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Exploration of CSFs for TQM Implementation – A Study of Manufacturing Firms in South India

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ABSTRACT

This study is exclusively carried out with the primary focus on the exploration of the factors that are considered to be the key for the implementation of TQM by the manufacturers in South India. This study also throws a light on the driving forces and resisting forces towards the TQM implementation. A structured questionnaire was administered in 132 manufacturing firms sampled from South India on the basis of area-cum-judgemental sampling. The outcome of this study clearly revealed that continuous improvements, effective training & education, leadership skills, customer focus, employee involvement, and customer relations were found to be critical success factors for the effective implementation of TQM. This study also confirmed that the driving forces that boost manufacturers to embrace TQM were improvement in product quality, increased customer satisfaction, improved employee involvement, improved company image, and increase in profitability. It is clear from the study that inadequate strategic planning, lack of senior management commitment, lack of recognition & reward, inadequate allocation of resources, lack of effective communication and lack of sufficient training & education were the stumbling obstacles that might impede manufacturers from embracing TQM.

Keyword: Critical Success Factors (CSFs), TQM Implementation, Driving Forces, Resisting Forces, Manufacturers and South India.

1. INTRODUCTION

Total Quality Management (TQM) has become the ubiquitous practice in the manufacturing industries over the past three decades. Quality is by no means a new concept in modern business. In the current scenario, quality has emerged as a competitive strategic tool for the survival and growth of the organization. Today, TQM received widespread acceptance by the various sectors of the economy including manufacturing, service, government, health care, and education. Therefore, it has become utmost important for an organization to fulfill its purpose and mission through effective implementation of TQM.

The core ideas of TQM were introduced in the mid-1980s by, most notably, W. Edwards Deming, Joseph Juran and Kaoru Ishikawa (Hackman and Wageman, 1995). Whilst it is acknowledged that TQM is not a clear-cut concept (Hackman and Wageman, 1995), TQM is generally understood as an integrated organization strategy for improving product and service quality (Waldman, 1994). Over the past few decades, quality gurus such as Deming (1986), Juran (Juran and Gryna, 1993), Crosby (1979), Feigenbaum (1991), and Ishikawa (1985), the primary authorities of TQM, have developed certain propositions in the field of TQM, which have gained significant acceptance throughout the world. Their insights provided a good understanding of the TQM philosophy, principles, and practices. TQM is also seen as a source of competitive advantage (Powel, 1995; Hackman and Wageman, 1995; Douglas and Judge, 2001), innovation (Singh and Smith, 2004), change and new organizational culture (Irani et al., 2004).

From the above definitions, it is obvious that the employees' involvement/attitude is an important factor for the effective implementation of quality management system in an organization in addition to its focus on customer satisfaction. However, the past studies clearly reveal that the employee involvement/attitude positively correlates with total quality enablers and improvements in organizational performance (Vathsala and Anuradha, 2011). An important key issue for any productivity improvement program in an organisation is management of people (Sandeep et al., 2006). The study carried out here has highlighted the importance of human aspects for the successful implementation of total quality management system. Some studies have concluded that behavioural factors can improve organizational performance and create competitive advantage more strongly than the traditional TQM tools (Laxminarayan et al., 2009).

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The identification of human factors effecting the successful TQM implementation has thus recently emerged as an important research agenda (Douglas and Judge, 2001; Sadikoglu, 2004). Within the context of successful TQM implementation, there is increasing recognition of the importance of human factors in quality management (Brah et al., 2002; Chen, 1997; Fok et al., 2000; Golhar et al., 1997; Montes et al., 2003). Many of the basic elements of TQM involve people, such as teamwork, participative management, creativity, effective communication, customer feedback, employee involvement and empowerment, employee and management trust and support (Guimaraes, 1994).

For an organization to realize the benefits of TQM, the consideration of human factors is critical for the successful implementation of TQM. Human factors previously identified in the TQM literature include leadership style, type of employees, departmental interaction, management commitment, employee's attitude toward change, authority to empower employees, rewards/recognition for innovation and citizenship behaviours (Mann and Kehoe, 1995; Montes et al., 2003).

