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Study of Quality Assurance and Project Management System in High Rise Multistorey R.C.C Building (Case Study of Residential Township at Pune)

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ABSTRACT: In the construction sector, quality planning, quality assurance, and quality control are all part of the quality management system (QMS). The construction industry's major goal is to ensure that projects are completed on schedule and for the least amount of money possible. Construction businesses should create a flexible and supportive organizational structure that fosters the development of quality management systems in all parts of work, according to research based on QMS. For many years, the development industry has struggled with quality concerns, and as a result, the cost to our economy has been significant. If the quality assurance concept, which has been adopted by many other sectors of the economy, is implemented by the industry, cost savings are anticipated to be significant. Building owners should be required to learn about what they are doing. A quality guarantee allows them to start speaking up to defend their investment and encourages them to employ this method to cut building expenses. Quality assurance (QA) and internal control (QC) are becoming increasingly critical concerns for project managers. Built-in facility defects or faults can result in increased costs. In addition to minor flaws, facility functions have deteriorated, necessitating reconfiguration. Costs will rise, and there will be delays. Any construction procedure that aims to improve the quality and continuity of the project should include quality assurance and internal control. Significant changes in recent years, technological advancements, and high user expectations have all raised the necessity for QA and QC in building projects. QC and QA are in charge of maintaining the quality of the product. Homogeneity in the construction process and assure more cost-effective material use, resulting in significant cost savings for the user. The cost difference between QA and QC is proportional to the advantages. In the housing industry, a technique for QA and QC has been established. In the construction process, the procedure satisfies the requisite quality. Finally, it is critical to have a high level of quality. So, in general, quality may be defined in numerous ways: quality is the adaptation of needs or features, for example. Fitness is quality. It's a quality indicator that shows how well a set of built-in features satisfies the requirement.

KEYWORDS: Infrastructure growth, rapid construction, Pune Metro, Precast Superstructure

I. INTRODUCTION

Each of the many parties involved in the planning, designing, funding, construction, and operation of physical facilities takes a distinct approach to construction project management. Experts in many fields can give significant services, which can be especially useful in large and complex projects. Understanding how the various aspects of the process interact is, nonetheless, beneficial. Lack of coordination and communication among experts can result in waste, high expenses, and delays. It is in the owner's best interests to prevent such issues from occurring. And everyone involved in the process must look out for the owner's best interests, because the owner is the one who supplies the resources and makes the final decisions. Construction efficiency and productivity are constantly declining, which is bad news for the economy as a whole. The construction industry is particularly important. Improving project management can benefit not only the construction industry but also the national and global economies. To make meaningful improvements, however, you must first understand the organizational constraints that affect the construction industry, its operating environment, and its activities, as well as the nature of project management. The quality management system (QMS) is defined as "all activities in the overall management work that define quality policies, objectives, and responsibilities

and implement them in the quality system through means such as quality planning, quality control, quality assurance, and quality improvement." QMS has numerous applications. Customer satisfaction and the implementation of quality management systems are linked to quality in the construction industry. The project's quality is frequently assumed, and insufficient attention is paid to this parameter. Then, in the absence of an effective quality management process, a significant amount of time and resources are wasted each year. This is due to the subjectivity associated with the definition and evaluation of quality, as well as the high level of uncertainty in its assessment involving a large number of variables. A quality management system is a continuous improvement process that encompasses all aspects of the business.

Purpose of quality assurance in project management:

The goal of project management is to produce an end result that will impact change for the benefit of the organization that initiated the project. It is the starting, planning, and controlling of a variety of actions that are necessary to create this ultimate result. The purpose of quality assurance is to complete the front and back-end processes in the most efficient and fluid manner possible, to produce the desired product or service on schedule and within budget, and to go up and down in all transactions and customer contacts. Quality assurance reviews are crucial for finding opportunities, making recommendations for improvement, and improving the Chief Audit Officer's (CAE) and staff's performance and services, eventually boosting the image and credibility of internal audit work.

Problem Statement:

Almost every building business in India is currently experiencing delays. The issue develops for a variety of reasons; both efficiently planned and unanticipated construction operations generate a large amount of resources prior to the project's actual execution. To finish the job, the contractor will have to provide an extension. Extensions of time will be granted due to a lack of proper care (careless, ignorant) and a delay in the resolution of the problem due to a



contractor's error, but most commonly due to inconvenient supply of construction materials, major forces such as Variation Order Consumers due to natural calamities such as rains. Extending the project's life will increase the cost to both the customer and the contractor. The challenge of providing this proof in the form of documentary evidence is sometimes made more difficult by a lack of relevant documents. As a result, financial loss frequently follows a loss of good will. According to the project documents, the questions were not asked when they were scheduled to be asked, unless an issue was discovered. The time saved by concurrent work will be aggregated at the conclusion of the building term and manifest as early completion. The key to construction success is to plan projects so that they can be completed



simultaneously or in overlapping time using a scheduling technique. The following points should be approached with caution. Poor quality crises frequently cause delays in successfully moving forward contracts, resulting in delays and costs, and undoing the expected benefits accrued. The satisfaction of the project's participants can be measured by the quality of the construction projects as well as the project's success.

