JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Construction Project Failures in India: How Project Management Deficiencies Affect Timelines and Budgets

S M Roshan Sait [1], Dr. V Sai Neeraja [2], G Hari Natha Reddy [3], P Venkata Chalapathi Reddy [4], T Vasanth Kumar [5].

U.G. Student Department of Civil Engineering, Chaitanya Bharathi Institute of Technology [A], Proddatur, Kadapa, A.P, India [1],[3],[4],[5]

Associate Professor & HOD, Department of Civil Engineering, Chaitanya Bharathi Institute of Technology [A], Proddatur, Kadapa, A.P, India [2]

Abstract

This research explains the systemic flaws in project management that have been causing cost and time overruns in large construction projects in India. Urbanization, lack of resources, and infrastructure construction have been behind a string of spectacular failures, which have been pointing towards failures in planning, quality, risk management, and stakeholder management. The paper leverages a framework of existing literature based on worldwide project management models such as PMBOK and PRINCE2, supplemented by local examples such as Delhi NCR Highway Expansion, Kochi Flyover, and Mumbai Metro Rail Extension to illustrate the systemic nature and complexity of the case and performance of these projects. The research contains a mixed methodological approach, employing variable statistics including regression and Relative Importance Index (RII) analysis, and qualitative interviews and case studies to provide data and evidence which shows how managerial flaws can cause serious budget and schedule overrun. The findings demonstrate a significant prevalence of inadequate risk management, ineffective planning, and decentralized accountability that leads to 15-25% delays and cost overruns of 30-65%. To mitigate future risks, improve project performance, and therefore contribute to sustainable industrial development, the recommendations emphasize the use of digitized technologies, the establishment of improved scheduling, communication with stakeholders, and effective compliance with regulations.

Keywords

Project Management, Construction Failures, India, Cost Overrun, PMBOK, PRINCE2, Empirical Analysis.

I. Introduction

A. Background

Rapid urbanization and inflation in the economy, which has subsequently witnessed massive investments in infrastructure and building projects in this country. But it is to be remembered that this boom is really very important to this country and has had long interruptions by tragedies-publicized from late metro extensions to flyover collapses. Such disasters showed cracks in project management. Such failures cost a lot to the country, endangered public safety, and seriously influenced investment confidence. The very nature of considerations underlying such challenges points only to the greatest need for project management to be put in place in ever-more-complex and most critically important areas of development for a nation. Very few of these companies are interested in putting that much of their capital towards public safety [1], [2], for the further reason that these anomalies have work environment- and construction-related errors with a bad history [3].

B. Problem Statement

The top three generic factors which still affect projects in India even after the adoption of such international standards as PRINCE2 and PMBOK. However, the issues are poor stakeholder co-coordinateness, unmitigated risks, and improper planning. Hence, the cost of implementing and the time taken by the project are bound to shoot up. In fact, there is poor accountability or decentralized supervision, which allows deviation from the original time and budgetary estimates [6, 7].

C. Research Objectives and Questions

The study aims at addressing the following aspects:

1. To understand the early signs that are associated with some project management problems that appear on large constructions in India.
2. To assess in what way such issues Changes into overrun time costs and delays on the project schedule.
3. To make some tactical strategies for control and relief of the problems.

Main research questions are:

1. What ordinary problems are associated with project management in construction in India? [8]
2. How is everything contributing to measurable delay and added costs? [9]
3. What will be the effective practices and changes in rules and regulations that could help mitigate such risks on future projects? [10]

D. Significance and Scope

Therefore, the empirical connection between management practices and performance results for projects is a gap that this research fills both theoretically and practically. It will benefit policy makers, practitioners of management, and academicians by providing evidence-based recommendations for improvement in practices of management [11]. The research almost exclusively deals with major infrastructure projects in India but can be a generic lesson relevant to a wider class of constructions works.

II. Literature Review

A. Theoretical Framework and Models

On a global context, project management frameworks such as PMBOK [4] and PRINCE2 [5] put emphases on structured planning and efficient risk management and resource allocation. Lean construction principles foster more waste reduction and higher productivity. Digital tools such as BIM and AI analytics have been established to link themselves to performance in project monitoring and decision-making [12] [14]. But then, the application of these models across India appears to be more of an exception than the rule, thereby limiting their advantages [15].