This study examines the significance of critical success human factors (i.e., leadership, employee participation, education & training, teamwork, reward & recognition, and customer focus) on the potential implementation of TQM. These human variables have been consistently viewed by many quality gurus and researchers as most significant factors in the successful implementation of TQM (Montes et al., 2003). TQM implemented within a supportive work environment is more likely to motivate employees to work harder and smarter in achieving quality outcomes for the organization (Hackman and Wageman, 1995).

2. REVIEW OF LITERATURE

Although the literature on TQM includes a rich spectrum of works, there is no consensus on the definition of quality. The notion of quality has been defined in different ways by different authors. Gurus of the TQM practices such as Garvin, Juran, Crosby, Deming, Ishikawa and Feigenbaum all provided their own definitions of quality concept and TQM. One of the essential objectives of this study is to explore the significance of human factors on the potential implementation of TQM in South Indian manufacturing firms. After various human aspects had been evaluated by the researchers, it was decided that six human constructs of TQM would be adopted in this study: (i) Leadership, (ii) Employee Participation, (iii) Education & Training, (iv) Teamwork, (v) Reward & Recognition, and (vi) Customer Focus. In fact, these constructs were already implicitly addressed by many quality gurus and researchers. The importance of the five human constructs of TQM is described below:

Leadership is the ability to inspire confidence and support among those needed to achieve organizational goals (DuBrin, 1995). The European Quality Award (1994) and the Malcolm Baldrige Quality Award (1999) recognize the crucial role of leadership in creating the goals, values and systems that guide the pursuit of continuous performance improvement. Thus, the concept of leadership in this study can be defined as the ability of top management to lead the firm in continuously pursuing long-term overall business success. This is exemplified by top management participation, top management encouragement, employee empowerment, top management learning, top management commitment to employee education and training, and top management pursuit of product quality and long-term business success. According to Juran and Gryna (1993), some of the roles of top management can be identified as: Establish quality policies, establish and deploy quality goals, provide resources, provide problem-oriented training, and stimulate improvement.

Employee participation can be defined as the degree to which employees in a firm engage in various quality management activities. By personally participating in quality management activities, employees acquire new knowledge, see the benefits of the quality disciplines, and obtain a sense of accomplishment by solving quality problems. Participation is decisive in inspiring action on quality management (Juran and Gryna, 1993). Employee participation is exemplified by things such as teamwork, employee suggestions, and employee commitment. Empowerment is the process of delegating decision-making authority to lower levels within the firm. Particularly dramatic is empowerment of the workforce (Juran and Gryna, 1993), which is valuable because it may release creative energy (DuBrin, 1995). In order to effectively lead the firm, top management must empower employees to solve the problems they encounter. Thus, employees can have the authority to fix problems and prevent their further occurrence.

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Hackman and Wageman (1995) stated that 65% TQM firms create employee suggestion systems. Production workers are encouraged to make suggestions and take a relatively high degree of responsibility for overall performance (Deming, 1986). To have effective employee participation, employee contributions and ideas must receive serious consideration and be placed into operation whenever the recommendations are sound and relevant. Among the motivational programs that have received major attention are employee suggestion programs (Feigenbaum, 1991). Deming (1986) and Ishikawa (1985) identified one source of human motivation at work as task motivation, the good feeling that comes from accomplishing things and seeing them actually work.

Training refers to the acquisition of specific skills or knowledge. Training programs attempt to teach employees how to perform particular activities or a specific job. Education, on the other hand, is much more general, and attempts to provide employees with general knowledge that can be applied in many different settings (Cherrington, 1995). According to Hackman and Wageman (1995), training is the second most commonly used TQM implementation practice in the United States. Firms that implement TQM invest heavily in training for employees at different levels. Deming (1986) spoke often of the importance of properly training workers in performing their work. Otherwise, it is difficult to improve their work.

In order to effectively lead the firm, top management must be committed to providing sufficient resources for employees' education and training, building trustful relationships with employees, and regarding them as valuable resources of the firm. Top management must be committed to allocating sufficient resources to prevent, as well as repair, quality problems. Top management should discuss quality frequently; for example, by giving speeches on the topic and asking questions about quality at every staff meeting. Therefore, people make things happen. In fact, top management must train and coach employees to assess, analyze, and improve work processes (Dale and Plunkett, 1990; Deming, 1986).

