

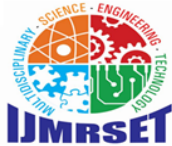
# International Journal of Multidisciplinary Research in Science, Engineering and Technology

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## International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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# An Analysis of Quality Control in Building Projects

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**ABSTRACT:** The study examined the effectiveness of quality management practices in the construction industry. The research focused on factors such as supervision, employee training, communication, management commitment, modern technology, and quality audits in maintaining project quality. Primary data were collected from 110 construction professionals through a structured questionnaire and analyzed using percentage and statistical methods. The findings showed that effective quality management systems improve construction performance by reducing defects, delays, and costs. Skilled workers, proper supervision, regular inspections, and quality materials were identified as key contributors to successful project execution. The study concluded that strong quality control practices enhance project efficiency, durability, safety, and customer satisfaction in building projects.

**KEYWORDS:** Quality Control, Building Projects, Construction Management.

### I. INTRODUCTION

Contractors, project managers, consultants, and regulatory agencies may all benefit from the practical insights that this study might provide. The research seeks to establish a quality awareness culture in the construction sector by reducing defects, minimizing rework, increasing customer happiness, and identifying crucial control points and offering practical changes.

In order to emphasize the essential reality that quality is not an act, but a habit in building, the dissertation employs a methodical inquiry. Not only does technical expertise need to be there, but so do disciplined procedures, dedicated leadership, and shared responsibility among all parties engaged in making the concept a reality if we are to achieve consistent excellence. It is believed that future generations of students, scholars, and professionals will find this study's conclusions and suggestions helpful as they work to improve building construction standards.

#### Important Roles of Quality Management in Construction Industry

##### 1. Ensures Compliance with Standards and Specifications

It guarantees that materials, workmanship, and procedures follow approved guidelines, reducing the possibility of structural failures and legal disputes.

##### 2. Improves Construction Quality

Through regular inspections, testing, and supervision, quality management improves the quality of construction work. It ensures proper execution of activities such as concreting, reinforcement placement, masonry, finishing, and structural work. High-quality construction increases the durability and performance of buildings and infrastructure.

##### 3. Enhances Customer Satisfaction

Clients expect agreed standards. Quality management helps meet these expectations by delivering reliable and defect-free structures. Satisfied clients increase the reputation and credibility of construction companies.

##### 4. Reduces Rework and Wastage

Poor quality construction often leads to errors, material wastage, and rework, resulting in additional costs and delays. Effective quality management identifies defects at early stages and prevents mistakes before they become major problems. This improves productivity and saves both time and resources.

##### 5. Improves Safety on Construction Sites

Quality management contributes significantly to construction safety by ensuring that materials, equipment, and construction methods are reliable and properly maintained. Regular inspections and adherence to safety standards reduce accidents, injuries, and hazardous working conditions.



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### OBJECTIVES

1. To assess how well a quality management system works on building projects.
2. To assess the essential elements influencing the quality control system on performance and quality enhancement in building projects.

### II. REVIEW OF LITERATURE

#### Singh, R. et al. (2024)

The benefits of prefabrication outweigh the disadvantages of conventional building methods, and the process is gaining popularity as a sustainable alternative. Important for long-term viability, lean construction seeks to minimize expenses without sacrificing quality or the value it provides to clients. It is necessary to identify and resolve the multiple challenges that hinder in order to promote lean techniques.

#### Irannejad Shirouyehzad and Shahin (2023)

It is critical for modern organizations to have an assessment efficiency and effectiveness of their systems if they want to know how desirable and high-quality their operations are, particularly in surroundings that are always changing management success factors and organizational agility success factors in order to assess the performance of both production and service companies.

#### Bittharia (2021)

These days, it seems like every industry has a quality management system in place for some product or service. Project managers place a premium on control and assurance measures since subpar work may cause structures to break prematurely, tarnish the company's image, and rack up astronomical repair bills.

