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ISO 9000: Link between Seeking Certification and Perceived Benefit

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ABSTRAK

Makalah ini menerangkan keputusan kajian tentang faedah tertanggap di dalam pensijilan ISO 9000. Seterusnya, kajian juga meliputi hubungan di antara tujuan untuk mendapatkan persijilan ISO dengan faedah tertanggap. Keputusan diasaskan oleh tinjauan daripada 405 syarikat di Malaysia yang 307 daripadanya adalah syarikat ISO dan 98 syarikat bukan ISO. Hasil kajian menunjukkan tiga faedah dalaman hasil daripada pelaksanaan ISO: (1) Dokumentasi yang Lebih Baik (2), Kesedaran Kualiti yang Tinggi, dan (3) Memperbaiki Sistem Pengukuran. Bagi faedah luaran, perkara-perkara berikut telah dikenal pasti: (1) Peningkatan Kepuasan Pengguna, (2) Peningkatan Kualiti Terjangka, dan (3) Berdaya Saing. Keputusan statistik berkenaan hubungan di antara tujuan untuk mendapatkan pensijilan ISO dengan faedah tertanggap, menunjukkan bahawa syarikat yang mempunyai alasan ke arah pembangunan beroleh faedah dalaman yang lebih tinggi dari aspek: (1) Pengurangan Pembaziran, (2) Meningkatkan Kerjasama Di antara Jabatan, (3) Kesedaran Kualiti yang Tinggi, dan (4) Peningkatan Tindakan Pencegahan, apabila dibandingkan dengan syarikat yang tidak berasaskan pembangunan. Bagi syarikat yang berasaskan pembangunan dan kepelbagaian, perbezaan yang signifikan hanyalah ditemui pada aspek kesedaran kualiti yang tinggi. Manakala tiada perbezaan signifikan yang ditemui bagi syarikat yang berasaskan kepelbagaian dan tanpa pembangunan. Dari sudut faedah luaran, tiada perbezaan signifikan yang ditemui bagi mana-mana kombinasi tujuan untuk mendapatkan sijil ISO. Ini mungkin berdasarkan fakta bahawa faedah luaran adalah merupakan faktor-faktor luaran yang tidak boleh diambil kira sebagai tujuan untuk mendapatkan sijil ISO.

ABSTRACT

This paper presents the result of a study on perceived benefits of obtaining ISO 9000 certification. In addition, the link between the intentions of seeking ISO certification with perceived benefit was explored. The results were based on a survey of 405 Malaysian companies with 307 being ISO companies and 98 non-ISO companies. The study revealed that three internal benefits were expected from ISO exercise: (1) Better Documentation (2), Greater Quality Awareness, and (3) Improved Measurement System. For external benefits, these items were identified: (1) Improved Customer Satisfaction, (2) Higher Perceived Quality, and (3) Competitive Edge. Statistical results on the link between the reason for seeking the certificate with perceived benefit have indicated that companies with developmental reasons have higher perceived internal benefits in areas such as: (1) Reductions in Scrap, (2) Improved Departmental Co-operation, (3) Greater Quality Awareness, and (4) Higher Preventive Action, as compared to non-developmental companies. For pair developmental and mixed, significant difference was only evidenced for greater quality awareness. No significant differences were identified for pair mixed and non-developmental. In terms of external benefits, significant differences were not found for any combination of reason seeking certification. This may be due to the fact that external benefits were exogenous factors that could not be considered as reasons for seeking certification.

