Study on Total Quality Management and Reward (TQMR)

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Abstract: - As the whole world is becoming anextended community with the free trade movements of the products and services across the countries and as a result the Indian consumers too is getting exposed to the International best standard practices and products, the same also goes true when it comes to the products of the construction industries like Infrastructure, Buildings and other projects. Total Quality Management (TQM) can be answers to the quality requirements of developing nations like India. The India construction companies can adopt the TQM tools and techniques to involve every activity and everyone associated with the project to produce world class project.

Keywords- *Total Quality Management, International best Practices, Extended community.*

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1. Introduction

With India being a member of the World Trade Organization (WTO) with free trade zone, more and more foreign companies are bringing their products and services to India. The Online giants like Amazon, Snap deal, Flipkart, Jabong etc. have made available the best worldwide product and technology at the doorsteps of the Indian consumers. Today's consumer is the most informed customer exposed to the internet information and expects best products and services when it comes to the Infrastructure, buildings and the Quality products of the Construction Industries as well, which can be met by adoption of the TQM.

Moreover, due to the slowdown of Western economy and at the same time due to the high growth rate of Indian economy, many of the Multinational construction related companies have already opened up their business in India and are available to the Indian Consumers whether it be the Private companies or to the Govt. Tenders. Most of the developed nations have constructed their Infrastructure for next 5 decades and hence their resources have been freed for next few years and now are available for developing nations like India. All these above factors have contributed to the fact that more and more tenders are being published as the global tenders and all such Multinational companies are actively participating in such tenders.

There are multiple effects due to the increased competition from these MNCs, the prominent two are:

1. Firstly, the Indian Construction related companies need to raise their performance standards to match the International Best Practices and Quality of Work to compete with them.

2. Secondly, they need to match the International quality expectation to collaborate with these foreign companies to bid for the works which is implemented for the first time in India.

The objective of this paper is to highlight the importance of adoption of TQM approach by the Indian construction industries to sustain the global competition.

Construction Sector is one of the sector which has to go through an enormous change to match the global quality standards due to the age old practice followed by majority of the Construction Industries. As the manpower in India is still cheaper than other countries, the construction sector in India engages the second highest workforce after agriculture. The Work force engaged stitches between agriculture sector and construction sector during the harvest season. Due to this fact the much needed training to the work forces for good quality of work, jeopardizes and the actual construction at the site takes place more or less in the same old fashion.

It is a quite challenging task to implement the TQM philosophy in factory conditions where the works are carried out inrepetitive manner on same set of machineries for a particular product. However it becomes much more challenging to implement at construction project sites due to a new project every time at different geographical locations, working with task forces comprising of migratory workers and unpredictable complications under varying situations.

The importance of TQM in construction industry is evident from the fact that even today a good amount of Time and Cost is wasted in identification of snag on the completion of the project and its rectification. The bad quality of work executed resurfaces in the form of visible quality defects and usability defects after the project is put to its intended use and in many cases cannot be repaired. The need is to apply the TQM to the entire life cycle of the project involving a good team work by various stake holders like Clients, Architects, Engineers, Supervisors, Contractors and Work Force.

TQM aims at improving the work culture, employee empowerment, customer satisfaction, Maximization of Return on Investment and overall performance excellence by adopting the Standard Operating Procedures and Statistical Quality Control. It is not limited to material testing or quality assurance of end product only but it aims at the process of quality

planning, quality improvement and quality controlas per Juron's trilogy at each and every phase. Adoption of the ISO certification helps in documentation control and put emphasis on the procedural aspect eliminating the human error.

Once the organization decides to implement the TQM philosophy the biggest road block or resistance comes as non-cooperation of the employees and the work force. The best way to overcome this difficulty is to motivate them with the reward system based on both the quality of work based on TQM and the quantity of work done as per the KRA's (Key Performance Area) of the employee.

