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THE ROLE OF ISO 9001: 2000 CONSULTANTS

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ABSTRACT

The revision of ISO 9000 standards involving a paradigm shift from being quality assurance oriented to quality management oriented imply a change in their implementation approach. This paper chooses to focus on one of the often overlooked issues of ISO 9000 implementation – the role of the ISO 9000 consultant in the implementation process. Specifically, this research attempts to find out (i) the role of consultant in ISO 9000: 1994, (ii) the role of the consultant in ISO 9001: 2000, and (iii) the shifting of roles from ISO 9000: 1994 to ISO 9001: 2000. The results suggest that for ISO 9000: 1994, the ISO consultant plays four major roles in the implementation process: Trainer, Coordinator, Documenter, and Adviser. On the other hand, there can only be one major role for ISO 9000: 2000, that of the 'Comprehensive Implementer', suggesting a dramatic change in the ways the ISO consultant assists and coordinates the ISO 9000 applicant (the company). In addition, the results also imply a change in the consultant's role from that of a 'knowledge broker' to a more 'expert' oriented one in ISO 9000 implementation.

JEL classification: M10

Key words: ISO 9000, Consultants, Quality standard

1. INTRODUCTION

The wave of globalization has made the ISO 9000 certification more valuable and attractive. On obtaining the certificate, a firm is instantly recognized as a quality producer or service provider. It also provides the certified firm with the passport to enter foreign markets. Additionally, it may improve the level of customer satisfaction and thus the value of

the firm's share in the international financial market. However, the process of obtaining the ISO 9000 certificate is not easy (Dzus and Skyes, 1993; Kim, 1994; Olsen, 1994; Calingo et al., 1995; McCullough and Laurie, 1995; Quazi and Padibjo, 1998; Lipovatz, Stenos and Vaka, 1999; Chin, Poon and Pun, 2000; Withers and Ebrahimpour, 2000). The type of barriers range from organizational ones (i.e., lack of top management support and commitment, resistance of employees towards change) to ISO specific ones (i.e., over-development of the quality system, excessive documentation and control). Judging from the list of possible barriers, it would be wise if the ISO consultants were involved in the preparation and implementation of ISO 9000. With their knowledge and experience of ISO implementation and registration, organizations will be able to avoid wasting additional time and resources on implanting a quality assurance system.

It is generally recognized that the primary role of organizational development consultants is to solve their clients' problems. While research on consultants and their interaction with clients is abundant, it is interesting to find a shortage of studies on the role consultants play in the ISO 9000 preparation and registration process. That issue becomes even more engaging when taking into account the fact that the new ISO 9001: 2000 is relatively uncharted territory in the ISO 9000 research. Specifically, the year 1994 version of ISO 9000 has been updated into ISO 9001: 2000 that also comprises the Quality Management Oriented approach into its list of requirements and clauses (Laszlo, 2000). This also means that the focus of ISO 9000 has shifted from a standard mechanistic paradigm into the mainstream business process approach by adding on the element of "continuous improvement". In addition, the number of specifications and technical requirements has been reduced to increase the compatibility of ISO 9001 with the ISO 14000 series of environmental management system standards. All in all, the paradigm of ISO 9000 seems to be evolving from a technical oriented standard into a generic management tool. This shift certainly demands a change in the consultant's approach and focus during the preparation of the ISO registration. Against this background, the current study focuses on finding out (a) the role of consultants in ISO 9000: 1994, (b) the role of consultants in ISO 9001: 2000, and (c) the shifting of roles from ISO 9000: 1994 to ISO 9001: 2000.

2. LITERATURE REVIEW

2.1 THE BACKGROUND OF ISO 9000: 1994 AND ISO 9001: 2000

The first generation of the family of ISO standards was born with the purpose of providing a universal quality language for organizations in different countries in the hope of reducing the confusion arising due to the different quality standards and initiatives championed by different parties and organizations. That family of ISO standards operates on the concept that by standardizing certain minimum characteristics of the quality management system, it will implant an effective quality system into the organization that is able to conform to customers' specified requirements, and thus enhance and facilitate an organization's trade (ISO, 1994a; Tummala and Tang, 1996; Affisco, Nasri and Paknejad, 1997). The initial version of ISO 9000 standard comprised: ISO 9001: 1994, ISO 9002: 1994, and ISO 9003: 1994 and ISO 9004: 1994 (ISO, 1994a, 1994b). The function of ISO 9000: 1994 and ISO 9004: 1994 is to provide guidelines to applicants for ISO 9000 certification. The latter describes the establishment of an internal quality management system, and the former deals with the use of standard ISO 9001: 1994, ISO 9002: 1994, and ISO 9003: 1994. ISO 9001: 1994 covers all activities in all stages of an organization's operations, starting from the design and development of the product or service, to the servicing of customers (ISO, 1994b). ISO 9002: 1994 is largely for organizations with core activities of production and installation. ISO 9003: 1994 is for organizations engaged only in final inspection and testing (BSI, 1994).

