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Quality management practices of ISO vs non-ISO companies: a case of Indian industry
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This empirical study is a first attempt to find the differences between ISO and non-ISO organizations in India. Four areas of study include technology management, causes of poor quality, participation in the quality improvement programs and quality control techniques used. The results of this study indicate that statistically significant differences do exist between ISO and non-ISO organizations under all the four categories specifically in training, using quality in the strategic planning, product design and team building.

Content Indicators: Readability**, Practice Implications**, Originality**, Research Implications**

The process of liberalization of The Indian economy has opened up imports from various countries. Indian manufacturers’ ability to compete in the domestic market will largely depend on their ability to compete with the imports from foreign countries. One of the tests will be the quality of goods produced by the domestic manufacturers. Indian manufacturers have just begun to realize that quality will play a greater role in the future growth or even survival of their business. In fact, this may be the factor that could decide the fate of this country in the twenty-first century. Several studies have examined the quality management practices of Indian manufacturers (Motwani et al., 1994; Jordan, 1997; Raghunathan et al., 1997). All these studies have used a general list of Indian manufacturers. Whereas in our study we also focus on manufacturers having ISO 9000 registration. Consideration of ISO 9000 registered companies provides us with a more focussed analysis and insight into the quality management practices of organizations competing and intending to compete internationally.
Literature review

The interest in international quality management practices has been growing for some time. Several studies have focussed on assessment of quality management practices of single or multiple countries. Sarkar (1990) studied the status of quality control in India. He observed that no performance evaluations of quality control operations are done in Indian manufacturing organizations. He suggested that a culture for quality improvement and cost reduction should be infused to all employees across the functional groups and hierarchical levels. His study was quite general in nature and the outlook and behavior of Indian industry has changed quite a lot since then. Motwani et al. (1994) studied 73 organizations to pinpoint the degree of quality management in Indian manufacturing firms in India. In the study, nine critical factors for the effective enforcement of quality management were identified, such as quality department visibility, employee training, quality product design and close cooperation with vendors. Raghunathan et al. (1997) in a comparative study including India indicated that quality was considered important in the country. Leadership, strategic quality planning and quality assurance practices were given greater importance than the other constructs compared in the analysis. The other constructs considered in this study were information and analysis, supplier relationships, quality results, customer orientation and human resource development.

The measures used to determine the quality practices in an international context have been quite diverse. Reitsperger and Daniel (1991) used single item variables and differences in the answers to these questions to determine quality practices of Japanese and US companies. Rogers (1993) found differences in quality practices between Japanese and US approaches with respect to strategic planning process, communication and human resource management. Hull et al. (1988) found differences between Japanese and US companies on aspects like marketing output, material input and manpower. A close examination of literature reveals a lack of analysis based on an international standard such as ISO 9000. In this study we attempt to determine the difference between the quality management practices of ISO 9000 registered companies and non-ISO 9000 registered companies in India. The question is why ISO 9000 registered organizations. An exploratory study conducted by Mallak et al. (1997) found that quality improvement programs in ISO 9000 organizations seek to achieve and maintain product quality, assure management that quality standards are being achieved, and provide consistent products to consumers. Findings of this study suggest that ISO 9000 certification efforts are supported by such values as team orientation, group training, defect prevention and attention to detail. Min (1998) suggests that strict adherence to supplier quality requirements, incorporation of customer feedback for process improvements, and employee training/empowerment are essential components of a world class quality improvement program. In this study we consider quality improvement programs such as customer orientation, QC team building, QC circle, employee training/empowerment, cooperation with the suppliers, QC cost analysis and strategic quality planning.
Companies with high quality priorities also need essential quality tools (Horai, 1993). Quality tools enable employees to translate each phase of the problem solving cycle into action. They help them to think about, see, and reveal what otherwise would not be apparent. A check sheet of essential quality tools consists of pareto analysis, variable and attribute inspection, scatter diagram, cause and effect diagram (Channeski, 1998). For this study we are focusing on quality control techniques such as control limits, attribute and variable inspection, pareto analysis and control limits.

Garvin (1984) suggests that quality pertains to a product’s degree of conformance to engineering and design specifications. So a good quality will simply mean that the product meets or exceeds engineering and design standards and ISO 9000 standards are also based on the conformance based criteria (Russell and Miles, 1998). ISO companies would emphasize more on the design criteria in their assessment of quality. In this study we tried to explore this issue by asking our respondents about the main causes of poor quality such as poor design, lack of training, lack of monitoring, lack of management support etc. (see Table IV for a detailed list).

Data collection

A random sample of 500 manufacturing companies in the National Capital Region of India (New Delhi and surrounding areas) was selected and survey instrument was mailed to each company. The management representative from each company was contacted by telephone before and after mailing the survey instrument. A total of 121 completed and usable surveys were received with a response rate of 24.2 per cent. Validity and reliability tests were performed. Factor analysis provided a measure of construct validity of the instrument. The more variance explained by the factors resulting from the factor analysis, the more powerful the instrument in measuring what it is supposed to measure (Mallak et al., 1997). The factor analysis for the current study explains nearly 69 per cent of the variance compared to 38 per cent in O’Reilly and Chatman’s study (1986) and 40 per cent in Mallak et al. (1997) study. Given the diverse backgrounds of respondents, first application of the instrument to the given domain and ambiguous nature of quality practices, this level of variance supports the exploratory nature of this study.