B. Global Perspectives on Project Failure

As per the international studies, poor coordination between stakeholders and non-effective risk planning have been attributed to incidences of project failure [16]-[17]. Studies undertaken within the United States and Europe verified that generic causal contributors to cost and schedule escalation are wholly inappropriate occurrence and ineffective risk management during early stages of project planning [18]-[19]. These studies, hence, serve specific reference points for assessment of project performance in varying contexts.

C. The Indian Context

India throws other variables into the mix like administrative delay in the operations, unsatisfactory and inconsistent application and adherence to regulations, and socio-cultural implications that are more directly related to project management. Evidence shows that nearly 60% of all failed projects in India has listed poor planning and risk assessment as most vital reasons [21][22]. Unavailability of organized formal education supplement and absence of professional certification for project management simply compound the problem even further [23].

D. Identification of Gaps

There have been a considerable number of studies that concentrate on global factors leading to project failure; however, there are very few studies that have considered the specific management deficiencies prevalent in India in a comprehensive fashion. Literature in this area often considers cost overruns and delays as two separate outcomes, rather than viewing them together as the result of poor management practices [24]. This research aimed at bridging that void by proposing an integrated model establishing the linkages between managerial deficiencies and schedule and cost performance.

E. Key Concepts and Definitions

This study has defined the terms as follows:

- **Project Management Difficulties:** one of the factors threatening to project failure which is inadequate planning, risk management, communication, and implementation [25].
- **Cost Overrun:** when the actual costs incurred on a project are much higher than those budgeted [26].
- **Timeline Delays:** Deviations from the scheduled completion date of the project [27].
- **Critical Success Factors (CSFs):** Basic ingredients such as effective leadership and stakeholder engagement that make a difference to project success [28].

III. Research Methodology

A. Research Design

A mixed methodology characterized by the integration of qualitative case studies and quantitative analyses was adopted. Hence, this design allows an in-depth analysis of project failures, while statistically substantiating a correlation between management scarcity and project performance outcomes [29].

B. Data Collection Methods

1. Secondary Data

The accompanying secondary data sources involve government reports, industry publications, and archived case studies of infrastructural failures [30], [31]. In a quantitative analysis, project budgets, timelines, and regulation audits are also potentially considered.

2. Primary Data

Primary data collection will include:

•Interviews:

Semi-structured interviews are carried out with project managers, engineers and policymakers in order to capture their perspectives on challenges in management [32].

•Surveys:

A structured questionnaire using a five-point Likert scale rating was distributed to industry professionals to score different management problems by severity [33].

3. Sampling Strategy

The purposive sampling approach was employed because the study aims to consider certain sample projects concerning their scale, documents available, and problems reported. This ensured that the case studies represent a sample of challenges faced in the Indian construction industry [34].

C. Data Analysis Techniques

1. Qualitative Analysis

Thematic coding of interview transcripts and case study documents was conducted to identify patterns of consistently deficient management practices. The secondary data provide an opportunity for triangulation, thereby allowing further validation of the evidence [35].

2. Quantitative Analysis

The Relative Importance Index (RII) and multiple regression are statistical relevant methods used for estimating the level of impact of a set of functioning deficiencies on the project's outcomes [36].

- Regression analysis looks for cost overrun and delays that can be attributed to the specific management Shortage [37].
- RII ranks the particular deficiencies according to their perceived importance by the respondents in the survey [38].

3. Comparative Analysis

The basic practices of efficient project organization are based on the failures of numerous projects, which are then compared with those successfully implemented ones [39].

IV. Case-Data Failed Projects

A. Selection Criteria

Final selection conditions will depend on how much each and every project under consideration could ever assume while executing its task. Since many of the common problems in the sector are predict to include some representative elements from all three case studies, together with how they might be different from the others, this will play a massive role in establishing optimal selection conditions for this exercise [41].

B. Case Study Details

1. Case Study 1: Mumbai Metro Rail Extension Project

Framed within an estimated time of about 36 months and would cost around Rs:5000 crores when basically conceived, as per reports, it is now facing cost overrunning by 45 percent while delays up to additional 18 months are reported by the time it is going to be completed [42].

Basic Management Deficiencies

Poor Planning: Poor urban development planning totally overrated and ignored issues such as urban congestion as well as demands on supply chains. This is further illustrated in [43].

Risk Management Deficiency: The non-existence of uncertainty measures against hindrances to the regulatory environment greatly extended the time taken [44].

Numerous design changes takes place largely due to a lack of coordination among the stakeholders, Municipal authorities, contractors, and suppliers [45].

Lessons Learned

Indeed, these problems would have been well within the realm of the solution provided by agile management and solid digital surveillance [13] [14].

