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MEASURING IMPORTANCE OF LEADERSHIP PROVIDED BY TQM IN MARBLE INDUSTRY

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Abstract: Today, the Indian marble companies are having established itself as the market leader in marble mining, processing, research and technology development. The Companies have a strong team of 3500 persons, who work with state-of-the-art machinery worth over Rs. 250 crores to produce 2 million tonnes per year (equivalent to over 80,000 sq.mt daily) of marble. Total quality management places great emphasis on the human element and the crucial role it plays in achieving quality as the pivot around which all other elements revolve. These defining characteristics of TQM can be seen to constitute the most basic principles which should underpin any TQM strategy, regardless of the activity involved. The current paper analysis the leadership provided by TQM in the marble industry.

I. INTRODUCTION

In TQM, quality is viewed not simply in terms of product or service but also as a key to the cost-effective management of the material and human resources used in the delivery of that product or service. As such, it is seen as a better alternative to traditional approaches to management in ensuring the competitiveness of the business while, at the same time, delivering quality and value to customers whose purchasing decisions are often made primarily on this basis. Quality is increasingly being regarded as the key to success in a world economy which is becoming more and more competitive. This trend of increased global competition, boosted by the lowering of trade barriers recently agreed under the GATT Uruguay Round, has led to ever growing attention to Total Quality Management. Whether in the US, Japan or Europe, there is a growing awareness of the need for constant improvement as a means of remaining competitive, particularly in the manufacturing sector whose market share has recently been losing ground to the emerging economies of Asia and Latin America. Thus, in addition to concentrating on the advanced technologies of the post-industrial era, many Western businesses are turning to Total Quality Management (TQM) as a means of keeping one step ahead of the competition through increased management efficiency and the provision of value to the customer. The paper analyses the leadership on several grounds including the consolidate its leadership position in the marble industry, Providing health and safety of labors, Providing a working environment that encourages team work and awarding the teams, The senior executives provide highly visible leadership in maintaining an environment that supports quality improvement, The CEO/Administrators are a primary driving force behind quality improvement efforts, The senior executives have demonstrated an ability to manage the changes (e.g., organizational, technological) needed to improve the quality

II. REVIEWS OF LITERATURE

Ozgur Akkoyun and Huseyin Ankara. (2009) revealed that a quality cost model to measure and control costs of quality (COQ) occurring in marble plants was developed. In the marble industry, most properties associated with quality depend on uncontrolled and mostly immeasurable natural and geological conditions. And because of these nature-related problems, it is difficult to apply commonly used quality cost models to the marble industry and there has not been any application of cost models to the marble industry in literature. For the first time, quality costs occurring in marble production systems are determined, classified and calculated. A computer program containing this model and statistical quality control tools was developed. The software was tested using data from marble plants located in the Diyarbakir (Turkey) Region that has a significant share of the Turkish natural stone industry. It was found that quality costs vary depending on product types in range from 9 to 34% of total production costs for three different stone types.

Mohammed, Mohammed el Bakri (2005)ⁱⁱ revealed that due to growing competition and increasing customer expectation, the focus of management moved away from simply managing processes for achieving quality to continuous improvement of processes to ensure the customer expectation would always be met. The objective of this study is to use TQM techniques in the construction practices in order to obtain higher quality in all field of

the company chosen. Khartoum Company for Roads and Bridges is chosen as a case study to implement TQM in Sudan. **Charles Schoengrund. (2013)**ⁱⁱⁱ credited C. I. Lewis, W. A. Shewhart, W. Edwards Deming, Joseph Juran and Kaoru Ishikawa with the development of the total quality management (TQM) epistemology. However, so fundamental to organized human existence are basic concepts underlying TQM principles and practice that they have been discussed using pre-industrial language in ancient classical texts such as Aristotle's *Nicomachean Ethics* and *de Anima*, and Thomas Aquinas' *De Magistro*.

