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Quality Management System in High Rise Buildings

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Abstract: ***The growing demand for more living space and scarcity of land availability is leading to vertical development of building projects in Indian cities. India is the second-most populated country in the world and so its cities. Growing urban population and shrinking availability of land is pushing for a vertical development of realty projects. While skyscrapers have become a necessity in metros and Tier 1 cities in India, Tier 2 cities are now gradually following the trend with growing population and changing lifestyles. Property and land are becoming costly and scarce where tall buildings pose the best option. Developing vertically through constructed structures can accommodate more people, than developing horizontally, which saves availability of land also. And Quality management in high-rise building construction projects is an essential factor to avoid defects in the end product, which could lead to the need for replacements, faults, accidents or any kind of anomalies that will end up having a negative impact on the final result and the customer's experience.***
Keywords: RII method, SPSS Modelling, Quality Management

I. INTRODUCTION

Quality, as a profession and the managerial process associated with the quality function, was introduced during the second half of the 20th century and has evolved since then. Over this period, few other disciplines have seen as many changes as the quality profession. The quality profession grew from simple control to engineering, to systems engineering. Quality control activities were predominant in the 1940s, 1950s, and 1960s. The 1970s were an era of quality engineering and the 1990s saw quality systems as an emerging field. Like medicine, accounting, and engineering, quality has achieved status as a recognized profession.

As Lee and Dale (1998) state, there are many organizations that are striving to assess the methods and ways in which their overall productivity, the quality of their products and services and the required operations to achieve them are done.

CONCEPT OF QUALITY MANAGEMENT

The quality management system can be defined as overall activities of management that defines the quality policies, the objectives, responsibilities their implementation through quality planning, quality control, quality assurance and continuous quality improvement within the quality system. While talking about quality management system in the construction industry it is required both at the company level and at the project level. Quality in the construction industry is directly proportionate to the customer satisfaction. It is basically a tool to reliably manage the goal of client satisfaction. The quality planning involves identification of quality standards; quality assurance needs evaluation of overall performance of the project and quality control needs monitoring of specific project results.

II. LITERATURE REVIEW

The potential benefits offered by QM techniques are varied and the consensus from various studies is that it has been successfully applied in other industries and can be very beneficial in the construction industry. The implementation of QM programs enables companies to improve long-term relationships, product and process improvement, create a harmonious team spirit, more customer focused, employee job satisfaction, increased revenues, reduction in quality costs, decreasing waste and rework, better coordination of activities, improved customer service and market competitiveness, enhance professionalism and skills in all spheres of the construction sector, encourage open addressing of problems, better control over the construction process, improved safety, subcontractors with proper QM systems, closer relationships with subcontractors and help to achieve the intended project objectives (Abdul-Rahman and Tan, 2005; Landin, 2000; Abu Bakar, 2011; Low and Teo., 2004; Al-Tayeb, 2008). All the above advantages cited for construction organizations are based on the lessons learned from the use of an effective QMS. An example cited in the study of Abdul-Rahman and Tan (2005) is that the majority of Malaysian constructors have been able to improve their company competitiveness by 80%, after having certified to ISO 9001. This clearly indicates that QMSs need to be developed and implemented for any construction company wishing to become a sector leader (Willar, 2012).

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A. Objective Of The Study

1) To assess current practices of QM in construction Industry from the perceptions of the main actors of the construction industry in around Bhubaneswar.
2) To identify any present quality problems and obstacles that exist in this sector.

B. Scope Of The Study

1) The scope of this study to find the implementation of quality management system in high rise building in Bhubaneswar.
2) This study is to find the challenges faced by construction companies in and around Bhubaneswar to implement quality management system.

III. QUESTIONNAIRES FORMAT

Dear Respondent,

This questionnaire has been designed to study the quality management system in high rise building. The study is being conducted by the student pursuing an M.Tech program at Gandhi Institute for Technology, Bhubaneswar. This study is done only for academic purposes and your response will not be used for any other purpose. Participation in the survey is voluntary. Each question is having choices and you have to tick only one choice. There is no right or wrong answer; you have to pick the choice you agree the most with. Kindly ensure that none of the questions is missed and you answer them to the best of your knowledge.

Your participation is highly appreciated. Thanks and Regards

DHIRANJANA PATRA

Q-1: Type of Organization?

1) Consulting office
2) Contracting company

Q-2: What is your Designation?

1) Company manager
2) Supervision engineer
3) Site Engineer
4) Project Manager

Q-3: Would you mention age group (in yrs)

1) Less than 35
2) 35-45
3) 45 or above

IV. DATA ANALYSIS

In this thesis work the excel software was used to calculate and analyze the statistical data which was collected by the questionnaire survey other than that complete statistical tests can also perform in that software. The collected data from the questionnaire survey will be analyzed by using excel software so as to carry out the data analysis in this research.

