

# A Case Study on Implementation of Total Quality Management Projects in Manufacturing Industry

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**Abstract**— The objective of this study is the application of some important TQM tools and techniques subsequently study the tangible and intangible benefits gained through implementation of these tools. The finding shows that Rejection quantity level of NISSAN IMS reduced from 270 to 0. Productivity of RPS assembly line YAD model improves by increasing the production rate from 77% to 99 %. Rack housing rejection quantity level reduced from 25 to 0 and also some parameters like customer's satisfaction and profits for the company increases.

**Key words:** Total Quality Management, Cause and Effect Diagram, Confederation of Indian Industries

## I. INTRODUCTION

The manufacturing industry has experienced an unprecedented degree of change in the last three decades, involving drastic change in management approaches, product and process technologies, customer expectations, supplier attitudes as well as competitive behavior. In today's highly dynamic and rapidly changing environment, the global competition among organizations has lead to higher demands on the manufacturing organizations. With increased global competition, attention has been shifted from increasing efficiency by means of economies of scale and internal specialization to meeting market condition in terms of flexibility, delivery performance and quality.

A detailed case study on a TQM projects in Sona Koyo Steering Systems limited is formulated and presented. The company has taken up the journey of Total Quality Management (TQM) with the help of JUSE Japan and CII. Normally the TQM implementation is four to five year process and in Sona Koyo Steering Systems limited, Gorgon plant it started in 1998 and completely implemented in 2003. SKSSL, Gorgon initiated TQM implementation through a consultant Professor Tsudu from JUSE, Japan with the aim to implement TQM in a phased manner. In this the concepts of TQM work culture in India and other countries has been taken from various journals and articles discussed and also attention towards case study have also appeared. A brief review of Total Quality Management techniques is also discussed from various articles and journals

## II. LITERATURE REVIEW AND ISSUES OF OLD ARTICLES

Singla, et al. (2011) identified the set of critical success factors of TQM implementation by comparing a set of 24 awards based frameworks and 26 research based framework as given by various agencies and researchers. The study also gives the details of the ten best CSF's, which are highly emphasized by most of the National Quality Awards (NQA) 7 researchers separately. Implementation of these CSF's will add to the competitive position of a manufacturing firm and thus provides a firm with strategic advantage in the

marketplace. Finally it shows a comprehensive list of most important critical success factors of TQM implementation required for sustaining or achieving manufacturing excellence.

Valmohammadi (2011) provided a reliable and valid constructs of total quality management (TQM) and a measurement instrument in the context of Iranian manufacturing small to medium- sized enterprises (SME). It also examined the effects of eight TQM criteria: leadership, process management, supplier, customer focus, employee management, communication, quality information system (QIS) and tools and techniques on the organizational performance of the Iranian manufacturing SME. The finding shows that leadership plays an important role in enhancing organizational performance of the Iranian manufacturing SME.

Kumar, et al. (2011) identified the benefits of TQM, shortcomings of TQM and significant difference in the understanding of seven success factors of TQM in manufacturing and service industries of North India. The findings shows that success factors have different rankings in manufacturing and service Industries, but both Sectors comprehend that implementation of TQM success factors is very important. It also found that both sectors understand the importance of management commitment to TQM so ranked it the same.

Khanna, et al. (2011) investigated a critical success factors (CSF's) of total quality management (TQM), and to rank these in the Indian manufacturing industry. It identified ten CSF's as a part of a TQM process to increase a company chance of success in the Indian context. These factors are: Top management commitment, Suppliers quality management, Human resources management, Process management, Customer focus, Role of quality department, Product design, Quality information system, training and Quality citizenship. The findings shows that Process management, top management leadership and customer focus are the top three factors for implementation of TQM in the manufacturing industry in India.

Islam and Haque (2012) provided the implementation issues of TQM in manufacturing organizations. A framework for TQM implementation was developed that engaged essential pillars, and their associated factors. The developed framework was verified in the practical settings in Ready Made Garments (RMG) Industry in Bangladesh. In this empirical investigation, 31 export-oriented organizations in the Ready Made Garments (RMG) industry were studied. The findings shows that the creation of quality management environment, team work, quality control tools and techniques, supplier relationship and customer focus are the main pillar of TQM implementation.

Garg, et al. (2013) investigated the issue of excellence of quality strategy in a Deming Application Prize

winner company. The finding showed that whatever quality philosophy we follow, be it TQM, six sigma, ISO 9000, or something else, we must have a continuous zeal and serious intentions of improving the quality of our products and services. Tata Steel has inculcated the philosophy of Total Quality Management and Business Excellence as part of the company's Corporate Business Strategy. Any company can gain competitive advantage and move towards business excellence.