A remarkable characteristic of employee participation is teamwork (e.g., cross-functional teams and within-functional teams). The aim of a team is to improve the input and output of any stage. A team may well be composed of people from different staff areas, everyone having a chance to contribute ideas, plans, and figures. Teamwork is sorely needed throughout the firm; it can compensate one's strength for another's weakness (Deming, 1986). Cross-functional quality teams and task forces are among the most common features of TQM firms (Hackman and Wageman, 1995). Teamwork can be characterized as collaboration between managers and non-managers, between different functions (Dean and Bowen, 1994). A quality control (QC) circle is a group of workforce-level people, usually from within one department, who volunteer to meet weekly to address quality problems that occur within their department (Juran and Gryna, 1993). QC circles have been successfully implemented in Japan, contributing a great deal to the Japanese economy (Lillrank and Kano, 1989).

Recognition is defined as the public acknowledgment of superior performance of specific activities. Reward is defined as benefits, such as increased salary, bonuses and promotion, which are conferred for generally superior performance with respect to goals (Juran and Gryna, 1993). Public recognition is an important source of human motivation (Deming, 1986). A firm's TQM initiative must be supported with a recognition and reward system that encourages and motivates employees to achieve the desired performance. Firms that are serious about achieving quality and customer satisfaction must integrate these aspects into their recognition and reward system. Ishikawa (1985) suggested that firm-wide gain-sharing or profit-sharing programs can appropriately be used to recognize and reward collective excellence.

Customer focus can be defined as the degree to which a firm continuously satisfies customer needs and expectations. A successful firm recognizes the need to put the customer first in every decision made (Philips Quality, 1995). The key to quality management is maintaining a close relationship with the customer in order to fully determine the customer's needs, as well as to receive feedback on the extent to which those needs are being met. The customer should be closely involved in the product design and development process, with input at every stage, so that there is less likelihood of quality problems once full production begins (Flynn et al., 1994). Deming (1986) suggested that the customer is the most important part of the production line; product should be aimed at the needs of the customer.

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TQM has been widely implemented throughout the world. Many firms have arrived at the conclusion that effective TQM implementation can improve their competitive abilities and provide strategic advantages in the marketplace (Anderson et al., 1994). Several studies have shown that the adoption of TQM practices can allow firms to compete globally (e.g., Easton, 1993; Handfield, 1993; Hendricks and Singhal, 1996, 1997; Womack et al., 1990; American Quality Foundation and Ernst & Young, 1991). Several researchers also reported that TQM implementation has led to improvements in quality, productivity, and competitiveness (Benson, 1993; Schonberger, 1992).

A study conducted by Rategan (1992) indicated that a 90% improvement rate in employee relations, operating procedures, customer satisfaction, and financial performance is achieved due to TQM implementation. In the field of TQM implementation, much research has already been conducted, different researchers adopting different definitions of TQM. The concept is still a subject of debate (Easton and Jarrell, 1998), still a hazy and ambiguous concept (Dean and Bowen, 1994). So far, TQM has come to mean different things to different people (Hackman and Wageman, 1995).

3. RESEARCH GAP & PROBLEM STATEMENT

In the constantly changing business paradigm, competition has become more intense and the market has changed rapidly. To beat out the turbulent, complex and even chaotic market, the manufacturing companies need to effectively implement TQM philosophies, practices and principles to achieve the competitive edge at their business operations. In today's global economy if firms are not getting ahead of the core competence or not keeping pace with the latest developments in the industry, they are losing ground to the competition. In order to be excellent in the journey of quality improvement, the manufacturing industries need to nurture a culture of continuous improvement in manufacturing operations.

The major part of the studies tends to focus on the impact of Critical Success Factors (CSFs) on the implementation of TQM approach. There is a limited research on the factors considered to be the key for the effective implementation of TQM in developing countries like India. This article intends to close this gap by providing some insights into the significance of critical success factors on TQM implementation in a developing country like India.

4. RESEARCH OBJECTIVES

To explore critical success factors on the successful implementation of TQM by manufacturers in South India, the researchers have developed two major research objectives:

1) To explore the factors which are critically found to be significant among manufacturers for TQM implementation.
2) To identify the significant benefits that drive manufacturers to implement TQM and the obstacles which may impede them from embracing the TQM.