The three different standards, ISO 9001: 1994, ISO 9002: 1994, and ISO 9003: 1994, have now been replaced by a single quality management system requirements standard, ISO 9001: 2000 (ISO, 2000). The rationale for the revision is (ISO, 2002):

- Applicability to all product categories and to all sizes of organizations.
- To simplify the current structure, making it simple to use, having a clear language, readily translatable and easily understandable.
- Ability to connect Quality Management Systems to organizational processes.
- To be used as a natural stepping-stone towards Total Quality Management.

- Greater orientation towards continuous improvement and customer satisfaction.
- Compatibility with management systems, such as ISO 14000 Environmental Management System.
- The need to provide a consistent basis to address the concerns and interests of organizations in specific sectors.

There are four major changes resulting from the revision:

- Promoting the adoption of the process-oriented approach of quality management by shifting from 20 clauses of requirements (element-oriented structure) to a plan-do-check-act type of structure (process-oriented structure) (ISO, 2000); the motive for this change is to align and enhance the compatibility of ISO 9001: 2000 with ISO 14001: 1996, which also follows a process-based approach,
- Reduction in the number of technical requirements directed at the operational level of organizations; greater stress is placed upon top management by assuming more responsibility in the quality management system,
- Shifting from a narrower focus of the quality assurance system to a broader combination of the quality management system; emphasis is placed on the management of the entire quality management, and its ability to facilitate continuous improvement in quality performance,
- Recognizing and incorporating the element of customer satisfaction into the new standard, apart from control of suppliers; top management must ensure that customer requirements are met to enhance customer satisfaction.

According to Laszlo (2000), these changes may lead to the following potential difficulties in the registration of ISO 9000 for the applicants and examiners:

- **Applicants**: Organizations with a deceptive attitude towards ISO 9000 can previously convince the registrar that they have conformed to the requirements when, in fact, they have not. Now, the new ISO standard requires an open and cooperative culture in order to achieve the TQM – both in terms of standard and requirements. This can be a difficult task since organizations must

move from being deceptive to having an open culture and subsequently move on from the quality assurance approach to quality management.

- **Examiners**: the new standard that has embedded complex concepts may cause problems for the examiner. There are no more audits of compliance to specific standardized requirements, but in-depth evaluations of organizational excellence. In such a case, the evaluation of applicants falls principally on the examiners. Inexperienced examiners (without adequate prior experience and mentoring) may fall into three possible traps during the evaluation of ISO applicants:

  a. "Halo-effect": this happens when examiners who are observing relatively standard aspects of quality management in action for the first time may be greatly impressed. This results in overly high evaluation scores.
  b. "So-what": this is the opposite of the "halo-effect", whereby the examiners tend to minimize outstanding achievements because of their lack of awareness of the actual significance of the efforts required for implementation. This results in a tendency of lowering the evaluation scores.
  c. "Play-it-safe": this refers to the examiners who "play-it-safe" by attributing average scores during evaluation, resulting in poor quality assessment.

A study by Janas and Luczak (2002) indicated that the majority of respondents hoped that the new ISO 9000 would encourage further quality improvement initiatives by shifting from element-based quality management (ISO 9000: 1994) to process-based quality management (ISO 9001: 2000). The quality representatives also expected an optimization in the organization performance and workflow due to the more defined assignment of tasks and responsibilities, and the establishment of more stable processes. With respect to the shortcomings of ISO 9000: 1994, Janas and Luczak's (2002) survey indicated that the major weakness of the old ISO 9000 system was the weak interest of the executive personnel "in the conception and establishment of quality management systems and in the later use of specific quality management methods and regulations" (Janas and Luczak, 2002, 129).