INTRODUCTION

Since the introduction of quality concept, various methods have been advanced in materializing this particular concept. The more acknowledged methods included Total Quality Management (TQM), Statistical Process Control (SPC), Quality Functional Deployment (QFD), Kaizen, International Standard Organization (ISO), and Business Process Re-engineering (BPR). Among these methods, ISO 9000 appeared to be the most controversial one (Sun 1999). Many arguments have been put forward about the benefit and cost of ISO 9000. Criticism was loud, yet there were many advocates for ISO 9000. Taylor (1995) argued that ISO 9000 is necessary for the implementation of TQM. Garver and Lucore's (1994) enthusiasm toward ISO 9000 was reflected by believing that in the future, ISO 9000 is imperative for business. Jones *et al.* (1997) have provided statistical evidence showing that certified companies have eventually benefited from implementation of ISO 9000. Motwani *et al.* (1996) have summarized the benefits of ISO cited by Dzus (1991), Sateesh (1992), and Sprow (1992) into 6. These benefits are businesses with European countries, recognition by the international community; marketing edge; improvement in quality, productivity, costs; discarding second-party audits by prospective customers, and being listed in the international "certified supplier" directory. Benefits such as reduced customer complaints and conforming to specification were also reported (Kemezis 1992).

On the other hand, Sun (1999) has claimed that depending only on ISO 9000 would not guarantee quality improvement. To support this claim, it has pointed out that emphasis of ISO 9000 was not on Quality improvement. ISO 9000 focused more on quality management system and quality assurance. A similar notion was perceived by Juran and Gryna (1988), with reference to European inclination to ISO 9000. Lee (1998) in a study of ISO 9000 development in Hong Kong has revealed one big limitation of ISO 9000, which is the use of technology. Nonetheless, Lee's study has lent support to implementation of ISO 9000. Motwani *et al.* (1996) have listed out five major criticisms of ISO 9000 from previous literature. Their criticisms are the litigation problems concerning product safety, unaddressed issues on continuous improvement, preparation costs for certification, and maintenance of ISO certification.

Following all these debates, this study attempts to assess the perceived benefits of ISO 9000. This specifically refers to the degree of perceived ISO (internal and external) benefits of its implementation. Furthermore, the relationship between the intentions of seeking ISO certification with perceived benefits was also explored. This study would contribute to the presently scarce literature on the Malaysian ISO experience.

ISO Perceived Benefit

Jones *et al.* (1997) have delicately approached the perceptions of benefits received from ISO. Attempts have been made to see the relationship between intentions of applying ISO with perceived benefits. A questionnaire survey of 272 Australian ISO 9002 quality-certified companies has indicated that those companies that seek certification for internal development experienced a wider range of favorable outcomes from ISO than companies that seek certification for the purpose of "obtaining certificates". In particular, the favorable outcomes consisted of greater standardization of operational procedures, fewer mistakes and less defective work, fewer customer complaints, more business, lower operating costs. Statistical evidence has also indicated that longer-certified companies did not experience more beneficial outcomes from ISO than recently-certified companies, irrespective of the purpose of applying for certificates. However, authors revealed that longer-certified companies seem to outperform the newcomers in terms of businesses and operating costs. This finding holds true only for companies that seek certification for internal development.

Leung *et al.* (1999) presented the results of costs and benefits from obtaining ISO certification. Using 500 ISO certified companies in Hong Kong, the survey result buttressed the adoption of ISO, as 65% of the sample showed that the certification is worthwhile, and 76% believed that costs involved in obtaining the certificate are inexpensive. Three factors were investigated in its effect upon ISO cost and benefit, which were the duration of time taken to get certification, number of years since certification and reason for certification. The

first two factors did not significantly affect cost-benefit. For the third factor, few companies that seek certificates to satisfy customers requirements indicated that benefits outweigh costs, as compared to companies seeking certification due to internal development. However, statistical results failed to indicate the significance of this factor. This finding commensurates with Jones *et al.* (1997) study but contradicted the study result of Lloyd's Register Quality Assurance (Osman 1994; Brecka 1994). It has found that longer-established certified companies (more than 5 years) enjoyed many more benefits compared to newcomers (less than 5 years).

In a study on the relationship between TQM practice and an organization's performance using a sample consisting of 1341 manufacturing sites located at Australia and New Zealand, Terziovski and Samson (1999) have conveyed an unfavorable message for ISO. As ISO status was suspected in influencing organization performance, its effect was removed from a TQM Model that linked TQM with organizational performance. After controlling this factor, it seemed that ISO did not have any significant explanatory power of organizational performance, irrespective of presence or absence of TQM environment. The authors believed that "ISO certification is implemented as part of the TQM philosophy and methods" (Terziovski and Samson 1999).

