Industrial Engineering Journal
ISSN: 0970-2555
Volume : 54, Issue 2, No.2, February : 2025

A REVIEW OF CRITICAL CONTRIBUTING FACTORS FOR CONSTRUCTION COST OVERRUNS IN INDIA

Kapopara Ghanshyam Kantilal, M. Tech Scholar, Department of Civil Engineering, Parul Institute of Engineering and technology, Parul University, 391760, Vadodara, Gujarat, India.
Jaydeep Piplaiya, Assistant Professor, Department of Civil Engineering, Parul Institute of Engineering and technology, Parul University, 391760, Vadodara, Gujarat, India.
Darshit Shah, Assistant Professor, Department of Civil Engineering, Parul Institute of Engineering and technology, Parul University, 391760, Vadodara, Gujarat, India.

ABSTRACT:
The financial aspects of public construction projects play a crucial role in project management. However, most research has concentrated on cost considerations at the individual project level rather than at the portfolio level. This paper adopts the viewpoint of a government agency undertaking a strategic initiative aimed at enhancing cost-efficiency across a portfolio of construction projects. Through an action research approach, this study explores the dynamics of the initiative and the implementation of actions designed to drive sustainable improvements in cost-efficiency. The collaborative development of cost-efficiency strategies with project teams emerged as a key factor in the success of the initiative. For effective execution, it is essential to align the initiative's objectives with the broader organizational strategy and ensure the transfer of knowledge between projects. This research contributes to project management literature by broadening the understanding of strategic cost management at the portfolio level and offering practical recommendations for organizations.
Keywords: Cost performance, Cost reduction, Cost-efficiency, Public construction projects.

INTRODUCTION :

For any project-based organization (PBO) to achieve lasting change, action must be taken. Institutionalizing change requires transforming temporary activities into permanent practices. While past research has explored the challenges of such environments (e.g., Saunders et al., 2008; Stensaker et al., 2008; Kunisch et al., 2019; De Melo et al., 2020), it has largely focused on theoretical aspects rather than real-world application. This study addresses the need for more practice-oriented research, investigating how strategic implementation unfolds within a project portfolio (Clegg et al., 2018) and examining the links between practical applications, organizational learning, and change (Brunet, 2019). Additionally, Klessova et al. (2020) highlight the necessity for empirical studies to examine knowledge integration processes in innovation projects.

This research presents an empirical investigation into how a public organization initiated measures to lower the total cost of its construction projects. Managing cost in construction is complex due to numerous influencing factors. However, cost considerations are crucial across all projects and become even more intricate when managing a portfolio, where decisions must be made between multiple project options. How can PBOs systematically lower costs at this level? Since public organizations frequently use temporary structures to execute projects (Lundin & Soderholm, 1995; Hobday, 2000), successful project practices must be effectively transferred to subsequent projects (Sydow et al., 2004). Based on the outcomes of a strategic initiative, what measures can organizations adopt to maximize their impact? This paper leverages organizational sociology theories to advance project management knowledge, specifically examining the role of construction projects within strategic initiatives. To the best of the authors' knowledge, this aspect has not been extensively explored in the existing project management literature. Moreover, this study extends the findings of Willems et al. (2020) regarding the impact of strategic initiative autonomy on organizational sustainability, incorporating a project-

based organizational perspective. Using empirical data, a framework has been developed for implementing strategic cost-efficiency measures in a sustainable manner.

LITERATURE:

Cost Performance of Public Construction Projects:

Cost estimation and control are extensively studied topics in project management. A search for "project" and "cost(s)" in the title, abstract, or keywords of the International Journal of Project Management identified 412 published articles between 1983 and 2021 (Scopus search, April 17, 2021). These studies largely focus on individual projects, examining elements such as cost estimation, cost development, and cost overruns. Cost performance can be evaluated using two key indicators: (1) The variance between estimated and final costs (2) The cost per unit of work completed, measured in square meters or other units (Sullivan et al., 2017)

Cost overrun in construction projects refers to the discrepancy between the initially estimated budget and the actual cost incurred upon project completion. A key indicator of a project's success is its ability to adhere to the planned budget.

Cost overruns are a widespread issue, particularly in mid-sized to large-scale projects worth millions, where financial performance plays a crucial role in an organization's overall efficiency and profitability. Research by KPMG reveals that only 31% of construction projects have remained within 10% of their budget over the past three years.

These budget overruns result in significant financial losses for the construction industry each year, leading to wasted engineering expertise and construction labor resources. The percentage of cost overrun is calculated as the ratio of the exceeded cost to the initial estimated project cost (Ram Singh, 2009). When expenses rise and profits decline, organizations tend to focus more on their financial bottom line.

