Developing a Collaborative Cost Management Framework for Public Sector Projects

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Abstract
Cost overruns on public sector projects in South Africa have persisted despite multiple interventions. Although the prevalence of traditional cost management techniques has been blamed for the challenge's persistence, there are not many studies showing how collaborative cost management techniques can help address this issue in the context of South Africa. The goal of this study was to highlight the value of a collaborative cost management framework for engendering enhanced cost performance of public sector projects. In accordance with the case study research design, information was gathered through a combination of interviews and project-related documentation from five finished and ongoing public sector projects that served as cases. The study's projects and participants were chosen with purposefully. Thematic analysis was used to examine the data. The study's conclusions demonstrated how well public sector projects performed overall and at a lower cost when using the collaborative cost management approach. It was explained there how the framework may serve as a set of guidelines for all project participants to participate in cooperative cost management activities with the sole goal of adding value for the client. Also, the framework's ability to minimize recognized cost management difficulties was enunciated. It is anticipated that this study's conclusions will lead to the effective cost management on public sector projects.

Keywords*: Collaboration; Construction; Cost management; Public projects*

1. INTRODUCTION

Public sector projects in South Africa have continued to face poor cost performance, thereby increasingly exceeding allowed budgets. Because of this, it has become more challenging for the government to provide citizens with infrastructure-related services in an economical way. In today's corporate contexts, efficient cost management is still essential to an organization's success (Datar & Rajan, 2021). It makes it possible for businesses to increase profitability, maximize resources, and stay competitive. Although numerous research studies have been carried out to identify the reasons behind the low cost performance in these projects and provide solutions (Abdul Nabi & El-adaway, 2021), recent reports in the literature suggest that the problem still exists (Parsamehr and associates, 2023). However, scholars have failed to probe the contributions of the old cost management strategies to the maintenance of this imbroglio (Farouk & Rahman, 2023).

The efficiency of traditional cost management techniques may be hampered by a number of issues in the complex and dynamic corporate world of today. From static budgeting processes to reactive approaches and limited stakeholder interaction, traditional methodologies may fail to match the growing needs and problems of modern projects. Monyane et al. (2020) have proposed adopting agile, collaborative, and proactive ways to cost management in order to overcome these restrictions. These approaches would involve using technology, engaging stakeholders, and utilizing flexible methodologies to produce better project outcomes. In the context of cost management, cooperation becomes essential for integrating different viewpoints, skills, and resources in order to attain cost effectiveness (Monyane et al., 2020). The coordinated actions of multiple stakeholders, such as departments within an organization, suppliers, and others, constitute collaborative cost management. (Klassen et al., 2019). Organizations can uncover cost-saving possibilities, optimize processes, and

improve value creation by using varied viewpoints and skills through cross-functional collaboration and knowledge sharing. The numerous advantages that collaboration provides to businesses highlight how crucial it is for cost control. First of all, through group problem-solving and brainstorming sessions with stakeholders from various departments or areas of expertise, collaboration makes it possible to identify and prioritize cost-saving measures (Fayard et al., 2022). Second, when stakeholders exchange data and information about expenses, budgets, and performance indicators, collaborative cost management encourages responsibility and transparency and builds an environment of openness and trust inside the company. Last but not least, cooperation makes it easier to put cost-cutting measures into action by guaranteeing support and dedication from all pertinent stakeholders, which raises the possibility of effective execution and long-term cost savings (Voss et al., 2020).

Furthermore, cooperation is crucial for cost management in ways beyond just cutting expenses. Organizations can get better goal and objective alignment, more efficient resource allocation, and more strategic decision-making by encouraging collaboration within internal departments (Papadopoulos et al., 2021). Similarly, partnerships with suppliers allow companies to take advantage of economies of scale, bargain for favorable conditions, and innovate in the design and delivery of their products, all of which improve value creation and customer happiness. Collaboration is essential to cost management because it helps businesses maximize resources, improve productivity, and achieve long-term success. Adopting cooperative frameworks and strong stakeholder engagement tactics fosters legitimacy, trust, and resilience in addition to improving innovation and decision-making. However, in order for companies to fully reap the benefits of collaboration and stakeholder involvement, they must deliberately cultivate a culture of inclusivity, transparency, and mutual benefit while navigating the inherent hurdles involved.

The aforementioned suggests that, particularly in the South African context, implementing a collaborative approach to cost control on public sector projects may be the answer to the problems associated with cost overruns. Nonetheless, it has been noted that there are few research attempting to determine its value in promoting efficient cost management performance on these projects. Previous research emphasizing the value of these cooperative frameworks has concentrated on the setting of industrialized nations (Johnson et al., 2020; Tan et al., 2022). Notably, circumstance frequently influences collaborative cultures. Consequently, it is essential that research be done to evaluate the efficacy of these cooperative frameworks in a different (poor country) setting. The goal of this work is to close this gap. In order to do this, the study aims to respond to the following research question: how might the use of cooperative techniques lead to better cost management outcomes for South African public sector projects? The results of this study should add to the growing corpus of information about cooperative cost management in public sector initiatives.