Sun (1999) showed similar inclination with regard to the effectiveness of ISO. Contributions of ISO and TQM towards quality improvement in 600 companies located in 20 different countries were elicited. The results postulated that TQM performed better than ISO. A strange phenomenon occurred as results showed that non-ISO certified companies exhibited a tendency of outperforming ISO-certified companies. The explanation given was the non-ISO certified companies might have implemented other TQM methods. However, extensive use of ISO techniques tends to associate with higher achievement. Learning effect may be the reason behind this occurrence. In regard to this, the author proposed a combination of ISO and TQM, which produced much more quality improvement as compared to companies adopting solely TQM and ISO.

Haversjo (2000), in an attempt to assess financial effects of ISO 9000 registration, has revealed that financial enhancement occurred simultaneously with registration. The author contended that a third variable may be in play here and not necessarily the effect of ISO registration. The third variable, according to the author, could be other improvement programs initiated by registered companies. Hence, financial effect is due to innovative management rather than ISO 9000. However, the view is kept open as ISO 9000 may be one of the improvement technologies applied by "the most innovative management". Than, ISO 9000 could be considered as worthwhile after all.

In another study, Lee *et al.* (1999), have presented the survey result of 363 companies on benefits of certification. The samples were manufacturing (114 companies), service (110 companies), and construction (139 companies). Table 1 below shows the findings documented in their study.

TABLE 1
Benefits of certification

Benefits	Percent(%)
Clearer work procedures	99
Improved quality of product/service	88
Improved team spirit	89
Better control of subcontractors	73
Increased efficiency	68
Less customer complaint	61

Source: Lee, T. Y., K. N. Leung and C. C. Chan (1999)

METHODOLOGY

This study forms a part of a larger study on quality practices among Malaysian manufacturers. 405 sets of usable questionnaire are utilized in producing the present results. Respondents' profiles are as in Tables 2 and 3. The 8 dimensions of internal benefits were considered here, namely: scrap/rework, inter-company communications, departmental/cross functional cooperation, documentation, measurement system, cultural change, quality awareness, and prevention. A 5 point Likert-scale was used upon these 8 dimensions, with 5 = most important and 1 = less important. The external benefit constructs were also based on a 5 – point Likert-scale, with 7 distinct items. The items stipulated in the questionnaire consist of: customer satisfaction, market share, perceived quality, company's glory, competitive edge, time to market, and quality audits (external).

TABLE 2
Respondent profile

Paid Up Capital (RM)	ISO	Non-ISO	Operating Years	ISO	Non-ISO
Not specified	95	28	Not specified	13	2
below 0.5 million	5	9	below 5 years	14	10
0.5-2.5 million	44	28	5-10 years	77	26
2.5-5 million	21	8	10-15 years	68	20
5-7.5 million	21	10	15-20 years	41	15
7.5-10 million	6	0	20-30 years	69	15
10-25 million	45	6	greater or equal to 30 years	25	10
25-50 million	37	3			
50-100 million	17	3			
greater than or equal 100 million	16	3			
Total	307	98	Total	307	98

TABLE 3
Respondent grouping by sectors

Sectors	ISO	Non-ISO
Agricultural & Machinery Products	3	2
Automotive & Component Product	12	3
Building Materials & Related Products	22	6
Cement & Concrete Products	14	0
Ceramics & Related Products	4	1
Chemical & Adhesive Products	19	6
Diversified Industries	4	1
Electrical & Electrical Products	79	14
Food & Beverages	14	19
Footwear & Leather Products	1	2
Furniture & Related Products	5	6
Gift & Jewelry	1	3
Industrial & Engineering Products	18	6
Iron & Steel Products	20	5
Petroleum & Gas	3	0
Pharmaceutical, Medical Equipment, Cosmetics & Toiletries	2	2
Plastic Resins & Plastic Products	16	3
Paper, Printing, Packaging & Labeling	22	6
Rubber Products	14	3
Stationery	1	0
Textiles &Wearing Apparel	5	1
Consultancy Services & Industrial Estates	2	2
Computer & Related Products	3	1
Transportation & Freight Forwarding	2	0
Mining and Quarrying	1	0

