A study of the perceived impact of ISO Certification on companies and individuals through Q-Methodology

Fredrick K. C. Tao
Professor, Asia International Open University (Macau)
L. C. Koo
Professor, International Management Centres
Hannah Koo
Doctoral Candidate, International management Centres

ABSTRACT
The benefits and disadvantages of acquiring ISO certification have been a controversial issue among academic, business practitioners and consultants. The impact of ISO on the performance of organizations and / or individual employees would depend on the circumstances prevailing at the time. Objective assessment of ISO impact can be difficult if not impossible. This paper focuses on the perception of ISO impact on the organization on the one hand and on individuals as employees on the other hand. Understanding people's perception is still very important because of common sense wisdom :"*Reality is reality and perception is also reality*". If peoples' perception is inappropriate then this is a communication problem. The concerned management should rectify the misconception among the employees. This paper discusses the use of Q-Methodology to reveal peoples' perception towards the impact of ISO certification on the performance of the organization as well as on the behaviours and performance of individual employees.

Keywords: ISO certification, Q-Methodology, Organization Performance, Individual Performance

Background

As a quality system, ISO certification has won wide recognition and is generally accepted by both manufacturing and service sectors alike. Despite it success, debate on ISO's usefulness has never ended and should perhaps still remain unsettled for quite sometime. The pros and cons of ISO certification scheme have been a controversial topic among the academic and the business practitioners (Mallek et al. 1997, Quazi et al. 1997, Ho 1994, Yung 1997, Koo et al. 1999, McLachlan 1996, Dale 1994, Mo and Chan 1997, Seddon 1997, Syrett et al. 1995).

There are little researches performed on the impact of ISO on the company and on the individual levels. It is indisputable that the importance of studying ISO's impact should not be understated. A purely objective study on the impact of ISO certification would be difficult, as it would entail the study of cause and effect relationship among the variables. This study proposes a new perspective to review the issue using Q-Methodology to examine the subjective perception of ISO impact on the organization and on the individuals.

What is Q-Methodology?

Q-Methodology was invented in 1953 by British physicist/psychologist William Stephenson (1902-1989). It involves a distinctive set of psychometric and operational principles that, when combined

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with specialized statistical applications of correlational and factor analytical techniques, that provides a systematic and rigorously quantitative means for examining human subjectivity (McKeown et al., 1988). Subjectivity means a person's communication of his or her point of views. Q-Methodology offers a systematic means to examine and understand respondent's personal experience through preserving his or her frame of reference.

Central to Q-Methodology is a concern with ensuring that self-reference is preserved rather than compromised by or confused with an external frame of reference brought by the researcher. Q-Methodology is different from the conventional R-Methodological approaches to the measurement and study of subjective phenomena such as opinion, attitude, traits, and values. R-Methodology is a method of expression and the respondents are measured from an external point of view. On the other hand, Q-Methodology is a method is a method of impression, under which the personal, intraindividual significance of 'test stimuli' is of importance. When responding to Q-sorting, a respondent using his or her frame of reference assigns the items in a qausi normal distribution table ranging from two extreme states. A freeware package PQMethod 2.06 is available from Kent State University's Listserver (Brown, 1996) to perform the Q-Methodological analyses.

Since the observational perspective is the respondent's own frame of reference, the tests of validity and reliability essential in the mainstream attitude research are simply not important in in Q-Methodology study.

Design of the Research instrument

A total of 55 ISO related items were generated from the 20 ISO clauses. A convenient sample of 23 respondents who were attending a Quality Management module in the MBA curriculum was selected for this action research. These postgraduate students were from various industries and they all had had many years of working experience. The 20 ISO clauses were explained in detail to all respondents. The technique of Q-Methodology was outlined. Most respondents did not have ISO certification in their organizations yet. In view of their working experience and education, they should be matured enough to appreciate the impact of the ISO requirements on the organization on the one hand and on them as individuals on the other hand. The respondents were asked to rank sort the 55 items on a quasi normal distribution according to their perceived extent of impact on their organization and them as individuals respectively. Some demographic data were also obtained (i.e. Gender; Job Grade; Grade; Industry their companies are in and whether they have ISO certification or not). Some facilitation support was provided during the Q-sorting by the respondents.

The 55 ISO items were typed with scrambled number on 55 cards. The cards were then shuffled. Each respondent was given a pack of cards and was required to rank sort the cards on a long table and write the number on the Q-Sort input form.