II. LITERATURE REVIEW

A. Lydia is a fictional character who appears in the novel A. Lydia (2010) To ensure quality in planning, follow these guidelines:

- i. Include all relevant parties, such as consultants, subcontractors, and suppliers, in the task of quality planning for the project;
- ii. Establish and define the purpose of the quality system
- iii. Minimize the effort required to amend copies of documents in the plan;
- iv. Form a quality system development team so that the team can develop a quality system;
- v. Form a quality system development team so that the team can develop Construction is a broad term that encompasses many process involving multiple businesses on a single project; yet, the responsibilities of the contractor, consultant, and client are critical to the success of any project. Contractors serve as the contact between the public and the sector, demonstrating the business's true performance. They serve as the public face of the construction business. Their performance, goals, rules, processes, and methodologies have a direct influence on all industry stakeholders.

Abdul Aziz et al. (1999) :

Internal and external parts of quality systems are involved. An internal quality system encompasses operations that provide management assurance that the desired level of quality is being met. A "quality management system" is the term for anything like this. A successful quality management system installation can result in higher product quality, better craftsmanship and efficiency, less waste, and more profits. Meanwhile, an external quality system encompasses actions targeted at giving the customer confidence that the supplier's quality system will provide a product or service that meets the client's quality expectations.

According to C.Kam, C.W., and Tang (1997):

Implementing a quality management system may increase a company's competitiveness by concentrating on customer demands and offering quality training for all levels of an organization in order to fulfil consumer expectations. As a result, implementing a QMS not only improves intra-project communication, but it also increases client confidence and allows the construction business to focus more on customer expectations.

Dheeraj A Bumb, D. M. Ghaitidak "Study of Quality Assurance and Quality Management System in Multistoried RCC Building". International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169 Volume: 4 Issue: 5 May 31, 2016

One of the most crucial parts of building projects is quality. The amount of success of building projects is determined by the quality of their execution. Quality management creates an atmosphere in which relevant tools, techniques, and processes may be applied successfully, resulting in the project's success. Although quality management is crucial at all stages of a project, it is especially critical during the execution stage. Quality management at this point has a substantial impact on the ultimate quality output of construction projects. In the construction industry, the QMS (Quality Management System) relates to quality planning, quality assurance, and quality control. The construction industry contributes significantly to a country's economic growth and is vital to the country's development ambitions. The construction sector in India employs over 3.2 million people. After the agricultural industry, it is the second greatest contributor to GDP. The construction business is viewed as a service industry.

Reshma S. Fegade and P.P.Bhangale Govt. college of engineering jalgaon "ASSESSMENT OF QUALITY PROBLEMS FOR HIGH RISE BUILDING-CASE STUDY". International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2277-9655 IC™ Value: 3.00 Impact Factor: 4.116 July 2016

Quality is an important aspect in the success of building projects. Construction project quality, as well as project success, may be defined as the fulfillment of project participants' expectations (i.e. satisfaction). For many years, India's building sector has struggled with quality difficulties. Every year, a major portion of the budget is spent on infrastructure and other development initiatives. Faulty construction occurs as a result of project quality results that do not meet specified criteria. The primary goal of this project is to first determine the elements that influence the quality of various items of work for High Rise Building. High-rise building location The primary elements seen on the site of a high-rise building. The primary elements responsible for affecting quality are observed on the site of a high-rise



structure, and images of quality concerns are gathered. This obtained data is analyzed using a ranking approach to determine the amount (in percent) of each component responsible for influencing high-rise building quality.

P. Siva Sankar Govt. college of engineering jalgaon “RESEARCH ON QUALITY ASSURANCE & QUALITY CONTROL IN HIGH RISE BUILDINGS”. IIOA3 Journal ISSN: 0976-3104 :

When it comes to any service or product, quality is critical. Because of the enormous demand in the market, quality has become a critical criterion for nearly all products and services. As a result, all manufacturers and service providers should be aware of this. Continuously strive to improve their product or the quality of the examination. In order to keep or improve the quality of the water, Manufacturers utilize two approaches to help: quality assurance and quality control. These two high-quality procedures ensure that the final product or service satisfies the product's or service's quality requirements and standards. Performance evaluation of tall building-integrated wind turbines for power generation by Q.S. Li, Z.R. Shu, and F.B. Organizations use a variety of strategies to maintain and archive the appropriate level of quality.