#### Patel and Solanki (2020)

A country's building stock is an indicator of its economic health, and the construction sector is its backbone. People in the nation are able to meet their most fundamental requirements via the construction of housing. Developing a solid foundation requires the construction of further buildings and structures. Problems with quality management are quickly becoming an absolute must in India's construction sector.

#### Kulshrestha (2019)

The effectiveness of the management system of EIA consultant groups greatly determines the quality of Environmental Impact Assessments (EIAs). Organizations providing environmental impact assessments (EIAs) in India are required by law to hold an accreditation.

#### Bhatia and Awasthi (2018)

The goal of this article is to take a look at how system (QMS) implementation relate to company performance. The majority of the research looks at how these elements, together with the direct effects of implementing a quality management system, affect company performance.

#### Ali (2017)

It is important to manage, perform, and check quality-related operations at the project site with utmost care if a high-rise building construction project is to be a success. Maintenance on construction projects for high-rise buildings consumes a considerable portion of the money annually. Finding and analysing the most important aspects influencing quality control measures in Indian building construction projects is the primary goal.

#### Adsire and Kulkarni (2016)

Building materials account for almost 60% of the whole construction budget. Using high-quality materials may extend a building's lifespan. You may extend the life of your building by utilizing high-quality materials. Countless lives are lost annually in India as a result of careless and ineffective safety management. The construction sector places a premium on safety.



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### III. METHODOLOGY

In order to provide readers a thorough grasp of the methods, difficulties, and efficacy in the construction sector, this dissertation uses a mixed-methods research methodology to examine quality control in building projects. The approach is intended to detect weaknesses in existing systems and investigate how quality control methods affect project results, such as cost efficiency, deadline adherence, and structural integrity. The study's pragmatic paradigm ensures that the results are both quantifiable and contextually rich by providing flexibility in the integration of factual data and interpretative insights. Three stages make up the exploratory and descriptive research design: a study gathering of primary data via surveys and case studies; and data analysis and validation.

Table 1: Detail of Construction Companies with no. of Respondents

| S. No. | Company Name                     | No. of Questionnaire Distributed | No. of Questionnaire Received |
|--------|----------------------------------|----------------------------------|-------------------------------|
| 1      | K K Contractor and Engineer      | 15                               | 11                            |
| 2      | GK Construction Company          | 15                               | 9                             |
| 3      | Jagdamba Construction Company    | 15                               | 10                            |
| 4      | Tungnath Builder Private LTD.    | 15                               | 9                             |
| 5      | Shekhawati Architects & Builders | 15                               | 12                            |
| 6      | Suraj Construction Company       | 15                               | 13                            |
| 7      | SRS Construction Company         | 15                               | 12                            |
| 8      | MSK Construction Company         | 15                               | 10                            |
| 9      | DIEST Construction               | 15                               | 13                            |
| 10     | Golden Construction Company      | 15                               | 11                            |
| Total  |                                  | 150                              | 110                           |

A total of 150 questionnaires were distributed among employees and professionals working in ten selected construction companies located in the Churu and Jhunjhunu region. The survey was conducted to collect reliable information related to construction practices, quality control measures, and organizational working conditions. Out of the distributed questionnaires, 110 properly completed responses were received and considered suitable for analysis.

### IV. RESULT AND DISCUSSIONS

Table 2: Gender-wise Distribution of Respondents

| S. No. | Gender            | No. of Respondents | Total | % of Respondents |
|--------|-------------------|--------------------|-------|------------------|
| 1      | Male              | 93                 | 110   | 84.55            |
| 2      | Female            | 17                 | 110   | 15.45            |
| 3      | Prefer not to say | 0                  | 110   | 0.0              |

The percentage analysis shows that 84.55 percentages of the respondents were male and 15.45 percentages were female.



