Improvement in Management Reporting of ISO9000 Companies and Its Relationship With Performance

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Abstract

In the last two decades, there have been an increasing number of organizations obtaining accreditation from the International Organization for Standardization (ISO). ISO 9000 was created to assist organizations worldwide in their pursuit for quality management practices. There have been numerous debates on whether the benefits of ISO certification outweigh its costs. A review of past literature on ISO 9000 reveals vague, mixed and inconclusive results of the relationship between ISO certification and performance, both financial and non-financial. This study investigates the relationship between improvement in management reporting and business performance among ISO 9000 companies in Malaysia. A personally administered questionnaire survey was conducted to collect data from randomly selected ISO certified firms listed in the SIRIM Directory of Certified Products and Companies. The survey results revealed significant relationships between management reporting and performance, consistent with the predictions about the hypothesized relationships between management reporting and performance. The results suggest that improved management reporting in ISO companies is significantly related to overall performance as well as to each component of performance, namely product quality, customer satisfaction and profitability.

Keywords: Management reporting, ISO9000, Performance

1 Introduction

In 1987, the International Organization for Standardization in Geneva created the ISO 9000 series of international standards to govern quality assurance with the objective of standardizing quality management systems. The underlying principle of ISO 9000 is the provision of minimum international standards for quality management systems that can be universally adopted by organizations worldwide. It is a framework specifying a systematic approach on how to manage the process of producing goods and services that conforms to the requirements of quality. In order to attain and maintain ISO 9000 certification, organizations must consistently deliver the procedures and document the practices that affect the quality of their products and services in accordance to the guidelines of a quality management system provided by the standard. The focus of ISO 9000 is on management processes that affect quality rather than on quality standards relating to products and services (Stein & Hitchcock, 1997). Since ISO 9000 focuses on the process of attaining the minimum international standards of

quality, it is a form of management control procedure (Abraham, Crawford, Carter, & Mazotta, 2000; Magd & Curry, 2003).

The original ISO 9000 specifies the quality management and assurance standards for selection and use by organizations. On 15 Dec 2000, the ISO 9000:2000 standards were revised to encompass the "quality management system fundamentals and vocabulary" which define the terminology and the standards using a more simple process-based structure (Magd & Curry, 2003; Stevenson & Barnes, 2002). The revised standard emphasizes on management responsibility, resource management, product realization and measurement, analysis and improvement (Magd & Curry, 2003). ISO 9000 standards allow organizations to attain and maintain certain quality standards by following specific well-documented procedures in the making of their products and services (Singles *et al.,* 2001). Thus, it could be argued that ISO certification could give certain benefits for organizations.

Brooks (1995) and Singles *et al.* (2001) classified the benefits of ISO certification into two categories: internal and external. Internal benefits are benefits concerning the internal functioning of organizations which are related to the processes and structure of the organization while external benefits are related to the organization in relation to its environment (Singles *et al.,* 2001). Internal benefits include better documentation, increased quality awareness, increased productivity and improvement in efficiency. External benefits are those related to increased competitive advantage, improved sales and market share, and improved customer satisfaction. Since ISO 9000 requires formal documentation of quality procedures and practices, it is expected that the certification will lead to improvement in documentation and information flow within organizations. Better and timely information will assist managers in making better business decisions which in turn will lead to improvement in companies' performance (Gotzamani & Tsiotras, 2001; Skrabec Jr, Ragu-Nathan, Rao, & Bhatt, 1997).

Although ISO 9000 certification was created with the intention to improve performance for organizations worldwide through quality standards, ISO 9000 certification has not been free of criticisms and debate (Terziovski, Samson, & Dow, 1995; Wenmoth & Dobbin, 1994; Zuckerman, 1994). Some of the criticisms, as suggested by Abraham *et al.* (2000), relate to additional costs and time spent for obtaining ISO certification, increase in paper workload, and its disputed effect on product quality, customer satisfaction and overall profitability. For example, ISO 9000 certification process is argued to be non-value added; unable to ensure product quality; driven by documentation and not organizational behavior; hence under-emphasizing improvement. Terziovski *et al.* (1995) argued that ISO 9000 is not positively related to customer satisfaction. Carr *et al.* (1997, p.384) argued that certain companies have not been able to gain benefits from ISO certification because they seek the certification "to satisfy external requirements such as specifications imposed by customers rather than a genuine commitment to quality". Thus, it remains unclear whether companies obtaining ISO certification would gain the internal and external benefits derived from the certification and enjoy improvements in their business performance.

