implementation. In addition, the study compares the difficulties experienced by the firms in implementing the standard between the 1994 version and the 2000 version, as well as examining the difficulties experienced by firms in transitioning from the requirements of 1994 version to 2000 version of ISO 9000.

The information will be of particular value to organisations considering implementing ISO 9000.

The research is extremely timely. With an approximately seven year cycle between versions, the next version of ISO 9000 is likely to be under development. This report also provides a valuable contribution to these developers and will help to ensure the success of the next version of ISO 9000.



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1. EXECUTIVE SUMMARY

1.1 Introduction

This study was conducted by Monash University's Australian Supply Chain Management Research Unit (ASCMRU) in the Faculty of Business and Economics, in collaboration with the Joint Accreditation System of Australia and New Zealand (JAS-ANZ). The aim of this study was to address the lack of research focusing on the current ISO 9001 version, particularly in comparison to ISO 9001:1994. This was achieved by investigating the perceptions of Australian businesses regarding the motivations, approaches, challenges and benefits of ISO 9001:2000 implementation.

1.2 Summary of Major Findings

The sample was split into two groups. This was done in order to explore differences between the 1994 and 2000 versions of ISO 9001 in terms of their users' experiences. The first group consisted of respondents whose businesses' were first certified to ISO 9001:1994 and the second group contained those first certified to ISO 9001:2000. The major findings were:

- (1) Out of 326 respondents, 219 firms were first certified to ISO 9001:1994 and 107 were first certified to ISO 9001:2000.
- (2) There were no differences between the two ISO 9001 groups, except in relation to implementation difficulties, with the 2000 version significantly easier to implement.
- (3) The top three reasons for seeking certification were externally-oriented, namely enhancing company's image, meeting customer demands, and gaining preferred supplier status.
- (4) The most common approaches to implementation were people-focused, namely to appoint particular staff to manage the quality system, and training employees on the concepts of quality and quality systems

- (5) On average, respondents took ten months to implement ISO 9001:1994 and eight months to implement ISO 9001:2000.
- (6) ISO 9001 most benefited companies in the areas of customer relations, process management, information and knowledge management and organisational strategy and culture.
- (7) Companies experienced few difficulties in their transition from ISO 9001:1994 to ISO 9001:2000.

1.3 Conclusion

In the introduction to this report, it was stated that recent ISO 9001 literature has had two major shortcomings. The first of these shortcomings was the shortage of research comparing 9001:2000 to its 1994 predecessor in terms of implementation motivations, approaches, benefits and difficulties. The second of these shortcomings was the shortage of data collected from Australian businesses. This study made significant grounds toward rectifying these omissions as well as pointing towards an additional conclusion, that is; that companies need to go above and beyond meeting the basic requirements of the standard if they are to reap the greatest benefits.

2. INTRODUCTION

2.1 Background

The ISO 9001 series of quality standards was developed by the International Organization for Standardization (ISO) in 1987, and has since become the international quality standard. Since the release of the first revision in 1994, ISO 9001 has generated considerable research attention, with its merits well documented in the management literature. As well as being of interest to scholars, the quality management system has become deeply entrenched in practice. Over the last two decades there has been a steady increase in the number of countries that have adopted ISO 9001 as their national quality standard, as well as a continual increase in the number of companies who certify to the standard.

Despite its widespread acceptance, ISO 9001 has had several criticisms. The most notable of these relates to the perceived cost/benefit ratio of implementation (Lee & Palmer, 1999, Terziovski, Samson, & Dow, 1997). In response to such criticisms, ISO published a new series of ISO 9001 standards on 15 December 2000. ISO 9001 is now based on eight quality-management principles, which are thought to reflect best management practices. These include customer focus, leadership, people involvement, process and system approaches to management, continuous improvement, factual approaches to decision making, and mutually-beneficial supplier relationships (ISO, 2000). Other major improvements on the earlier version include: change in focus from activities that impact the product to all organisational activities that serve to satisfy the customers; simplification of the structure from twenty elements into five, and a sharp reduction in the number of requirements needed to achieve certification, from 323 down to 250 (Hoyle, 2000).

The 2000 version reduces the many standards within the ISO 9001:1994 series standard, merging the ISO 9001, ISO 9002 and ISO 9003 versions into one standard. The intent of the standard has also changed, and now primarily focuses on customer satisfaction rather than quality assurance; on defined objectives rather than procedures; and on continuous improvement rather than the correction of errors (West, 2002).

2.2 This study

Although considerable research has been conducted in relation to the earlier version of ISO 9001, few studies have investigated ISO 9001:2000. Additionally, few ISO 9001 studies have been conducted within the Australian context.

This study aims to rectify both these omissions by (a) collecting data from a large sample of Australian companies, and (b) comparing the experiences of those first certified by the earlier quality management system (i.e. ISO 9001:1994) to those certified by the more recent revision (i.e. ISO 9001:2000). To achieve this aim, four primary areas of comparison are targeted: motives for and approaches to certification, benefits of implementation, and difficulties experienced during implementation. Additionally, this study examines the ease by which companies transitioned from the ISO 9001:1994 to ISO 9001:2000, using a sub-sample of firms who have experienced both.

3. METHODOLOGY

3.1 Company selection criteria

Participating companies were selected from a JAS-ANZ database, which lists all companies that are certified to ISO 9001. Of a total of 10,015 companies, 1,300 companies were selected on the conditions that (1) they were based in Australia and (2) their listing in the database included the company's name, postal address, and a contact person (complete with name, phone number and email address). The latter items were important so as to allow for a follow up/reminder letter to be sent to all participating companies. Upon selection, each company was sent a questionnaire, via the named contact person. If this person was not the person in charge of quality management, they were asked to forward the questionnaire to a more suitable person.

3.2 Questionnaire

The questionnaire content was designed on the basis of several dozens of accumulated studies, which have been published in academic journals. The content therefore covers most of the areas scholars and practitioners believe are relevant to ISO 9001 studies. These include reasons for, approaches to, and the impact (both benefits and difficulties) of implementation.

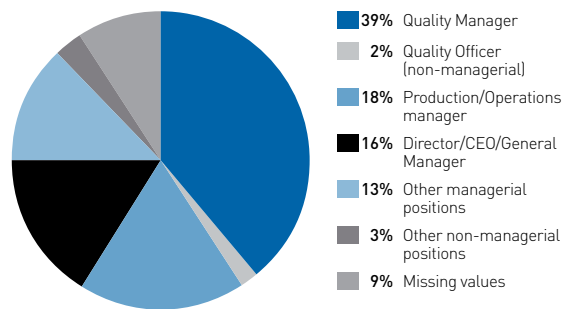
3.3 Company profiles

This section presents details of the sample used in the study including the number of companies surveyed, the industry sectors sampled, as well as the size, age, sales revenue and strategic position of the respondent companies.