Mitul Devpura, Jose Arturo Garza-Reyes, Vikas Kumar, Luis Rocha-Lona, Horacio Soriano-Meier. (2014)^{iv} explores the application of quality improvement programmes in the marble mining industry of India. A questionnaire survey was designed, validated and distributed to 52 Indian marble organisations. A total of 35 responses were obtained and analysed using descriptive statistics. Then, since the literature review and preliminary results of the questionnaire indicated ISO as the most popular quality improvement approach in this sector, an exploratory case study was conducted in India's leading marble mining company to gain more in-depth information about the application of ISO in this particular industrial sector. The results revealed that the marble mining industry of India lacks far behind in relation to other industries of this country, with ISO 9000 being the most popular quality improvement approach. The results also provide evidence of the degree of awareness, implementation issues and results achieved through the ISO implementation in this industry.

Craig M. Becker, Mary A. Glascoff (2014)^v explained that organizational leadership requires inspiring people and creating an environment so everyone can contribute toward the success of the organization. To accomplish this, a leader needs appropriate, real-time information about how to adjust the current situation. Rather than waiting for something to go wrong and then attempting to fix the situation or tamper with the process, management should use process measures to guide improvement efforts. They found that real-time process measures guide improvement efforts by the workers and management because it enables them to pay attention to the process while simultaneously performing it. Traditional improvement methods often lead to worse results because they use retrospective data that encourages process manipulation.

Al Nabhani, Maryam (2007)^{vi} seeks to identify the issues that need addressing in the Ministry of Education in Oman as it seeks to expand and improve its education system. The aims of this are (1) to highlight the issues that need addressing in the Ministry of Education, (2) to present a background survey on different approaches of managing change (3) to survey the literature about TQM in order to discover the underlying philosophy of TQM, its gurus, its development and its tools and techniques, (4) to review the experience of TQM in education, its success in this field and to also identify limitations of TQM, (5) to examine the feasibility of applying TQM in the MOE and (6) to design a model for implementing TQM in MOE .

Powell, T. C. (1995)^{vii} revealed that TQM has become, according to one source, 'as pervasive a part of business thinking as quarterly financial results,' and yet TQM's role as a strategic resource remains virtually unexamined in strategic management research. Drawing on the resource approach and other theoretical perspectives, this article examines TQM as a potential source of sustainable competitive advantage, reviews existing empirical evidence, and reports findings from a new empirical study of TQM's performance consequences..

Barron, J. M. and Gjerde, K. P. (1996)^{viii} revealed that the recent emergence of total quality management (TQM) in the U.S. has spawned a great deal of interest in management circles as well as in the mass media. However, despite the growing number of firms that have adopted this management technique, few formal tests exist concerning the pattern of adoption as well as the changes that accompany the adoption of TQM.

Fleisher, C. S. and Nickel, J. R. (1995)^{ix} revealed that the scholarship on TQM has provided little conceptual or pragmatic guidance with respect to the management of its adoption and diffusion throughout the organization. This dearth is especially pronounced with respect to the activities of organizational units which do not produce products to be purchased by customers in the consumer marketplace..

Soltani, E., Lai, P.-C. and Phillips, P. (2008)^x has drawn on multi-case data, there is some evidence to suggest that total quality management (TQM) effectiveness can be viewed as a direct function of the controlling mechanisms that senior managers created prior to TQM implementation. More importantly, control tools of TQM were not used by non-managerial employees, with which they could reduce variability or achieve uniformity; rather, they were regarded as a weapon used by their managers against them.

Kober, R., Subraamanniam, T. and Watson, J. (2012)^{xi} examined whether the management accounting practice of total quality management (TQM) positively impacts on the financial performance of small and medium enterprises (SMEs). While research has investigated the impact of TQM on larger firms, to date, there has been no comprehensive analysis of the impact of TQM on SMEs' financial performance. Our analysis of Australian Bureau of Statistics financial data for 3776 SMEs found no evidence that TQM improved financial performance after controlling for size and risk. Our results contribute to literature by highlighting that management accounting practices developed for larger companies may not necessarily be transposable to SMEs.