2. Understanding Cost Management Frameworks

2.1 Limitations of Traditional Cost Management Methods

A crucial component of project management is cost control, which is necessary to guarantee that projects are finished within financial restrictions and provide value to stakeholders. Many sectors have long used traditional cost management techniques, which offer a framework for planning, estimating, and regulating costs. But even while traditional methods are widely used, they have drawbacks. The dependence of conventional cost management techniques on rigid budgeting procedures is one of their main drawbacks. A typical aspect of static budgeting is the development of comprehensive, fixed budgets using expected costs and historical data. Such budgeting techniques, according to Smith (2017), frequently overlook unanticipated changes in project requirements and scope, as well as outside variables like changes in the market or regulatory actions. Projects may therefore experience delays or budget overruns when changes are made to the original plan.

Furthermore, conventional cost management techniques are typically more reactive than proactive. Conventional approaches usually concentrate on detecting and reducing cost concerns up front, as

opposed to tracking and managing expenses after they have been incurred. This reactive strategy may result in lost chances to optimize value and save costs. According to Ammar et al. (2020), conventional cost management frameworks frequently don't have the tools necessary to identify cost variances early on or take proactive steps to address new cost trends, which leads to worse than ideal project outcomes. The conventional cost management approaches' scant attention to stakeholder cooperation and participation is another drawback. Conventional approaches frequently disregard the significance of include stakeholders in cost-related decisions in favor of treating cost management as a purely technical exercise. The need of stakeholder engagement in cost management is emphasized by Liu and Walker (2022), who also stress the necessity of transparent communication, group decision-making, and interest alignment among project participants. Traditional cost management techniques may not be able to address stakeholder issues or obtain insightful information without the active participation of stakeholders, which could result in resistance or discontent. Furthermore, conventional cost management techniques frequently lack adaptability and suppleness to changing project specifications or outside circumstances. For instance, project teams may be unable to adapt to changing market conditions or needs if they are subject to strict spending caps or set resource allocations as a result of traditional budgeting techniques. Zhang et al. (2018) contend that by imposing bureaucratic procedures or hierarchical structures that discourage initiative and autonomy within project teams, standard cost management frameworks may impede creativity and innovation.

2.2 Shift towards Collaboration and Stakeholder Engagement in Cost Management

Over the past few decades, there has been a paradigm shift in cost management approaches due to the realization of the significance of stakeholder engagement and collaboration. Smith (2017) claims that conventional cost management frameworks frequently ignore stakeholder interests and the larger project environment in favor of concentrating only on cost control strategies. On the other hand, in order to attain cost effectiveness and project success, modern frameworks place a strong emphasis on cooperation between project participants, including contractors, government agencies, and community stakeholders (Garcia et al., 2022). The advent of collaborative technologies has been significant in enabling stakeholder participation in the cost-management process. Building Information Modeling (BIM) is one of these collaborative technologies. Throughout the project lifecycle, BIM helps stakeholders to see project expenses in real-time and spot possible areas for cost savings (Zhang et al., 2018). By encouraging information exchange among project teams, it also improves accountability and transparency in cost management procedures. Project teams can view cost information in real time on a digital platform made available by BIM. According to Zhang et al. (2018), BIM has the ability to enhance cost management procedures by giving stakeholders the ability to find possibilities for cost savings, allocate resources optimally, and manage risks all during the course of a project. Similar to this, different digital tools and platforms have enabled stakeholders, regardless of location or organizational function, to participate more actively in cost management processes. Examples of these include cloud-based data sharing platforms and collaborative project management software.

In addition, the public sector's cost management procedures have undergone a radical transformation with the advent of the agile project management technique. The agile methodology places a high value on iterative development and ongoing stakeholder interaction, which enables project teams to quickly adjust to changing requirements and reduce risks associated with costs (Ammar et al., 2020). Additionally, this strategy encourages cross-functional teamwork and makes it possible for stakeholders to work closely together on value engineering, forecasting, and cost estimating tasks. Scholars have underscored the significance of stakeholder participation and partnership in cost management strategies, in addition to technology developments. Effective stakeholder involvement, in the opinion of Liu and Walker (2022), is essential for fostering consensus and trust among project participants and raising the possibility that cost management will be successful. Public-private partnerships (PPPs) and joint