There has been very little empirical research on whether ISO certification in fact leads to improved performance. Empirical studies thus far show mixed results of ISO certification and performance. Moreover, most of the ISO studies to date have been conducted in developed economies while research in emerging markets such as Malaysia is still scarce (Idris *et al.*, 1996; Rahman, 2001; Sharma, 2005). Studying the emerging markets is becoming increasingly vital because of the need to achieve global competitive edge and sustainability. Therefore, the motivation for this research stems from the need to seek clarity on the relationship between

improvement in management reporting amongst ISO certified companies and their performance, within the specific setting of a developing country such as Malaysia. In line with this, the main purpose of this study is to investigate whether management improvement in reporting amongst ISO certified companies is related to performance. In particular, three aspects of performance namely, product quality, customer satisfaction and profitability will be explored.

2 Literature Review and Hypothesis Development

Over the past 2 decades since ISO 9000 was first introduced, there has been a phenomenal growth in the number of companies that have acquired the certification. However, a review of past studies on ISO 9000 to date reveals vague, mixed and inconclusive results of its effectiveness on companies' performance, both financial and non-financial (Magd & Curry, 2003; Martínez-Lorente & Martínez-Costa, 2004; Sharma, 2005; Singh, 2008). Some studies found positive relationship between certification and companies' performance (Abraham et al., 2000; Carr, Mak, & Needham, 1997; Corbett, Montes, Kirsch, & José, 2002; Gupta, 2000; Romano, 2000; Santos & Escanciano, 2002; Singh, 2008; Terziovski, Power, & Sohal, 2003; Withers & Ebrahimpour, 2000) while other reported insignificant relationship to performance of ISO 9000 registered companies (Aarts & Vos, 2001; Lima, Resende, & Hasenclever, 2000; Martínez-Lorente & Martínez-Costa, 2004; Rahman, 2001; Simmons & White, 1999; Singels, Ruel, & van de Water, 2001; Sun, 2000; Terziovski, Samson, & Dow, 1997).

Sharma (2005) suggested that the inconsistent results found in past studies are due to the differences in context and the motivation of organizations pursuing certification of the standards. On the other hand, Singels *et al.* (2001, p. 72) attributed the mixed findings to the "various operationalizations of the variable performance". For example, Jeng (1998) classified performance into six dimensions: leadership, information and analysis, strategic quality planning, human resource development and management, management of process quality, and customer focus and satisfaction. However, Huarng *et al.* (1998) divided performance into four dimensions: quality, cost, sales and internationalization.

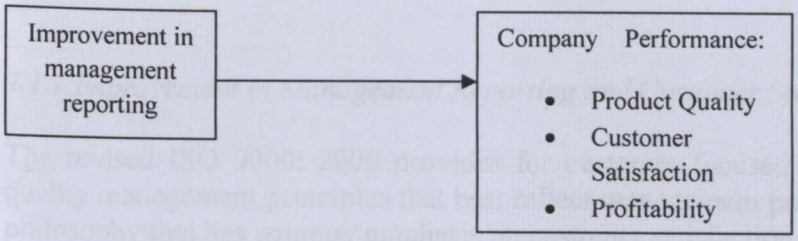
In today's highly competitive business environment, quick and effective business decisions are paramount for survival and sustained performance. Thus, access to better information is invaluable to managers in arriving at these decisions. Since part of internal benefits of ISO 9000 is better documentation (Brooks, 1995), it is expected that improved management reporting will then lead to better flow of information within the ISO 9000 certified companies. Despite the growing number of research on ISO 9000, there is still little evidence on how ISO 9000 related management practices affect business performance (Singh 2008; Naveh & Marcus 2005). The findings of Rao *et al.* (1997) provided some enlightenment where they found that ISO 9000 certified companies exhibit higher levels of quality management practices in strategic quality planning, quality assurance, leadership, customer satisfaction and enjoy better quality results. However, a recent replication of Rao *et al.* 's (1997) study by Quazi *et al.* (2002) on certified companies in Singapore did not demonstrate the same relationship.

In view of the paucity of research that examine the relationship between ISO certification and performance, and the conflicting research findings, Singles *et al.* (2001) emphasized that further empirical research in this area is needed. Thus, the primary objective of this study is to explore possible relationships between improvement in management practices and performance among ISO certified companies. This study specifically investigates how improvement in

management reporting by ISO certified companies affects their performance in three key areas namely product quality, customer satisfaction, and profitability.