3.3.1 Sample size

In total, 326 questionnaires were returned, which constitutes a 25.2% response rate. All respondents to the questionnaire were requested to be managers within the company who had knowledge and responsibility for the implementation and maintenance of the company's quality system. Figure 1 presents the positions of these respondents. The majority of respondents are quality managers, production/operation managers, directors, CEOs or general managers. This creates an appropriate sample for the objectives/requirements of the study.

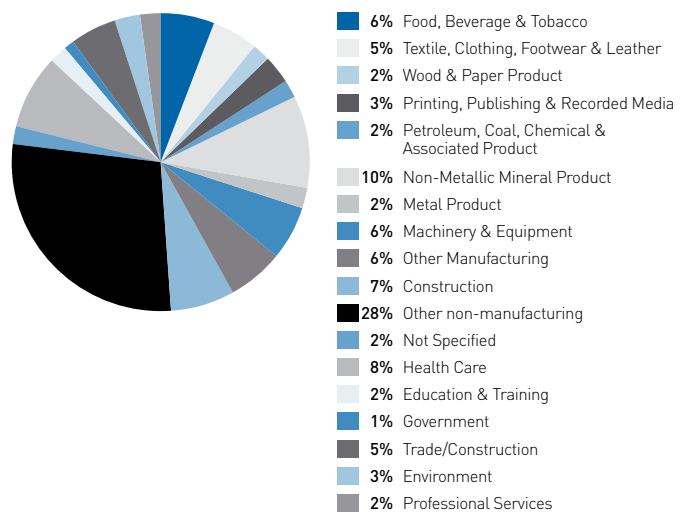
FIGURE 1 SAMPLE BREAKDOWN IN TERMS OF RESPONDENTS' POSITION WITHIN THE COMPANY (N=326)



3.3.2 Industry sectors

As shown in Figure 2, the sample represents a number of industry sectors. Manufacturing and non-manufacturing sectors each account for approximately 50% of the sample. The manufacturing category captures most sectors under the ANZIC code, including food, textile, wood, printing, mineral, metal, and machinery. The non-manufacturing category includes health care and community services, education and training, professional services, environment, government and trade and construction.

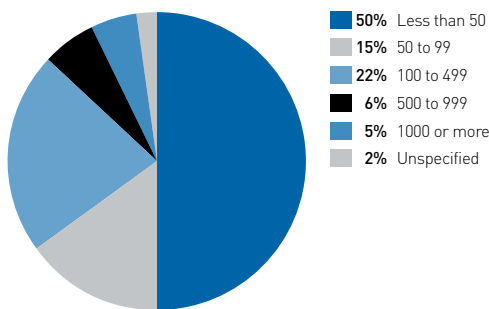
FIGURE 2 INDUSTRY SECTORS (N=326)



3.3.3 Organisational Size

Eighty-seven percent of the sample consists of small to medium enterprises (SMEs). Of these SMEs, 50% employ less than 50 workers, 15% employ between 50 and 99 workers and 22% employ between 100 and 499 workers. Of the remaining 13% of the sample, 6% employ 500-999 workers, 5% employ more than 1000 workers and 2% have not specified the number of employees (see Figure 3).

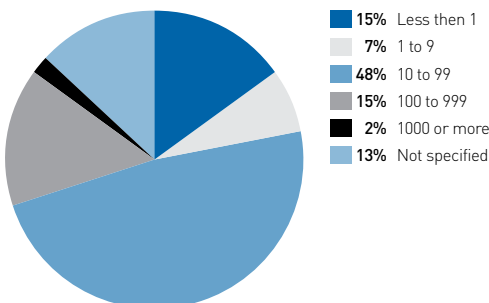
FIGURE 3 ORGANISATIONAL SIZE (N=326)



3.3.4 2004/05 Sales Revenue

Figure 4 presents the sales revenue of surveyed companies for the 2004/05 financial year. Almost half of the sample report being in \$10-99 million dollar range (the median category). Of the other 50%, 15% produced less than \$1 million, 7% produced between \$1 and \$9 million, 15% produced between \$100 and \$999 million and 2% produced more than \$1000 Million in sales revenue. These figures are comparable to the size of the included organisations (Figure 3).

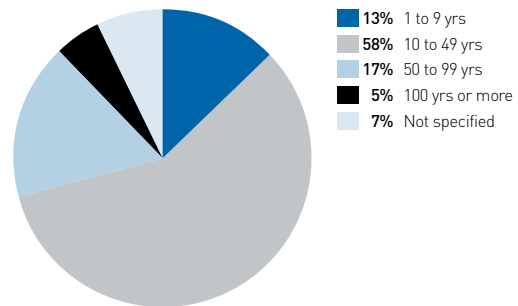
FIGURE 4 2004/2005 SALES REVENUE (IN MILLIONS) (N=326)



3.3.5 Company's age

Figure 5 categorically presents the age of sampled companies. A high proportion of companies are well-established, age-wise, falling into the 10-49 years category (58%). The sample also consists of older and quite new companies, with 17% and 13% represented respectively. The mean age of sampled companies is 31.6 years.

FIGURE 5 COMPANY'S AGE (N=326)



4. KEY FINDINGS

The following section presents the results of the current study. All results are presented graphically and each graph depicts mean scores. For the majority of analyses, the sample has been split into two groups. This allows a comparison to be made between businesses that were first certified before 2000 (ISO 9001:1994) and businesses first certified after 2000 (ISO 9001:2000).

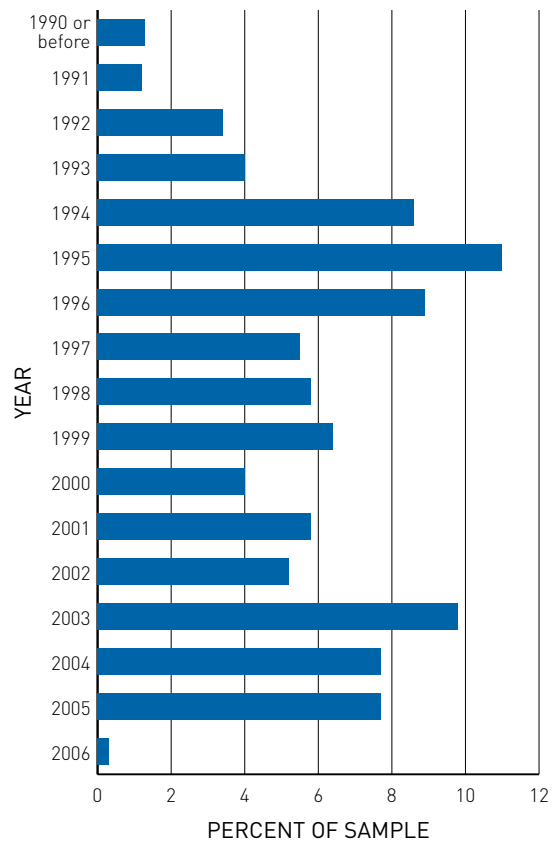
4.1 Number of firms first certified to ISO 9001:1994 and ISO 9001:2000

Out of 326 respondents, 219 firms were first certified to ISO 9001:1994 and 107 were first certified to ISO 9001:2000. Of the former group, 26 firms were first certified to ISO 9001:1994 after the year 2000. This may be due to firms having been given a leeway to keep the certification of the 1994 version until the three-year transitional period passed, which was on December 2003.