2.2 THE DIFFICULTY OF ISO IMPLEMENTATION

Like many organizational change programs, ISO 9000 also shares some general organizational obstacles in its implementation. From the literature (Dzus and Skyes, 1993; Kim, 1994; Olsen, 1994; Calingo et al., 1995; McCullough and Laurie, 1995; Quazi and Padibjo, 1998; Lipovatz, Stenos and Vaka, 1999; Chin, Poon and Pun, 2000; Withers and Ebrahimpour, 2000), the general difficulties faced are the lack of top management support and commitment, resistance of employees towards change, allocation of personnel responsibilities, inadequate training and quality knowledge, low level of quality awareness and culture, and resource constraints (in terms of manpower, time and finance). In terms of ISO implementation obstacles, empirical evidence indicates these barriers: lack of understanding of the ISO 9000 system, unclear benefits of obtaining certification, misinterpretation of ISO 9000 requirements, over-development of the quality system, excessive documentation and control, and underestimation of the efforts and resources needed for certification. In terms of certification audit problems, Robert Bakker of Entela, Inc. (Quinlan, 1996) provided these: (a) improper control of documents and data, (b) improper calibration of tools and gauges, (c) inadequate examination of incoming materials, (d) non-adherence to process control procedures, (e) improper control of suppliers, (f) improper control over non-conforming products, (g) lack of training/credentials, (h) improper documentation, (i) improper periodic management review and recording of it, and (j) improper contract review.

The empirical evidence on the specific level of difficulty or criticality in fulfilling the ISO clauses and requirements is provided by the studies of Chin, Poon and Pun (2000) and Salleh and Goh (2001). First, Chin, Poon and Pun (2000) examined the criticality of the twenty ISO 9000 clauses in the maintenance of the ISO 9000 system. Their findings suggest the following five clauses as critical to the maintenance of the ISO 9000 system: corrective action and preventive action, internal quality audit, management responsibility, document and data control, and control of quality records. Salleh and Goh's (2001) study indicates the seven most difficult elements as being corrective and preventive action, design control, management responsibility, statistical techniques, process control, document and data control, and quality system. It has been argued that all these elements are closely related to an organization's

quality system, thereby suggesting that an inefficient quality system can significantly affect the implementation of the ISO 9000 elements. On the other hand, those elements that were relatively easy to implement and accomplish are: inspection and test status, packaging, preservation and delivery, and inspection and testing, which seem to be more related to operational procedures.

A more intriguing finding on difficulty is documented in the study by Fuentes et al. (2000) who gauged consultants' views on the difficulties faced in ISO implementation. Their findings suggested these as the major difficulties: low level of top management and employee involvement, lack of appropriate technical knowledge, flow of information (for the functioning of the quality system), resistance to new responsibilities, and difficulty in the communication of new tasks and functions for each job, at all levels. On the other hand, their findings suggested that, in the eyes of consultants, the following barriers were not that hard to overcome: difficulty of accessing to test laboratories, difficulty in the certification stage involving the accreditation authority, lack of co-operation from customers, lack of training programs related to quality, and lack of information/help from public organizations.

2.3 THE ROLE OF CONSULTANTS IN ISO 9000 IMPLEMENTATION

There are many reasons why consultants are invited by organizations to assist in the execution of organizational change programs. The two most typical reasons are that executives or managers want to (a) exercise control over the management and investment of the change program but lack the expertise to do so, or (b) use the objectivity and/or status of consultants to legitimize or influence a course of action. Big companies also consider external consultants as cost effective ways of solving their problems who have the advantage of not becoming entwined in their internal politics and conflicts (Handy, 1987; Adamson, 2000). In general, the functions and roles of a consultant are (Soriano, 2001):

a. Providing expert opinion and information.
b. Analyzing and solving client's problems.
c. Recommending certain solutions to be implemented.
d. Providing assistance in decision-making.

e. Helping to establish cooperation and commitment among the staff in the client's firm.
f. Improving efficiency of organization, rewarding correct actions and discouraging incorrect actions.
g. Listening, offering support and advice to the client in difficult moments, and looking after his/her interests at all times.

Another way of looking at the consultant's role is offered by Schein (1990):

a. Providing expert information: this can be in terms of expertise in a certain industry (e.g., manufacturing), function (e.g., equipment selection) or functional area (e.g., finance).
b. Playing doctor: the term "doctor" implies the expectation that consultants will provide an outside, independent diagnosis, based on certain capabilities or insights.
c. Process consultation: acting as an expert in how to diagnose and develop a cooperative relationship.