A. RII Index Method

Data of all these tables were analyzed by a RII Index was calculated for each type of claims as follows;

RII Index = $\sum W / (A \times N)$

Where, W = weight given to each factor by the respondents, ranges from 1 to 5, A = highest weight (i.e. 5 in this case) and N = total number of respondents.

Ranking formulation using RII method

Obstacle in QMS	Practically Ignored	Seldom Used	Moderately Used	Highly Used	Extensively used	weighting	Ran k
Lack of top- management commitment/understanding of quality issues	11	8	4	10	3	94	0.52

Absence of a clear strategy for quality management in the	8	10	7	7	4	97	0.53
company							
Lack of employees‟ and workers' commitment/underst anding, and resistance to quality programs	9	8	9	7	2	90	0.5
Lack of communication between project's parties (contractor and consultant)	4	12	10	8	1	95	0.52
Firms emphasis on short-term objectives/gains	0	1	7	5	23	158	0.87
Lack of education and training to drive the improvement process	1	4	6	5	20	147	0.81
Loss of part of the productivity of workers as a result of the effort in training	7	8	11	6	4	100	0.55
Too much documents are required which lead to difficulty on documentation ability	7	10	5	9	5	103	0.57
Lack of expertise/resources in Quality Management System	0	3	6	9	16	140	0.77
A lack of codes and specifications	10	8	7	8	3	94	0.52
Insufficient attention to achieve quality by workers in projects	9	6	10	8	2	93	051
Instability of the volume of work and the instability of the national Economy	4	11	10	8	3	103	0.57

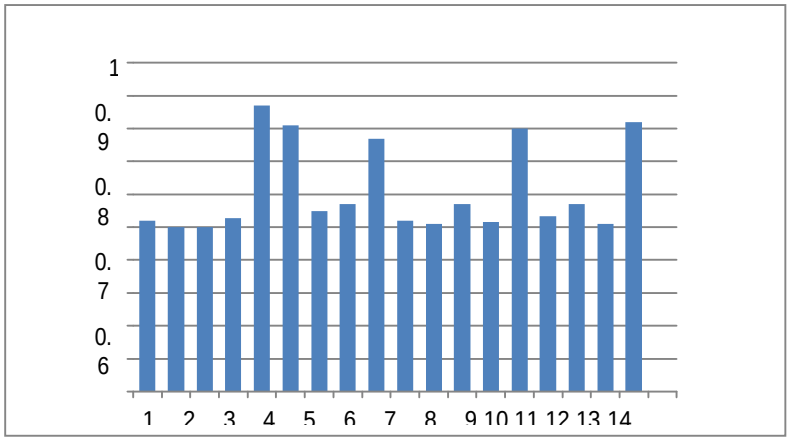


Fig : Factors affected in QMS

B. SPSS Analysis

SPSS Statistics are software system package used for statistics analysis. SPSS is among the foremost wide used programs for statistics analysis in scientific discipline. it's additionally employed by market researchers, health researchers, survey firms, government, education researchers, selling organizations, and others. the initial SPSS manual has been represented in concert of "sociology's most influential books" for permitting normal researchers to try and do their own statistical analysis .In addition to statistical analysis, knowledge management

C. Frequency Statistics

The Frequencies procedure provides statistics and graphical displays that are helpful for describing many sorts of variables. to make a table of frequencies (number of occurrences of given categories), by analyzing by suggests that of descriptive Statistics, the frequency within the needed variables would be calculated. Figure shows concerning choose the variables to be pictured within the frequency table by moving them from the left- to the right- hand box. SPSS provides the user further choices, as well as statistics, charts, and format

1) Statistics

Table 4.2 Frequency table of factors affecting QMS

		Firms	Tender	Owner	Education	Expertise
N	Valid	36	36	36	36	36
	Missing	0	0	0	0	0

2) Firms

Table 4.3 Frequency table of firms emphasis on short- term objectives/gains affecting QMS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Practically ignored	1	2.8	2.8	2.8
	Seldom Used	1	2.8	2.8	5.6
	Moderately used	6	16.7	16.7	22.2
	Highly Used	5	13.9	13.9	36.1
	Extremely used	23	63.9	63.9	100.0
	Total	36	100.0	100.0	

3) Tender

Table 4.4 Frequency table of award tender on the basis of lower prices not efficiency affecting QMS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Practically ignored	2	5.6	5.6	5.6
	Seldom Used	2	5.6	5.6	11.1
	Moderately used	8	22.2	22.2	33.3
	Highly Used	6	16.7	16.7	50.0
	Extremely used	18	50.0	50.0	100.0
	Total	36	100.0	100.0	