4.2 Year of ISO 9001 Certification

The peak periods of certification are presented in Figure 6. As shown, the first peak occurred in the mid 1990s. A second peak occurred around the year 2003, most probably as a result of the standard's 2000 revision. It is interesting to note that, despite a large number of arguments against using ISO 9001 (Terziovski, Samson, & Dow, 1995), the international standards' popularity has not waned dramatically.

FIGURE 6 YEAR COMPANY WAS FIRST CERTIFIED TO ISO 9001/2/3 (N=326)

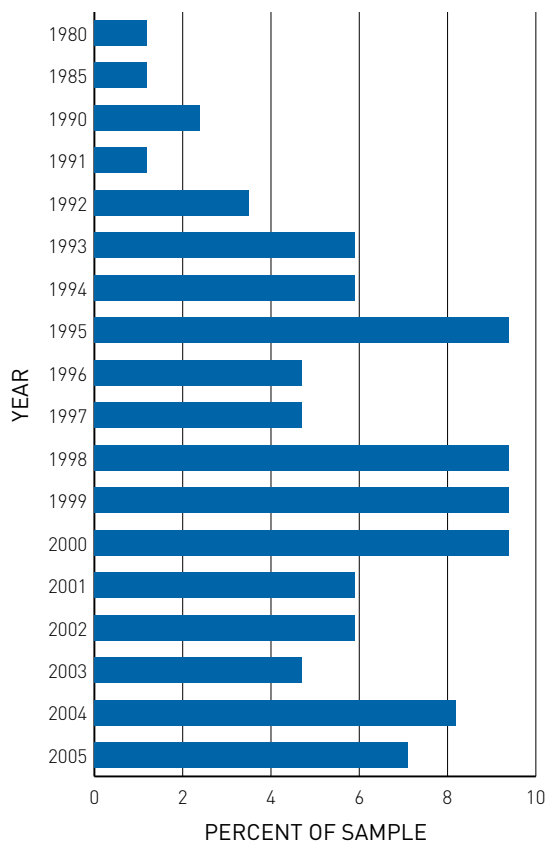


4.3 Year of TQM/CI/Six Sigma Implementation

The awareness of a company on the importance of quality has been reflected not only in adopting ISO 9001, but also in establishing quality improvement programs such as Total Quality Management (TQM), Continuous Improvement (CI), and, more recently, Six Sigma.

Around 25% of the current sample (89 companies) reported having such programs. As displayed in Figure 7, the peak period for implementing these programs ran from the mid 1990s to early 2000. Despite several arguments claiming that TQM or CI is declining in popularity (Adam, 1994, Rahman, 2004), the current results indicate that these programs are still being adopted. This may be due to the recent popularity of Six Sigma and lean Sigma initiatives.

FIGURE 7 YEAR COMPANY FIRST IMPLEMENTED TQM, CI AND/OR SIX SIGMA (N=89)



4.4 Reasons for implementing ISO 9001

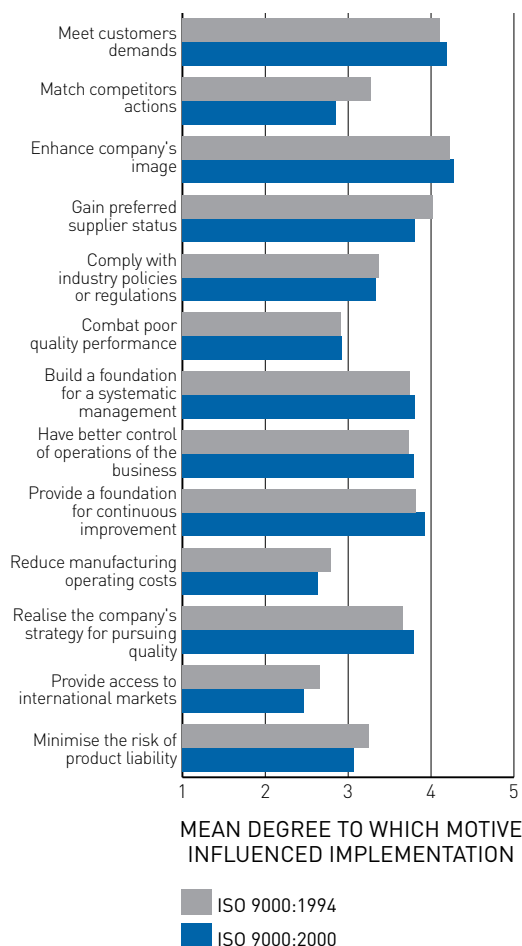
Respondents were asked to indicate their reasons for first seeking ISO 9001 certification. Each participant was provided with 13 implementation motivations and asked to rate their strength of agreement along a five-point scale, where 1= 'strongly disagree', 3= 'neutral' and 5= 'strongly agree'. Mean responses to each statement are shown in Figure 8.

ISO 9001 literature has distinguished between two major motivations for seeking ISO 9001 certification, that is, those that are internally-oriented (i.e. derived from the desire to see the company benefit internally via the improvement of services etc.) and those that are externally-oriented (i.e. derived from the desire to benefit externally via increased revenue etc.). Thus, the items included to assess this dimension of quality management tapped both internal and external orientations.

As indicated in Figure 8, the top three reasons for implementation are externally-oriented. These reasons are, to enhance company image, meet customer demands, and gain preferred supplier status. The top three internal reasons for

achieving ISO 9001 certification show a close connection to each other; by implementing ISO 9001, companies hope to establish better control over business operations and provide a foundation for continuous improvement.

FIGURE 8 PRIMARY MOTIVES FOR IMPLEMENTING ISO 9001



The minor differences between the two ISO 9001 groups' motivations are noteworthy. In particular, the strong external reasons among companies who were certified to ISO 9001:2000 seem to contradict the idea that quality systems no longer have external value, with most of the competitors requiring ISO 9001 registration already certified (Casadesús & Karapetrovic, 2005). On the other hand, the results strongly indicate that customers still demand firms to be certified to ISO 9001. This has been noted in the recent literature (Williams, 2004).