A general description of the consulting process provided by Soriano (2001) runs chronologically as follows (Soriano, 2001, 45):

a. Preparing a report on the advantages of a project.
b. Identifying, gathering and analyzing key information.
c. Assessing initial system and features that are critical to client's performance.
d. Verifying status with firm's directors.
e. Identifying the necessary changes and courses of action to be taken.
f. Rating the activities to be developed.
g. Monitoring the development by department or area.
h. Analyzing the results of the activities under study.
i. Verifying the results with the firm's directors.
j. Measuring the benefits of the consulting process.
k. Designing and drafting the report.
l. Verifying the report with the firm's directors.
m. Implementing the report.
n. Obtaining approval from the firm's directors.
o. Identifying control indicators of the deviations that have occurred.
p. Finalizing activity.

The above framework of a consultant's roles and functions can, with a minimum of ramifications, be applied in the context of ISO 9000 preparation and implementation. Specifically, according to Label and Priester (1996) the ISO consultants can facilitate applicants in ISO implementation by (a) providing documentation services in support of registration efforts, (b) performing audit for assessment, and (c) providing training for staff on documentation and auditing. In terms of the ISO implementation enablers, the consultants provide the following factors: (a) top management and employee involvement, (b) availability of external advisers relevant to client's core businesses, (c) initial training, (d) existence of appropriate communication routers, and (e) past experience of formalized processes (Fuentes et al., 2000).

3. METHODOLOGY

3.1 INSTRUMENT AND SAMPLE

The data was collected through a questionnaire survey, with the ISO consultants as the target sample. The list of ISO consultants was retrieved from the Malaysian Register of Certified Auditors, MRCA (2000). Since the entire population of consulting companies involved in ISO consultancy services is only about 46, the questionnaire was sent to all the companies on the list. To increase the response rate, a field survey at the consulting companies was also carried out. A total of 42 sets of usable questionnaires were successfully retrieved, yielding a response rate of 91 percent. In terms of consultant profiles, on average their length of consultation experience is 8 years, with a mean salary of RM6000 per month. The highest drawn salary is RM10,000. The questionnaire comprised two sections. The first section focuses on the background information of the respondents and their company. The second section captured the consultant's opinions and perceptions with regards to: (a) the perceived severity of a range of organizational problems in hindering the implementation of ISO 9000, (b) the perceived role of consultants in ISO 9000: 1994, and (c) the perceived role of consultants in ISO 9001: 2000. For the first research focus, five major groups of organizational problems (or constructs) were listed in the questionnaire: people, knowledge, equipment and tools, system (procedures), and system (processes). In technical terms, a set of five

constructs were initially developed, and measured through a number of items/statements; for example, the 'people' barrier is measured through these statements: Lack of employee involvement, low quality awareness and initiative, lack of top management involvement, lack of cooperation among middle managers, and difficulty in communication of new tasks and functions.

For the second and third research focuses, the list of possible consultant's roles is developed based on the general nature of consulting activities and ISO requirements and fulfillment activities. Intuitively, six major roles with their respective descriptions were developed; the six different roles are adviser, trainer, coordinator, facilitator, documenter and auditor. For example, the role (or construct) of trainer is captured through these three statements (or items): Carrying out technical and manual training, Communication skills training for managers and employees, and Creating quality awareness and co-operation among staff. Note that in the questionnaire, respondents were only given the descriptive statements/items without the designated role. For all the statements (or items), respondents were asked to indicate their degree of perception on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

3.2 STATISTICAL ANALYSIS

The first step of the analysis is to determine the extent of the internal consistency, or reliability, of the respective measurement statements for roles, difficulties and improvement. The internal consistency refers to the degree to which the items (or statements) in the measurement set are homogeneous (Ngai and Cheng, 1997). For example, if one of the statements that was used to measure the organizational barrier was not stated properly, or incorrectly perceived as an organizational barrier, that statement would not be internally related with the other statements that are intended to measure organizational barriers. In other words, that item does not actually belong to the list, and should be filtered out. In order to examine the reliability of the individual statements, the Cronbach Alpha analysis was chosen. The overall Cronbach Alpha for the entire list of statements (for roles/difficulties/improvement) and the individual Cronbach Alpha for each statement should be 0.70 or higher in order for it to qualify as a reliable measurement set, and be retained in the subsequent analysis (Hair et al., 1998). The Cronbach

Alpha reliability analysis is conducted on all four measurement sets of (a) Consultant Roles in ISO 9000: 1994, (b) Organizational Barrier, (c) Organizational Improvement, and (d) Consultant Roles in ISO 9001: 2000.