**Proceedings of the Civil Engineering PG Conference 2015, Held at MAEER's MIT, Pune-411038, 24-25 April 2015
Pravin P. Mane, Dr. Jalindar R. Patil Quality Management System at Construction Projects April 10, 2015:**

In the construction sector, the Quality Management System (QMS) relates to quality planning, quality assurance, and quality control. The primary purpose of the construction business is to guarantee that construction projects are executed effectively within the limitations of highest quality, specified time frame, and lowest feasible cost. According to the QMS research, construction organizations should build a flexible and supportive organizational environment that supports the development of quality management systems in all parts of their activity. In this study, a questionnaire survey was conducted by conducting interviews with project participants. Owner/builder, project management consultant, contractor, numerous consultants, and suppliers are among the project's participants. Authors created questionnaires for builders/contractors, consultants, and customers/occupants of buildings based on quality factors in construction projects. This dedication must begin with the chief executive officer and spread across the company. Without senior management's full commitment and engagement, the QMS will fail. Managers in all

Mr. Ayman Rashed Alshehri “QUALITY MANAGEMENT SYSTEM FOR BUILDING MAINTENANCE” Heriot-Watt University School of Energy, Geoscience, Infrastructure and Society March, 2016 :

Quality management (QM) is defined as a set of concepts, principles, or procedures that combine prescriptive viewpoints with empirical data to build and operate an industry. to boost the efficiency Building Maintenance (BM) is increasing as a percentage of total revenue. The production of the construction sector has increased awareness of the necessity to manage. The cost of construction projects in the Kingdom of Saudi Arabia is on the rise. Riyadh City's 2014 budget is around SR 181 billion, which includes the operation and other costs. In 2014, maintenance projects cost SR 10 billion. However, this segment of the industry faces several challenges in the Kingdom. The nature of BM is examined in detail in the literature review, to ensure the subsequent collection of appropriate knowledge and information from the empirical interviews and focus group discussions. The first qualitative exercise relates to interviews conducted to collect information to examine the current BM processes in public departments, with a view to ascertaining underlying problems and assess awareness and implementation of QMCs. This was followed by a second qualitative technique, the focus group, intended to explore the most suitable and effective QMCs for implementation in BM departments. After that, the QMS was developed and then validated by focus group method a second time. In this study, thematic analysis is used for both qualitative methods.

PICMET 2008 Proceedings, 27-31 July, Cape Town, South Africa (c) 2008 PICMET Herman Steyn University of Pretoria, Graduate School of Technology Management, Pretoria, South Africa “A Framework for Managing Quality on System Development Projects”

While project success is typically measured using the "iron triangle" of time, cost, and quality performance, project quality management rules are sparse. Practitioners creating complex engineering systems use a variety of approaches to manage quality, but project management literature focuses mostly on quality management processes and gives few guidance for effective techniques. Where these strategies are addressed, they are often drawn from high-volume manufacturing and statistical quality control, with few rules for quality management on non-repetitive project undertakings such as system development. A framework for controlling quality on system development projects is given in this study. The close relationship between project quality management and project risk management strategies is also underlined. While project success is commonly quantified using the "iron triangle" of time, money, and quality performance, project quality management guidelines are few and far between.



Andrey Burmistrov, Maria Siniavina¹ and Oksana Iliashenko “Project Management Life Cycle Models to Improve Management in High-rise Construction” Peter the Great St.Petersburg Polytechnic University, Polytechnicheskaya, 29, St. Petersburg, 195251, Russia :

It is useful to breakdown the entire big scale project and separate it into the "project chain" in order to adapt more flexibly to the rising unpredictability and complexity of the building project. The former phases of "Concept, Design & Planning" become individual projects in this chain, which are completed in order. Then, in order to manage these projects, which have quite diverse features, customized Management Life Cycle Models based on Agile Project Management Approaches that are particularly built for these situations will be able to be used. It is simpler to quit "small" initiatives than large-scale projects if inefficiency or ineffectiveness of continuing the job is revealed. Simultaneously, for the "Procurement and Construction" project. The classic Incremental or Linear Model Management Life Cycle Model is recommended when the goals, requirements, and solutions have already been specified. In conclusion, dividing the whole large-scale project into a "project chain" would improve the manageability of large-scale building projects and raise the efficiency of all participants' activities in such projects.