A reliability analysis was performed on the 8 internal benefits and 7 external benefits using Cronbach's coefficient alpha (Cronbach 1951). This approach was being adopted to examine whether these instruments were internally related or not in measuring degree of ISO's internal/ external benefits. Cronbach's alpha approach was preferred, as it is free from limitations of split-half (Flynn *et al.* 1990). Two separate reliability analyses are conducted as the nature of external and internal benefit would be distinct and different, and both the analysis outcomes

are documented in Table 4. Using SPSS reliability analysis-Cronbach's alpha, the Cronbach's alpha value along with *Alpha if item deleted* for each instrument were derived. According to Hair *et al.* (1992), an alpha value higher than 0.70 and above is considered as acceptable. With Cronbach's alpha of 0.8388 for internal benefit and 0.7851 for external benefit, and *Alpha if item deleted* over 0.70 for all instruments, it could be concluded that items stipulated in internal and external benefit were (statistically) consistent and reliable in measurement of perceived benefit of ISO.

RESULTS

Internal Benefit

Table 4 also depicts the mean scores for eight stipulated questions on internal benefits generated by ISO. The highest mean value for internal benefit was (i) Better Documentation, which appeared as the most important benefit and this finding commensurates with the finding of Lee *et al.* (1999b) as shown in Table 1. ISO disciplines were seen as "imposed on calibration, document control and internal audit ensure a company operating efficiently (Pun *et al.* 1999)." Hence, the adoption of ISO would eventually lead to establishment of new systems and procedures that intend to document relevant activity performance. Data solicited through documentation was used in conducting gap analysis. Velury (1996) contended that emphasis of ISO 9000 is on analyzing the gap between the standard and existing procedures, which then find ways to eliminate the gap. Pun *et al.* (1999), on the other hand, claimed that emphasis of ISO 9001 is on validating the supplier's ability in conforming to contract requirement.

(ii) Greater Quality Awareness is the second most important internal benefit on the list. It seems that many perceived certification of ISO as eventually improving quality awareness of their employees. Perhaps as organizations practise and fulfill all clauses specified in ISO, it is expected that the general perception on quality would change and be improved. However, this may not be true as many hold that ISO is weak on continuous improvement (Chin *et al.* 1995; Pun 1998). Moreover, claim has been made that ISO is more toward process and customer focus. It largely depends on an organization's ability to fulfill customer requirement. It would be presumptuous to claim that practices that aim to fulfill contract specifications lead to greater quality awareness.

(iii) Improved Measurement System is another important benefit that has been highly expected. ISO stresses the meeting of defined

TABLE 4
Reliability analysis of internal and external benefit

Internal Benefit	Mean	Std. Dev	Alpha if item deleted	Cronbach's Alpha
Reduced scrap	3.81	1.00	0.8360	0.8388
Enhance inter-company communication	3.87	0.87	0.8187	
Improve departmental cooperation	4.02	0.87	0.8052	
Better documentation	4.44	0.72	0.8330	
Improved measurement system	4.13	0.79	0.8202	
Positive cultural change	3.87	0.89	0.8099	
Greater quality awareness	4.24	0.74	0.8084	
Increase prevention action	4.03	0.86	0.8155	
External Benefit	**Mean**	**Std. Dev**	**Alpha if item deleted**	**Cronbach's Alpha**
Improve customer satisfaction	4.43	0.74	0.7642	0.7851
Increased market share	3.91	1.05	0.7636	
Higher perceived quality	4.31	0.80	0.7549	
Glory for the company	3.98	1.07	0.7626	
Competitive edge	4.27	0.83	0.7570	
Quicker time to market	3.55	1.06	0.7322	
Reduced quality audits	3.16	1.22	0.7691	

requirements stipulated in ISO principal clauses. In order to assess and verify the actual performance with standards spelt out by ISO, empirical data must be at hand. Hence, comprehensive measurement system must be established in this connection. With this essential system in place, the basic requirement of ISO could be attained; measurement system enables organizations to document process and procedures that ensure conformity to specifications. However, caution was noted on the objectives of collecting and processing data (Lee *et al.* 1999). Pouring in all these efforts without clear objectives would be a waste of resources.