The 55 ISO 9001 related items (grouped under the respective principal clauses) are as follows:

1. Management responsibilities

- Corporate quality policy development, statement, deployment, implementation, communication, and understanding
- Organization, structure, responsibility, and authority
- Management review of the system to ensure its effectiveness

2. Quality system

- Documentation and implementation of procedures and instructions
- Quality manual describing how the company operates and listing the requirements of various standards

- Quality plans, work instructions, and inspection instructions

3. Contract review

- Definition and documentation of internal and external customer needs and requirements
- Contract and tender compatibility
- Quality planning
- Capability of compliance with requirements

4. Design control

- Design and development planning
- Identify and allocate resources
- Definition and control of design inputs, outputs and interfaces
- Review, approve, record and control design changes

5. Document control

- 'Document' needs to be defined
- Review and approval of documents by authorized personnel
- Correct issues of necessary documents available at appropriate locations
- Changes to documents are authorized and recorded

6. **Purchasing**

- Suppliers' assessment and monitoring of performance and capability
- Records of acceptable suppliers
- Formal written definition of requirements and specification

7. Purchaser supplied material

- Verification, storage and maintenance of customer supplied material for use on their order

8. Product identification and traceability

- Unique and positive identification of material, parts, and work-in-progress through all stages of production, delivery and installation

9. Process control

- Identify and plan the process
- Monitoring of key characteristics and features during production
- Processes carried out under controlled condition

10. Inspection and testing

- Established procedures for inspecting and testing
- In-process inspection and testing
- Final inspection and testing

11. Inspection, measuring and test equipment

- Control, calibration and maintenance of equipment needed to demonstrate compliance with requirements
- Documentation and calibration records

12. Inspection and test status

- Identification of inspection and test status (i.e. untested, tested, checked, reject, meets requirements)
- Confirmation that test and inspections have been carried out

13. Control of non-conforming product

- Segregation of non-performing materials, parts and products, where practicable
- Review and decide on appropriate remedial action (e.g. destroyed, repaired, reworked, or regraded)
- Reinspection

14. Corrective action

- Investigation and analysis of causes of problems
- Taking preventive action
- Assignment of responsibilities for corrective action

15. Handling, storage, packaging and delivery

- Methods and equipment which prevent product damage and/or deterioration
- Receipt and delivery of items into and out of storage

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- Procedures to ensure that the product is packed to prevent damage throughout the entire production to delivery cycle

16. Quality records

- Adequate records relating to inspections, test and process control, demonstrate achievement of product quality and effective operation of quality system
- Traceability and full history
- Storage, retrievability, legibility and identification
- Method of disposition when no longer required

17. Internal quality audit

- Compliance with the documented system
- Reporting of discrepancies and results to personnel responsible for the area audited

18. Training

- Assessment and identification of training needs
- Provision of the required training
- Written job responsibilities and specification
- Training records

19. After-sales servicing

- Procedures for performing and verifying that needs and requirements are met

20. Statistical techniques

- The use of samples to determine product and service quality
- Process capability determination and acceptability through analysis

Details about the respondents

All respondents are MBA students from AIOU in Macau. Nine out of the 23 respondents were male and 14 were female. Seven respondents were junior executives, eight were supervisors and eight were managers or above. Most of the respondents (i.e. 12) worked in the service sector. Eight of them worked for the public sector. Only 4 (i.e. 17%) respondents had ISO certification in their organizations. Nearly all (i.e. 21 out of 23) respondents perceived that ISO was good.

Q-Method findings

The PQMethod software first generated a correlation matrix of the 23 sorts. An unrotated factor matrix was also produced . Four factors were specified for Varimax rotation and the following are the factors representing the perceived impact of ISO certification on the ***individuals*** as employees (listing items with z-scores larger than 1 within brackets below) :

Clear Guidelines: (Organization, structure, responsibility & authority; Corporate quality policy development, deployment, implementation; Documentation & implementation of procedures & instruction; Management review of system to ensure effectiveness; Written job responsibility & specification; Design & development planning; Manual describes how company operates & lists standards; Identify & plan the processes; Formal written definition of requirement & inspection; Documents needs to be defined; Compliance with documented system; Quality plan, work & inspection instruction)

Problem Prevention: (In-process inspection & testing; Management review of system to ensure effectiveness; Final inspection & testing; Investigation & analysis of causes of problem; Confirm test & inspection have been carried out; Taking preventive action; Procedure for performing & verifying needs are met; Formal written definition of requirement & inspection)