2. LITERATURE REVIEW

In the quest to perfect the art of existence in the early centuries among the animals in jungles to now fulfil the needs and wants of today's world, humans have every time perfected the work by way of improvement over previous work, which is the basic definition of TQM of continuous improvement.The aim of this chapter is to understand the variety of definitionsgiven by several worldwide researchers from the available literature in public domain and to establish the precise concepts of TQM and its Applications to construction sector.

2.1 Review of Technical papers:

1. Kenneth T. Sullivan (2011)

i. The study identifies three established quality management programs of TQM, lean production, and six sigma, which has been widely implemented in manufacturing industry, however the their application in construction industry is very lean.
ii. This paper analyses these three programs on the basis of their success and failures in the construction industry.
iii. First one is TQM whose application to the construction industry was limited due to low bid by the contractor and lower cost benefit ratio on implementing TQM to construction industry.
iv. The Second is lean production gives emphasis on least of everything in Production, time, tool, space and human efforts to produce same result, which was practiced by the Toyota Production System. It eliminates the waste efforts which do not add value to the process. A major hurdle on implementing the Lean production in construction industry is due tothe non-repetitive nature of unique projects and secondly as it relies more on Inspection of defects and rectification rather than to get it right first time.
v. The Third isSix sigma is the quantitative approach for improvement by limiting the number of defects below 3.4 Parts per Million. Six sigma was found to be user friendly for implementation in construction industry by following the DMAIC process – Define, measure, analyze, improve and control.
vi. These programs were then compared with the latest developed "The best value system", an owner-driven quality program that focus on quality improvement by elimination of waste by two methods: fist one is to reduce client decision making by allocating the most suitable contractor to the client through performance information and second by minimizing the need of client management by transferring risk to the appropriate third party.

2. Elghamrawy, T. and Shibayama, T. (2008)

The study recognizes TQM as a successful philosophy which can be implemented in the construction Industries in Egypt. A comparison of management system is made between a Japanese company working in Egypt with the Egyptian company, to demonstrate how TQM can be implemented effectively in the Egyptian construction industry. Based on the research, the paper presents the following:

i. The Characteristics of the Egyptian Construction industries.
ii. Issues in Application of TQM in Construction industries.
iii. Some features of the Japanese construction industry which could be applied in the Egypt.
iv. Proposed a new model for TQM implementation which is suitable to Egyptian construction industries.

New Model proposed to implement TQM through the following steps:

1. Commitment by Top Management
2. Orientation
3. Planning of the Program
4. Training on the TQM
5. Conducting the Quality Projects
6. Improving Job site quality
7. Measuring Results.

3. Tang, W, Qiang. M, Duffield, C., Young, D., and Lu, Y. (2009).

This paper focus on increasing trend of TQM in Construction Industry with the key TQM factors as customer focus, quality measurements and improvement, leadership, total involvement, training, empowerment, motivation, teamwork, system approach and culture. TQM implementation faces multiple barriers in construction industry due to its fragmented nature each project being unique, leads to difficulty in developing standards, excessive price competiveness and high risk business. The study bring out partnering as a solution to all the barriers and a way to effective implementation. Partnering brings the various stakeholders to form a united multifunctional project team to improve quality.

The Win – Win approach by partnering is by sharing the reward among the members to boost the performance. The data was collected through triangulated questionnaire survey method, Interview and Case study involving the Chinese construction industries. The study reveals a strong Positive correlation between Partnering, use of incentive and TQM.

4. Chokor, A., El Asmar, M., and Sai Paladugu, B. (2016).

This Research paper address how the Construction projects so often suffer from cost overrun and time delay and how the Incentive scheme encourage the stakeholders to

complete the project with optimal cost and time. The Study analyses the adoption of incentive mechanisms which is more and more adopted in last few decades in U.S Construction. Here the incentive is categorized into four types based on Cost, Time, Quality and Safety, the former two being more focused by the industry. Cost based incentive advocates the sharing of the saved cost, Time based incentive is to save time and a reward associated with it, Quality and Safety based incentive is to minimize the defects and accidents.

The study showed the result that that cost-based incentives scheme can reduce cost and schedule overruns by 5.3% and 8.4%, respectively.