ventures are two examples of collaborative governance frameworks that enable shared decision-making and risk-sharing, which improves the effectiveness of cost management results (Smith et al.,2023).
Another factor affecting the move towards collaboration has been recognized as the interconnectedness of current undertakings. While collaborative approaches prioritized active engagement from all relevant stakeholders, including project owners, contractors, suppliers, and end users, traditional cost management methods frequently relied on hierarchical decision-making and limited stakeholder involvement, which frequently led to inefficiencies and missed opportunities (Smith, 2017). A thorough grasp of the project's needs, risks, and restrictions is made possible by this inclusive approach, which promotes more informed decision-making and efficient cost control. Moreover, it is believed that cooperation and stakeholder involvement are crucial for establishing transparency and trust in cost management procedures. According to Ammar et al. (2020), including stakeholders in choices pertaining to costs can foster agreement, reduce conflict, and guarantee that a range of viewpoints are taken into account. Collaborative techniques foster a culture of trust and accountability among project participants by encouraging open communication and shared decision-making. This, in turn, improves the overall success of cost control programs.
Case studies of the Singapore public housing development program (Tan et al., 2022) and the London Crossrail project (Johnson et al., 2020) show how successful collaborative cost management is in reducing costs and improving project outcomes in the public sector. These projects have illustrated how proactive risk management, performance measurement, and stakeholder participation may result in successful cost optimization programs. Notwithstanding the advantages of cooperation and stakeholder involvement in cost management, there are still a number of obstacles preventing its application. Adopting collaborative ways is frequently hampered by competing agendas, corporate silos, and cultural opposition to change. Furthermore, problems with data interoperability and worries about privacy and security may make it difficult to effectively involve stakeholders. Strong leadership, clear communication, and an openness to embracing new technology and approaches will be necessary to overcome these obstacles.

3. RESEARCH METHODS

It is useful for performing context-dependent research, a qualitative, multi-case study was chosen (Yin, 2018). The case study research strategy was selected because it allows for the use of a variety of methods for data elicitation and analysis and facilitates an in-depth exploration into a phenomena within its natural contexts (Awuzie & McDermott, 2017). Case studies contribute to the development of new theoretical views on collaborative cost management in the public sector, as well as the improvement of current ideas through meticulous data collection, analysis, and interpretation (Baxter & Jack, 2020; Eisenhardt & Graebner, 2019). The Free State Department of Public Works (FSDPW) project management system was used to choose the projects that served as case studies for this study. The initiatives were anonymously coded and uniquely identified using project numbers. Before moving forward with a project, the FSDPW conducts a feasibility analysis of all viable choices and compares the needs against properties owned by the state. The public sector official was asked to select instances using a set of case selection criteria from a list of projects carried out under the FSDPW in Bloemfontein, South Africa, in order to eliminate bias. These requirements included school buildings that were given to contractors in grades 7 and 8, located in the province of the Free State, awarded between 2020 and 2024, and that were either recently finished, under construction, or terminated and re-awarded, but with a cost overrun of between 5% and 30%.
Document analysis, semi-structured interviews, and focus groups were used to gather data for this investigation. The sufficiency of interviews was assessed using the data saturation criteria (Fusch and Ness, 2015). After analysis, five examples were decided to be included in this study. Furthermore, records were reviewed in order to understand data that represented preliminary cost projections from the beginning to the conclusion. Project timelines were recorded by looking through the contract

documentation. Minutes from site meetings, contract paperwork, final financial statements, and instruction booklets were also examined. The primary cost management performance issues were identified by an analysis of the data gathered from the cases.

It is important to note that contractors can only submit a bid for a project after registering on the Construction Industry Development Board (CIDB) grading system in order to comprehend the South African system. In order to advance contractors to a new grade, the grading system is used to assess them based on the successful completion of projects and the best turnover achieved. The CIDB grading system, system 1, provides the standards for assigning contractors a grade based on the value of the work they can complete.

To understand the South African system, it is pertinent to mention that contractors only qualify to tender for contracts after registering on the Construction Industry Development Board (CIDB) grading system. The grading system is used to evaluate contractors based on the successful completion of projects and the best turnover achieved to promote them to a new grade. Table 1 shows the CIDB grading table with the guidelines for grading contractors according to the value of work they can execute.

Table 1 Rating values for CIDB grading

Designation	Contract value limit	Best Annual Turnover (R) (2 year) % of Tender value	Largest contract(R) (5 year) % of Tender value
Grade 1	R500 000	0	0
Grade 2	R1 million	0	20%
Grade 3	R3 million	50%	22,5%
Grade 4	R6 million	50%	22,5%
Grade 5	R10 million	50%	22,5%
Grade 6	R20 million	50%	22,5%
Grade 7	R60 million	50%	22,5%
Grade 8	R200 million	50%	22,5%
Grade 9	N/A	50%	22,5%

Table 2 shows a profile of all the selected case studies obtained from the public sector project management system. It provides a brief overview of the selected cases, referred to as ‘Case 1’, ‘Case 2’, ‘Case 3’, ‘Case 4’, and ‘Case 5’.