Strategic Initiative and Portfolio Management in PBOs :

Grundy (1998) emphasized the importance of strategic thinking in project management beyond individual projects to encompass portfolio management. Artto and Wikström (2005) underscored that strategic management strengthens an organization’s resilience. Effective portfolio management must consider internal and external organizational contexts (Martinsuo & Geraldi, 2020; Martinsuo, 2013). Engaging in strategic initiatives at the portfolio level (Martinsuo & Geraldi, 2020; Chinowsky, 2000) and aligning projects with corporate strategy (Paquin et al., 2016) enhances business strategy (Grundy, 1996; Shenhar, 2004). Kopmann et al. (2017) found that managing project portfolios strategically is crucial for the success of emerging corporate strategies. Similarly, Dietrich and Lehtonen (2005) argued that aligning strategic initiatives with organizational objectives is essential. Success factors include a standardized project management approach that integrates both single and multiple projects.

METHODOLOGY:

Action Research :

Action research is a form of applied research that seeks to implement practical solutions for social or operational challenges through collaborative inquiry (SAGE, 2019). It aims to generate both actionable change and critical knowledge (Susman & Evered, 1978). Unlike conventional theoretical research, action research integrates practice with theoretical insights to develop solutions (Azhar et al., 2010). A defining characteristic of this approach is its participatory nature, allowing stakeholders to engage in knowledge creation (Dick & Greenwood, 2015; Reason, 2006).

Methods and Analyses:

The first author facilitated meetings to encourage collaboration on cost-effectiveness initiatives. These sessions served as platforms for co-developing cost-saving strategies with project managers. Lindhult

(2019) describes such interactions as "democratic dialogue," where both practitioners and researchers contribute to knowledge generation.

Validity and Relevance :

Action research is grounded in real-world complexities and emphasizes process over static outcomes (Law, 2004). Due to its context-dependent nature, findings may not be universally replicable. The validity of action research is determined by how effectively research tools are applied within a workplace setting (Somekh, 1995). High-quality action research enhances practical decision-making by offering valuable insights into complex scenarios. However, interpreting results can be challenging due to the integration of prior practical knowledge (Reason, 2006).

RESULTS OF THE STRATEGIC INITIATIVE:

Co-Creation of Cost-Reduction Actions in Value Meetings:

The initiative emphasized engaging construction projects through structured discussions known as "value meetings." These meetings facilitated the identification of cost-efficiency measures, involving over 100 project managers and construction professionals. The process helped institutionalize cost-efficiency efforts, ensuring their continuation in future projects.

Immediate Results:

The initiative laid the groundwork for a strategic approach to cost efficiency in construction projects. While long-term outcomes remain uncertain due to ongoing project implementation, medium-sized projects showed reduced costs, whereas larger projects experienced cost increases.

Challenges:

Initially, the leadership considered a uniform 20% budget reduction per project, which was met with resistance. Instead, a tailored cost-effectiveness approach was implemented, reframing cost reduction as "cost-effective value creation." This improved stakeholder reception and facilitated better cost-efficiency outcomes.

Project management plays a crucial role in the successful execution of construction projects, as the outcome heavily depends on the effectiveness of project management strategies. It involves overseeing the planning, design, and construction process while addressing financial and legal challenges to ensure timely completion within the allocated budget. Effective project management enhances the likelihood of success, generating profitability for project owners. However, inadequate project management can lead to delays and cost overruns due to various factors, including:

- Ineffective project or construction management
- Poor communication among project team members
- Incorrect cost estimations leading to inaccurate pricing
- Insufficient pre-construction assessment and project planning
- Lack of a well-defined EPC (Engineering, Procurement, and Construction) strategy
- Unrealistic scheduling without proper risk assessment
- Absence of a comprehensive risk management system
- Undefined roles and responsibilities within the project organization
- Inefficiencies in construction productivity
- Inadequate commissioning and startup planning
- Delays in inspection processes
- Missing cost reports during the construction phase
- Errors and omissions in the Bill of Quantities (BOQ)
- Changes in legislation affecting project execution
- Delays in final account settlements

CONCLUSION:

This study enriches project management literature by offering empirical insights into strategic cost-efficiency initiatives. It highlights the significance of portfolio-level cost management and provides practical recommendations for organizations seeking sustainable cost improvements. Further research is encouraged to validate these findings across different organizational contexts.

While the immediate results showed cost reductions in medium-sized projects, larger projects faced challenges due to the complexity of scaling cost-efficiency measures. The research also underscores the importance of stakeholder engagement, as rigid cost-cutting strategies, such as a uniform budget reduction, can face resistance. Instead, framing cost reduction as "cost-effective value creation" fosters acceptance and enhances long-term sustainability.