After the reliability analysis, factor analysis is carried out to group the items or statements into their underlying dimension or factor. Before that, the appropriateness of conducting factor analysis on the different measurement set must be assessed. For that purpose, two statistics are required: (a) the Barlett Test of Sphercity that test for the presence of nonzero correlations, and (b) measures of sampling adequacy that assess the overall correlation pattern. Both statistics determine the factorability of the measurement set; in order for a measurement set to be qualified for the factor analysis, its Barlett statistic should be large and significant, and its measure of sampling adequacy should be larger than 0.5 (Coakes and Steed, 2001). The principal component factor analysis is used with orthogonal VARIMAX rotation. The VARIMAX method was used as it produces clear factor structures with higher factor loading on the appropriate dimensions (Choi and Chu, 2000). This rotation method is also the standard rotation method for factor analysis (Manly, 1986; Ngai and Cheng, 1997). The criterion "eigenvalue greater than 1" was used to determine the number of factors to be extracted from the analysis. The eigenvalue is the total variance explained by each factor. For grouping of items, the item is assigned to that component (or factor) where it had the highest factor loading score. However, when none of the item's loading score is higher than 0.5, that particular item is removed from the analysis.

4. STATISTICAL ANALYSIS AND RESULTS

4.1 DIFFICULTY OF ISO IMPLEMENTATION

The results of the reliability analysis and factor analysis for the measurement set of *Difficulty of ISO Implementation* are summarized in Table 1. The overall Cronbach Alpha is 0.8965, with all the statements' individual Cronbach Alpha values greater than 0.70, suggesting that all items can be retained for factor analysis. The measurement set has a Barlett Test of Sphercity statistic of 602.7240 with a significance level of 0.0000, and a Kaiser-Meyer-Olkin Measure of Sampling Adequacy of 0.5830, qualifying it for factor analysis. Through the factor analysis,

TABLE 1
Difficulty of ISO Implementation

	Mean	F.L	Comm	C.A.	EV	V
Factor 1					7.3904	33.5925
Poor machinery/equipment maintenance	3.6905	0.8174	0.8664	0.8901		
Failure in control of quality records	3.4286	0.8057	0.7508	0.8875		
Failure in design control	3.5952	0.7644	0.7331	0.8957		
Obsolete testing and inspection equipment	3.3810	0.7433	0.8078	0.8859		
Failure in quality control and assurance	3.3571	0.6340	0.6898	0.8877		
Lack of appropriate technical knowledge	3.4286	0.5227	0.7365	0.8890		
Factor 2					2.6134	11.8791
Lack of employee involvement	4.1429	0.8042	0.8670	0.8927		
Lack of middle managers' cooperation	3.9286	0.6853	0.6605	0.8961		
Low quality awareness and initiative	4.1667	0.6657	0.8705	0.8898		
Underestimation of efforts and resources	3.8810	0.6398	0.7126	0.8898		
Factor 3					2.0828	9.4674
Problem in establishing quality system procedures	3.8810	0.8096	0.8467	0.8873		
Problem in quality planning	3.8333	0.8065	0.8223	0.8890		
Preparation of specifications and manual	3.5476	0.6160	0.8345	0.8889		
Lack of top management involvement	4.1429	0.5488	0.7299	0.8966		

TABLE 1 (continued)

	Mean	F.L	Comm	C.A.	EV	V
Factor 4					1.7048	7.7491
Failure in quality information feedback	3.3810	0.7411	0.7051	0.8943		
Formulating quality policies and objectives	3.4286	0.7048	0.6930	0.8926		
Lack of statistical knowledge and application	3.7857	0.6862	0.6355	0.9028		
Factor 5					1.3572	6.1693
Communication of new tasks and functions	4.1190	0.8217	0.7650	0.8955		
Factor 6					1.0904	4.9563
Failure in corrective and preventive actions	3.9286	0.7440	0.6165	0.8976		
Data analysis, measurement and documentation	4.0952	0.5956	0.7697	0.8933		

Notes: CA =Cronbach's Alpha; F.L = Factor Loading; Comm = Commonalities; EV = Eigenvalue; V = Variance explained.

empirical results suggest six major categories of difficulties with regard to ISO implementation. The first is 'Control of Processes', comprising items related to the quality system such as maintenance of machinery and equipment, inappropriate testing and measurement tool, control in design, quality records, and quality control activities. The human-related barriers, 'Culture', ranked second covering items such as lack of middle managers' and employees' initiatives, and lack of quality awareness and knowledge, which may have led to an underestimation of efforts and resources. The third category of difficulty is associated with problems in 'Quality Planning', including items like failure in establishing quality plans, drafting of quality systems and procedures, and the related documents on specification and the manual. The remaining three are, however, difficult to identify and would, in general, be considered as 'Quality System Failures'.

