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A Review of Quality Management Practices and their Effectiveness in the Indian Manufacturing Industry

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Abstract: *Global firms seek durable competitive edge in today's competitive market. Better goods or services at reduced prices may provide an advantage. Commercial organizations must use cost-based and differentiation-based strategies to survive and flourish in today's complex business climate. Global competitiveness includes product life cycle innovation acceleration. Total Quality Management improves efficiency and quality to save costs and foster innovation. Deregulation of the Indian economy has forced firms to enhance quality. The industry improves quality via procedures. Quality in Indian company has increased considerably in recent years. This empirical research investigates Indian manufacturers' quality management strategies. This essay also discusses how quality management systems impact product quality*

Keywords: Total Quality Management, Product Reliability

I. INTRODUCTION

The Indian economy is evolving from government control to free market, protection to competition, and isolation to globalization. Thus, India's business climate is changing fast. The nation's industry and trade are affected by new economic policies and global competitiveness. Today, global competition makes customers king. Since consumers are king, only inexpensive, high-quality companies will succeed. Customer service should be outstanding at these firms. Indian companies use TQM to fix these issues. Quality increasingly drives competitive advantage for industrial and service companies.

Quality management is accepted by many companies. Marketing, sales, R&D, production, accounting, finance, clerical, laboratories, transportation, and distribution are included, as well as law firms, accounting practices, medical services, government agencies, military services, engineering construction firms, manufacturing, aerospace, universities, farming, oil, dentists, offices, and transportation Rapid quality improvement may not provide many companies a competitive advantage in 10 years, but it may be critical. Many companies are embracing quality improvement. Many companies today consider quick quality improvement smart management.

To satisfy customer expectations, total quality management (TQM) oversees quality in all elements and stages of a business. System-focused TQM implementation approaches reflect this viewpoint. Model structures apply to all organizations. However, circumstance may alter TQM adoption in various organizations. Contextual considerations include industry type, which is usually divided into manufacturing and service companies. Many analysts claim four factors separate service companies from industrial ones. Intangibility, heterogeneity, perishability, inseparability. Service companies differ from manufacturing in ways that make TQM adoption challenging, and what works in manufacturing may not work in services. This is particularly true because TQM was developed in manufacturing and has long been used in industry.

Many nations' quality management systems have been studied. Many studies compare national quality management systems. Despite renewed interest in Indian markets, few studies have evaluated Indian enterprises' quality management systems. Both Indian manufacturers must evaluate quality management systems.

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II. LITERATURE REVIEW

TQM is used by most managers [Dow et al., 1999]. TQM research is prevalent in developed countries. Underdeveloped countries analyze TQM success and implementation.

Indian industrial quality management is well-studied. Jaguareesh R examined Indian firms' TQM growth. Mandal and colleagues [1999] examined Indian industry quality management. Studies demonstrate that Indian companies adopted quality management systems soon following 1991 economic openness.

Few empirical research have established TQM program success factors. Lakhe and Mohanty examined Indian enterprises' TQM adoption. Industry leaders evaluate key components. Assessing internal consistency and dependability. Authors can explain global perspectives, understand business imperatives, and strategically implement TQM across industries using a factor model.

Motwani and Mahmoud investigated Indian companies' quality assurance systems. Indian firms value product quality, according to the report. 96% of quality-policy firms agreed. The causes of quality concerns were discovered. Material and component supply came first. Staff training, equipment difficulties, and maintenance followed.

India has a large manufacturing sector but little quality management research. Industrial quality control in China matters. Years ago, India and China traded similarly. China increased its trade share but India did not during 1978-1989. Despite growing markets and decreasing trade barriers, India is not attracting international investment like China. Lack of awareness of Indian industrial management practices, especially quality management, may explain this gap.

Quality methods provide high-quality outputs, defining quality management. Flynn, Schroeder, and Sakakibara describe quality management “an integrated approach to achieving and sustaining high quality output”. Most empirical data was collected by consulting firms or quality groups with a stake in the outcomes and did not follow normal methods, but it supports this viewpoint.

