Analyzing Contract Management Strategies For High-Rise Building Projects: A Case Study Approach

Devashish Padmakar Joshi[1], Prof. Manish Mata[2], P. P. Bhangale[3]
[1, 2, 3] Hindi Seva Mandal's Sant Shree Gadage Baba College of Engineering And Technology, Bhusawal.

Abstract- *This research paper focuses on contract management in high-rise building projects, aiming to identify best practices and strategies to address the challenges associated with this aspect of construction projects. The study involved a literature review and a case study analysis of two high-rise building projects in Pune, India. The research findings reveal that Design and Build Contracts are more commonly used in high-rise building projects, with flexibility in changing scope and price being a key feature of most contracts. However, the projects took more than 3 years to complete, and delays were experienced due to design changes, material shortages, and contractor's fault. The effectiveness of the contract in managing project risks is unclear, and the project goals and objectives were not closely aligned with the contract terms. In addition, safety and health hazards on the job site were not managed very well.*

Keywords- Contract management, High-rise building projects, Design and Build Contract, Risk management, Project outcomes

I. INTRODUCTION

The management of contracts is an essential part of any construction project, and this is particularly true for high-rise building projects. The effective management of contracts is crucial to ensure that the project is completed on time, within budget, and to the required quality standards. However, the challenges of contract management in high-rise building projects are significant, and there is a need to identify best practices and strategies to address these challenges.

Background

The construction industry has experienced significant growth in recent years, fueled by urbanization and the increasing demand for residential and commercial spaces. As a result, high-rise building projects have become more common, necessitating efficient and effective contract management to ensure the successful execution of these projects (Chileshe & Haupt, 2010). Contract management is a crucial aspect of construction management, as it establishes the legal framework within which projects are executed, and it directly impacts project outcomes, such as cost, time, quality, and risk management (Wang, Wang, & Wu, 2016).

Research Scope: The scope of this study focuses on the analysis of contract management in high-rise building projects. The study will specifically cover the following areas: A case study analysis of high-rise building projects to identify the different contracts used and their impact on project outcomes.

Research questions

What are the common contract types used in high-rise building projects, and what are their key characteristics?

Based on the comparative analysis, which contract types demonstrate better performance in terms of cost, time, quality, and risk management?

II. OBJECTIVE

The objective of this study is to examine and analyze various contract types used in high-rise building projects. The study aims to identify the different types of contracts used in real-world case studies of high-rise building projects, and compare their effectiveness in terms of cost, time, quality, and risk management. The study seeks to provide a comprehensive understanding of contract management practices in the construction industry and help identify the best practices for contract management in high-rise building projects.

III. LITERATURE REVIEW

Kemala Hayati et.al (2019) Risk-based Contract Management on the Design and Build Construction to Minimize Disputes in Infrastructure Projects A poor contract management is considered the main cause of disputes in construction contracts. While dispute in a project oftenly unavoidable, it is however can be minimized by applying a proper contract management which should be in line with the project's nature. A common understanding to the roles and intricacies of the contract will lead the involved parties in the project to be open to negotiate, hence produces a better construction contract in a balanced manner.

Jeffrey S. Russell et.al (1991) Contractor Failure: Analysis The possibility exists for any construction contractor to fail to filfill the contract requirements associated with a facility. Contractor failure occurs when a contractor is unable to perform his/her contractual duties, thus requiring the facility owner to invoke the contract's nonperformance clause. This paper provides aggregate contractor business failure statistics and outlines potential causes for failure.

M. Ernita Joaquin et.al (2010) Contract Management Capacity Breakdown? An Analysis of U.S. Local Governments Research indicates that successful government contracting depends on sufficient internal management capacity. Numerous studies have examined the decision to contract out and its pitfalls, but few have tracked government contract management capacity. The is study exploring whether a change is observable in the capacity of U.S. local governments to engage in eff effective contracting from 1997 to 2007. The authors discuss whether this change represents a decline or degradation, and in which form and type of government it occurred.

Imayanti Basari et.al (2017) Estimation Risk of High Rise Building on Contractor The increasing need for space and limited land especially in big cities cause many high rise building projects in Indonesia. Construction projects including high rise building projects are located in complex and dynamic environments result in high levels of uncertainty and risk. Risks are always present in construction projects and often lead to delay schedules or cost overruns. Risk management is a process consisting of risk identification, qualitative and quantitative assessment, response with appropriate methods of handling and risk control.