4.2 ROLE OF CONSULTANT - ISO 9000: 1994

The results of the reliability analysis and factor analysis for the measurement set of *Role of Consultant - ISO 9000: 1994* are summarized in Table 2. The overall Cronbach Alpha is 0.8798, with all statements' individual Cronbach Alpha values greater than 0.70, suggesting that all items can be retained for factor analysis. The measurement set has a Barlett Test of Sphercity statistic of 342.6560 with a significance level of 0.0000, and a Kaiser-Meyer-Olkin Measure of Sampling Adequacy of 0.6630, qualifying it for factor analysis. The factor analysis outcome in Table 2 suggested four major consultant's roles in the ISO implementation process. The first primary role is 'Trainer', which emphasizes the preparation of ISO implementation, including evaluation of the quality system gap, training of managerial and technical skills and assistance in maintenance and renovation. The second role is 'Coordinator', which covers activities associated with the implementation of ISO requirements and specifications. That would include assignments like assigning responsibilities and tasks, coordinating the activities, identifying corrective areas, recommending solutions and putting them through the quality system. The third role is more of a paperwork-oriented character of 'Documenter', concentrating mostly on documentation activities of the client quality system. Examples of this are drafting of quality policies and preparing the quality manual and

TABLE 2
Role of Consultant in ISO 9000: 1994

	Mean	F.L	Comm	C.A.	EV	V
Factor 1: Trainer					5.8318	38.8789
Communication skill training for managers and employees	4.0000	0.8219	0.6853	0.8759		
Assistance in maintenance and renovation	3.7857	0.7525	0.6143	0.8798		
Carrying out technical and manual training	4.4762	0.6970	0.5828	0.8726		
Quality system (discrepancy) evaluation	4.1190	0.5298	0.6491	0.8681		
Factor 2: Coordinator					2.0971	13.9804
Preparation for audit and certification	4.1667	0.7761	0.7326	0.8709		
Facilitating activities for corrective actions	3.9762	0.7532	0.8007	0.8690		
Coordinating ISO certification process	4.1905	0.6855	0.5681	0.8744		
Organizing activities and responsibilities	3.9048	0.6565	0.6167	0.8724		
Recommending solution and implementing it	4.0476	0.6086	0.7612	0.8598		
Factor 3: Documenter					1.4286	9.5237
Executing documentation activities for client	3.9762	0.8816	0.8909	0.8688		
Preparing quality manual for client	3.7619	0.8097	0.8314	0.8730		
Drafting quality policies and objectives	4.1190	0.6776	0.8186	0.8722		
Factor 4: Adviser					1.1848	7.8985
Listening and offering support and advice	4.2381	0.8779	0.8247	0.8794		
Providing expert information	4.2619	0.5392	0.6348	0.8788		

Notes: CA =Cronbach's Alpha; F.L = Factor Loading; Comm = Commonalities; EV = Eigenvalue; V = Variance explained.

TABLE 3
Role of Consultant in ISO 9001: 2000

	Mean	F.L	Comm	C.A.	EV	V
Factor 1					5.7104	38.0691
Quality system (discrepancy) evaluation	3.9762	0.7455	0.6303	0.8691		
Organizing activities and responsibilities	4.3333	0.7429	0.6821	0.8766		
Recommending solution and implementing it	3.9048	0.7407	0.6463	0.8708		
Preparing quality manual for client	4.4524	0.6704	0.7048	0.8714		
Facilitating activities for corrective action	4.0952	0.6130	0.6620	0.8719		
Creating quality awareness and cooperation	4.0952	0.5685	0.6769	0.8642		
Assisting in maintenance and renovation	4.0714	0.5666	0.6198	0.8667		
Factor 2					2.2495	14.9965
Conducting technical and manual training	3.7381	0.7855	0.7018	0.8717		
Executing documentation activities for client	4.1429	0.7588	0.6692	0.8748		
Listening and offering support and advice	3.8810	0.6182	0.4702	0.8759		
Factor 3					1.3648	9.0984
Communication skills training for managers and employees	3.9762	0.9089	0.8808	0.8705		
Coordinating ISO certification process	4.1905	0.8398	0.8303	0.8720		
Preparing for audit and certification	3.8571	0.8135	0.8034	0.8707		
Factor 4					1.2065	8.0433
Providing expert information	4.0952	0.8627	0.8183	0.8733		
Drafting quality policies and objectives	4.0238	0.7459	0.7349	0.8719		