Zatzick, C. D., Moliterno, T. P. and Fang, T. (2012)^{xii} explored how fit with the organization's strategic orientation relates to performance following total quality management (TQM) implementation. Conceptualizing the organization as a system of interrelated activities, we propose that TQM is an 'elaborating element' that achieves internal fit when the core elements of the activity system are orientated toward a 'cost leadership' rather

than ‘differentiation’ strategic position. **Schnelle, J. F., Ouslander, J. G., Osterweil, D. and Blumenihl, S. (1993)**^{xiii} Describe the application of the Total Quality Management (TQM) model to the unique work force, resident population, and regulatory issues that characterize long term care settings. The key differences between TQM and current management and training practices in nursing homes are described. **Soltani, E., Van Der Meer, R. and Williams, T. M. (2005)**^{xiv} Using a survey, this paper provides information about the current state of performance management (appraisal) from a sample of UK-based EFQM-affiliated organizations. At the end they combined with previous literature, to discuss the implications of these results for designing a contextually appropriate performance management for TQM and in the interest of the future research on TQM and HRM.

Redman, T. and Grieves, J. (1999)^{xv} argued that the study of total quality management (TQM) failure is a valuable vehicle to extend our knowledge of strategic change management. The article reviews the literature on TQM and, after reporting the findings from an in-depth case study concludes by discussing the meaning of ‘failure’ and the lessons for managing strategic change that can be learnt from the study of TQM decline.

III. RESEARCH METHODOLOGY

The research format is based on cause-effect relationship between independent and dependent factors. Schedule method will be used for data collection. It is a form containing a series of questions to be asked to respondents and their replies will be filed. Structured Schedule containing easily understandable questions for the consumers will be prepared. The schedule will be pilot tested before finalization which also includes the testing of reliability of scales used and the validity of the questions. Pilot test will be used for improving the questionnaire and some questions will then appropriately rewritten to give a final shape to the schedule.

In order to test this hypothesis, a questionnaire was developed on Likert scale for attributes explaining the quality of the marble in marble industry by using the TQM methodology. The statistical significance of the data will be tested using Student’s “t” test and multiple regression analysis at 95 percent confidence level.

For this purpose the data were gathered for TQM implementation and for implementation of TQM as per the satisfaction in the areas of Leadership, TQM HR, Customer Focus, Quality Process, Quality Measure, Education and Training, Continuous improvement, Marketing and Promotion, Strategic Quality control, Communication and Growth of Marble Sector companies.

Data Collection Tools

1. **PRIMARY DATA:** For primary data a well fabricated questionnaire was prepared, this was to be filled up by the 236 respondents, who are the responsible for TQM implementation in marble companies, selected by a judgmental sampling method under the geographic area of study i.e., Rajasthan. The companies includes Madhav Marbles & Granites Ltd., Arihant marbles, R. K. marble, Mumal marble, Talesara marble and Madhusudan Impex.
2. **SECONDARY DATA:** Secondary data related with performance of companies and their quality management were gathered from the files, newspapers, reports, records, policies, government publications, magazines, company publications, journals, books, articles, websites, etc.

Variable	Frequency	Percent	Variable	Frequency	Percent
Manufacturing Process			Implementation process		
Reason for implementation of TQM					
Customers' requirement	114	48.3			
marketing purpose	98	41.5			
others	24	10.2	Easy	72	30.5
Total	236	100.0	Challenging	144	61.0
Occupation of respondents			Difficult	8	3.4
			Extremely difficult	12	5.1
			Total	236	100.0
			Company-wise distribution of respondents		
Job	164	69.5	Madhav marbles	48	20.3
Service	48	20.3	Arahant marbles	63	26.7
Business	24	10.2	R. K. marble		
Total	236	100.0			
Gender of respondents					
Male	120	50.8			
Female	116	49.2	Talesara marble	14	5.9
Total	236	100.0	Madhusudanimpex	14	5.9

IV. DATA ANALYSIS

As per the objectives of the research work (to measure the satisfaction of respondents from implementation of TQM) the agreement of the respondents related with the various areas are checked with the broader hypothesis.

At this stage the perception of the stakeholders are sought in relation to satisfaction of respondents from implementation of TQM. The following hypothesis was developed:

$H_{1(g1)}$ = Attributes configuring leadership provided by TQM has significantly influence on satisfaction of respondents from implementation of TQM.