Saraph, Benson, Schroeder, and Krafcik explored quality management systems and their influence on quality outcomes, then Flynn, Schroeder, and Sakakibara strengthened theoretical explanations. Every research showed a clear link between quality procedures and outcomes. Powell first disputed it. Powell found that just three of his 12 quality practice criteria impact corporate performance. The author concludes that TQM may assist companies without full adoption. Powel investigates if all quality management approaches increase quality.

Shrivastava et al. provided a comprehensive TQM-organizational performance assessment technique. In the previous decade, they developed a diagnostic tool for Indian TQM enterprises. Both strong and weak partnerships improve TQM.

The literature review lacks industrial quality management research. Examine Indian quality control. This study maps Indian manufacturers' quality management practices and examines how they improve product quality.

III. RESEARCH METHODOLOGY

Research is empirical and the survey was emailed. The respondent businesses got a well-designed questionnaire via email. After brainstorming with quality management experts, the questionnaire was produced. The questionnaire was designed using early survey input. The questionnaire has ranking and variable questions. Most of these questions stem from two prior international quality probes. Our poll has five categories. The divisions are:

- “Quality is free” philosophy,
- Quality performance,
- Causes of poor quality,
- Efforts to improve quality, and
- ISO 14000 certification.

First, questions assess managerial commitment to quality in a company. This collection of questions, based on Crosby's concept, covers strategic decision-making, quality's role in other decision-making elements, and management's role in quality challenges. The “quality is free” mindset was chosen to compare the study's findings to those of other nations including the US and Japan. Quality performance questions in the second category assess Indian industry quality standards. These focused on customer happiness and company product quality.

The third set of questions examines how process control, worker training, raw materials, and vendor diversity affect product quality. Each poll question tackles the company's overall position to reduce prejudice and conjecture. The

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fourth group of questions evaluates manufacturing companies' quality management initiatives to enhance product quality. Their major focus:

- level of employee involvement,
- Commitment of management,
- Future projections of quality improvement efforts, and
- Quality as a factor in performance evaluation of employees.

The final group of questions measures quality management standards commitment. ISO 14000-related queries. Many global firms are embracing ISO 14000 quality standards. This series of questions estimates Indian manufacturers' readiness to embrace quality standards. Apart from above, four quality indicators are used to assess the relationship between quality management methods and product quality:

- Percentage of defects at final assembly,
- Cost of warranty claims,
- Total cost of quality, and
- Assessment of the defect rate relative to competitors.

The database for this research includes 100 randomly selected big Indian manufacturing organizations. The list of Indian manufacturers came from CMIE Prowess. The poll was delivered to 100 random large manufacturing businesses. This research includes big enterprises with over 1000 workers, medium-sized organizations with 500 to 1000 employees, and small companies under 500 employees.

IV. RESULTS AND DISCUSSION

Emails were sent to numerous organizations with the questionnaire. About 90% of firms participated in the research. Some major conclusions from company responses are shown below. As they impact the important results, the number of workers of responding firms, their position, demography, and TQM implementation status are the primary emphasis areas.

Company Size

Company size is determined by staff count. Large corporations contributed 57.8%, medium companies 26.7%, and small organizations 15.5%.

Position of Respondents and Quality Programmes

The majority of responders were directors/vice presidents, production managers, and quality managers. In terms of TQM application, 86.7% of organizations obtained ISO certification for at least one division. Some firms are applying for ISO accreditation, while others hold various certifications.

Many firms developed many quality control procedures. Total quality management, statistical quality control, quality circle, sample inspection, batch inspection, and benchmarking are utilized. Sample selection is the most popular quality program. Nearly 91.1% of organizations use sample surveys to assess product quality. Average sample inspection lasts 10 years, the longest of any quality program in Indian industry.

Quality of Products/Services and Customer Issues

The first set of questionnaire questions assesses Indian producers' adherence to Crosby's “quality is free” concept. The data shows that more respondents agree with the “quality is free” mindset than disagree. A large proportion disagree with the “quality is free” concept. Companies do not always appreciate the “quality is free” mentality.

The second set of survey questions assesses Indian enterprises' qualitative performance as assessed by employees. The findings show that 72% of employees believe their goods are comparable to those of global market leaders, whereas 28% disagree.