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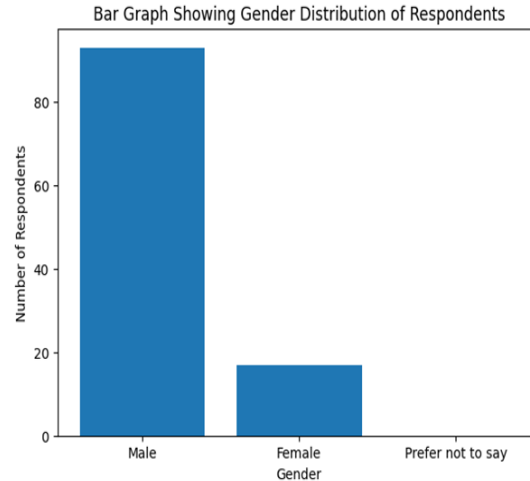
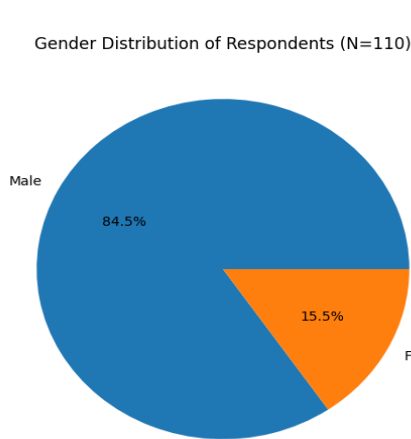


Figure 1: Pie Chart Gender Distribution      Figure 2: Bar Graph Gender Distribution

Table 3: Effect of the quality management system used in organization

| S. No. | Response             | No. of Respondents | Total | % of Respondents |
|--------|----------------------|--------------------|-------|------------------|
| 1      | Very Effective       | 28                 | 110   | 25.5             |
| 2      | Effective            | 34                 | 110   | 30.9             |
| 3      | Moderately Effective | 25                 | 110   | 22.7             |
| 4      | Ineffective          | 15                 | 110   | 13.6             |
| 5      | Very Ineffective     | 8                  | 110   | 7.3              |

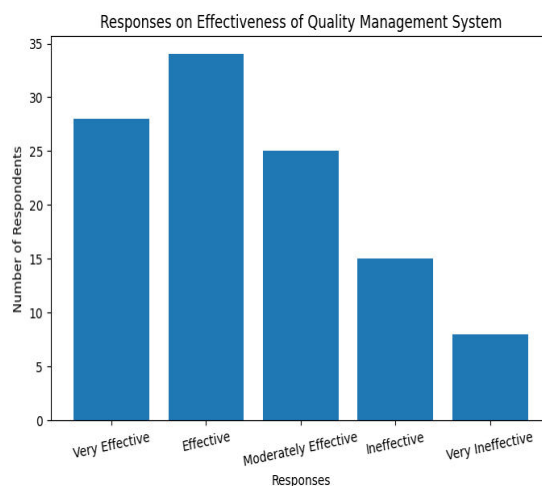
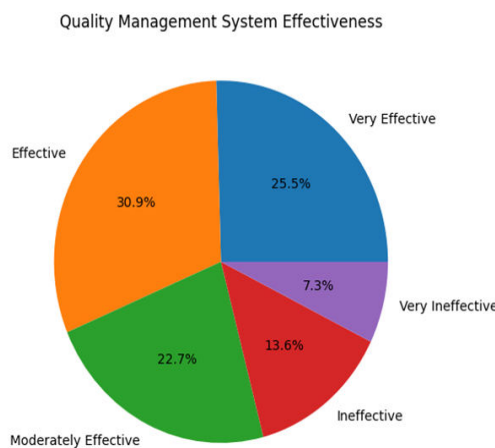


Figure 3: Pie Chart Effect of the quality management in organization

Figure 4: Bar Graph Effect of the quality management in organization

Among the 110 respondents, 34 respondents representing 30.9 percentages stated that the quality management system was effective, while 28 respondents accounting for 25.5 percentages considered it very effective.