4.5 Approaches to ISO 9001 Implementation

How a company implements ISO 9001 has been noted as a critical factor in predicting whether a company will or will not benefit from the process (Hughes, Williams, & Ryall, 2000). Several key practices in implementing ISO 9001 are presented in Figure 9. Respondents were asked to record the degree to which these practices were involved in their company's implementation process. A score of one indicated strong disagreement (the practice was not involved in the process), three indicated neutrality and five indicated strong agreement.

As evident in Figure 9, there are no differences between the groups. The only exceptions to this relate to the practice of assigning particular staff members to manage the firms' quality system and engaging consultants during the implementation process. Both of these practices were more common in the ISO 9001:2000 group.

Assigning a special project team to implement the standard, appointing particular staff to manage the quality system, and training employees on the concepts of quality and quality systems show the highest relative scores. This indicates that human factors received the highest attention in the implementation process. Surprisingly, the leadership role of senior management scores just below the mid-point (i.e. 3) despite strong assertions of its importance (Jabnoun & Al-Ghasyah, 2005). Availability of the necessary resources seems to be an additional problem, but more so for the ISO 9001:2000 group. Taken together, these

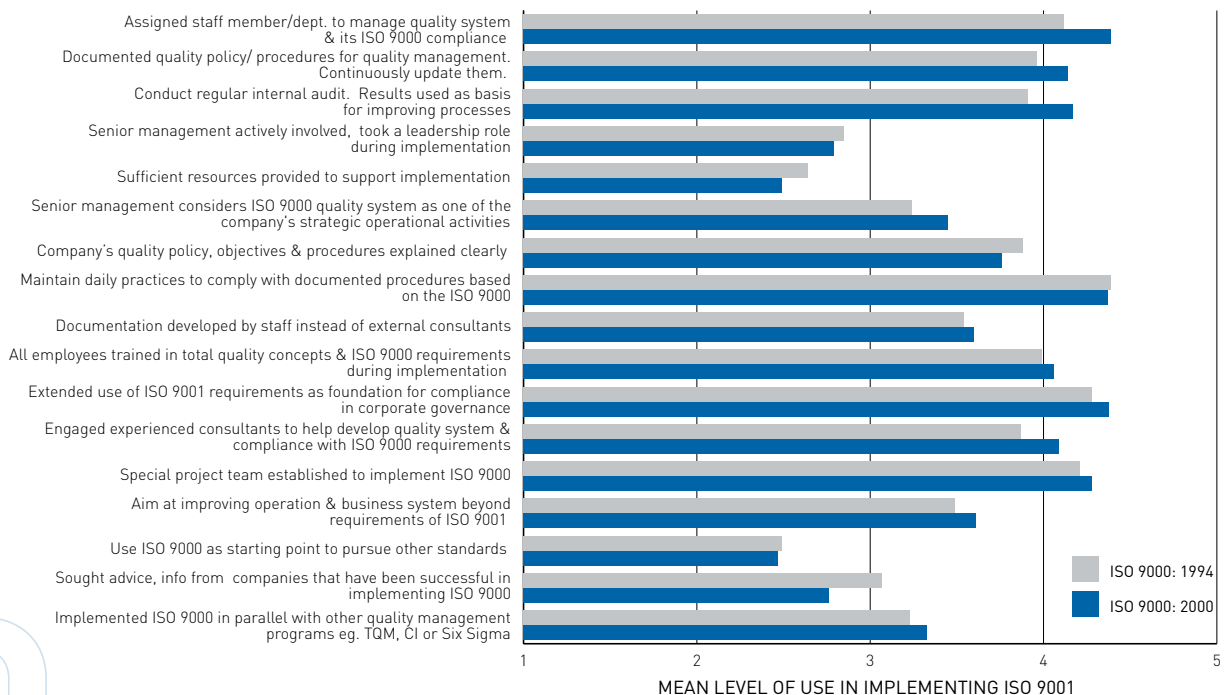
results reflect the difficulties experienced by firms in winning senior management's commitment to quality management beyond assigning particular staff to oversee quality systems. It seems that senior management does not perceive a need to get involved in the process.

Overall, these findings indicate that ISO 9001 is still seen as a 'stand alone' element rather than an integral part of the daily operating system. This trend does not seem likely to change with time, given the lack of difference between the 1994 and 2000 groups in almost all implementation practices.

In conjunction with this, it appears that companies do not intend to go beyond implementing the basic requirements of ISO 9001. Pursuing business excellence and implementing complementary programs such as TQM, CI, and Six Sigma only receive moderate attention. Additionally, using ISO 9001 as a starting point to pursue other standards (most notably, ISO 14001 and OHSAS 18001) receives only low attention. This is particularly interesting given that one of the aims of the 2000 version is to allow firms to integrate ISO 9001 and ISO 14001 (Matias and Coelho, 2002).

The integrated quality-environmental system can bring a number of benefits, including cost reduction as a result of improvement in data management (i.e. simplification and rationalisation of records) and personnel management (e.g. training), homogeneity in management methodologies, a decrease in the bulk of company papers and the creation of common forms that can be more easily used by employees (Renzi & Cappelli, 2000). These findings indicate a low awareness of this issue among the respondents.

FIGURE 9 APPROACHES TO IMPLEMENTING ISO 9001



4.6 Time taken by companies to attain ISO 9001 certification

Respondents were asked to provide an approximation of the time taken by their company to implement ISO 9001 requirements until attaining certification (in months). As shown in Table 1, it took companies less time to implement the 2000 version than to implement the 1994 version (average of 2 months difference).

TABLE 1 TIME TAKEN TO ACHIEVE ISO 9001 CERTIFICATION

	ISO 9001:1994		ISO 9001:2000	
	Mean	Range	Mean	Range
Time for achieving ISO 9001 certification (in months)	10.26	1 - 36	8.15	2 - 24

Intuitively, this may suggest that the new version is simpler to implement. This was intended by the new version. The more integrated elements of the standard should lead firms to address the requirements in a more efficient way, which would save significant amounts of time. There are two additional reasons that may explain the result. The first is the maturity of knowledge on strategic implementation approaches of the standard through the publication, and ready availability, of books or tool kits. The second and more commonsense reason relates to the benefit of past experience. Users of the 2000 version who have already been certified to the 1994 version are likely to have taken less time to implement the 2000 version due to their having had more time to familiarise themselves with the standard.