5. METHODOLOGY

The methodology of this research includes research framework, hypotheses formation, research instrument development, instrument validity and reliability, and sampling frame & design.

5.1 RESEARCH FRAMEWORK

As stated earlier, the crux of this research is to explore the Critical Success Factors (CSFs) considered to be the key by South Indian manufacturers on the successful implementation of TQM. In order to realize this broad objective, the research framework was developed by the researchers as shown in Figure 1. This research framework is a simple linear model of relationship between the independent and dependent variables. All the CSFs were considered as the independent variables. TQM implementation by South Indian manufacturers was considered to be the dependent variable of the research model. The arrows in Figure 1 represent the relationships or the proposed hypotheses to be tested in order to achieve the research objectives.

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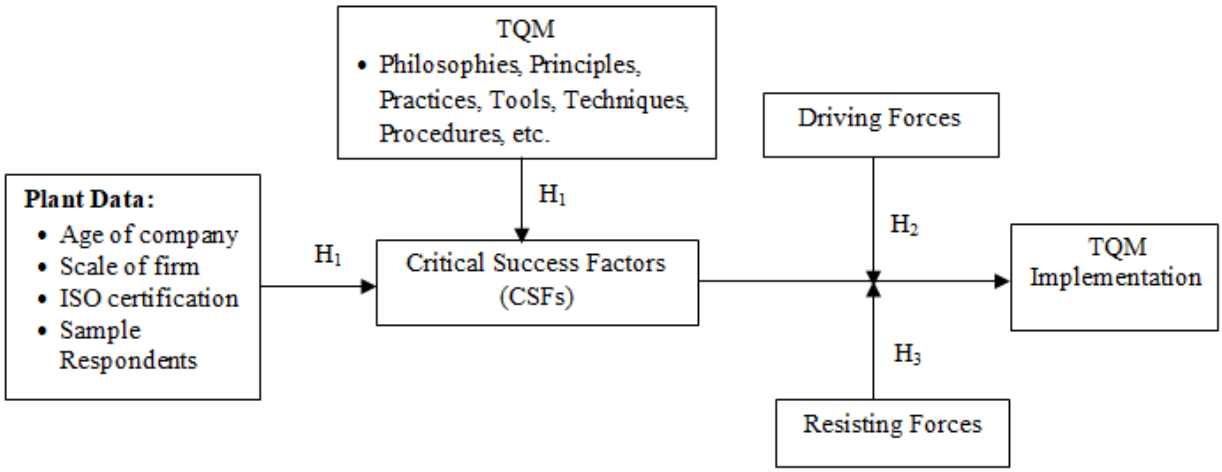

Figure 1: CSFs, Driving & Resisting Forces Toward TQM Implementation

5.2 HYPOTHESES FORMULATION

In order to shed light on the factors considered to be the key in TQM implementation, it is important to consider the following alternative hypotheses:

1) There is a significant relationship between CSFs and TQM implementation by South Indian manufacturers.
2) Basic driving forces positively affect the implementation of TQM in South Indian manufacturing context.
3) Basic resisting forces negatively affect the TQM implementation in South Indian manufacturing context.

5.3 RESEARCH INSTRUMENT DEVELOPMENT

The development of the research instrument was mainly based on new scales, because the researchers could not identify any past studies directly addressing all of the issues discussed in this research. However, and wherever possible, the researchers used validated measures that have been previously applied. Two consecutive rounds of pre-testing were conducted in order to ensure that the respondents could understand the measurement scales used in this study. First, the questionnaire was reviewed by two academic researchers experienced in questionnaire design and development and next, the questionnaire was piloted with two TQM experts known to the researchers.

The pilot test took the form of an interview where the participants were first handed a copy of the questionnaire and asked to complete it followed by a discussion on any comments or questions they had. The outcome of the pre-testing process was a slight modification and alteration of the existing scales, in light of the scales context under investigation. Based on the results and comments from the pilot tests, revisions were made to the questionnaire design. All of the items/questions in the structured questionnaire were being asked using 5-point Likert scale with 1 indicating Strongly Disagree, 2 indicating Disagree, 3 indicating Neutral, 4 indicating Agree, and 5 indicating Strongly Agree.