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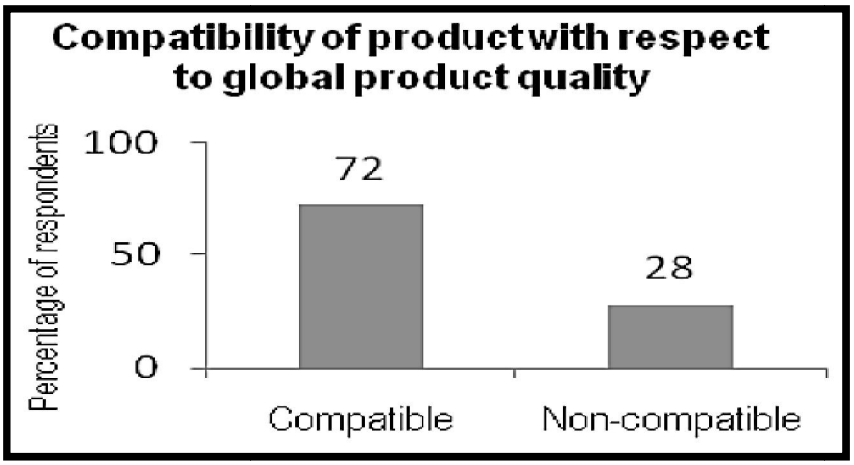

Figure-1 Product compatibility

86% of employees say their customer service is better than their rivals'. However, 14% strongly disagree (Figure-2). This suggests that some employees believe their firms are not offering excellent customer service. 83.2 % of respondents believe that their consumers are happy with their firms' product quality, whereas 16.8% disagree (Figure-3). Most respondents believe their firms provide high-quality goods and services.

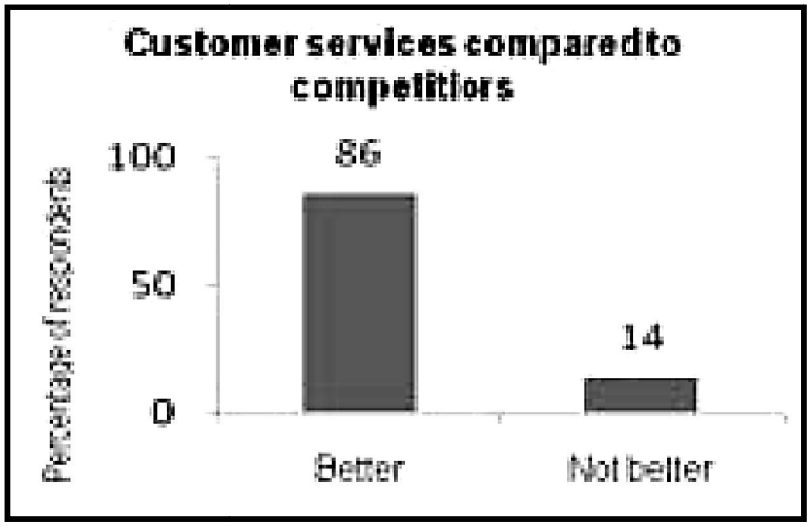

Figure-2 Customer services

Figure-3 Customer satisfaction

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Causes of Poor Quality

Third-set questions address quality issues. Most firms attribute poor quality to inadequate staff training, insufficient quality control, and faulty raw materials. Fewer than half of respondents blamed poor quality on management's failure to encourage workers and design engineers' lack of quality awareness.

Quality Improvement Efforts

The fourth set of questions demonstrates that most firms are improving and maintaining quality standards. They follow up on sales to guarantee customer satisfaction, prioritize client complaints, and resolve them. They encourage shop floor staff to suggest and try new ways to improve product quality and sustain quality year-round.

Quality improvement teams in Indian companies are 30% or less, lower than Germany and Japan but higher than Canada and the US. Less Indian companies have a large ratio of quality improvement team members, suggesting they expect growth.