4.7 Impact of ISO 9001

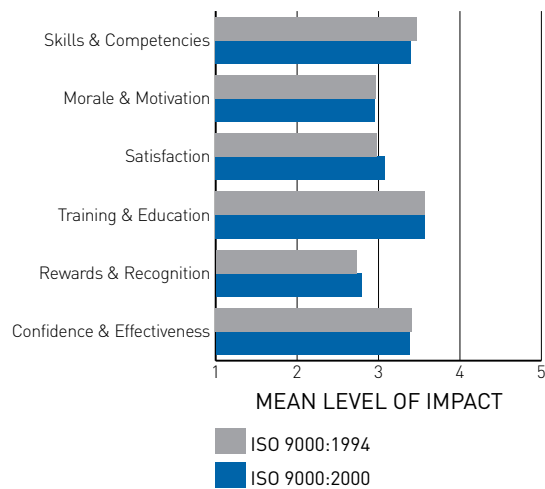
This section assessed the extent to which implementation of ISO 9001 impacted eight key company areas. These were people management, process management, customer relations, supplier management, purchasing and logistics, product management, information and knowledge management and organisational strategy and culture. Respondents recorded the degree to which the quality system affected a number of key elements within each area. For example, within the area of people management, participants responded to statements relating to employee skills and competencies, morale and motivation etc. The degree of impact was measured along a five-point scale, where 1 = 'Not at all', 3 = 'To some extent' and 5 = 'To a very large extent'.

4.7.1 People Management

As illustrated in Figure 10, implementation has benefited people management to a moderate extent. Mean scores indicate that implementation has been most useful by providing a foundation for employee training and education, as well as enhancing employees' job-related skills, competencies, confidence and effectiveness. These three areas are expected to benefit from ISO 9001 implementation. The standard requires firms to ensure they have sufficient resources, including human resources, to perform the processes. Most commonly, this is achieved via training which, in turn, increases employees' skills and competencies. The structured documentation of procedures is expected to positively impact on employees' confidence and effectiveness in performing their tasks. This chain reaction then affects job satisfaction as well as morale and motivation within the workplace.

The area perceived to be least affected by ISO 9001 is rewards and recognition. This result is not surprising given that this is not specifically addressed by the standard. No differences exist between the two groups.

FIGURE 10 IMPACT OF ISO 9001 IMPLEMENTATION ON PEOPLE MANAGEMENT



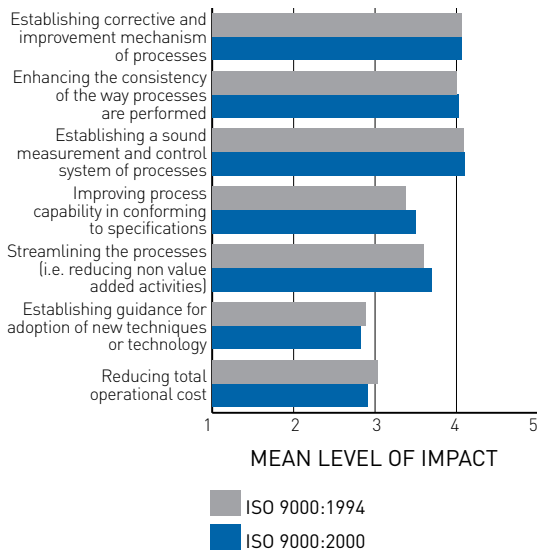
4.7.2 Process Management

ISO 9001 implementation has made quite a large impact in the area of process management, particularly in regards to process consistency, control and measurement. As shown in Figure 11, the last three items were endorsed most strongly, showing greatest benefit in these areas. Documentation of procedures is expected to provide firms with control systems and consistency in performing processes. Interestingly, there is a gap between consistency of processes and process capability in conforming to specification. These findings are important in the context of

statistical process control (SPC) as they suggest that, while ISO 9001 does reduce variability of processes, it does not necessarily improve process capability. The impact of ISO 9001 on the corrective mechanism of processes is expected as it is a primary requirement of the standard.

Streamlining processes is also improved by ISO 9001. This could be a result of knowledge acquired by firms whilst documenting their processes. Therefore, it is important not to simply 'document what you practise', but also to assess the value of each activity incorporated in the process. This learning effect, however, does not translate into operation cost reductions. Again, there are no differences between the two groups.

FIGURE 11 IMPACT OF ISO 9001 IMPLEMENTATION ON PROCESS MANAGEMENT

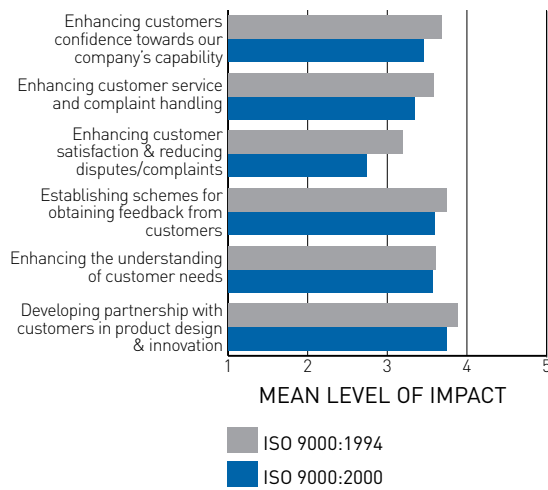


4.7.3 Customer Relationships Management

As presented in Figure 12, ISO 9001 was also of benefit to customer relations, with all means greater than three.

ISO 9001 most benefited this area by improving partnerships with customers in product design/innovation, helping companies to better understand customers' needs, and increasing feedback from customers. The only area that did differ as a function of the ISO 9001 version used was related to customer satisfaction, disputes and complaints. The 1994 group show more agreement with this statement.

FIGURE 12 IMPACT OF ISO 9001 IMPLEMENTATION ON CUSTOMER RELATIONSHIPS

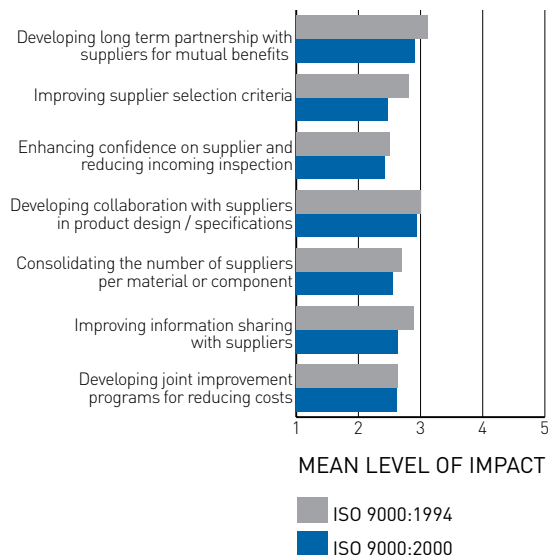


4.7.4 Supplier Management

ISO 9001 made the least impact on supplier management. The areas most benefited within this area are supplier-business relationships, namely collaboration efforts between company and supplier in relation to product designs and development of long-term, mutually-beneficial partnerships with suppliers. That said, these elements barely reach the mid-point score, indicating relatively low impact in comparison to the other seven areas.