5.4 INSTRUMENT VALIDITY AND RELIABILITY

After designing the questionnaire, validity and reliability tests were done to ensure whether the measurements are valid and reliable for our research. The reliability and validity of the constructs and scale items used in the research instrument were tested through pilot survey and Cronbach's Alpha. Reliability of the questionnaire was tested as well using reliability test (Cronbach's Alpha) with the help of SPSS software and the results obtained thereof are shown in the Table 3. The alpha values of the research variables range from 0.940 to 0.974, which indicates an internal consistency with the alpha value of more than 0.70, so no items were dropped from questionnaire.

5.5 SAMPLING FRAME & DESIGN

The survey reported here was conducted at manufacturing plants located in South India. The survey population of this study was defined as all South Indian manufacturing companies which have a strong

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inclination towards successful implementation of TQM. The data required for the study were purely primary data collected by the means of the structured questionnaires mailed to 150 senior production executives sampled from manufacturing plants in South India on the basis of area-cum purposive sampling technique. The target respondent in each company was the senior production executive in charge of quality management. All the selected companies had implemented at least one of the TQM practices, principles and techniques at least one year ago. This procedure resulted in 132 useful questionnaires or 88 % overall response rate. Thus, the sample size of the study was confined to 132 manufacturing companies only.

6. DATA ANALYSIS, RESULTS & DISCUSSIONS

The data analysis, survey results and conclusive discussions of the study are summarized in the following section.

6.1 DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The sample can be described as follows: With regard to age of the sample company, approximately 28.0 percent have more than 20 years of existence, 16.8 percent have 16-20 years of existence, 30.4 have 10-15 years of existence and 24.8 percent have less than 10 years of existence in the industry. Breakdown of the sample respondents based on the scale of firm indicates that a large proportion (53.0 percent) of the respondents function under small-scale operation, 32.6 percent function under medium-scale operation and 14.4 percent function under large-scale operation. With respect to ISO certification, 91.7 percent of sample respondents have claimed that their companies were ISO certified and 8.3 percent have said that they don't have ISO certification and in the process of implementing ISO QMS.

A majority of the respondents were involved on TQM implementation (79.8 percent), majority (approximately 43.1 percent) were more than 50 years old and remaining were younger than 40 years old (36.7 percent). Moreover, greater than three-fourth of the respondents hold the position of senior executives in their organizations (78.3 percent). On the other hand, 21.7 percent hold the position of production/section heads in their plants. To ensure that the valid responses were representatives of the larger population, a non-response bias test was used to compare the early and late respondents. The χ^2 tests show no significant difference between the two groups of respondents at the 5 percent significance level, implying that a non-response bias is not a concern.

6.2 DESCRIPTIVE STATISTICS OF CSFS AND MAIN FINDINGS

Table 1 provides consequential details regarding Mean, Standard Deviation and Coefficient of Variation of the Critical Success Factors (CFSs) preferred by manufacturing firms in South India for the effective implementation of TQM. When sample respondents were asked about the factors they consider to be the key for the successfully implementation of TQM, the responses obtained in this regard were presented in Table 1. With regard to strategic factors for TQM implementation, the 'Continuous improvements' with the highest mean score of 4.43 was considered to be the most CSF by manufacturing firms in South India. Linked to this, 'Leadership skills' with mean score of 4.31, and 'Strategic planning' with mean score of 4.15 were also considered to be most CSFs by the South Indian manufactures as individual mean scores of these factors were found to be more than the grand mid-point of 3.80.

With regard to tactical factors for TQM implementation, the 'Effective training & education' with the highest mean score of 4.36 was considered to be the most CSF by manufacturing firms in South India. Linked to this, 'Employee involvement' with mean score of 4.21 was also considered to be most CSF by the South Indian manufactures as individual mean score of employee involvement is found to be more than the grand mid-point of 3.61. With respect to operational factors for TQM implementation, the 'Customer Focus' with the highest mean score of 4.28 was considered to be the most CSF by manufacturing firms in South India as individual mean score of customer focus was found to be more than the grand mid-point of 3.57. Form the Table 1, the researchers have come to conclusion that continuous improvements, effective training & education, leadership skills, customer focus, employee involvement, and customer relations were found to be the most preferred Critical Success Factors (CSFs) by South Indian manufacturers for implementing TQM principles, practices and techniques effectively in the journey of quality improvement.