3. THEORY OF TQM

3.1Concept and Definition:

The word "Quality' is originated from the Latin word 'qualis', which means 'such as the thing really is'. In today's world of full of internet knowledge there is no single best definition of Quality. However it is better to understand the definition perceived by various quality Gurus to understand the genesis of the concept of quality to the latest buss word of TQM:

- **Walter Shewart**
  - ✓ Founder of P-D-C-A (Plan- Do- Check – Act) applied in situations where the processes are repeated again and again improvising in every next cycle.

- **W. Edward Deming**
  - ✓ Popularized the P-D-C-D cycle and defined Quality as a key Competitive advantage. After the world war-II when Japanese Industries were struggling to get a foot hold in the Western market, Daming led the quality revolution in Japan. For his contributions, Japan has named the most prestigious award for quality on his name as Daming Award. He formulated the Deming's Fourteen Points for excellence and seven diseases for the fall of the organization.

- **Joseph M Juran**
  - ✓ He also led the Quality revolution of the Japanese industries after world war-II. He defined "Quality as fitness for use by the customer". Juran gave the holistic method for Business excellence as Juran's trilogy of quality planning, quality control and quality improvement. He introduced the concept Cost of poor quality to measure the financial impact on overall profitability of the business.

- **Kaoru Ishikawa**
  - ✓ A legendary Japanese quality guru who was the founder of the problem solving technique "Cause and Effect or Fish Bone diagram". He classified the causes into five categories namely Men, Machine, Material, Method and Mother Nature and each causes was divided into further sub clauses till the root cause is identified and solution is found out for the corrective and the preventive action.

- **Philip b Crosby**
  - ✓ He was a Quality guru who wrote books like "Quality is Free", Quality without Tears", etc.
  - ✓ He defined "Quality as conformance to requirements". He was of the opinion that the responsibility of quality solely lies with the management and how a small percentage of earning spent on required training can substantially improve the quality. He propagated the concept of do it right first time and the Zero Defect Concept.

- **Sheigo Shingo**
  - ✓ He was the founder of single minute exchange of dies which is the reduction of set up time of change of dies to over less than 10 minutes i.e. a single digit minutes to change the set-up of manufacturing, which earlier used to be few hours or days where by a considerable time was wasted as down time.

- **A V Feigenbaum**
  - ✓ He was American quality control expert who was considered as father of TQM. The word TQM has originated from his concept of Total Quality Control.

- **Masaaki Imai**
  - ✓ He was founder of Kaizen Gemba which means improvement in work place. It was upgraded version of the Quality Circle which was the group effort of colleagues meeting periodically to resolve the work related quality issues.

- **Taiichi Ohno**
  - ✓ He was a Japanese Engineer who initiated the Toyota Production System later was called as Lean manufacturing, by eliminating the Waste (Muda). He found the Just In Time and Kanban system of Manufacturing.

4. Need of Total Quality Management in Construction Sector:

The aim of any construction project is to use to available resources in the best possible manner to produce results which should satisfy the end objective of the customer and at the same time should provide the highest rate of return for the investment made by all the stake holders. As TQM has been defined as Systematic and Scientific Method for the Continuous Improvement of quality for customer satisfaction, by optimisation of resources, it should provide the best solution to the above mentioned objectives for construction projects. TQM advocates the process approach by the involvement of every activity by each one involved in

the construction project during the Pre-construction, Construction and Post construction stage.

5. CONCLUSION

The world has become a Global village, the consumers have access to the best products and services across the countries and hence the same expectation of quality standard also applies to the construction projects. So the Indian Construction Industry has to gear up to stand andfulfil the needs and aspirations of trillion dollar Indian economy to satisfy the customer needs

As the goal of TQM matches with the objective of construction projects of continuous improvement of quality, customer satisfaction and optimisation of resources, it can be applied successfully with the desired results to the stakeholders.

For the best results the TQM can be combined with the reward mechanism to motivate employees based on the quality and the quantity of the work done by them.

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