Mr. Oksana Papelniuk Moscow State University of Civil Engineering, Yaroslavskoyeshosse 26, Moscow, 129337, Russia “Methodology of project management at implementation of projects of high-rise construction”

In terms of urban growth, high-rise building is the way to go. High-rise architecture appeals to developers because it allows them to fit a large number of dwelling and commercial spaces onto a relatively small land parcel. However, investment projects for the construction of high-rise structures are highly expensive and complex, making successful project management a difficult work for the corporate builder. The finest instrument in this field nowadays is project management technique, which has become a vital component in efficiency.

Mr. Pritesh B. Shrimali, Dr. Jayeshkumar Pitroda, Prof. Student of M.Tech. Construction Engineering and Management, Birla Vishwakarma Mahavidyalaya, Engineering College, Vallabh Vidyanagar, Anand, Gujarat.” “Material Management of High Rise Construction Project” www.jetir.org (ISSN-2349-5162) :

Material management's purpose is to guarantee that resources are available at the point of use when they are needed. As a result, a well-organized material procurement process is critical to the project's success. When materials are not correctly handled, it impacts the construction cost as well as the time and effort engaged on the building site. There is a slew of issues that are wreaking havoc on the civil construction project. Cost, time, quality, safety, and materials are just a few examples. This study demonstrates that in order to prevent project cost overruns and site completion delays, it is necessary to be aware of and respectful of the many aspects impacting construction material management. The planning, identification, procurement, storage, receipt, and distribution of materials are all part of material management. Data was gathered from both primary and secondary sources for this investigation. The core data was gathered through observation and interviews with contractors and site engineers who are involved in construction projects. Secondary data was gathered from a variety of sources, including prior research, the internet, journals, and books.

III. ROLE OF ISO-9000 IN CONSTRUCTION

The ISO 9000 standard makes it easier to apply standards, activities, systems, and responsibilities, among other things. ISO-9000 has the benefit of enhancing the company's quality image. It is beneficial to marketing. It boosts productivity while lowering waste. Customer satisfaction is ensured. ISO-9000 stands for International Organization for Standardization. ISO-9000 refers to a set of worldwide quality management and assurance standards. The ISO-9000 series is a living document that is updated on a regular basis. Selection and Applications of the ISO-9000 Quality Management and Quality Assurance Standards. As follows, this standard gives a recommendation for selecting the suitable standard among ISO 9001 and 9002. ISO-9001 is a quality assurance model for design/development, manufacturing, installation, and service. ISO-9002- Quality assurance model for manufacturing and installation. The distinction between ISO-9001 and 9002 is mostly one of design. If a company constructs buildings to meet the needs of its customers, it might apply for ISO 9001 certification. The ISO-9000 quality system standard defines the requirements of a quality-oriented system. It makes no specific criteria.

IV. CONCLUSION

Check lists are a high-quality instrument used in building projects. Quality of craftsmanship in all operations is the quality control measure utilized on site. Respondents firmly said that they adhere to a regular timetable for quality control during the planning and design phases of building projects. Poor planning is one of the barriers to project team



excellent work. In addition, respondents placed a high value on customer satisfaction. According to respondents, implementing a quality management plan on site is equally vital, and test results from suppliers should be given more weight than physical testing on site. According to the study, client happiness is always vital as long as the satisfaction of the other project participants is equally significant. It also emphasizes the significance of comprehensive quality control in building projects. Following a thorough examination of all of the above issues, the researcher came to the following conclusions:

- The satisfaction of all industry stakeholders.
- A better grasp of the quality assurance process.
- Client satisfaction.
- Appropriate quality assurance technique for the project.
- Improving the strength of building materials.

Before, during, and after the completion of the works, quality management tasks entail inspecting and judging site work against the needed specifications. When the task is finished, another step is taken to evaluate it. Site quality management for construction works does not imply a one-time task, but should be ongoing throughout the project's development term. Construction firms continue to be plagued by a lack of a site quality control system. The significance of this system resides in its ability to provide the organization with information about the quality of site work for any project at any time. In construction organizations, there is no distinct site team specializing in quality management. Because the traditional method of building is uneconomical, the use of software for construction project planning and analysis is more beneficial.

1. Advanced MSP and Primavera project management tools and approaches that assist in overcoming obstacles encountered during the traditional method of planning and management.
2. MSP and Primavera aid in the optimal and effective arrangement of activities, which aids in the completion of the project within the deadline.
3. Out of the two analyzed, MSP and Primavera, MSP is more straightforward, while Primavera is more user friendly.
4. Primavera allows you to work on numerous projects at the same time

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