Research Gap: The research gaps in contract management for high-rise building projects include a lack of comparative analysis of contract types in terms of cost, time, quality, and risk management. There might be a scarcity of research on real-world case studies, providing insights into the practical implications of different contract types. Additionally, existing research may predominantly focus on specific regions or sectors, leaving underrepresented areas unexplored

IV. METHODOLOGY

The research design for this study on contract management in high-rise building projects consists of two main stages: literature review and case study analysis. The literature review involved a comprehensive search for common contract types used in high-rise building projects and their characteristics, advantages, and disadvantages. The case study analysis involved the selection of two high-rise building projects in Pune, India, as case studies. Secondary data from project documents and relevant literature were collected and analyzed to gain insights into the impact of different contract types on project outcomes. Data was collected through in-depth surveys, focus group discussions, and project documents.

V. DATA ANALYSIS

To achieve these objectives, the data analysis process will involve the use of frequency distribution and cross-tabulation techniques. the data analysis methods of frequency distribution and cross-tabulation offer valuable insights into the use of different contract types in high-rise building projects and their impact on project outcomes. By applying these techniques to the case studies of Modern Blue Sapphire and N B Bhalchandra Akashvan, this study seeks to contribute to a better understanding of effective contract management in high-rise building projects and provide recommendations for future practice in the field.

Table 5.1contract was used in your high-rise building project

	Frequency	Percent
EPC	20	45.5
Design and Build Contract	24	54.5
Total	44	100.0

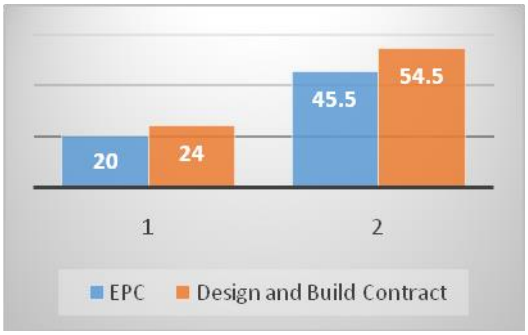

Fig 5. 1 contract was used in your high-rise building project

Interpretation: In the table above it appears that there were 44 contracts used in a high-rise building project. Of these contracts, 20 (45.5%) were EPC contracts, while 24 (54.5%) were Design and Build contracts. Therefore, it can be concluded that a greater proportion of Design and Build contracts were used in the project as compared to EPC contracts.

Table 5. 5 was the primary reason for the delay

	Frequency	Percent
Design changes	18	40.9
Material shortages	17	38.6
Contractor's fault	9	20.5
Total	44	100.0

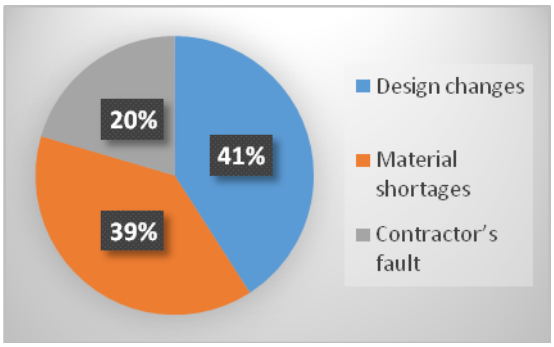

Fig 5.4 the primary reason for the delay

Interpretation: The table shows the frequency and percentage of different reasons for delay in a project. Out of a total of 44 instances of delay, the most common reason was design changes, which accounted for 40.9% of delays. Material shortages were the second most common reason, accounting for 38.6% of delays. Contractor's fault was the least common reason, accounting for only 20.5% of delays. It is important to note that the percentages do not add up to 100% as respondents may have selected more than one reason for the delay.

Table 5. 6 the project cost managed during the project duration

	Frequency	Percent
Strict adherence to the initial budget	16	36.4
Flexibility to adjust the budget as required	12	27.3
Other (Please specify)	16	36.4
Total	44	100.0

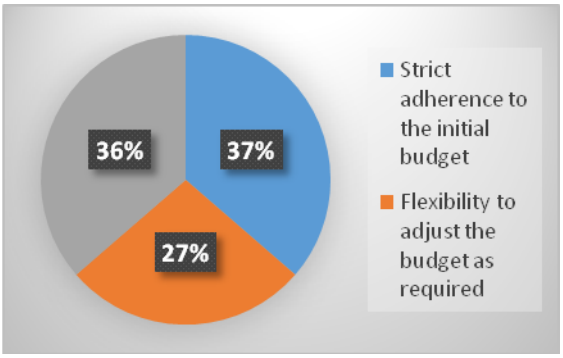

Fig 5. 5 the project cost managed during the project duration

Interpretation: It seems that the respondents were given the option to choose between strict adherence to the initial budget, flexibility to adjust the budget as required, or other (with a request to specify). Out of the 44 respondents, 16 (36.4%) chose strict adherence to the initial budget, 12 (27.3%) chose flexibility to adjust the budget as required, and 16 (36.4%) chose "Other" and provided their own response.