Despite the efforts required of firms to ensure the quality of products provided by suppliers, ISO 9001 does not seem to have brought more confidence on suppliers. This result also seems to contradict the suggestion that ISO 9001 will influence supplier selection, by companies demanding their suppliers to also be certified to ISO 9001.

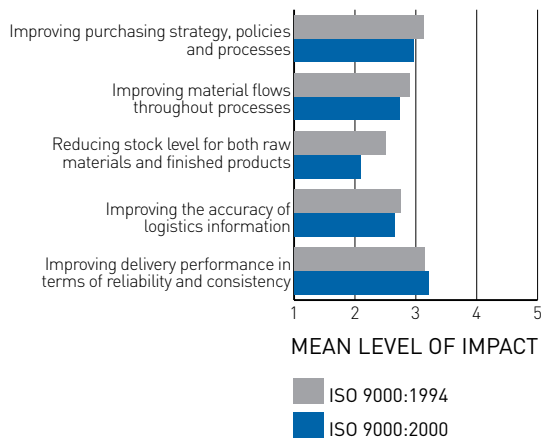
FIGURE 13 IMPACT OF ISO IMPLEMENTATION ON SUPPLIER MANAGEMENT



4.7.5 Purchasing and Logistics

Logistics is not strongly targeted by ISO 9001 requirements. Therefore, any impact on this area is considered as unintentional or indirect. As presented in Figure 14, the areas most impacted in relation to purchasing and logistics are delivery performance and purchasing strategy, policies and processes. The first is impacted by the requirements of ISO 9001 on supplier selection, whilst the latter is affected by the contract binding with customers. Other than these two areas, which are the only two that score above three, purchasing and logistics has not benefited greatly from implementation.

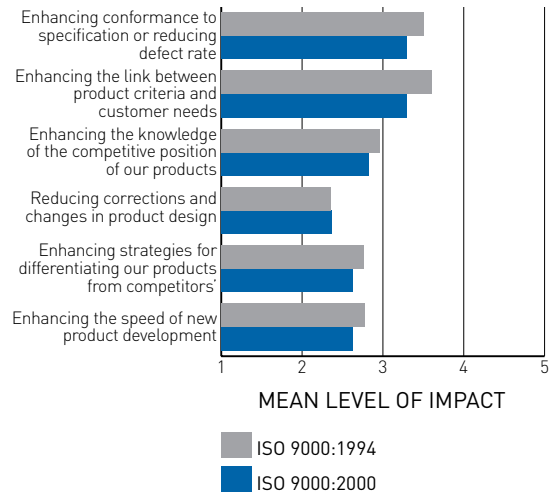
FIGURE 14 IMPACT OF ISO IMPLEMENTATION ON PURCHASING AND LOGISTICS



4.7.6 Product Management

As evidenced in Figure 15, product management also failed to benefit greatly from implementation. Enhancing conformance to specification and the link between product criteria and customer needs show the most impact, the only areas to score above three. These results accord with the aim of ISO 9001 to deliver products that meet customers' needs and specifications. Reduction in corrections and changes in product design are the areas least impacted by ISO 9001. This, however, could suggest that the complexity of products designed by firms is relatively low, particularly among service firms. The other strategic aspects of product management are not significantly impacted by ISO 9001.

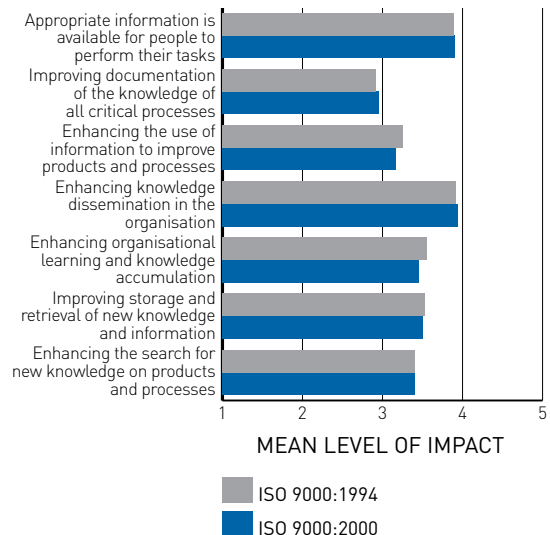
FIGURE 15 IMPACT OF ISO IMPLEMENTATION ON PRODUCT MANAGEMENT



4.7.7 Information and Knowledge Management

In terms of information and knowledge management, ISO 9001 implementation seems to be of much benefit, with all but one of the areas showing scores above three. Knowledge dissemination and availability of necessary information needed for staff to complete tasks are aspects particularly enhanced by the quality system. No differences are evident between groups, indicating that both ISO 9001 versions led to improvements in this area.

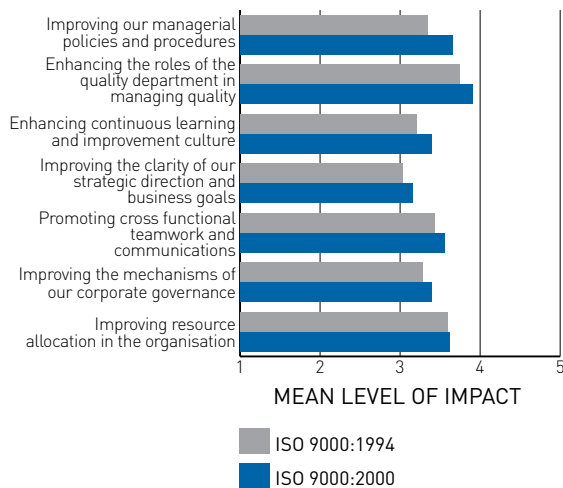
FIGURE 16 IMPACT OF ISO IMPLEMENTATION ON INFORMATION AND KNOWLEDGE MANAGEMENT



4.7.8 Organisational Strategy and Culture

As is presented in Figure 17, ISO 9001 impacted organisational strategy and culture to a significant extent, with all elements scoring above 3. The area most benefited is the increased role of quality departments. Whilst this appears to be positive, it also confirms the findings noted in section 4.5 that firms tend to treat their quality system as a stand alone program rather than part of an integrated business system. The impact of ISO 9001 on improving managerial policies and procedures is also expected since they are an important part of the standard's requirements. The fact that the remaining aspects of strategy and culture also lie above the mid-point is encouraging.