The research framework of this study is depicted by Figure 1 below:

Figure 1: Research Framework



2.1 Improvement in Management Reporting and Product Quality

In today's complex global business environment, emphasis on quality products and services to meet the needs and satisfaction of customers becomes inevitable for organization to secure competitive advantage, survive and strive for success. In fact, the focus on quality has progressed beyond the end product to looking at the processes of production throughout the entire company. Anderson *et al.* (1999) reported that companies are highly motivated to seek certification for reasons beyond regulatory or customer requirements. Their analysis showed that companies seek certification as credible public signals of effective quality management practices (Magd &Curry, 2003; Withers & Ebrahimpour, 2000).

Consequently, over the past two decades, an increasing number of organizations have pursued some form of quality-related concepts and initiatives such as TQM, JIT, The Deming Prize and ISO 9000 (Carr *et al.*, 1997; Magd & Curry, 2003; Sun, 2000). Lee and Palmer (1999) found that the most prevalent quality approaches or strategies implemented by companies were TQM and ISO 9000. For some, ISO 9000 have even become a pre-requisite to be a supplier of their industrial client (Martinez-Lorenta and Martinez-Costa, 2004).

Rao *et al.* (1997) viewed ISO 9000 as the basis for quality management practices since it requires implementing a management system that conforms to the standardized procedures and processes that assure consistency in product and service quality. One of the factors that underlie quality management practices in their study is "information and analysis". They advocate that a continuous flow of accurate information about processes that produce a product is needed to uphold quality. Early promoters of the concept of quality such as Crosby, Deeming, Isihikawa and Juran also agree that information from stakeholders of organizations such as employees, customers, suppliers and agents are equally important to improve and maintain product quality (Sharma, 2005). Analysis of such information allows management to make effective decisions in managing quality. According to the study by Rao *et al.* (1997, p.337), "information and analysis is conceptualized in terms of availability of quality-related data, improvement in quality-related data and usage of quality-related data at all levels of the organization". This is further supported

by the findings of Withers and Ebrahimpour (2000) where most American companies were reported to seek certification in order to achieve process improvements and to improve product quality. Thus the "perceived" information gathered through management reporting is hypothesized to have an impact on product quality. This leads to our first hypothesis:

H1: There is a positive relationship between improvement in management reporting and the organization's performance from product quality perspective in ISO certified companies

2.1.1 Improvement in Management Reporting and Customer Satisfaction

The revised ISO 9000: 2000 provides for customer focused organization as one of the eight quality management principles that best reflect management practices. This stems from the TQM philosophy that has stronger emphasis on customer satisfaction. (Magd & Curry 2003). Rao *et al.* (1997, p. 339) suggest that "in a customer-oriented organization, customers define quality and are the final arbiters of quality", thus customer-orientation enables sustainability of competitive advantage. The profitability and survival of companies are also dependent upon their ability to satisfy customers (Carr *et al.* 1997).

Sharma (2005) advocated 2 fundamental theories: "Internal Improvement Theory" and "External Improvement Theory" that could explain the benefits acquired from achieving ISO 9000 certification. He suggests that a company's improvement must not be acknowledged only from inside the organization, but its external business associates should also be able to do so because internal-process improvement could lead to external improvement. Further, ISO certified companies increase the confidence of customers, hence their customer base and market share are likely to increase (Yamada, 2001). Other studies have also concluded that the increase in perceived quality should result in more new customers, increased sales and reduced operating costs (Gotzamani & Tsiotras 2001; Withers & Ebrahimpour, 2000).

According to Rao *et al.* (1997), a customer-oriented organization is viewed in terms of the organization's commitment to satisfy its customers, usage of customers' feedback in new product design, monitoring customer satisfaction, responsiveness to customer complaints and level of interaction with customers. Thus internal management reporting practices could assist companies in identifying the critical indicators of customer satisfaction such as the number and the underlying reasons of customer complaints, response time and the number of repeat or new customers. Consistent and timely reporting could also help management to better serve the needs of customers. This leads to the development of our second hypothesis:

H2: There is a positive relationship between improvement in management reporting and organizational performance from customer satisfaction perspective in ISO companies.