Table 5. 7 contract help in managing project risks effectively

	Frequency	Percent
Yes	21	47.7
No	23	52.3
Total	44	100.0

Fig 5. 6 contract help in managing project risks effectively

Interpretation: The table shows the results of a survey question regarding the effectiveness of a contract in managing project risks. Out of the total 44 respondents, 21 answered "Yes" and 23 answered "No" to the question. The frequency analysis shows that 47.7% of the respondents answered "Yes" to the question, indicating that they believe the contract helped in managing project risks effectively. On the other hand, 52.3% of the respondents answered "No", indicating that they do not believe the contract was effective in managing project risks.

Table 5. 8 If yes, what were the key risk management strategies employed in the project

	Frequency	Percent
Risk identification and assessment	19	43.2
Risk mitigation measures	16	36.4
Contingency planning	9	20.5
Total	44	100.0

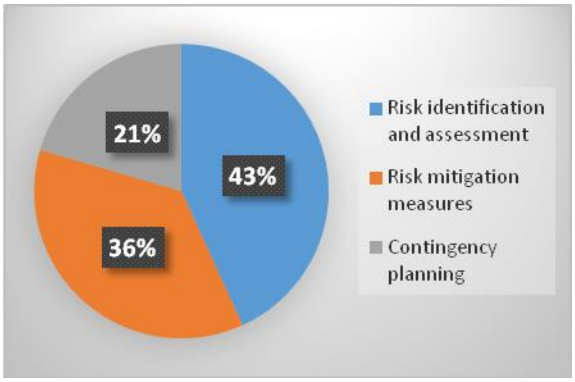

Fig 5. 7 the key risk management strategies employed in the project

Interpretation: The table shows the frequency and percentage distribution of responses to a question regarding the key risk management strategies employed in a project. Out of the 44 respondents, 19 (43.2%) identified risk identification and assessment as a key risk management strategy employed in the project. 16 respondents (36.4%) identified risk mitigation measures as a key risk management strategy employed in the project. 9 respondents (20.5%) identified contingency planning as a key risk management strategy employed in the project.

Table 5. 9 the quality of the final product maintained during the construction process.

	Frequency	Percent
Strict adherence to the quality standards	17	38.6
Flexibility to adjust the quality standards as required	27	61.4
Total	44	100.0

Fig 5. 8 the quality of the final product maintained during the construction process

Interpretation: 44 people were asked about how they maintained the quality of a final product during construction. 38.6% said they strictly adhered to quality standards, while 61.4% said they were flexible to adjust quality standards as needed.

Table 5. 10 Based on your experience, which contract type do you think is more suitable for high-rise building projects

	Frequency	Percent
EPC	14	31.8
Design and Build Contract	18	40.9
Both are equally suitable	7	15.9
None of the above	5	11.4
Total	44	100.0

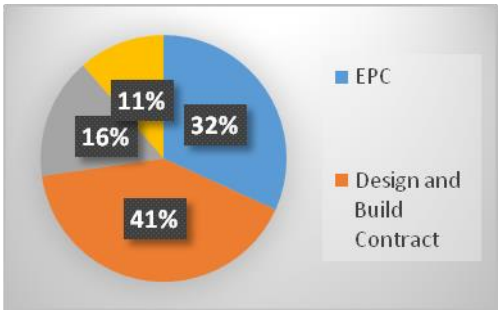

Fig 5. 9 Based on your experience, which contract type do you think is more suitable for high-rise building projects

Interpretation: 44 people were surveyed to determine which contract type, EPC or Design and Build, is more suitable for high-rise building projects. 18 respondents (40.9%) chose Design and Build Contract as the most suitable option, while 14 respondents (31.8%) chose EPC. 7 respondents (15.9%) thought that both options were equally suitable, and 5 respondents (11.4%) believed that neither option was suitable.