Notes: CA =Cronbach's Alpha; F.L = Factor Loading; Comm = Commonalities; EV = Eigenvalue; V = Variance explained.

handbook. The fourth role is 'Adviser', acting as a guide and counselor for organizations pursuing ISO certification by providing expert information, offering support and advice on aspects of ISO 9000 implementation.

4.3 ROLE OF CONSULTANT - ISO 9001: 2000

The results of the reliability analysis and factor analysis for the measurement set of *Role of Consultant - ISO 9001: 2000* are summarized in Table 3. The overall Cronbach Alpha is 0.8790, with all statements' individual Cronbach Alpha values greater than 0.70, suggesting that all items can be retained for factor analysis. The measurement set has a Barlett Test of Sphercity statistic of 302.6500 with a significance level of 0.0000, and a Kaiser-Meyer-Olkin Measure of Sampling Adequacy of 0.7730, qualifying it for factor analysis. From Table 3, it can be observed that the perceived primary role of the consultant (the first factor) can be considered as that of a 'Comprehensive Implementer'. This is reflected through the wide coverage of that role starting from the initial assessment of quality system discrepancy to the establishment of quality awareness, conducting technical and manual training, organizing activities and responsibilities, identifying errors in implementation, assisting the subsequent corrective and preventive actions, and the equipment and machine maintenance. The items for the following three factors appeared to be a mixture of the role of trainer, coordinator, documenter and adviser.

5. DISCUSSIONS

In terms of the consultant's role in ISO 9000: 1994, the empirical result has provided evidence that is in line with the generally agreed characteristics of ISO 9000 quality assurance systems. Specifically, the ISO 9000: 1994 quality assurance systems have four major underlying concepts: (a) conformance, (b) documentation, (c) design quality and prevention, and (d) inspection and testing. By taking into account the perceived consultant's role and perceived organizational barrier (see Table 1 and Table 2), it seems that the 'trainer' and 'coordinator' roles are mostly concerned with the ramification of the control processes, which are closely associated with the core concepts of conformance,

design quality, prevention, inspection and testing. Of course, as some companies may already have some form of quality assurance system in place, these clients may only require consultation in the preparation of documentation, which is carried out by the 'documenter', or advice on the audit and requirements of ISO, which is the primary task of the 'adviser'. That may explain why the factor structure for a consultant's role in the ISO 9000: 1994 quality assurance system is clear cut, as compared to the results in Table 4; meaning that the consultants can either be very close to the client in order to install the quality systems into their client operations, or the consultant can act only as 'documenter' or 'adviser' to help the client get the certificate. As pointed out by Santos and Escanciano (2002), as long the organization has evidence to prove that processes and procedures conform to the quality manual, and the product or service is obtained in a consistent and repeatable manner, that company will most likely be considered as fulfilling the ISO 9000 requirements, and be certified as an ISO compliant company. Thus, the consultant can either take a proactive or passive role in the implementation process, depending on the clients' will and needs.

The primary difficulty of ISO implementation, as perceived by the consultants, appeared to be due to failure in the 'Control of Processes', which is caused by (a) poorly maintained machinery, equipment, and testing or measurement tools, (b) deficient documentation of quality records, including design-related documents. The first problem leads to frequent down time and unstable product performance, and also unreliable product performance data due to absolute measurement equipment. The second problem has made (a) the recording and documentation of current processes and procedures difficult, if not complicated, and also caused (b) the documentation problem of current product features and specifications, as the product specification records have not been systematically updated. Both problems feed into the making of the quality system.