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Table 1: Descriptive Statistics of CSFs for TQM implementation

Critical Success Factors (CSFs)	N	Mean	SD	CV
Strategic Factors				
Top management commitment	132	3.64	1.564	2.447
Organisational culture	132	3.35	1.036	1.073
Quality goals and policy	132	3.52	0.918	0.842
Leadership skills	132	4.31	0.853	0.727
Continuous improvements	132	4.43	0.769	0.592
Organizational infrastructure	132	3.17	0.665	0.442
Strategic planning	132	4.15	0.880	0.774
Grand Mean Score	132	3.80	0.955	0.985
Tactical Factors				
Team building and problem solving	132	3.42	0.832	0.693
Employee empowerment	132	3.25	1.025	1.051
Employee involvement	132	4.21	1.050	1.103
Effective training & education	132	4.36	1.232	0.062
Reward & Recognition	132	3.57	0.944	0.047
Use of information technology	132	3.36	0.939	0.047
Supplier relationships	132	3.28	1.244	0.062
Supplier quality	132	3.41	1.037	0.052
Grand Mean Score	132	3.61	1.038	0.390
Operational Factors				
Customer focus	132	4.28	1.061	0.053
Customer relations	132	3.52	1.145	0.057
Resources utilization	132	3.22	1.017	0.051
Process control & inspection	132	3.36	1.061	0.053
Performance measurement	132	3.48	1.092	0.055
Grand Mean Score	132	3.57	1.075	0.054

Note: Based on a five-point Likert scale, SD: Standard Deviation, CV: Coefficient of Variation

6.3 MULTIPLE REGRESSION ANALYSIS

The first hypothesis (H_1) of this research study can be expressed in a multiple linear regression equation as described below:

$$TQM\ Implementation = Constant + B_1\ Continuous\ Improvement + B_2\ Effective\ Training\ \&\ Education + B_3\ Leadership\ Skills + B_4\ Customer\ Focus + B_5\ Employee\ Involvement + B_6\ Strategic\ Planning + \varepsilon$$

To investigate this hypothesis, entering all variables in a single block, we found that the proposed model explains a significant percentage of variance in TQM implementation. Table 2 shows that 91.6 percent of the observed variability in the TQM implementation is explained by the six independent variables ($R^2 = 0.916$, Adjusted $R^2 = 0.912$).

To test the equivalent null hypothesis that there is no linear relationship in the population between the dependent variable and the independent variables, the ANOVA in Table 3 is used. Results from Table 3 shows that the ratio of the two mean squares (F) was 227.797 (F-value = 227.797, $P < 0.05$). Since, the observed significance level was less than 0.001, the six variables influence the manufacturers' attitudes toward effective implementation of TQM.

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Table 2: Summary of Multiple Regression

Model	Multiple R	R^2	Adjusted R^2	Std. Error of the Estimate
1	0.957[a]	0.916	0.912	0.302

Note: [a]Predictors: (Constant), Continuous Improvement, Effective Training & Education, Leadership Skills, Customer Focus, Employee Involvement & Strategic Planning

Table 3: Summary of ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	124.681	6	20.78	227.797	0.000[a]
	Residual	11.403	125	0.091		
	Total	136.083	131			

Note: [a]Predictors: (Constant), Continuous Improvement, Effective Training & Education, Leadership Skills, Customer Focus, Employee Involvement & Strategic Planning
Dependent Variable: TQM Implementation

Table 4: Results of Regression Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		Beta (B)	Std. Error	Beta (β)		
1	(Constant)	0.554	0.092		6.004	0.000
	1. Continuous Improvement	0.165	0.058	0.178	2.823	0.006
	2. Effective training & education	0.157	0.064	0.160	2.450	0.016
	3. Leadership skills	0.164	0.058	0.177	2.822	0.006
	4. Customer focus	0.179	0.057	0.197	3.118	0.002
	5. Employee involvement	0.124	0.059	0.120	2.107	0.037
	6. Strategic planning	0.191	0.056	0.203	3.393	0.001