Table 5. 11 the overall level of satisfaction with the contract used in your project

	Frequency	Percent
Very satisfied	11	25.0
Satisfied	9	20.5
Neutral	8	18.2
Dissatisfied	9	20.5
Very dissatisfied	7	15.9
Total	44	100.0

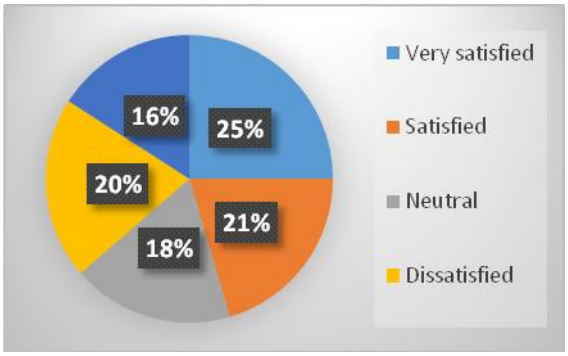

Fig 5. 10 the overall level of satisfaction with the contract used in your project

Interpretation: We can see that 25% of respondents were "very satisfied" with the contract used in their project, while 20.5% were "satisfied" and "dissatisfied" respectively. Another 18.2% of respondents were "neutral" about the contract and 15.9% were "very dissatisfied".

Table 5. 12 the contract address potential conflicts or disputes that arose during the project

	Frequency	Percent
Very well	13	29.5
Somewhat well	6	13.6
Not well	18	40.9
Not applicable	7	15.9
Total	44	100.0

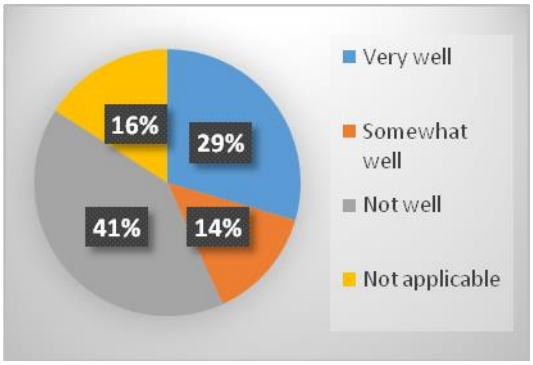

Fig 5. 11 the contract address potential conflicts or disputes that arose during the project

Interpretation: The above table provides the frequency and percentage distribution of responses to the question "How well did the contract address potential conflicts or disputes that arose during the project?" from a total of 44 respondents. Among the respondents, 13 (29.5%) rated the contract as addressing potential conflicts or disputes very well, 6 (13.6%) rated it as addressing them somewhat well, 18 (40.9%) rated it as not addressing them well, and 7 (15.9%) respondents did not provide a response as the question was not applicable to them. Overall, a majority of respondents (40.9%) rated the contract as not addressing potential conflicts or disputes well.

Table 5. 13 the project goals and objectives aligned with the contract terms

	Frequency	Percent
Very closely aligned	5	11.4
Somewhat closely aligned	9	20.5
Not very closely aligned	23	52.3
Not at all aligned	7	15.9
Total	44	100.0

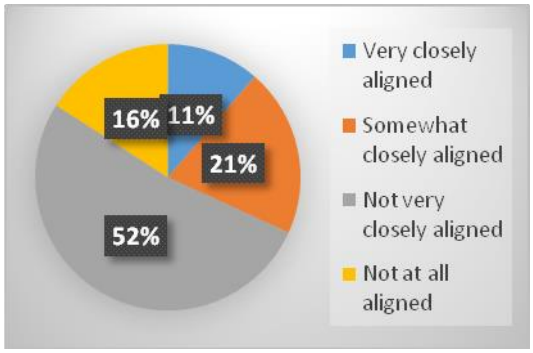

Fig 5. 12 the project goals and objectives aligned with the contract terms

Interpretation: The table shows the results of a survey that asked respondents to rate how closely the project goals and objectives were aligned with the contract terms. There were 44 respondents in total.5 (11.4%) said that the project goals and objectives were very closely aligned with the contract terms. 9 (20.5%) said that the project goals and objectives were somewhat closely aligned with the contract terms. 23 (52.3%) said that the project goals and objectives were not very closely aligned with the contract terms. 7 (15.9%) said that the project goals and objectives were not at all aligned with the contract terms.

VI. CONCLUSION

In conclusion, the study conducted a comprehensive investigation of various contract types employed in high-rise building projects, evaluating their impact on project outcomes such as cost, time, quality, and risk management. The research findings show that a Design and Build Contract is more common in high-rise building projects. The majority of the contracts used in the project allowed flexibility to change scope and price. However, the projects took more than 3 years to complete, and delays were experienced by 40.9% of respondents due to design changes, material shortages, and contractor's fault.

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