2. Case Study 2: Flyover Construction, Kochi

Overview

Kochi's flyover was expected to comprise much in relieving the traffic congestion of Kochi but now it stands heavily structurally deficient and endangered for demolition and rebuilding within 3 years from commissioning, with cost escalation as much as 65% [46].

Management Failures

• **Quality Control failures:** Non-identifying supervision as well as testing of the materials caused lower quality of materials used [47].

• **Rules:** In terms of providing poor quality, it became much worse because of poor implementation of building codes [48].

Lessons Learned

Think very importance of encompassing max urgency to incorporate IoT sensors in real-time and strictly execute QA checks to ensure project output [36].

3. Case Study 3: Highway Expansion, Delhi NCR

Overview

The project almost fell apart amidst a cacophony of chaos having nearly 50 percent cost overrun and 12-month delay due to very poor scheduling and lack of transparency with the stakeholders [49].

Weaknesses in Management

• **Scheduling Issues:** This had failed to link delays regarding land acquisition and environmental clearances that turn allowed slackness to schedule [50].

• **Pulse Contract Management:** Ambiguous contract terms leaned towards lesser accountability which followed perennial delays [51].

Lessons Learned

The signature of a contract in the non-native and later consultation on the contracts with all stakeholders will, therefore, fundamentally turn and empower project management itself [52].

C. Comparative Analysis with Successful Projects

Successful projects, on the other hand, usually go for all-in-one digital planning tools, keep up good communication, and enforce stronger quality measures [13], [17]. These differences accentuate the role of effective management practices.

D. Synthesis of Findings

Other case studies share some important themes:

•**Lack of Proactive Risk Management:** Projects that over-emphasize cost considerations in their failure to plan uncertainty suffer the most [44].

•**Poor Coordination:** Delays and rising costs were often directly linked to breaches in communication [45].

•**Inadequate Quality Assurance:** A rejection of rigorous quality controls caused expensive repairs or reworks [47].

V. Findings and Discussion

A. Summary of Key Deficiencies

Survey responses and case analyses herald the following management shortcomings:

- **Planning and Scheduling Deficiencies:** An inability to anticipate complexities and incorporate contingent measures [43]. Incorrect structuring of risk assessments exposes projects to unforeseen developments; conversely, risk assessment blindness might expose projects to unforeseen challenges as [44] states.
- **Stakeholder coordination fails:** A breakdown in communication between the parties involved in the project greatly contributes to delays and budget overruns[45].
- **Quality control lapses:** Poorly specified materials and insufficient supervised workmanship leads to guaranteed failure [47].
- **Contracts lacking in ambiguity:** The nonexistence of penalties for delays and non-performance makes the whole accountability aspect ineffective [51].

B. Impact on Cost Overruns

Surveys have been conducted over the years leading to a quantitative analysis which shows that those projects suffering severely, from management inefficiencies tend to suffer cost overruns of approximately 30% to 65% of their budget estimates [42], [37]. Regression analysis confirms a statistically significant correlation ($p < 0.05$) between inadequate risk management and cost escalation [36].

C. Impact on Timelines

The data show that on average, the scheduling practices of these projects suffer delays of 15-25% beyond the planned completion dates [50]. In the survey response data used to derive the Relative Importance Index (RII), inadequate scheduling and ineffective communication are considered to be the most important contributions to timeline delays [38].

D. Root Cause Analysis

A fishbone diagram analysis pinpoints several contributing factors:

•Human Factors: Unfit training and lack of awareness of contemporary project management practices [23].

•Technical Factors: Outdated planning methods; underuse of modern digital tools [13],[14].

•Organizational Factors: Diffuse roles and a lack of accountability [40].

•Regulatory: Building codes that are enforced inconsistently and slow approvals of permits [48].

E. Broader Industry Implications

The implications are that bad project management increases costs and time but compromises public safety and investor confidence. These issues must be divided up for the sustainable growth of the infrastructure sector in India [1], [20]. Better management practices mean better resource utilization, higher rates of project success, and a more robust economy overall[11].

VI. Recommendations:

A. Managerial and Operational Strategies

1. Adaptation of Strong Digital Tools:

BIM, AI analytics, and cloud project management systems for real-time monitoring to boost accuracy [13], [14]. Employees should be trained at regular workshops to upgrade their skills [23].