Analysis and results

Given the adequate sample size and the relative ease of interpretation, mean differences in rankings were tested with parametric t-tests. The results appear in Tables I, II, III and Table IV Quality control techniques used. Table I Technology management shows the differences between ISO and non-ISO in terms of technology management. Tables Table II Causes of poor quality and Table III Participation in the quality improvement programs show the causes of poor quality, participation in the quality improvement programs and quality control techniques respectively, between ISO and non-ISO companies. The significance of the results relative to each category are discussed next.
Research question no. 1: comparison of technology management practices

Results in Table I indicate that the differences between ISO and non-ISO are statistically significant on four issues:
1. use of total quality management;
2. offer training with regards to quality control;
3. use of computer integrated manufacturing;
4. use of quality improvement as part of strategic planning.

The percentage of respondents responding “yes” to the above issues was also higher for ISO than non-ISO companies. The results of this analysis suggest that the ISO companies are aggressively moving ahead of non-ISO companies in terms of technology management. ISO organizations also consider quality as a strategic planning aspect.

Research question no. 2: comparisons based on causes of poor quality

Results in Table II indicate that the differences between ISO and non-ISO are statistically significant on four issues:
1. poor design;
2. lack of training;
3. low commitment to QC;
4. lack of monitoring.

Research question no. 3: comparisons based on participation in the quality management programs

Results in Table III indicate that the differences between ISO and non-ISO are statistically significant on six issues:
1. customer orientation;
2. QC team building;
3. employee training/empowerment;
4. cooperation with supplier;
5. QC cost analysis;
6. strategic quality planning.

Research question no. 4: comparison based on quality control techniques used

Results in Table IV indicate that the differences between ISO and non-ISO are statistically significant on four issues:
1. control limit;
2. tolerance limit;
3. pareto analysis;
4. random inspection.
Discussion of results

The results of this study indicate that ISO and non-ISO organizations do differ on at least four aspects: i.e. technology management; quality management programs; causes of poor quality; and quality control techniques used. In terms of quality management programs, team building and training turned up to be significant. In this era of total quality management, organizations tend to resolve problems through teams. This type of task is normally assigned to steering committees and in ISO organizations steering committees are already in existence. The use of steering committees goes beyond departmental boundaries and several problems that are interrelated can be resolved easily. The significance of teams in ISO companies may be due to the familiarity with the steering and working committees and the group work involved in those committees.

Companies that achieved ISO certification advocate a corporate-wide employee involvement strategy using training programs. Training supports a self-perpetuating quality environment that promotes investment returns by advancing education and familiarization among employees. Characterized by a training delivery scheme based on customer requirements, it also addresses issues associated with change and performance standards. Moreover, training correlates very well with the gathering and evaluation of important process information associated with ISO 9000 standards. It also initiates control and strategic policies that let employees analyze work processes, correct system faults and receive acknowledgment for changing.

The difference in strategic quality management between ISO and non-ISO organizations is significant because it requires a strong future orientation and a willingness to make long-term commitments to customers, employees, stockholders, suppliers and the community. ISO organizations’ quality goals as well as the strategic and operational plans do reflect these commitments. They are developed in concrete terms and are highly focussed. Also, they address training, employee development, supplier development, technology evolution and other relevant factors that bear on quality. They incorporate the short-term and long-term needs. In addition, the goals are integrated into the overall corporate business strategies (Tumala and Tang, 1996).
Managerial implications

This study has several managerial implications: first, it provides in-depth analysis of the key indicators for ISO registration such as quality improvement programs, team building and technology management. The identification of these provide opportunity to firms in terms of increasing the benefits of registration. The positive impact of ISO 9000 registration on service/product quality, cost savings, access to markets and overall efficiency will provide them competitive edge. ISO is increasingly required to do business overseas and it is therefore very important that organization leaders know about ISO 9000 and are able to assess its fit into their organization (Simpson, 1994). Second, this study provides an empirical base in understanding ISO 9000. While most senior executives have a passing awareness of the name of ISO 9000, many do not appear to be clear about the purpose of it. This lack of understanding is addressed in this paper by providing an empirical analysis of broad differences between ISO and non-ISO organizations. Third, the common understanding is that implementation of ISO 9000 does require resources such as better training facilities. But, it is difficult for the managers to provide quantitative data to justify this proposition. This study provides them the politically safe and quantitatively sound justification. Lastly, we feel that this study will stimulate discussion in management circles about the core competencies for a successful registration.

Conclusion and future directions

Two major conclusions emerged from this study. First, ISO and non-ISO organizations do differ in their quality management practices. ISO 9000 registered manufacturing organizations in this study appear to have formal commitment to quality management. These organizations have a singular unifying goal of quality. Second, this study does find differences between ISO and non-ISO organizations in regards to training. Mean scores indicate that ISO organizations emphasize more on training. Effective training with employee involvement is the most efficient means of initiating quality improvement programs (Geisler and Justus, 1998). Training of employees allows them to understand:

- the gap between what is being done and what needs to be done;
- opportunity to learn the benchmarks and make the necessary changes to meet those quality benchmarks.

This study laid the ground work for future research in the following areas:
- further exploration of the reasons for the differences between ISO and non-ISO organizations;
- further fine tuning and extension of this study to other countries and multinational firms;
- to study the effects of ISO registration on financial performance of an organization;
- to study the differences between quality management practices of technology driven firms.

Table I Technology management
Table II Causes of poor quality
Table III Participation in the quality improvement programs
Table IV Quality control techniques used

References