Control: (Review & approve document by authorized personnel; Definition & control of design input, output, interface; Organization, structure, responsibility & authority; Quality plan, work

& inspection instruction; Monitor key characteristics during production; Investigation & analysis of causes of problem; Procedure to prevent damage to product throughout cycle; Corporate quality policy development, deployment, implementation; Storage, retrievability, legibility & identification; Review, approve, record & control design changes; Reinspection; Provide the required training)

Process Review: (Define & document internal/ external customer needs; Review approve, record & control design changes; Definition & control of design input, output, interface; Review & decide on appropriate remedial action; Quality planning; Identify and plan the process; Corporate quality policy development, deployment, implementation; Management review of system to ensure effectiveness; Manual describes how company operates & list standards; Procedure for performing & verifying needs are met)

Similarly the PQMethod analyzed the perceived impact of ISO on the ***organization***. Four factors after Varimax rotation are listed below with items with z scores larger than 1:

Quality Regulation: (Organization, structure, responsibility & authority; Quality planning; Corporate quality policy development, deployment, implementation; manual describes how company operates & lists standards; Management review of system to ensure effectiveness; Quality plan, work & inspection instruction; Written job responsibility & specification; Identify & plan the process; Identify & allocate resources)

Planning & Monitoring: (Investigation & analysis of causes of problem; Quality plan, work & inspection instruction; Management review of system to ensure effectiveness; Taking preventive action; Monitor key characteristics during production; Procedure for performing & verifying needs are met; Records for test & process control to ensure quality; Assignment of responsibilities for corrective action)

Documentation: (Records for test & process control to ensure quality; Define & document internal/external customer needs; Documents needs to be defined; Corporate quality policy development, deployment, implementation; Processes carried out under controlled condition; Manual describes how company operates & lists standards; Review, approve, record & control design changes; Formal written definition of requirement & inspection)

Capability Review: (Identify & allocate resources; Design & development planning; Management review of system to ensure effectiveness; Contract & tender compatibility; Review & decide on appropriate remedial action; Assessment & identification of training needs)

Conclusion and recommendations

From this Q-Methodological study, it can be observed that the perceived impact of ISO certification on individual employees (i.e. Clear guidelines; Problem prevention; Control; and Process review) are not the same as the perceived impact of ISO on organizations (i.e. Quality regulation; Planning & monitoring; Documentation and Capability review). The perceived impact on individuals are more related to inherent issues of prevention of problems and the perceived impact on organizations are more related to interfering control from top. The present study has not incorporated in the Q-Methodology study the respondents' affective feelings towards the ISO. These can be supplemented (or triangulated) by a separate R-Methodological approach of using questionnaire survey to examine the extent of perceived importance and the level of satisfaction of the respective ISO attributes. The gaps (operationally defined as the difference between importance and satisfaction). The Importance-Satisfaction-Gap approach to analyse the attitudes of the respondents should shed more lights on the study of impact of ISO certification on individuals as well as on the organizations.

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The Q-Sort input form

The purpose of this study is to find out your attitudes towards the impact of ISO certification on you as an individual employee and to the organization as a whole. If your employer has not applied/obtained the ISO certification, please image the likely impact of ISO as best as you can.

Please supply your personal data below. The data will be analyzed on an aggregate basis and will be kept strictly confidential by the researcher.

Name: _____
Please tick the appropriate boxes below:
Gender: Male [ ]; Female [ ]
Job Grade: Clerical [ ]; Supervisor [ ]; Manager [ ]; Professional [ ]; Above managerial grade [ ]
Industry your company is in: Manufacturing [ ]; Service [ ]; Public Sector [ ]; Others, please specify: _____
Your company has [ ] / does not have [ ] **ISO Certification** currently.

I think ISO certification is good [ ] / not good [ ],
because:_____
_____

Please rank sort the 55 ISO related requirements in the following two tables by putting the relevant item number in the respective boxes. The first table refers to ISO impact on you as an individual and the second table refers to the ISO impact on your organization.

Table 1: ISO impact on you

← The related ISO requirement helps improve my work behaviour / performance					The related ISO requirement does not help → improve my work behaviour / performance			
+ 4	+ 3	+ 2	+ 1	0 (Neutral)	- 1	- 2	- 3	- 4

Table 2: ISO impact on your organization

← The related ISO requirement helps improve the performancee of my organizaation					The related ISO requirement does not help → improve the performance of my organization			
+ 4	+ 3	+ 2	+ 1	0 (Neutral)	- 1	- 2	- 3	- 4

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