2.1.2 Improvement in Management Reporting and Profitability

The findings of some previous studies suggest that ISO 9000 may have a positive effect on profitability and overall management performance only when there is an internal belief in its derived benefits (Haversjo, 2000; Martínez-Lorente & Martínez-Costa, 2004; McAdam &

McKeown, 1999; Rao, Ragu-Nathan, & Solis, 1997; Simmons & White, 1999). In other words, companies that attain ISO 9000 certification motivated by external reasons such as customer pressures or as a marketing device, but do not believe that the certification will help improve quality and efficiency, are unlikely to improve their performance (Gotzamani & Tsiotras, 2002; Lima et al., 2000; Martínez-Lorente & Martínez-Costa, 2004; Sharma, 2005; Terziovski et al., 1997).

Rao *et al.* (1997) concluded that the effect of good quality management practices is reflected in improved quality levels of internal operations, customer satisfaction, market share and financial performance. Similarly, Sharma (2005) proposes that internal-process improvements could lead to improvements in overall financial performance where ISO certified companies are likely to increase their customer base and market share, which will in turn enhance their sales revenue.

Abraham *et al.* (2000) also found that ISO certified companies in Australia provided little guarantee of high performance outcomes because many became registered simply to gain marketing edge rather than having any intrinsic interest in quality improvement. This is further supported by Sun (2000) who found that ISO 9000 certified companies in Norway performed better in profitability, productivity and had a reduction in customer complaints. But if the certification is obtained for advertisement purposes, the ISO 9000 certification is unlikely to contribute to their business performance.

From the above discussion, the following hypothesis is proposed:

H3: There is a positive relationship between the improvement in management reporting and organization's performance from profitability perspective in ISO companies.

3 Methods

3.1 Sample and Data Collection Procedure

The sample of the study consisted of 200 randomly selected ISO 9000 certified companies obtained from the Standards and Industrial Research Institute of Malaysia (SIRIM) Directory of Certified Products and Companies 2007. The data was collected through a questionnaire survey personally delivered to the selected respondents or delivered through email. The targeted respondents were production managers or senior managers as they are expected to have expert knowledge about ISO implementation, aspects of management reporting and performance in their organizations. The questionnaires were sent with self-addressed envelopes and cover letters explaining the purpose of the survey to targeted respondents. Respondents were given up to two weeks to respond to the questionnaires and follow-up telephone calls were made after that period. Due to time constraint[1], the data collection ceased after four weeks and a total of 64 questionnaires were received. Finally after taking out incomplete questionnaires, a total of 50 useable responses were selected for the final analysis, giving a final response rate of 25%.

[1] This study was an MBA research project which must be completed within 3 months.

3.2 Questionnaire Design and Selections of Measures

The initial draft of the questionnaire was refined following feedback from a pre-test with 4 quality managers and 2 academic staff. The questionnaire consists of three sections. Section A consists of questions related to characteristics of the companies, Section B contains the items on the impact on management reporting and firm performance and Section C is related to the characteristics of the respondents.

The dependent variable, company performance, consists of three components: product quality, customer satisfaction and profitability. There are eight questions regarding the impact of improvement in ISO management reporting on product quality, six questions about the impact on customer satisfaction, and nine questions regarding both the impact on profitability and management performance. The respondents were asked to rate the impact of ISO management reporting on each perspective of performance based on a five points Likert scale ranging from 1 (strong impact) to 5 (no impact). The independent variable, improvement in management reporting, was measured by asking the respondents to indicate their agreement to six statements regarding the improvement in management reporting on a Likert scale of 1 (strongly agree) to 5 (strongly disagree).

4 Results and discussion

4.1 Characteristics of the Companies and Respondents

Table 1 shows the profile of the sample companies and respondents. The companies surveyed came from a wide range of industries, consisting of manufacturing (38%), service (52%) and others (10%). In terms of average gross annual revenue, 30% of the sampled companies had average gross annual revenue of more than RM50 million. In terms of the total number of employees, 16% of the surveyed companies had less than 100 employees, 16% had 101 to 500 employees, 14% had 501 to 1000 employees and 22% had more than 1000 employees.

Among the companies surveyed, a majority (84%) of them had certification for more than 2 years with almost half of them (42%) being certified for more than 5 years and another 42% with more than 2 years of certification, but less than 5 years. The remaining 18% had the ISO certification for less than 2 years. 64% of the companies were locally owned while only 28% of the surveyed companies were multinational companies with more than 50% ownership status, while only 8% were joint ventures.