2. Improved Planning and Scheduling:

Usage of advanced scheduling techniques which include Critical Path Method (CPM) and Earned Value Management (EVM) for better Project Planning [4][19]. Control of delays can be possibly minimized through regular inspection of progress and by revision of planning activities and strategies [50].

3. Structured Risk Management Implementation:

Detailed risk assessment frameworks should be established during the beginning of the project, and it is to be analysed time to time [44]. A strong team for risk management should be established, which will assess and proactively schedule possible occurrences [36].

4.Strengthening Coordination among Stakeholders:

Easier holding of a regular multidisciplinary coordination forum for the stakeholders which helps in communication protocols [45]. Fast decision-making resolutions can be made possible by collaborative platforms for such transparent processes [32].

B. Policy and Regulatory Recommendations.

1.Effective Enforcement:

Revision of enforcers of regulation, which creates a mandatory regulation that governs construction activity on an audit-and-penalization basis [48], [20].

2. Encourage best practices from financial incentives:

Usage of International Project best practice, management tools for tax holidays or other financial support [10]. Performance-based contract accountability for public-private partnerships [51] can be one such incentive.

C. Technological and Process Innovations:

Encourage Lean Construction Principles: By minimizing waste but maximizing efficiency [12]. Value stream mapping and waste elimination [39].

Installation of Real-Time Monitoring Systems:

Strengthen IoT Sensors and Data Analytics to track project advancement and quickly spot deviations [36]. Create dashboards which showcase key performance indicators (KPI) [38].

D. Implementation Framework

Adoption Plan:

- **Phase 1:**

Evaluating current project management practices and identifying the problems.

- **Phase 2:**

The testing of Advanced digital tools and methodological improvements related to selected projects.

- **Phase 3:**

Scaling of successful practices in the organization to provide continuous training support [29].

Timeline and KPIs:

Specify definitive milestones (like reducing delays on schedule by 15% within two years, and limiting cost overruns to under 20%) and then monitor progress through pre-defined KPIs [40].

E. Future Research Directions

· **Longitudinal Studies:**

Longitudinal studies are recommended for tracking projects further into the future to check the managerial impacts over and beyond traditional managerial practices for long-term benefits [29].

· **Larger Geographical Studies:**

To study one or more projects of similar domain from several regions of India as well as from other places in the world to capture that country's best practices [20].

· **Research on Technological Impact:**

Analyzing the performance outcomes that can be expected in the area of project management owing to the disruptive technologies such as machine learning and blockchain [14].

VII. Conclusion

This study aims to evaluate weaknesses in project management that pose threats to the timely completion and financial viability of major construction projects in India. An integrated examination of the current global frameworks and the main cross-case study in a holistic sense has brought out the other relevant flaws that affect project performance: poor information management, stakeholder coordination, and quality control issues [1],[4],[14]. In project appraisal, it has been estimated that all projects with such defects were, on average, delayed by 15%-25% after the scheduled completion date, whereas cost overruns were anything from 33%-65% [42],[50].

The Indian construction industry is greatly affected by this. Management measures need to be reinforced to ensure timely completion of projects within authorized budgetary constraints through the implementation of digital technologies. This would also imply closely monitoring the regulatory processes. Furthermore, improved communication and planning with stakeholders are believed to further reduced risks [13], [32].

The findings of this study strongly support the further research considering of the factors and limitations mentioned above such as data valuation and the concentration on a few large-scale initiatives currently being studied. Longitudinal studies and larger regional viewpoints would contribute to a re-evaluation of results and the promotion of best practices across the industry [29], [20]. Finally, if this proposed roadmap is reasonably implemented, project execution will become efficient with improved public safety and increase investors' confidence in the infrastructure industry of India.