Such a focus on these control and record aspects of operations by the consultant is understandable, as they form some of the underlying requirements of the ISO 9000 quality assurance systems. It is quite surprising to observe that the human-related factors are in second place (for 'Culture'). The plausible reason may be the increased acceptance and recognition of the importance of ISO 9000 certification among suppliers and buyers, which in part is also fueled by the increasing

legitimacy of the certificate in international business communities. Nevertheless, the consultant sees the lack of quality-oriented thinking and awareness among employees and managers to be the second prime barrier to ISO implementation. The third category of barrier is the 'System Formation', as top management is less enthusiastic about participating in the formulation stage of the process and procedures. This can significantly restrain the consultant's ability to draft the necessary work plan to prepare the company for ISO 9000 implementation. Perhaps that is the reason why in the 'Trainer' role, apart from the process control elements of (a) quality system evaluation, and (b) machinery maintenance and renovation, these elements are also covered: (i) establishing quality awareness and cooperation, and (ii) quality training.

As the ISO 9000 migrates into the realm of organizational management, the consultants no longer have the option of distancing themselves from the implementation process and being involved only in the paper work process. That is because to instill a process-based system, as highlighted in the new ISO 9000 quality system requirements, into the client's company's system definitely requires a greater portion of time, resources and effort. It is also reasonable for the ISO consultant to expect a single and more comprehensive role in the implementation process to fully address the needs of the new technical and management tool – ISO 9001: 2000. Perhaps, that is why the results in Table 3 suggest that there is only a single primary role for consultants in the new system – to become the comprehensive implementer that blends together the elements of trainer, coordinator, documenter, and adviser. In other words, the consultants are now faced with a situation in which, apart from the technical and systematic requirements and specifications of ISO 9000 quality system, they also have to be equipped with the skills of the organizational development consultant who is extensively involved with quality programs such as Total Quality Management and Continuous Improvement.

It can be expected that with the implementation of ISO 9001: 2000, greater leadership and participation is required from top management, and rather than being inward looking, the focus should be on the issue of customer satisfaction. The success of ISO consultation to a large extent depends on the communication and collaboration between the top management and the consultant. That is definitely different from

the previous quality standard that could afford to have less participation from the top people, and concentrated mostly on middle level managers and those operational personnel involved in the quality processes. Apart from that, the shift from the element-based to the process-based management of ISO 9000 quality systems would suggest a surge in demand for auditing agencies. The agencies are for the representation and transparency of an organization's work processes and its respective interfaces that are critical to the quality of the organization (Janas and Luczak, 2002). In other words, greater pressure can be expected from the middle managers and operational personnel, as they have had to tear down their territorial barriers in order to fulfill the new ISO 9000 requirements. The consultants, thus, must not only be well versed in the technical aspects of ISO 9000 but also be involved in the negotiation and facilitation process of opening different departmental gates and doorways. Finally, it may be noted that the ISO 9000 is also moving in the direction of more general requirements, providing for greater flexibility for organizations to use the standards for their specific purposes (Larsen and Haversjo, 2001). This means that the consultants can now no longer afford to address different organizations with a standard off-the-shelf manual and approach. Instead, greater attention and observation is required to provide a customized quality assurance system for the client that is able to simultaneously fulfill both the organization's needs and the auditor's requirements.

6. CONCLUSION

In summary, the shifting paradigm of ISO 9000 requirements and concepts demand new approaches and roles of ISO consultants. In the old ISO 9000 quality assurance systems, consultants often act as knowledge brokers who transfer their codified knowledge of ISO 9000 technical requirements and implementation, which is learnt through the precise ISO 9000 codebook, to the client's organization. They also function as informers or advisers of best practices and 'know-how' in ISO implementation to their clients. On the other hand, for the new ISO 9000, the consultants are to be expected to play a more creative and innovative role in tailoring their client's operations and systems to fit in with the new ISO 9000 requirements. The role of the consultant may also depend on the status of the consultant's client. For organizations that already have the certificate but are required to update to the new ISO standard, the primary task of the consultant is to facilitate the

transition from element-based quality systems to process-based ones, with emphasis on the integration of the current quality system with the total quality oriented system that focuses on customer satisfaction and continuous improvement. If the client, without having any ISO certificate, would like to certify as a new ISO compliant company, then the consultant's roles would be focused on leading the top management through the implementation process, and also breaking down the territorial/departmental barriers in order to instill the process-based quality management approach into the organization. However, it is to be noted that these statements may require further empirical evidence that is beyond the scope of this study. Thus, future studies may consider exploring the different experiences ISO consultants have had in their ISO revision/maintenance exercise and ISO registration process.

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