The biggest group of the respondents (40%) were from the production department, 22% from the accounting and finance function, 18% from the sales and marketing function while the remaining 20% were from other departments. Most of the respondents (68%) had more than 2 years of working experience in their current position, of which 40% had been in their current position for more than 5 years and 28% had between 2 to 5 years of working experience. The remaining 32% of the respondents were relatively new with less than 2 years in their current position. Thus, it can be implied that a majority of them (68%) had been in their companies

sufficiently long to be considered as suitable respondents as they had sufficient expert knowledge about their companies' activities including ISO reporting requirements, management reporting and the various aspects of quality performance.

Table 1: Profile of Companies and Respondents

Profile of Companies	Frequency	Percentage (%)	Profile of Respondents	Frequency	Percentage (%)
Type of Industry:			**Managers' Job Position:**		
Manufacturing	19	38	Accounting and Finance	11	22
Service	26	52	Production	20	40
Others	5	10	Sales and marketing	9	18
Total	**50**	**100**	**Total**	**50**	**100**
Annual Gross Revenue:			**Work Experience:**		
< RM1 million	9	18	Less than 2 years	16	32
RM1 – RM5 million	10	20	More than 2 years, but less than 5 years	14	28
RM5 – RM10 million	7	14	More than 5 years	20	40
RM10 – RM50 million	9	18			
> RM50 million	15	30			
Total	**50**	**100**	**Total**	**50**	**100**
Number of Employees:			**Involvement in Management Reporting:**		
Less than 100	16	32	Yes	34	68
101 to 500	16	32	No	16	32
501 to 1000	7	14			
More than 1000	11	22			
Total	**50**	**100**	**Total**	**50**	**100**
Number of Years Company with ISO certification			**Academic Qualification:**		
Less than 2 years	9	18	High School	2	4
More than 2 years, but less than 5 years	20	40	Diploma	5	10
More than 5 years	21	42	Bachelor	21	42
Total	**50**	**100**	Professional	7	14
Ownership Status			**Total**	**50**	**100**
Locally owned (more than 50%)	32	64			
Multinational (more than 50%)	14	28			
Joint venture	4	8			
Total	**50**	**100**			

Table 2: Motivation in Getting ISO Certification

	Mean (Rank)	Min.	Max.	SD
1. Improving corporate work procedures	1.66 (1)	1.00	4.00	0.79
2. Promoting corporate image	1.78 (2)	1.00	4.00	0.76
3. Improving product quality	2.04 (3)	1.00	5.00	1.05
4. Develop international markets	2.06 (4)	1.00	4.00	0.91
5. Customer requests	2.50 (6)	1.00	5.00	1.16
6. Follow the trend in the market	2.30 (5)	1.00	4.00	0.86
7. Pressure from competitors	2.58 (7)	1.00	4.00	0.88
8. Requirement by government	2.90 (9)	1.00	5.00	1.11

Table 3: Improvement in Management Reporting

		Mean (Rank)	Actual Range		SD
			Min	Max	
1	Reports are provided frequently on a systematic, regular basis such as daily reports, weekly reports, etc	2.04 (1)	1.00	4.00	0.70
2	Requested information to arrive immediately upon request	2.08 (2)	1.00	4.00	0.80
3	Information supplied automatically upon its receipt into information systems or as soon as processing is completed	2.08 (2)	1.00	4.00	0.88
4	Relevant information is reported without delay after certain event	2.18 (4)	1.00	4.00	0.82
5	Reports preparation is easier	2.36 (5)	1.00	4.00	0.85
6	Cost of gathering information/ preparing reports is lower	2.70 (6)	1.00	5.00	0.91

4.2 Descriptive Statistics

4.2.1 Motivation in Getting ISO Certification

Table 2 presents the descriptive statistics of their motivation in obtaining ISO certification. The motivation of companies to obtain ISO certification was measured on a five-point Likert scale anchored by 1 (strongly agree) to 5 (strongly disagree). Ranking of the mean for each item indicates that the top three motivations in getting ISO certification were improving corporate work procedures, promoting corporate image, and improving product quality. On the other hand, the weakest motivations were requirement by government, pressure from competitors and following the market trend. This suggests that the companies were more motivated by internal factors to obtain the ISO certification in order to improve work procedures, improve corporate image and improve quality.