FIGURE 17 IMPACT OF ISO IMPLEMENTATION ON ORGANISATIONAL STRATEGY AND CULTURE



4.8 Impact of ISO 9001 Implementation on Organisational Performance

Organisational performance comprises six operational indicators (product, brand, innovation, cost, price, delivery), and three financial indicators (sales, profit, and market share). Firms were asked the extent to which implementation of ISO 9001 had affected each of these areas, where 1 = 'Not at all', 3 = 'To some extent' and 5 = 'To a very large extent'. In general, the operational indicators show relatively greater scores than the financial indicators. These results are expected since ISO 9001 should affect operational areas which are under the firms' control rather than wider business areas. Comparing the relative scores between the 1994 and 2000 versions, it is interesting to see declining trends. At a glance, these results may suggest that the 1994 version yielded relatively more benefits than did the 2000 version. However, given that all firms have now been

converted to ISO 9001:2000 in the last three years, we are more inclined to attribute the results to the lagging effect of ISO 9001 implementation on organisational practices and performance. Therefore, early adopters (in this case the adopters of 1994 version) will enjoy relatively larger benefits from the standard than the later adopters.

FIGURE 18 IMPACT OF ISO 9001 ON PERFORMANCE

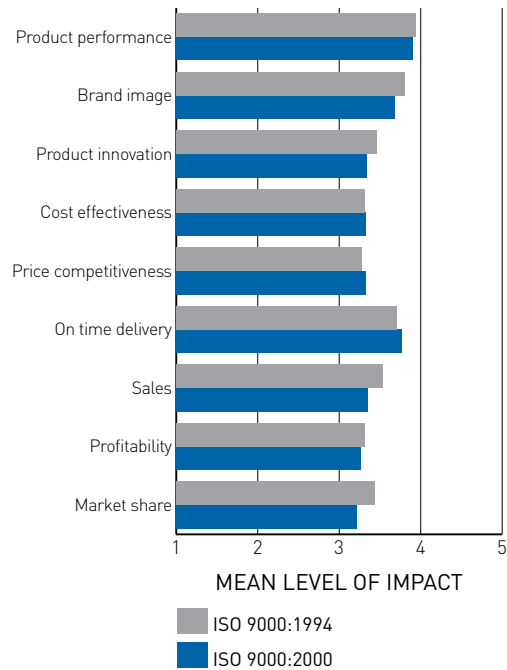


Figure 18 presents the impact of ISO 9001 on nine key elements of organisational performance. These are market share, profitability, sales, on time delivery, price competitiveness, cost effectiveness, product innovation, brand image and product performance. Considerable impact was made in a large majority of areas, particularly in relation to on-time delivery, brand image and product performance. The finding that the quality management system is so useful in terms of improving both business and competitive performance supports its still common use.

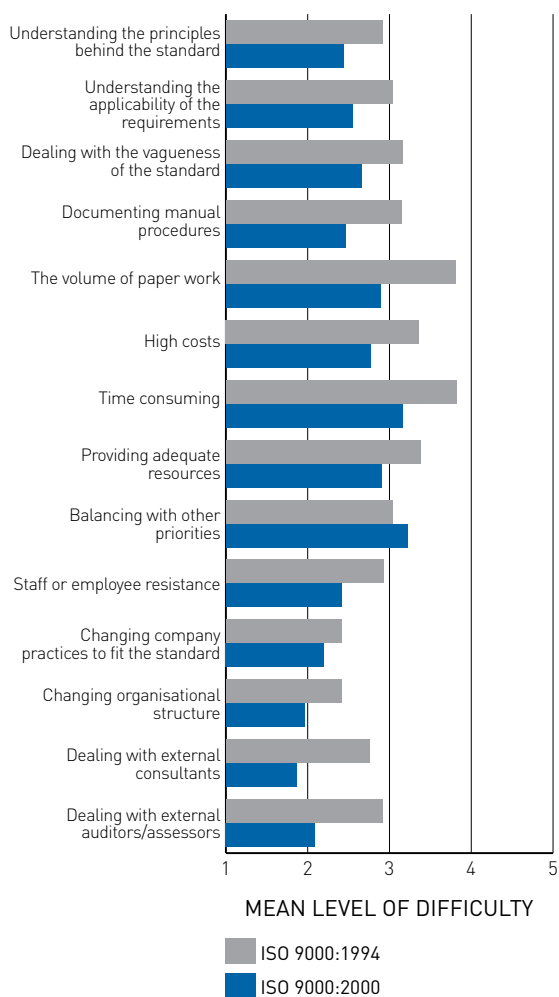
4.9 The Difficulties in Implementing ISO 9001

One of the prime areas of potential improvement by the ISO 9001:2000 is in regards to the difficulties encountered by firms in implementing the system. To assess this aspect, respondents were asked to rate the level of difficulty experienced in relation to 14 implementation elements. For example, understanding the principles behind the standard, resistance by staff, high costs etc. Again, responses were

recorded on a five-point scale, where one indicated minimal difficulties, three indicated moderate difficulties and five indicated major difficulties.

As presented in Figure 19, there were considerable differences between the 1994 and 2000 versions. The top four implementation difficulties for ISO 9001:1994 related to the considerable time and money expenditures involved in obtaining certification, the large volume of paper work involved and the trouble of providing adequate resources. Although the difficulties mentioned in relation to the 2000 version are somewhat similar, the troubles relating to high costs and volumes of paper work are notably reduced. Instead, balancing other priorities with implementation demands is noted as the greatest difficulty. Overall, it is apparent that the 2000 version was associated with substantially fewer difficulties for users.

FIGURE 19 DIFFICULTIES IN IMPLEMENTING ISO 9001



As this section showed the greatest degree of difference between the two groups, it was the only one to warrant further examination in the form of significance testing. These analyses

focused on three potential differences. First, the differences of difficulties between the two versions of ISO 9001 were examined, using a sub-sample of companies that had experienced both. Second, the differences in difficulties between the two versions of ISO 9001 were examined by comparing the perspectives of the companies which were certified to the 1994 version and those who were certified only to the 2000 version. Third, the difficulties in implementing the 2000 version were examined by comparing the perspectives of the companies which were initially certified to the 1994 version before converting to the 2000 version and those who were first certified to (and thus had only experienced) the 2000 version.

As shown in Table 2, companies who were certified to both versions experienced significantly less difficulties with the 2000 version compared to the 1994 version. This result is important as it meets the intention of the ISO 9001 revision; that is to simplify its implementation. Comparing the experiences of companies which were initially certified to the 1994 version and those which were initially certified to the 2000 version, the results indicate that the implementation of the 2000 version brought significantly less difficulties to firms compared to the 1994 version. This result is also important as it suggests the 2000 version, in itself, is easier to implement than the 1994 version.

With regards to the implementation of the 2000 version, companies which had been certified to the 1994 version experienced less difficulties compared to those who were first certified to the 2000 version. This suggests the importance of learning from experience in regards to ISO 9001 implementation.

4.10 Transition to ISO 9001:2000

Seven potential areas of difficulty in transitioning from ISO 9001:1994 to ISO 9001:2000 are listed in Figure 20. Only a subset of participants (n=219) responded to this section as not all of the surveyed companies had been certified to both the 1994 and 2000 versions of the quality standard. Those that had been certified before the year 2000 were asked to rate the degree to which they experienced transition difficulty in each area. A score of one indicated minimal difficulty, three indicated moderate difficulty and five indicated major difficulty.