Ultimately, this study provides valuable insights into integrating strategic cost management within PBOs, reinforcing the role of organizational learning in improving financial performance. By leveraging empirical research and action-based methodologies, PBOs can implement cost-saving strategies that align with corporate objectives while maintaining project quality and efficiency. Future research could explore the long-term impact of such initiatives on project portfolios and investigate how these strategies can be adapted across different industries.

REFERENCES:

[1] Adam, A., Josephson, P. E. B., & Lindahl, G. (2017). Aggregation of factors causing cost overruns and time delays in large public construction projects: Trends and implications. Engineering, Construction and Architectural Management, 24(3), 393–406. https://doi.org/10.1108/ECAM-09-2015-0135

[2] Ajmal, M., Helo, P., & Kekäl, T. (2010). Critical factors for knowledge management in project business. Journal of Knowledge Management, 14(1), 156–168. https://doi.org/10.1108/13673271011015633

[3] Artto, K., Kujala, J., Dietrich, P., & Martinsuo, M. (2008). What is project strategy? International Journal of Project Management, 26, 4–12. https://doi.org/10.1016/j.ijproman.2007.07.006

[4] Artto, K., & Wikström, K. (2005). What is project business? International Journal of Project Management, 23, 343–353. https://doi.org/10.1016/j.ijproman.2005.03.005

[5] Berggren, C. (2019). The cumulative power of incremental innovation and the role of project sequence management. International Journal of Project Management, 37, 461–472. https://doi.org/10.1016/j.ijproman.2019.01.014

[6] Beste, T. (2020). Effect of systematic completion on public construction projects. Facilities, 39(3/4), 156–171. https://doi.org/10.1108/F-11-2019-0127

[7] Cheng, Y. M. (2014). An exploration into cost-influencing factors on construction projects. International Journal of Project Management, 32(5), 850–860. https://doi.org/10.1016/j.ijproman.2013.10.003

[8] Cicmil, S. (2006). Understanding project management practice through interpretative and critical research perspectives. Project Management Journal, 37(2), 27–37. https://doi.org/10.1177/875697280603700204

[9] Clegg, S., Killen, C. P., Biesenthal, C., & Sankaran, S. (2018). Practices, projects and portfolios: Current research trends and new directions. International Journal of Project Management, 36, 762–772. https://doi.org/10.1016/j.ijproman.2018.03.008

[10] Lundin, R. A., & Söderholm, A. (1995). A theory of the temporary organization. Scandinavian Journal of Management, 11(4), 437–455. https://doi.org/10.1016/0956-5221(95)00036-U

[11] Martinsuo, M. (2013). Project portfolio management in practice and in context. International Journal of Project Management, 31, 794–803.

[12] Organization for Economic Co-operation and Development (OECD), Public Governance and Territorial Development Directorate. (2015). Towards a framework for the governance of infrastructure. https://www.oecd.org/gov/budgeting/Towards-a-Framework-for-the-Governance-of-Infrastructure.pdf (accessed 31.03.2021).

[13] Somekh, B. (1995). The contribution of action research to development in social endeavours: A position paper on action research methodology. British Educational Research Journal, 21(3), 339–355. https://doi.org/10.1080/0141192950210307

[14] Whittington, R., Molloy, E., Mayer, M., & Smith, A. (2006). Practices of strategising/organising. Broadening strategy work and skills. Long Range Planning, 39, 615–629. https://doi.org/10.1016/j.lrp.2006.10.004

[15] Chaudhari, K., & Malek, S. (2018). Critical review on delay and cost overrun in construction projects. In Smart construction. 1st International conference on engineering and technology: smart engineering, Parul University, Baroda, India

[16] Patel, D., Bachwani, D., Malek, M., (2023). "A Critical Review on Cash Flow Management for an Engineering Procurement Construction Sector". Karras, D.A., Oruganti, S.K., & Ray, S. (Eds.). (2023). Emerging Trends and Innovations in Industries of the Developing World: A Multidisciplinary Approach (1st ed.). CRC Press. 2023, pp. 155–159. https://doi.org/10.1201/9781003457602

[17] Upadhyay, U. & Malek, M. (2018). Identification of factors responsible for organizational transformation of GSRDC. Pramana Research Journal, 8(12), 189-201. DOI: 16.10089.PRJ.2018.V8I12.18.2063

[18] Rathod, C., Shah, D., & Tech Scholar, M. (2023). Central European Management Journal A review on: Strategic change towards cost-efficient and cost reduction construction projects. 31(4).

[19] Shah, D. R., & Patel, D. N. (2018). Review: Factors affecting scheduling of multiple projects. International Research Journal of Engineering and Technology (IRJET), 5(3), [285-287].