4.2.2 Descriptive Statistics for Main Variables

To reduce the items on each variable into a smaller and meaningful set, the Principle Component Analysis (PCA) with varimax rotation was used for the main variables and only the items with factor loadings higher than 0.5 were retained for final analysis (Hair *et al.*, 2006). After the PCA, all six factors of management reporting were retained as their loadings were

higher than 0.5. For the components of performance, five factors, six factors and seven factors were extracted for quality, customer satisfaction and profitability, respectively.

Table 3 shows the descriptive statistics for management reporting. From the ranking of the means, the respondents perceived that ISO certification has resulted in improvement in management reporting in terms of 'reports are provided more frequently on a systematic, regular basis such as daily reports, weekly reports, etc.' (mean = 2.04), followed by 'requested information to arrive immediately upon request' (mean = 2.08), and 'information supplied automatically upon its receipt into information systems or as soon as processing is completed' (mean = 2.08).

Table 4 presents the descriptive statistics on overall performance and for each component of performance: product quality, customer satisfaction and profitability. The overall mean of performance was above average (mean=2.14) suggesting that the respondents perceive that their companies had achieved a higher average performance. The means for each component performance were 2.07 for both quality and customer satisfaction but relatively lower for profitability with a mean 2.27. For product quality performance in their companies, the respondents perceived their companies performed best in terms of product reliability (mean=1.94), followed by reducing defect rate (mean=1.98), and reducing reject rate by customer (mean=2.08).

With respect to customer satisfaction, the respondents perceived that the three areas in which their companies performed best were reduced customer complaints (mean=1.94), improved response to meeting customer requirements (mean=2.00), increased new customers and improved response time to customer enquiry (mean=2.06). With respect to profitability, the top three areas of improvement were increased orders (mean=2.12), reduced costs of rework and waste (mean=2.20), followed by enhanced price bargaining position (mean=2.22).

Table 4: Performance

	Mean	**Actual Range**		**SD**
	(Rank)	**Min.**	**Max.**	
Overall performance	**2.14**	**1.11**	**3.81**	**0.61**
Quality:				
Improved product reliability	1.94 (1)	1.00	4.00	0.79
Reduced defect rate	1.98 (2)	1.00	5.00	0.89
Reduced reject rate by customer	2.08 (3)	1.00	4.00	0.88
Enhanced product performance	2.18 (4)	1.00	4.00	0.80
Final product produced exactly as according to required specification	2.18 (4)	1.00	5.00	0.83
Overall quality	**2.07**	**1**	**4.00**	**0.64**
Customer Satisfaction:				
Reduced customer's complaints	1.96 (1)	1.00	4.00	0.88
Improved response to meeting customer requirement	2.00 (2)	1.00	4.00	0.88
Increased new customers	2.06 (3)	1.00	4.00	0.89

Improved response time to customer enquiry	2.06 (3)	1.00	4.00	0.84
Increased repeat customer	2.10 (5)	1.00	4.00	0.86
Reduced delivery time	2.26 (6)	1.00	4.00	0.96
Overall customer satisfaction	**2.07**	**1.00**	**4.00**	**0.71**
Profitability:				
Increased Orders	2.12 (1)	1.00	4.00	0.94
Reduced costs of rework and waste	2.20 (2)	1.00	4.00	0.86
Enhanced price bargaining position	2.22 (3)	1.00	4.00	0.86
Reduced manufacturing cost	2.28 (4)	1.00	4.00	0.83
Improved overall profitability	2.34 (5)	1.00	4.00	0.82
Higher repeat sales volume	2.34 (5)	1.00	4.00	1.02
Increased overseas sales	2.40 (7)	1.00	4.00	0.93
Overall profitability	**2.27**	**1.00**	**3.57**	**0.69**

4.2.3 Pearson Correlation

Pearson correlation was carried out to investigate whether timeliness in management reporting is related to performance factors. Table 5 shows the correlations between improvement in management reporting and company performance from the perspectives of product quality, customer satisfaction, profitability and management performance.

The results show that management reporting was significantly correlated with overall performance (r=0.75) as well as with profitability (r=0.76), customer satisfaction (r=0.74), and product quality (r=0.77). This provides an indication of initial support for the hypothesized relationships between the dependent and independent variables. The Cronbach alpha coefficients ranged from 0.83 to 0.89, which indicates acceptable levels of scale reliability for the variables concerned (Nunally, 1970).