Note:[a]Dependent Variable: TQM Implementation

Results from Table 4 indicate that we can safely reject the null hypotheses that the coefficients for CSFs such as Continuous Improvement ($\beta = 0.178, t = 2.823, p < 0.05$), Effective Training & Education ($\beta = 0.160, t = 2.450, p < 0.05$), Leadership Skills ($\beta = 0.177, t = 2.822, p < 0.05$), Customer Focus ($\beta = 0.197, t = 3.118, p < 0.05$), Employee Involvement ($\beta = 0.120, t = 2.107, p < 0.05$), and Strategic Planning (($\beta = 0.203, t = 3.393, p < 0.05$) were less than 0.05. The β weights show that Strategic Planning ($\beta = 0.203$) have a strong significant positive influence on TQM implementation. Similarly, the β weights show that Customer Focus ($\beta = 0.197$), Continuous Improvement ($\beta = 0.178$), Leadership Skills ($\beta = 0.177$), Effective Training & Education ($\beta = 0.160$), and Employee Involvement ($\beta = 0.120$) have also a strong significant positive influence on TQM implementation. These results support the first hypothesis (H_1).

6.4 ONE-SAMPLE T-TEST FOR DRIVING & RESISTING FORCES

The second and third hypotheses (H_2 and H_3) of this study focused on the association between driving forces, resisting forces and their impact on the potential implementation of TQM approach. A one-sample test was conducted to determine whether these observed means of the TQM driving forces and resisting forces are significantly different from the mid-point 3.0. The results were given in Table 5. According to Table 5, the results were found to be very significantly different from the mid-point 3.0 ($p < 0.05$). This confirms that all the TQM driving forces are in the positive side and TQM resisting forces are in the negative side. From the Table 5, the researchers have concluded that the driving forces positively affect the implementation of TQM by manufacturing firms in South India and the resisting forces negatively affect the implementation of the TQM by manufacturing firms in South India.

Table 5 shows that the most significant resisting force to the application of TQM within the manufacturing companies was found to be 'Inadequate strategic planning' scoring a highest mean value of -11.981. Linked

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to this, the other significant resisting forces that might prevent or delay the implementation of TQM by the manufacturing industries were found at 5% level of significance can include 'lack of senior management commitment' (mean=-10.090), 'inadequate allocation of resources' (mean=-9.902), 'Lack of recognition and reward' (mean=-9.647), 'Lack of effective communication' (mean=-8.925), 'Lack of sufficient training & education' (mean=-8.782), 'Lack of employee participation' (mean=-6.924), 'Work force resistance' (mean=-6.569), 'Lack of customer focus' (mean=-6.176), 'Inability to quantify the benefits' (mean=-5.467), 'Incompatible organizational structure' (mean=-3.907) and 'Ineffective measurement techniques' (mean=-3.163).

Having described the common resisting forces that may prevent the South Indian manufacturers to embrace TQM successfully, the next part of this analysis involved the realization of driving forces for application of TQM, which is the focus of this survey. Table 5 shows a summary of the mean scores of common driving forces that boost South Indian manufacturing firms to embrace TQM. As can be seen, the mean score ranges from 5.540 to 12.215, which is obviously higher than the mid-point value 3.0. Of these 12 driving forces, 'the improvement in product quality' gave the highest overall mean rating of 12.215 and 'the reduction of cycle time' (mean=5.540) the lowest.

Besides, the other most significant driving forces that were found to emerge from the embrace of TQM at 5% level of significance can include 'the increased customer satisfaction' (mean=11.532), 'the improved employee involvement' (mean=9.517), 'the improved company image' (mean=8.987), 'the increase in profitability' (mean=8.941), 'the improved delivery times' (mean=7.172), 'the increased productivity' (mean=6.983), 'the enhanced competitive edge' (mean=6.621), 'the reduction of costs, wastes and defects' (mean=6.579), 'the improved work culture' (mean=6.235) and 'the increased staff motivation and morale' (mean=5.830). The driving force of improvement in product quality and increased customer satisfaction were always identified as the potential CSFs by any corporate entities and so it is no surprise that these two driving forces scored the highest mean rating of more than 10 points from the mid-point 3.0.