To identify key variables in TQM satisfaction multivariate regression analysis has been used with SPSS-19 software and results were shown in table 4.28 as under:

Table-4.28: Multiple Regression of TQM Leadership

a. Descriptive Statistics											
Variables					Spss Code	Mean	Std. Deviation	N			
Satisfaction from the TQM adoption					TQM_sat_1	2.6568	1.27028	236			
Consolidate its leadership position in the marble industry					TQM_lead_1	3.5636	1.47323	236			
Providing health and safety of labors					TQM_lead_2	3.5975	.94702	236			
Providing a working environment that encourages team work and awarding the teams					TQM_lead_3	3.6780	1.14395	236			
The senior executives provide highly visible leadership in maintaining an environment that supports quality improvement.					TQM_lead_4	3.7458	1.15730	236			
The CEO/Administrators are a primary driving force behind quality improvement efforts.					TQM_lead_5	3.7331	1.10739	236			
The senior executives have demonstrated an ability to manage the changes (e.g., organizational, technological) needed to improve the quality					TQM_lead_6	2.4449	1.06847	236			
Establish cost reduction programs					TQM_lead_7	3.6441	1.01500	236			
Monitor the cost of quality					TQM_lead_8	2.6186	1.52103	236			
The senior executives consistently participate in activities to improve the quality					TQM_lead_9	2.6610	1.29628	236			
The senior executives generate confidence that efforts to improve quality will succeed.					TQM_lead_10	2.3771	.93953	236			
b. Model Summary											
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics						
					R Square Change	F Change	df1	df2	Sig. F Change		
3	.422 ^c	.178	.168	1.15901	.024	6.814	1	232	.010		
c. Predictors: (Constant), TQM_lead_2, TQM_lead_9, TQM_lead_4											
c. ANOVA ^d											
Model		Sum of Squares		df	Mean Square		F	Sig.			
3	Regression	67.555		3	22.518		16.764	.000 ^c			
	Residual	311.644		232	1.343						
	Total	379.199		235							
c. Predictors: (Constant), TQM_lead_2, TQM_lead_9, TQM_lead_4											
d. Dependent Variable: TQM_sat_1											
d. Coefficients ^a											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
3	(Constant)	2.114	.378		5.592	.000					
	TQM_lead_2	.467	.080	.348	5.817	.000	.323	.357	.346	.989	1.011
	TQM_lead_9	-.178	.060	-.181	-2.942	.004	-.208	-.190	-.175	.932	1.073
	TQM_lead_4	-.177	.068	-.162	-2.610	.010	-.172	-.169	-.155	.924	1.082
a. Dependent Variable: TQM_sat_1											

V. Discussions and Conclusion

The final Regression model with 3 independent variables (TQM_lead_2, TQM_lead_9 and TQM_lead_4) explains almost 16.8% of the variance of satisfaction from Leadership provided by TQM. Also, the standard errors of the estimate has been reduced to 1.15901, which means that at 95% level, the margin of errors for any predicted value of Leadership under Satisfaction from TQM can be calculated as ± 2.2716596 (1.96×1.15901). The three

regression coefficients, plus the constraints are significant at 0.05 levels. The impact of multi colinearity in the 3 variables is substantial. They all have the tolerance value less than 0.924, indicating that only over 7.6% of the variance is accounted for by the other variables in the equation. The ANOVA analysis provides the statistical test for overall model fit in terms of F Ratio. The total sum of squares (379.199) is the squared error that would accrue if the mean of satisfaction from Leadership has been used to predict the dependent variable. Using the values of TQM_lead_2, TQM_lead_9 and TQM_lead_4 this errors can be reduced by 17.82% (67.555/379.199). This reduction is deemed statistically significant with the F ratio of 16.764 and significance at level of 0.000^c. With the above analysis it can be concluded that only three variables i.e., TQM_lead_2, TQM_lead_9 and TQM_lead_4 explains the leadership provided by TQM has significantly influence on satisfaction of respondents from implementation of TQM.

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