Overall, results indicate that there were no major problems in the transition process, with none of the areas showing a mean score above 2.5 (out of a possible 5). Revising documents had the highest score, this being quite understandable given that ISO 9001 is document-based. The low endorsement of the additional burden of paper work item is associated with

TABLE 2 DIFFICULTIES IN IMPLEMENTATION OF ISO 9001

Difficulties in implementing ISO 9001	ISO 9001:1994	ISO 9001:2000 a)	ISO 9001:2000 only b)	Δ Mean
Understanding the principles behind the standard	2.93	2.40	2.51	1-2** 1-3**
Understanding the applicability of the requirements	3.05	2.48	2.67	1-2** 1-3**
Dealing with the vagueness of the standard	3.17	2.56	2.84	1-2** 1-3* 2-3*
Documenting manual procedures	3.16	2.35	2.68	1-2** 2-3*
The volume of paper work	3.81	2.80	3.08	1-2** 1-3**
High costs	3.38	2.67	2.95	1-2** 1-3**
Time consuming	3.84	3.02	3.44	1-2** 2-3**
Providing adequate resources	3.40	2.80	3.06	1-2** 1-3*
Balancing with other priorities	3.62	3.12	3.40	1-2**
Staff or employee resistance	3.04	2.30	2.60	1-2** 1-3**
Changing company practices to fit the standard	2.94	2.16	2.26	1-2** 1-3**
Changing organisational structure	2.41	1.93	2.00	1-2** 1-3**
Dealing with external consultants	2.41	1.79	1.96	1-2** 1-3**
Dealing with external auditors/ assessors	2.76	2.09	2.05	1-2** 1-3**

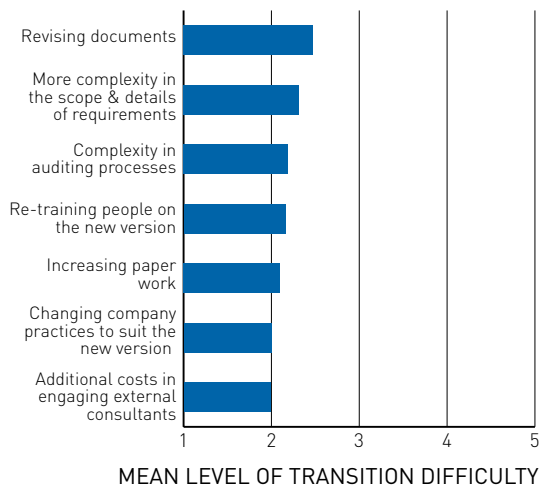
a) These firms were initially certified to 1994 version before being converted to 2000 version

b) These firms were certified to 2000 version from the beginning

* p<.05, ** p<0.01

changing company practices and re-training people. This is confirmed by the low scores of additional costs in engaging consultants and the complexity of auditing processes, confirming the findings of previous studies (eg. Liebesman & Mroz, 2002).

FIGURE 20 PROBLEMS TRANSITIONING FROM ISO 9001/2/3 TO ISO 9001:2000



5. CONCLUSIONS

This study found no significant differences between the 1994 and 2000 versions of ISO 9001 in terms of their users' implementation motivations and approaches, areas of impact and perceived benefits. The only area that did show a difference was implementation difficulties, with ISO 9001:2000 being significantly easier to implement. Overall, the current results validate the 2000 revision of ISO 9001, indicating that, as hoped, the quality standard has been greatly improved in terms of its ease of implementation and simplicity, whilst maintaining high levels of impact in all business areas.

The data also highlights a number of additional notable factors. These included the strong influence of externally oriented motivations in the pursuit of ISO 9001 certification, the difficulties in winning top management support and involvement in the certification process and the 'stand alone' rather than integrated approach taken to quality management. Taken together, these factors suggest that companies have not yet gone beyond a minimalist approach to ISO 9001 implementation (Brown & Van der Wiele, 1996). This trend may well be preventing Australian companies from reaping the optimal benefits of ISO 9001 implementation.

6. REFERENCES

- Adam, E. E. 1994. Alternative quality improvement practices and organization performance. *Journal of Operations Management*, 12(1): 27-44.
- Brown, A. & T. Van der Wiele. 1996. A typology of approaches to ISO certification and TQM. *Australian Journal of Management*, 21(1): 51-73.
- Casadesús, M. & S. Karapetrovic. 2005. The erosion of ISO 9001 benefits: a temporal study. *International Journal of Quality & Reliability Management*, 22(2): 120-36.
- Hoyle, D. 2000. *ISO 9001 quality systems handbook - ISO 9001: 2000 version*. 4 ed. Oxford: Butterworth-Heinemann.
- Hughes, T., T. Williams, & P. Ryall. 2000. It is not what you achieve it is the way you achieve it. *Total Quality Management*, 11(3): 329-40.
- ISO. 2000. *International Standards Organisation ISO 9001- Quality Management Systems Standards*. Geneva: ISO Publications.
- Jabnoun, N. & H. A. Al-Ghasyah. 2005. Leadership Styles Supporting ISO 9001:2000. *Quality Management Journal*, 12(1): 21-29.
- Lee, K S. & E. Palmer. 1999. An empirical examination of ISO 9001-registered companies in New Zealand. *Total Quality Management*, 10(6): 887-99.
- Liebesman, S. & J. Mroz. 2002. ISO 9001:2000 experiences: first results are in. *Quality Progress*, 35(4): 52-59.
- Matias, J. C. & D. A. Coelho. 2002. The integration of the standards systems of quality management, environmental management and occupational health and safety management. *International Journal of Production Research*, 40(15): 3857-66.
- Rahman, S. 2004. The future of TQM is past. Can TQM be resurrected? *Total Quality Management & Business Excellence*, 15(4): 411-22.
- Renzi, M. F. & L. Cappelli. 2000. Integration between ISO 9001 and ISO 14000: opportunities and limits. *Total Quality Management*, 11(4/5/6): S849-56.
- Terziovski, M., D. Samson, & D. Dow. 1997. The business value of quality management systems certification: Evidence from Australia and New Zealand. *Journal of Operations Management*, 15: 1-18.
- Terziovski, M., D. Samson, & D. Dow. 1995. The impact of ISO 9001 certification on customer satisfaction. *Asia Pacific Journal of Quality Management*, 4(2): 66-68.
- West, J. E. 2002. Should you transition to ISO 9001:2000? *Quality Progress*, 35(9): 58-60.
- Williams, J. A. 2004. The impact of motivating factors on implementation of ISO 9001: 2000 registration process. *Management Research News*, 27(1): 74-84.

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