External Benefit

Views that ISO enables establishments of effective quality systems which enhance and facilitate trade, have been expressed (BSI 1994; Mahoney and Thor 1994). Many buyers and traders in the markets, irrespective of national or international, display vested interest in those organizations that have ISO certification. Possessing this certificate to some extent reflected organization's commitment to quality and dedication of performing in accordance with customer requirements. Hence, the result of (i) Improve Customer Satisfaction ranked at top position should not be surprising at all. Customers or buyers appreciate organizations that display attractive and beautiful performance in regard to products or services. Thus, owning the certification consequently improves existing customer satisfaction upon product and its producer.

(ii) Higher Perceived Quality falls in second position. This benefit is the result of general public perception on ISO. Contention has been made that in future, businesses and organizations should possess ISO certification in order to operate and sustain in operation (Garver and Lucore 1994). These beliefs and the recognition of ISO means that those holding this particular certification would display greater quality commitment and dedication than those that did not have this certification. Thus, holders of ISO certification generally yield higher perceived quality before certification.

The reasoning presented above is also applicable for (iii) Competitive Edge. With the majority of the public upholding the ISO, this certification has actually turned into a strategic tool or weapon in outperforming competitors. Furthermore, holders of certification sent a message that their products followed the stringent requirement of ISO clauses and hence should perform better than their competitors. This particular competitive edge becomes valuable for those who intend to penetrate into the European community. The European community has strongly advocated the implementation of ISO (Sun 1999; Chelsom 1997).

Relationship between Intention and Perceived Benefit

The hypothesis advanced by Jones *et al.* (1997) was tested here in order to compare and contrast the present study with the prior one. The hypothesis that is of interest here is:

H: Organizations that apply ISO certification for non-developmental reasons perceived fewer benefits obtained from ISO implementation than those organizations that apply ISO certification for developmental reasons.

To categorize the reasons gave by respondents, the grouping was based on paradigms proposed by Jones *et al.* (1997):

- Non-developmental reasons: requirement of major customer(s), desire not to be locked out of future tendering processes or markets, realization that it is progressively becoming a requirement of doing business, marketing and public relations tool.
- Developmental reasons: desire to improve the company's internal processes, desire to enhance the overall competitive performance of the company.
- Mixed reasons: constitutes the combination of developmental and non-developmental reasons.

Independent sample t-test (Table 5) was carried out upon these three pairs: mixed and non-developmental, mixed and developmental, developmental and non-developmental. The result for pair mixed and non-developmental was omitted here as none of the items for external and internal benefits exhibited statistical differences.

For pair developmental and non-developmental, statistical differences ($p<0.1$) are found for four items in internal benefits, namely:

TABLE 5
Independent sample t-test result

	Develop and mixed			Develop & Non-develop		
	T	SIG.	diff	T	SIG.	diff
External Benefit						
Improve customer satisfaction	0.875	0.383	0.10	1.095	0.275	0.11
Increased market share	0.662	0.509	0.11	0.060	0.952	0.01
Higher perceived quality	0.925	0.356	0.12	0.313	0.754	0.04
Glory for the company	0.151	0.880	0.03	-0.560	0.576	-0.08
Competitive edge	-0.526	0.599	-0.07	0.590	0.556	0.07
Quicker time to market	0.834	0.406	0.14	0.903	0.368	0.14
Reduced quality audits	-0.246	0.806	-0.04	0.058	0.953	0.01
Internal Benefit						
Reduced scrap	0.621	0.536	0.10	1.744	0.083	0.24
Enhance inter-company communication	0.339	0.735	0.04	1.492	0.137	0.17
Improve departmental cooperation	0.342	0.733	0.04	2.016	0.045	0.24
Better documentation	-0.447	0.655	-0.05	1.145	0.253	0.11
Improved measurement system	0.125	0.901	0.02	0.542	0.588	0.06
Positive cultural change	-0.125	0.901	-0.02	0.561	0.575	0.07
Greater quality awareness	2.986	0.003	0.33	2.370	0.019	0.23
Increase prevention action	0.321	0.749	0.04	1.824	0.070	0.22