Table 5: Correlation

	1	2	3	4
1. Management reporting	1	0.50**	0.74**	0.76**
2. Product quality		1	0.66**	0.63**
3. Customer satisfaction			1	0.82**
4. Profitability				1
Overall performance	0.75**			
N	50	50	50	50
Cronbach's Alpha	0.87	0.83	0.89	0.88

** Correlation is significant at the 0.01 level (2-tailed)

4.3 Hypothesis Testing

Univariate regressions were run to test the whether there is support for the hypothesized relationships between management reporting and performance among ISO certified companies. Separate regression runs were conducted for each hypothesized relationship between the dependent variable (overall performance: product quality, customer satisfaction, profitability) and the independent variable (management reporting). The regressions results are summarized in Table 6.

Table 6: Regression Results

IDV	DV: Overall performance	DV: Product Quality	DV: Customer Satisfaction	DV: Profitability
	Std. β	Std. β	Std. β	Std. β
Mgmt reporting	0.75**	0.50**	0.74**	0.76**
Model Summary	F= 61.06 (p=.000) R^2 = 0.56 Adjusted R^2 =0.55	F=16.00 p=.000) R^2 = 0.25 Adjusted R^2 =0 .23	F= 57.97 (p=.000) R^2 = 0.55 Adjusted R^2 = 0.54	F= 66.10 (p=.000) R^2 =0.58 Adjusted R^2 = 0.57

** Correlation is significant at the 0.01 level (2-tailed)

The results show significant relationships between management reporting and overall performance (β=0.75, p=0.000) and also between management reporting and each component of performance: product quality (β=0.50, p=0.000), customer satisfaction (β=0.74, p=0.000) and profitability (β=0.76, p=0.000). These results provide support for all the hypothesized relationships between management reporting and performance with respect to product quality, customer satisfaction and profitability.

4.4 Summary and Discussion

The objective of this study is to examine the relationship between improvement in management reporting and performance with respect to quality, customer satisfaction and profitability among ISO 9000 certified companies. Consistent with the predictions, the results of the survey provide support for the hypothesized relationships between management reporting and performance. The results suggest that improved management reporting in ISO certified companies is significantly related to overall performance as well as to each component of performance, namely product quality, customer satisfaction and profitability. This study contributes to the current understanding on the benefits of ISO by providing additional empirical evidence on the relationship between ISO certification and performance.

The findings imply that ISO certification could lead to improvement in business performance as the certification enables companies to enhance the quality of their services and products which will eventually lead to higher sales, better cost management and thus, improved profitability. These results are consistent with Rao *et al.* (1997) and others (Simmons & White, 1999; McAdam & McKeown 1995; Häversjö, 2000; Martinez-Lorente & Martinez-Costa, 2004; Sharma, 2005) who assert that ISO 9000 is the basis for quality management practices that ensures consistency in product and service quality.

The research results have an important contribution to practice. The results suggest the managers in ISO certified companies perceive that better documentation and management

reporting will assist companies in enhancing performance. Adoption of the standards permits a continuous flow of accurate information about processes related to products or services which are needed to uphold quality. Access to such information is very critical for managers to make fast and effective decisions in managing quality, which is one of the most important criteria to succeed in today's highly competitive and dynamic global business environment. Hence, it is possible that companies that obtained the ISO 9000 certification are in a better position to survive and prosper due to the benefits and competitive edge gained from the certification.

There are several limitations associated with this study. First, this study is associated with the usual limitations of cross-sectional questionnaire survey research, namely data collected at a single point in time, low response rate and respondent bias. In addition, the use of questionnaire survey does not shed light to the questions of 'how' and 'why' of the relationships (Yin, 1994). However, since this study is exploratory and the main aim is to explore possible relationships, perhaps at this stage, a questionnaire survey is adequate (Carr *et al.,* 1997). Second, this study covers only a small number of firms which may limit the generalizability of the findings. In addition, this study did not include non-ISO certified companies.

Taking into account the limitations above, there are several areas where future research can be useful. To answer to the questions of 'how' and 'why' of the relationships, future research should use a case study approach (Yin, 1994). Furthermore, future research may cover a bigger sample from various industries in order to improve the generalizability of findings and a comparison could be made about ISO 9000 practices and its relationship with performance among the different industries. Future studies may also use more accurate measurements of the variables used in this study, namely improvement in management reporting and business performance. Other areas where future research should also consider are the length of time that ISO organizations had been accredited and the company size. Finally, a comparison of the relationships among ISO and non-ISO certified organizations could also be investigated.

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