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Table 4: Essential Elements Influencing Quality Control Performance

| S. No. | Factors Affecting Quality Control | No. of Respondents | Total | % of Respondents |
|--------|-----------------------------------|--------------------|-------|------------------|
| 1      | Skilled Workforce                 | 28                 | 110   | 25.45            |
| 2      | Quality of Materials              | 24                 | 110   | 21.82            |
| 3      | Proper Supervision                | 31                 | 110   | 28.18            |
| 4      | Modern Equipment                  | 15                 | 110   | 13.64            |
| 5      | Management Support                | 12                 | 110   | 10.91            |

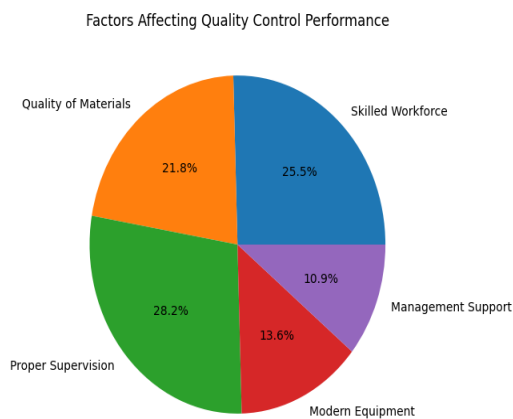


Figure 5: Pie Chart Essential Elements Influencing Quality Control Performance

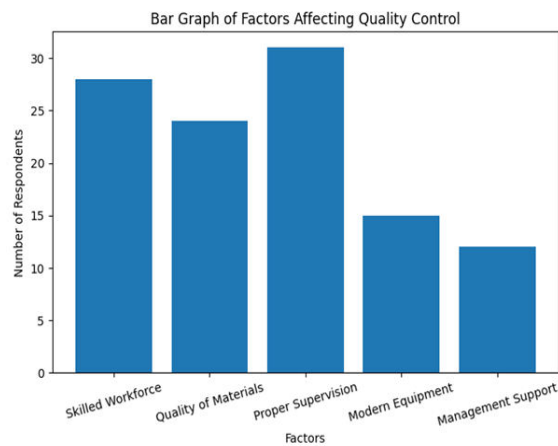


Figure 6: Bar Graph Essential Elements Influencing Quality Control Performance

As reported by 31 respondents (28.18%). Skilled workforce was identified by 28 respondents (25.45%), indicating the importance of experienced and technically competent workers in ensuring construction quality.

Table 5: Opinion Regarding Establishment of Formal Quality Management Framework

| S. No. | Response          | No. of Respondents | Total | % of Respondents |
|--------|-------------------|--------------------|-------|------------------|
| 1      | Strongly Agree    | 38                 | 110   | 34.55            |
| 2      | Agree             | 31                 | 110   | 28.18            |
| 3      | Neutral           | 18                 | 110   | 16.36            |
| 4      | Disagree          | 14                 | 110   | 12.73            |
| 5      | Strongly Disagree | 9                  | 110   | 8.18             |



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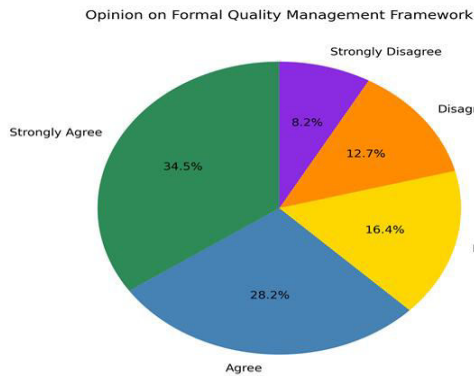