reductions in scrap, improve departmental co-operation, greater quality awareness, and increase prevention action. For pair developed and mixed, statistical difference is evidenced only for greater quality awareness. In contrast to Jones *et al.* (1997) findings, mixed and non-developmental pair did not exhibit any form of significant difference for all items under internal and external benefit. In addition, findings of statistical difference in pair developmental and mixed also contradicted with Jones *et al.* (1997) study where the opposite has occurred. However, the divergence of findings is considered mild as only one item (greater quality awareness) showed statistical difference.

The plausible explanation for no statistical difference for external benefit for all three pairs might rest on the factors themselves. As external benefits are exogenous variables for ISO certificate organizations, the endogenous variable of seeking certification should not cast any significant influence upon perceived external benefits. In other words, the external benefits perceived are more of reflection upon current business development and international community perception of ISO. Hence, no significant differences should be expected, and this is what happened here, in respect of reason in seeking ISO certification.

The same argument is implied for internal benefits. Motives of applying ISO certification exert salient impact upon perceived internal benefit. This is shown through statistical differences in internal benefit for pair developed and non-developmental, and a slight extent for pair developmental and mixed. For organizations that explored further into the realm of quality with the purpose of internal improvement, it was mostly initiated by top management. The case of operation or supporting level employees urging top management to pursue quality improvement is very rare in reality, hence it would not be assumed here. With strong drive from top management, an organization's quality awareness improved consequently. Proactive implementation of ISO exercise usually required interdepartmental involvement and collaboration. As a result, an organization with a more serious attitude toward ISO exercise naturally demonstrates higher perceived benefit of interdepartmental co-operation.

Organizations concerned with internal efficiency normally keep an eye open on defect rates of products during the production process. ISO exercise generally produces adequate quality record and product performance data, which may be of use in fixing line errors and formulation of preventive actions. Lee *et al.* (1999) have contended that ISO registered organizations exhibited better performance in employing quality records, which enable these firms to pinpoint the exact training needed to avoid repetition of errors. From here, the argument is clear. Statistical differences for reduced scrap and increase preventive action have buttressed forwarded claims.

Absence of significant differences for both improved measurement system and better documentation in three different pairs might be due to weight allocated upon these two elements by ISO certificate. Notable weight is placed upon auditing through document for ISO implementation when certifying the ISO applicant. Hence, regardless of what motivates the applicant of ISO, adequate attention and resources are directed toward establishment of proper measurement and documentation systems. As for inter-company communication, this is not strongly emphasized by ISO. This explains the insignificant difference for this particular item. Finally, positive cultural changes seemed likely soon as the shift of organization culture is apparent and identifiable.

To sum up, developmental companies perceived higher degree of beneficial outcomes as compared to non-developmental companies. As for mixed companies, its intention of seeking ISO certification may have caused the insignificant differences for all items.

CONCLUSION

The present paper has found that these three internal benefits were expected from ISO certification: (1) Better Documentation (2) Greater Quality Awareness, and (3) Improved Measurement System. For external benefits, these items were identified: (1) Improved Customer Satisfaction, (2) Higher Perceived Quality, and (3) Competitive Edge. The identified internal benefits represent the core or thrust of ISO certification, which imply that the samples seek certification to derive the essence of ISO and instill it into their companies. Result for external benefits were in line with existing literatures, in which the recognition of international community upon ISO certification has transformed this certificate into a tool that helps increase customer satisfaction, perceived quality and competitive edge.

Investigation of the relationship between reasons seeking certificate with perceived benefits has arrived with the following results:

- For internal benefits: significant differences are found for pair developmental and non-developmental in: (1) reductions in scrap, (2) improved departmental co-operation, (3) greater quality awareness, and (4) higher prevention action. For pair developmental and mixed, significant difference was only found for greater quality awareness. Finally, for pair mixed and non-developmental, none of the items has significant differences.
- For external benefits: not significant differences were identified for any pair of reasons seeking certification.

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