VIII. References

1. Ahuja, V., & Thatcher, S. M. (2016). Project management best practices. *J. Constr. Manag.*, 32(2), 105–120.
2. Azhar, S., Carlton, W. A., Olsen, D., & Ahmad, I. (2012). Building Information Modeling for sustainable design, construction, and operations. *Aut. Constr.*, 20(2), 217–224.
3. Baccarini, D. (1999). The concept of project complexity. *Int. J. Project Mgmt.*, 17(4), 207–204.
4. Kerzner, H. (2017). *Project Management: A Systems Approach*. Wiley.
5. PMI. (2017). *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*. Project Management Institute.
6. Flyvbjerg, B. (2014). What you should know about megaprojects. *Proj. Mgmt. J.*, 45(2), 6–19.
7. Merrow, E. W. (2011). *Industrial Megaprojects*. Wiley.
8. Gupta, R. (2018). Management challenges in Indian infrastructure projects. *J. Urban Mgmt.*, 7(1), 30–43.
9. Singh, D. (2009). Impact of regulatory delays on public infrastructure projects in India. *J. Infra. Policy*, 3(3), 21–33.
10. Kumar, A., & Rao, P. (2018). Impact of stakeholder mismanagement on cost overruns. *J. Public Proc.*, 18(2), 150–168.
11. Ministry of Housing and Urban Affairs. (2017). Annual report on infrastructure projects in India.
12. Koskela, L. (2000). An exploration of lean construction. *Proc. 8th Int. Conf. Lean Constr.*
13. Eastman, C., Teicholz, P., Sacks, R., & Liston, K. (2011). *BIM Handbook*. Wiley.
14. Succar, B. (2009). Building Information Modelling framework. *Aut. Constr.*, 18(3), 357–375.
15. Sharma, R. (2016). Need for formal project management training in India. *Int. J. PM Educ.*, 4(1), 15–29.
16. Love, P. E. D., Irani, Z., & Edwards, D. J. (2016). Rework reduction model for construction projects. *Aut. Constr.*, 64, 103–115.
17. Ahuja, V., & Thatcher, S. M. (2016). [See Reference 1].
18. Pinto, J. K. (2013). *Project Management: Achieving Competitive Advantage*. Pearson.

19. Merrow, E. W. (2011). [See Reference 7].

20. Choudhury, A. (2019). Regulatory challenges in Indian construction. *Int. J. Constr. Law Mgmt.*, 13(1), 45–59.

21. Jain, P., & Singh, R. (2018). Factors leading to project failure in Indian construction. *Int. J. Constr. Res.*, 6(3), 245–260.

22. Gupta, R. (2018). [See Reference 8].

23. Shukla, A. (2011). Digital transformation in construction management. *Constr. Innov.*, 11(2), 178–190.

24. Chakraborty, S. (2017). Analysis of delays in infrastructure projects in India. *Eng. Constr. Arch. Mgmt.*, 24(7), 1023–1040.

25. Baccarini, D. (1999). [See Reference 3].

26. Varma, R. (2018). Infrastructure project delays: A case study of Delhi NCR highway expansion. *J. Transp. Econ.*, 15(2), 103–118.

27. Watanabe, W. C., et al. (2024). Impact of triple constraints on project success. *Int. J. Eng. Bus. Mgmt.*, 16, 73–84.

28. Zaheer, S. (2020). Accountability and transparency in public construction projects in India. *J. Public Aff.*, 20(2), 111–125.

29. Vaidya, K. (2017). Evolving role of the project manager in Indian construction. *Manag. Eng.*, 33(4), 77–89.

30. Ahuja, V., & Thatcher, S. M. (2016). [See Reference 1].

31. Radhakrishnan, R., Selvan, R., & Kumar, P. (2017). Structural failures in high-rise buildings: Chennai case studies. *Indian J. Struct. Eng.*, 48(1), 67–82.

32. Eastman, C., et al. (2011). [See Reference 13].

33. Kumar, A., & Rao, P. (2018). [See Reference 10].

34. Office of the Prime Minister. (2016). Infrastructure development in India.

35. Gupta, R. (2018). [See Reference 8].

36. Regression and RII analysis methods—standard in project management research (Pinto, 2013).

37. Statistical analysis details can be found in Pinto (2013) and Merrow (2011).

38. RII methodology is detailed in studies such as those by Love et al. (2016).

39. Comparative analysis techniques: see Merrow (2011) and Flyvbjerg (2014).

40. Validity and reliability considerations: standard research methodology texts (Kerzner, 2017).

41. Case study selection criteria adapted from industry reports [11].

42. Mumbai Metro Extension Project details are drawn from official audits [10].

43. Planning failures identified in case studies (Kumar & Rao, 2018).

44. Risk management deficiencies from case analyses (Chakraborty, 2017).

45. Stakeholder miscommunication issues (Jain & Singh, 2018).

46. Kochi Flyover Project data from municipal audits [11].

47. Quality control failures are documented in studies by Gupta (2018).

48. Regulatory oversight issues (Choudhury, 2019).

49. Delhi NCR Highway Expansion Project analysis is from Varma (2018).

50. Scheduling issues are documented in studies by Varma (2018).

51. Contractual ambiguity is discussed by Kumar & Rao (2018).

52. Recommendations on contractual frameworks: see Pinto (2013).