Table 5: One-sample t-test for driving forces and resisting forces to implementation of TQM Approach

Driving & Resisting Forces to TQM Application	**Test Value = 3.0**					
	One-Sample Test Statistics				**95% Confidence Interval of the Difference**	
	t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Lower**	**Upper**
Driving Forces:						
1. Improvement in product quality	12.215	131	0.000*	1.024	0.858	1.190
2. Increase in profitability	8.941	131	0.000*	0.672	0.523	0.821
3. Increased productivity	6.983	131	0.000*	0.672	0.482	0.862
4. Reduction of cycle time	5.540	131	0.000*	0.536	0.345	0.727
5. Improved work culture	6.235	131	0.000*	0.528	0.360	0.696
6. Enhanced competitive edge	6.621	131	0.000*	0.664	0.466	0.862
7. Improved employee involvement	9.517	131	0.000*	0.584	0.463	0.705
8. Reduction of costs, wastes & defects	6.579	131	0.000*	0.464	0.324	0.604
9. Increased customer satisfaction	11.532	131	0.000*	0.856	0.709	1.003
10. Improved delivery times	7.172	131	0.000*	0.624	0.452	0.796
11. Improved company image	8.987	131	0.000*	0.688	0.536	0.840
12. Increased staff motivation and morale	5.830	131	0.000*	0.528	0.349	0.707
Resisting Forces :						
1. Lack of senior management commitment	-10.090	131	0.000*	-0.808	-0.966	-0.650

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2. Inadequate strategic planning	-11.981	131	0.000*	-1.040	-1.212	-0.868
3. Work force resistance	-6.569	131	0.000*	-0.504	-0.656	-0.352
4. Lack of sufficient training & education	-8.782	131	0.000*	-0.366	-0.450	-0.280
5. Ineffective measurement techniques	-3.163	131	0.000*	-0.248	-0.403	-0.093
6. Inadequate allocation of resources	-9.647	131	0.000*	-0.688	-0.829	-0.547
7. Incompatible organizational structure	-3.907	131	0.000*	-0.312	-0.470	-0.154
8. Inability to quantify the benefits	-5.467	131	0.000*	-0.376	-0.512	-0.240
9. Lack of employee participation	-6.924	131	0.000*	-0.293	-0.380	-0.210
10. Lack of recognition and reward	-9.902	131	0.000*	-0.784	-0.941	-0.627
11. Lack of customer focus	-6.176	131	0.000*	-0.239	-0.320	-0.160
12. Lack of effective communication	-8.925	131	0.000*	-0.584	-0.714	-0.454
*Significance at 5% ($p<0.05$)						

7. CONCLUSION & MANAGERIAL IMPLICATIONS

Today, every manufacturing industry has become increasingly aware of the significance of Critical Success Factors (CSFs) in the journey of implementing TQM to achieve never-ending quality improvement in the product, service and process. Quality is being used as a strategic tool by most of the manufacturing industries to achieve excellence in their business operations and enhance their competitive position in the market. In the modern age of business, every manufacturing company strives hard for survival in this growing era of core competence. The survival of manufacturing company in this turbulent business environment is possible only when it rolls out the red carpet welcome to the new philosophy of TQM. For going global, TQM approach needs to be designed in a way to gain the driving forces to do the best in the field of core competitive priorities of quality, price, flexibility, delivery speed, innovation, and time.

It was evident from the study that there was a high degree of concurrence existed among the South Indian manufacturers on the Critical Success Factors (CSFs) such as continuous improvements, effective training & education, leadership skills, customer focus, employee involvement, and customer relations for the effective implementation of TQM. This study also confirmed that the driving forces that boost manufacturers to embrace TQM were the improvement in product quality, increased customer satisfaction, improved employee involvement, improved company image, and increase in profitability. It is clear from the study that inadequate strategic planning, lack of senior management commitment, lack of recognition & reward, inadequate allocation of resources, lack of effective communication and lack of sufficient training & education were the stumbling obstacles that might impede manufacturers from embracing TQM.

This study also clearly accentuated that the driving forces which boost manufacturers to embrace TQM are significantly in the positive side and the resisting forces which might prevent them from embracing TQM philosophy are significantly in the negative side. It was recommended that the future research must be done in other industries to provide support for these findings and also TQM philosophy must be introduced as a part of organizational culture into the tertiary industries which are not effectively practicing the TQM philosophy in South India.

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