Figure 7: Pie Chart of Formal Quality Management Framework

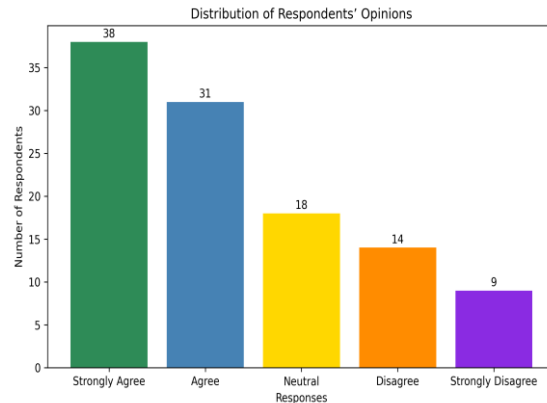


Figure 8: Bar Graph of Formal Quality Management Framework

Among the 110 respondents, 38 respondents representing 34.55 percentages strongly agreed with the statement, while 31 respondents accounting for 28.18 percentages agreed.

Table 6: Proper Respondents Opinion on Improving Quality Management

| S. No. | Response                       | No. of Respondents | Total | % of Respondents |
|--------|--------------------------------|--------------------|-------|------------------|
| 1      | Regular Training Programs      | 27                 | 110   | 24.5             |
| 2      | Better Supervision             | 19                 | 110   | 17.3             |
| 3      | Use of Modern Technology       | 24                 | 110   | 21.8             |
| 4      | Strict Quality Standards       | 16                 | 110   | 14.5             |
| 5      | Proper Planning and Monitoring | 24                 | 110   | 21.8             |

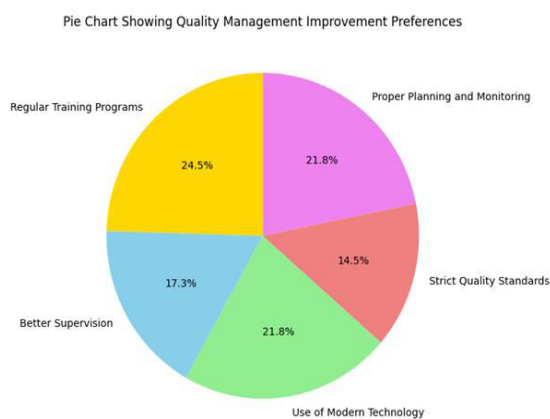


Figure 9: Pie Chart on Improving Quality Management

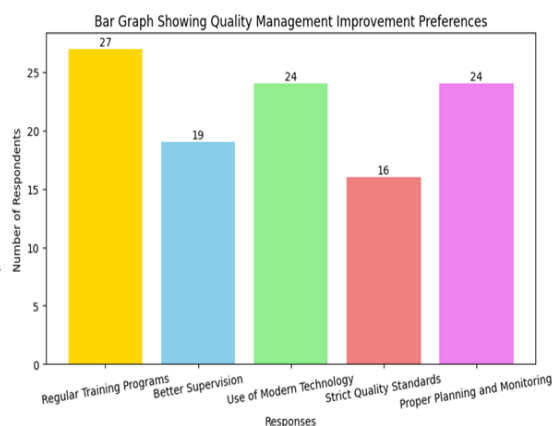


Figure 10: Bar Graph on Improving Quality Management

Out of the total 110 respondents, 27 respondents representing 24.5 percentages selected regular training programs modern technology and proper planning and monitoring were equally preferred by 24 respondents each, accounting for 21.8 percentages respectively.



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### V. CONCLUSION

- The majority of respondents were male, while female participation was comparatively low.
- Most respondents considered the quality management system either effective or very effective in improving construction project performance. Only a small proportion perceived it as ineffective.
- Employee training was considered highly important for improving quality management and enhancing workforce efficiency in construction projects.
- Management commitment was regarded as a highly important factor for effective implementation of quality control systems in construction projects.
- A majority of respondents favoured stricter governmental regulations and monitoring to ensure better construction quality standards.
- Most construction professionals recommended continuous improvement practices, believing that they significantly contribute to enhanced quality standards and sustainable project outcomes.

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