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IMPLEMENTATION OF QUALITY MANAGEMENT IN CONSTRUCTION INDUSTRY

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ABSTRACT

Construction sector is the second biggest sector in India after farming sector. Being such a major sector in the present worldwide markets, there is intense rivalry among firms. As building projects get bigger and more intricate, customers are additionally progressively requesting higher norms at their conveyance at lower cost. In some cases this may likewise prompt trade off with quality and it must be decreased. Quality is one of the basic factors in the achievement of construction projects. Quality of construction projects, and also project achievement, can be viewed as the satisfaction of desires (i.e. the fulfillment) of the project members.In all other industry the quality management framework has effectively been embraced. In construction industry likewise it is getting to be critical piece of construction. In this examination work the investigation was being conveyed to check the appraisal of quality management framework to little contractual workers. In any construction project the temporary worker is the individual who is most in charge of quality of project. The investigation was completed on premise of questionnaire study with little temporary workers. The research work is being carried out by questionnaire survey at site and project management professionals. The data collected is being analyzed by standard deviation and SPSS method.

Keywords: *Quality management, TQM, Standard deviation method.*

I. INTRODUCTION

Quality is one of the fundamental factors in the accomplishment of improvement of project. Quality of improvement of project, and assignment accomplishment, can be seen as the satisfaction of wants (i.e. the satisfaction) of the endeavor individuals. The advancement business in India has been fighting with quality issues for quite a while. A considerable measure of the budgetary support is put in consistently on system and other enhancement adventures. Since the quality consequences of the endeavors are not as shown by required standards, damaged advancement occurs. Subsequently additional hypotheses are required for clearing of distortions and bolster work. An improvement adventure in its future encounters various stages. The standard times of an assignment can be delineated as: hypothetical masterminding, achievability look at, plan, obtaining, improvement, affirmation, action and support.

Quality of development ventures is connected with appropriate quality administration in every one of the periods of undertaking life cycle. Outline and development are the two critical periods of undertaking life cycle which influence the quality result of development extends essentially. In a NEDO (National Economic Development Office), London study went for enhancing techniques for quality control for building works it was discovered that "outline" and "poor workmanship in the development procedure" joined to frame over 90% of the aggregate disappointment occasions. This paper consequently, centers around the quality administration in the execution period of development ventures. The point of this paper is to feature the significance of quality administration in the execution period of development ventures.

II. AIMS AND OBJECTIVE

The aims and objectives of this research project are to:

- Investigate the adoption and implementation of QMS in the construction industry.
- Determine the major factors that are mostly affecting the quality of construction during the construction particularly in execution phase.
- To create the quality awareness to the low level construction organizations.
- To minimize the indirect cost of the project and also reduce the wastage of wastage of materials, time, money, manpower etc.

III. DATA COLLECTION

This section introduces the information gathering and the approach received for the information accumulation. It likewise manages system received, comparision of examiner, last question are utilized for the overview and how testing ought to be finished.

IV. METHODOLOGY ADOPTED FOR DATA COLLECTION

Data collection is the way toward social affair and estimating data on factors of enthusiasm, in a set up orderly mold that empowers one to answer expressed research questions, test theories, and assess results. Data collection likewise relies on the sort of the examination which the individual is doing.

In construction industry the quality management assumes an incredible job in accomplishment of any project in any nation. So we will locate the different parts of quality management. The Total Quality Management (TQM) rule basically comprises of following eight components:

- Customer focused
- Total employee involvement
- Processed centered
- Integrated system
- Strategic and systematic approach
- Continuous improvement
- Fact based decision making
- Communications

The methodology includes considering every one of the elements in survey and approached the respondent for their view. The respondents were the key administrator in charge of basic leadership in their individual associations. Surveys were put to 5 (five) respondents to get the components they think about imperative in quality of projects and their encounters with prior projects.

V. DATA ANALYSIS AND INTERPRETATION

The focal point of this is to take a shot at methodology and data collection for research work. It likewise incorporates the exploration structure and technique used to complete the examination and choice of research members. The exploration approach actualized for this examination is both quantitative and systematic. The investigation expects to check the evaluation of quality management framework for little contractual workers.

The survey work will carried out through two methods

- Personal interview and questionnaire survey
- Online questionnaire survey

Sample size

Sample size alludes to number of respondents/people intended to be examined with the end goal of the exploration. So sample size anticipated research work was 120 little contractual workers who are in charge of quality management in construction projects.

Sampling data

Location of study	Across Haryana and Delhi NCR
Sample size	120
Response received	82
Method of data collection	Questionnaire and personal interview
Questionnaire basis	Jegan research paper

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The analysis of data will be done using Standard deviation method. The standard deviation will be calculated for each of factors that can effect quality of project in our study. Each factor will be ranked according to index which specifies the significance of that factor. In this way the method will summarize importance of each of factors.
The results of RII method are said to reliable if value of Index lies between 0.5 and 1.