Product/Technology Changeover

20% of respondents say they always, 48% say often, and 32% say sometimes incorporate consumer expectations into new goods and services (Figure-4). 60% say new technology is “important” in satisfying consumer expectations, and 35% say it is “extremely important”. Only 5% said it was “not important at all” (Figure-5). Concerning customer satisfaction in strategic planning, 71% say “important”, 19% say “very important”, and 10% say “somewhat important”.

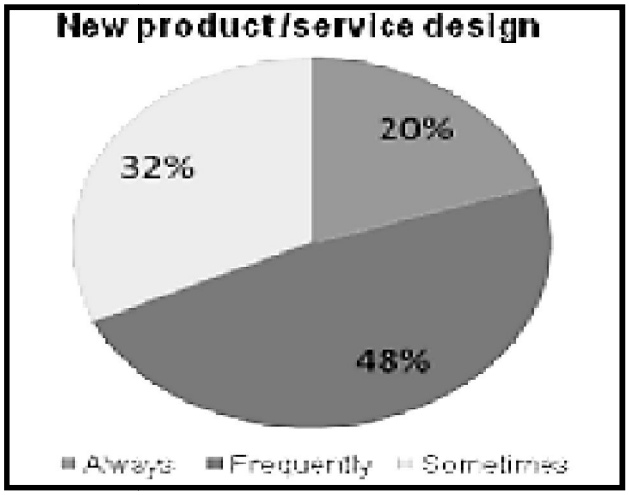

Figure-4 Customer expectation on product/service

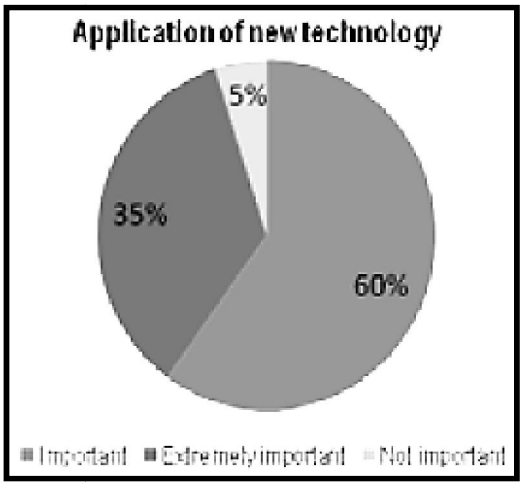

Figure-5 Importance of application of new changeover technology

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Quality Certifications

Section 6 evaluates Indian ISO certificates. Only 11% of survey respondents are ISO 14000 certified. 19% of uncertified businesses seek certification. 68 percent desire two-year ISO 14000 certification. All ISO 14000-certified companies say savings and earnings increases outweigh certification costs. They believe accreditation boosted exports and domestic market share.The quality outcome-quality practice link is examined by correlating each quality practice component with the quality result construct. Only three quality practices improve quality. Fourth construct mismatches. These statistics support Powell's findings, contrary to most TQM studies. Despite modest correlations, great practice aspects and dependent factors are comparable. Powell and this research indicate empowerment and dedication improve performance. Performance was unrelated to training, benchmarking, or flexible production in both experiments. Softer quality management techniques improve most areas when combined.

V. CONCLUSION

Indian manufacturers' quality management practices are explored in this study. Effects follow. The sixth set evaluates India's ISO certification. Only 11% of all companies are ISO 14000 certified. 19% of uncertified businesses seek certification. According to 68% planning study, most Indian firms understand quality management concepts and philosophies. Motwani and Mahmoud feel it boosts quality. Many of these companies promise high-quality goods and services. Indian enterprises are catching up to industrialized countries in quality improvement and management, but more effort is needed to reach best practices. The report helps managers understand Indian quality control. Global companies seek suppliers and partners. Thus, studying other countries' quality management systems is crucial.

Many variables restrict research. Small sample size in this study. Additional research is needed to confirm this study's conclusions. More study should analyze industry inequalities using larger sample numbers and particular industrial sectors to better understand Indian quality management systems. Ask managers and workers at all levels to grasp Indian businesses' quality management practices. Finally, this study may aid quality management researchers and managers. The study shows managers that several key components of current quality management systems increase quality outcomes and performance. This may increase consumer engagement, shared vision, and team participation.

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