Dubey, et al. (2015) examined the mediating effect of human resource (HR) between independent variables (i.e. leadership and quality culture (QC)) and successful total quality management (TQM) implementation for firm performance as dependent variable. The output suggests that HR is a complete mediation between independent variables (i.e. leadership) and successful TQM implementation for firm performance and QC is having direct impact on firm performance without any mediation effect of HR.

Majumdar, J.P (2016) investigated the critical factor for successful implementation of TQM and the causes responsible for reluctance of the SME in adopting TQM has been studied. By overcoming their weaknesses and effective utilization of their inherent strengths there is wide possibility of adopting TQM by Indian manufacturing SMEs effectively.

### III. PROBLEM FORMULATION

“A Case Study on Implementation of Total Quality Management Projects in Manufacturing Industry”. Which is a case study is taken up with a purpose to improve quality of Nissan Intermediate Shaft of Steering Column by Reducing Rejection through TQM Problem Solving Approach.

### IV. OBJECTIVES OF CURRENT RESEARCH

- 1) To study the implementation methodology of TQM in manufacturing industry.
- 2) To prepare case studies on TQM projects carried out in the manufacturing industry.

To identify the benefits achieved after implementation of TQM projects in manufacturing industry

### V. ANALYZE CAUSES

To understand the causes of higher rejection, the following two techniques were used by the project team.

- Brainstorming
- Cause and effect diagram (Fishbone diagram)

S. NO.	WHAT	WHERE	WHICH	WHY	WHO	HOW	Remarks
1	Widening clawplay	Nissan IMS	Stacking machine 1 & 2	Weak Design - While machine running condition widening claw position disturbed	Prod/ Maint	Both side mounting unit Dowell pin provided	Completed
2	Tool flow variation	Nissan IMS	Stacking machine 1 & 2	There is no method to ensure Stacking Tool Speed	Maint	Hydraulic Pressure Gauge provided in Front of the Operator and Interlinked with machine. (FM-CORP-150)	Completed
3	Bearing Grease Qty less	Nissan IMS	Stacking machine 1 & 2	Needle bearing grease qty less	SQA /Prod	Needle bearing grease volume increased from 0.23 gram to 0.35 gram (FM-CORP-258)	Completed

### VI. STANDARDIZE RESULTS

Standardization helps to minimize variations in materials, methods, equipment, and strategies. It establishes the base to improve the quality of a product. After improvement it is again standardized in processing condition, accuracy standard and other reference documents which give continual improvement. To Standardize results (What, Where, Which, Why, Who and How) was used as shown in Table 6.1  
Table 6.1: Standardization of Results

### VII. CHECK RESULTS

Before implement the countermeasure, average rejection quantity of Nissan Intermediate Shaft (IMS) model for five months (April 2018 to August 2018) was 270 units. Target was set by the project team to reduce rejection rate up to 90% i.e. from 270 to 27 units in three months from September 2018 to November 2018. But after implement countermeasures the rejection quantity reduces to 4 units by December 2018. The rejection trend was shown graphically in the Fig 7.1 which shows before and after applying the countermeasures.

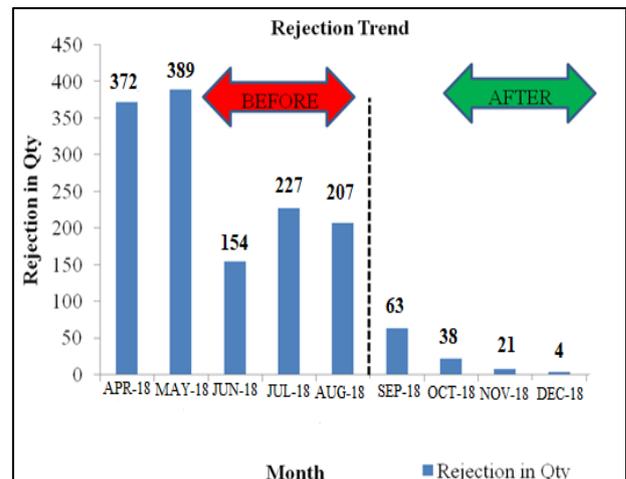


Fig. 7.1: Rejection trend before and after applying countermeasures.

## VIII. CONCLUSION OF SURVEY

It was concluded that after implementing TQM problem solving approach, quality improvement of NISSAN Intermediate shaft of Steering Column has been achieved by reducing rejection.

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