The data collected from is being analyzed using the RII method and it was concluded collectively that

Sr.No.	Question	RII	Rank
1	The company objectives for quality and its commitment to quality	0.6202	40
2	Define responsibility of personnel who manage, perform and verify work that affects quality	0.6996	10
3	A Communication system notifying all staff about quality responsibilities of every individual (or party for activities undertaken by subcontractors or suppliers).	0.661	27
4	Adequate provision of appropriate resources for performance of work	0.727	2
5	The appointment of management representative for monitoring system performance and compliance with the ISO quality management standards	0.6344	37
6	Reviews on the system undertaken by top management at pre-defined intervals	0.7336	1
7	Review of drawings and specifications prior to authorization for construction	0.693	14
8	Effective access to obtain the latest construction drawings and specifications	0.673	23
9	Assessment of subcontractors for their ability to meet the subcontractor requirements including commercial, statutory and technical aspects prior to selection	0.658	29
10	Testing and Inspection of incoming products for specification compliance	0.7188	4
11	Final Inspection and test plan including checklist on completion of construction project or a predetermined stage of work	0.6104	42
12	Control measures for ensuring that inspection and test equipment is capable of the necessary function and accuracy	0.681	19
13	Document procedure for reviewing the disposition of non-conforming products	0.7036	7
14	Document procedure for handling, storing and preserving raw materials and finished products	0.6724	24
15	Systematic filling and accessing procedures to enable efficient quality record retrieving	0.6428	34
16	Periodic internal auditing of the system by independent personnel to ensure effectiveness of the quality system.	0.6816	18
17	Identification and provision of required training for staff who are involved in activities directly affecting quality	0.6484	31
18	Identification and application of statistical technique required for verifying process capability and product characteristics for repeating items (e.g., doors, windows, facades, concrete batches, re-bar batches	0.631	38
19	Policies to encourage all employees to participate in quality	0.7248	3

	improvement discussions		
20	Practice to encourage project quality improvement discussions at internal site staff meetings	0.6896	15
21	Practices to encourage process quality improvement discussions at subcontractor/ trade contractor site meetings	0.6108	41
22	Policies to encourage process optimization discussion during early construction Planning based on methods and appropriate resources	0.6712	25
23	Policies to ensure prompt review on process to account for design changes during construction	0.6458	32
24	Employees are introduced to the principles and tools for total quality management at project commencement, in addition to contract specifications	0.6554	30
25	Practicing continual review on construction safety and work place environment with a view for improvement	0.674	21
26	Practicing continual review on process completion time with a view of improvement	0.7048	6
27	Practicing continual review on process cost with a view of improvement.	0.6974	11
28	Employee feel the top management provides full support to process and project quality improvement	0.6858	17
29	Conducting value engineering workshops with a client at project commencement in order to highlight potential cost or time saving proposals	0.625	39
30	Policies for regularly reviewing the client project priorities	0.6956	12
31	Explaining the proposed construction processes to the client prior to construction commencement	0.6732	22
32	Responding quickly to the client enquiries and complaints	0.7006	8
33	Offering reasonable explanations and solutions to legitimate complaints	0.6452	33
34	Establishing courteous attitude and efficient communication with subcontractors and suppliers	0.6606	28
35	All internal and external quality audits are considered constructive tools for improvement, but not solely specific controls for system compliance	0.6354	36
36	Most (more than 90%) of the activities pass the client's inspection without re-work	0.6864	16
37	Employees feel positive about the company's quality policy	0.6952	13
38	Planning for change	0.7134	5
39	Waste percentage in raw materials	0.6998	9
40	Defective rate relative to competitors	0.6806	20
41	Monitoring the productivity changes by the amounts of materials, tools, and equipment expanded during construction	0.6404	35
42	Lost time for waiting materials or equipment or people	0.6652	26

VI. CONCLUSION

In the summary of this research work I want to conclude that the quality management system is important factor in completion of any project. Survey that was conducted on small contractors and due to this many interesting facts are found that the number of the small contractor surveyed for the quality management assessment they do have the

proper objectives and responsibilities for the quality management. The communication methods and tools also play a very important role in the quality management that the proper communication tools like telephones and hwaki takies for the communication needs to be as the important tool as the quality management. Proper documentation for the number of employees and tools of construction and the machineries should be needed found in the survey.The proper management of the quality testing labs, material testing labs for the purpose of the testing of material and documentation is necessary for quality management. The provision of the resource management at the site is very necessary found through the survey. The assessment of the subcontractor and the testing and inspection of the subcontractors is found to be important at the site and is needed to be implemented positively for the purpose of the total quality management.

REFERENCE

1. *ISO 9000 is a standard for Quality Management Systems - Fundamentals and Vocabulary.*
2. *ISO 9001-2008 Guidelines for quality management principles*
3. *ISO 9004-2008 guidelines for quality management and process to obtain ISO certifications*
4. *BIS 15883: Part 4: 2015 Guidelines for quality management aspects of construction project management.*
5. *AnupW S, Arun Kumar H and SNA Saqhi (2015), Study of Quality Management System in Construction, International Research Journal of Engineering and Technology (IRJET) Volume: 02 Issue: 02*
6. *D.Ashok kumar (2014), Study of Quality Management in Construction Industry, International Journal of Innovative Research in Science, Engineering and TechnologyVolume 3, Special Issue 1*
7. *David Arditi and H Murat Gunaydin (1997), Total quality management in the construction process International Journal of Project Management Vol. 15, No. 4, pp. 235-243, 1997 Pergamon*
8. *G.S.Jegan and Dr.P.S.Kothai (2017),A Study on Quality Management System and Customer Satisfaction IN Construction Companies with a Special Reference to Coimbatore IJETSR ISSN 2394 – 3386*
9. *Gulin Idil Sonmezturk Bolatana, Sitki Gozlub, Lutfihak Alpkanc, Selim Zaimd, (2016) The impact of technology transfer performance on total quality management and quality performanceProcedia - Social and Behavioral Sciences 235 746 – 755 Elsevier.*
10. *Shreyas Gowda C H, Ramesh Nayaka, Sachidananda Murthy S, Shashi Kumar B N (2015) Total Quality Management in Construction International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056*
11. *Suganthi P, Sornalakshmi R ,Srinivasan N.P, Nivethitha M, Priyavadhana (2017) A study of factors affecting total quality management in construction projectsSSRG International Journal of civil engineering ICRTCETM*
12. *Theo C. Haupt, MCIOB, Mais Daniel E. Whiteman (2015) Implementing Total Quality Management on Construction Sites ASCE.*