4) Owner

Frequency			Percent	Valid Percent	Cumulative Percent
Valid	Practically Ignored	1	2.8	2.8	2.8
	Seldom used	2	5.6	5.6	8.3
	Moderately used	6	16.7	16.7	25.0
	Highly used	10	27.8	27.8	52.8
	Extremely used	17	47.2	47.2	100.0

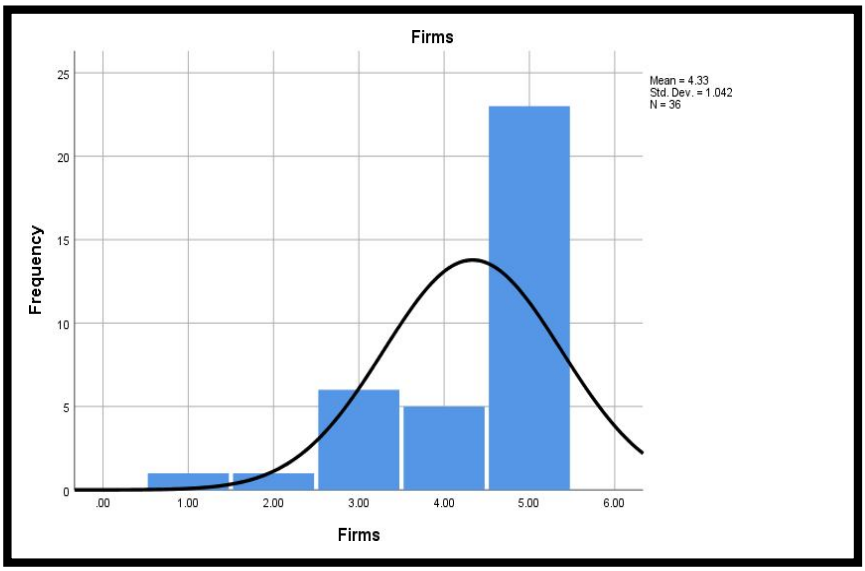


Fig : Histogram of Firms emphasis on short-term objectives/gains.

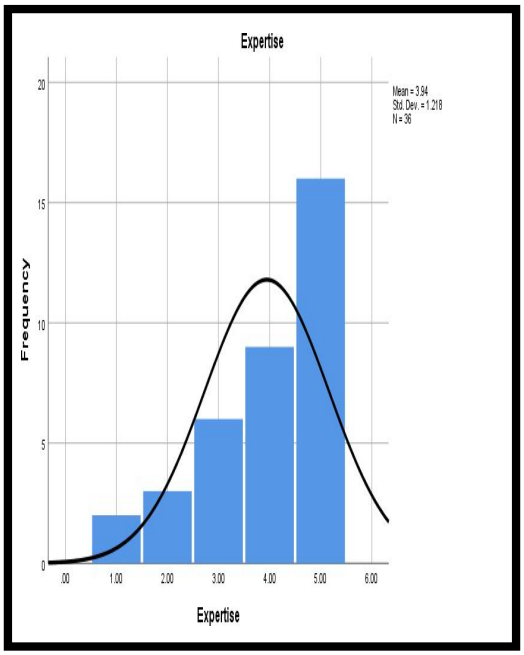


Fig: 10 Histogram of lack of expertise/resources affecting QMS

Table 4.5 Frequency table of lack of owner awareness affecting QMS

5) Education

Table 4.6 Frequency table of lack of education and training to drive the improvement process affecting QMS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Practically ignored	1	2.8	2.8	2.8
	Seldom Used	4	11.1	11.1	13.9
	Moderately used	6	16.7	16.7	30.6
	Highly Used	5	13.9	13.9	44.4
	Extremely used	20	55.6	55.6	100.0
	Total	36	100.0	100.0	

6) Expertise

Table 4.7 Frequency table of lack of expertise/resources affecting QMS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Practically ignored	2	5.6	5.6	5.6
	Seldom Used	3	8.3	8.3	13.9
	Moderately used	6	16.7	16.7	30.6
	Highly Used	9	25.0	25.0	55.6
	Extremely used	16	44.4	44.4	100.0
	Total	36	100.0	100.0	

V. CONCLUSION

Based on finding several points were concluded:-

1) According to majority of respondents, their perception of quality is by the continuous improvement, then inspection and corrective actions, then elimination of defects. This means that the concept of quality is a well-understood terminology by the employees within the company.

2) Most companies do not have quality documents, and the existing of quality policies, manuals or documents in respondent's companies is not sufficient and they do not follow any laid down policy. This indicates the lack of commitment of top management towards the implementation of QM in construction projects.

3) Majority of companies check for design conformance to standard before commencement of project and during construction. This means that this companies need more efforts to improve the quality.

4) Training is an integral part of QM program. The majority of employees in construction companies lack adequate training, lack of courses and lack of workshops on quality improvement which points to the need for more participation in training and workshops sessions.

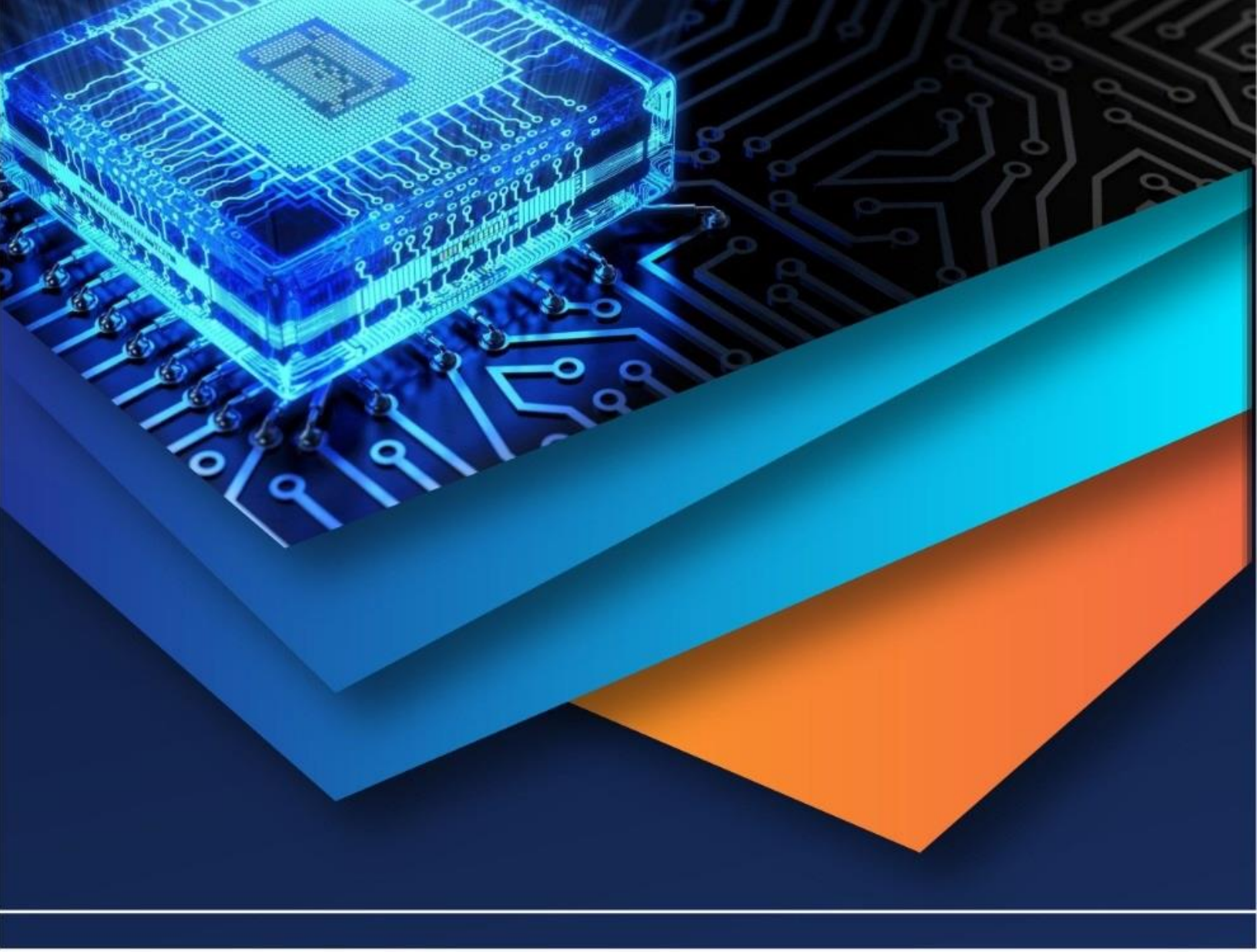
5) A large part of the existing construction projects in Bhubaneswar are given to contractor whose price is the lowest. According to interviewers "Financial situation is the basis of quality, there is no one working for the quality at the expense of losing his money".

6) There is lack of commitment by the contracting companies and governmental institutions to achieve quality, so they should work hard and hard in this field in order to improve quality systems in their companies.

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