Table 2. Level of CIDB grading for selected cases

Case		Contract value	CIDB grading	Status of the project	Project type	Procurement method
Case 1 (C1)		R74 811 000	8GB	Completed	New school	Develop and construct
Case 2 (C2)		R74 322 000	8GB	Under construction	New School	Develop and construct
Case 3 (C3)		R81 545 000	8GB	Under construction	New school	Develop and construct
Case 4 (C4)		R44 876 000	7GB	Under construction	New school hostel	Develop and construct
Case 5 (C5)		R77 745 000	7GB	Terminated and re-appointment	New school	Develop and construct

Twenty semi-structured interviews were conducted with participants from the selected cases. Participants included one construction project manager, quantity surveyor, architect and engineer from each case-study project. The semi-structured interviews were conducted at different intervals between March and September 2023 at the offices of the various organisations. Respective gatekeeper

permissions were obtained from each participating firm prior to the commencement of data collection. In addition, voluntary participation consent was obtained from interviewees prior to the start of each session. The interviewees were provided with a form, with the University letterhead, to complete before taking part in the study. The contents of the form were explained to all interviewees. Informed consent and confidentiality were upheld during the study. The first author acted as an interviewer for the reported cases whereas all authors reviewed the interpretation of the data, independently in a manner depictive of multi-investigator triangulation.

The interview sessions lasted between forty-five minutes to one hour. The interview sessions were recorded and transcribed verbatim with the consent of the interviewees. Thematic analysis was applied to make sense of the data (Kulatunga et al., 2007). The researchers made considerable efforts to ensure reliability and validity of the data collected by using different types of informants on various sites as well as by providing background data to establish the context of the study and details of the phenomenon in question to make it possible for comparisons to be made (Shenton, 2004). The limitations of this research include the fact that it was limited to South African public sector projects. Thus, the results might not be statistically generalizable, but they are analytically generalizable. Moreover, different procurement methods, other than those applicable to this study might provide different results.

4. RESULTS AND FINDINGS

Empirical results about project cost performance and its underlying causes are provided in this area. An assessment of the perception of collaborative costing within the South African construction industry is presented. The concept was examined in greater depth by means of multiple scenarios for evaluating its real-world application. Data for projects C1 through C5 are presented in Table 3.

The South African Construction Industry Development Board (CIDB) categorizes project types into four classifications: General Building (GB), Civil Engineering (CE), Electrical Engineering (EE), and Mechanical Engineering (ME). This study encompasses general building projects from the FSDPW, including structures such as school hostels and new educational facilities. The original tender amounts varied from R33,000.00 to R77,000,000.00, with all durations set at 18 months, not accounting for any extensions of time. Tables 3 and 4 present the results related to the cost performance of public projects. The project data from the cases indicate that the time performance was also unsatisfactory. The data indicate that cost overruns varied between 5% and 133% of the initial contract value. The factors identified in the projects included: client-requested additional work, time extensions, re-measurements, and variations that required collaborative cost management. Furthermore, no remedial measures were implemented in the projects. The develop and construct system, a collaborative procurement method, was employed in the selected cases. The projects did not meet the expected outcomes set by the clients regarding cost and time. The examination of the documents revealed that inefficient interaction, ongoing variation orders, insufficient planning, and subpar project management were significant factors in the failure of these projects. Upon detailed examination of the procurement methods employed, a discernible gap between the planning and construction phases of the projects was evident. Furthermore, the contractor was not involved at an early stage.

Table 3. Cost performance of C1, C2, C3, C4 and C5

PROJECT DATA	C1	C2	C3	C4	C5
Date contractor appointed	24 Feb 2020	17 April 2020	08 Jan 2020	27 Aug 2020	08 November 2020
Site hand-over date	23 March 2020	9 May 2020	17 Jan 2020	22 October 2020	25 November 2020
Practical completion date	23 September 2021	9 November 2021	17 July 2021	22 April 2022	25 May 2022

Actual completion date	3 March 2023	Under Construction	Under Construction	Under Construction	Under construction
Contract amount	R74 000 000	R75 300 000	R74 264 000	R44 300 000	R33 300 000
Estimated Final amount	R81 000 000	R79 200 000	R78 400 000	R81 600 000	R77 700 000
Overrun amount Procurement method	R7 000 000 Develop and construct	R4 400 000 Develop and construct	R4 000 000 Develop and construct	R42 400 000 Develop and construct	R6 000 000 at the time of termination of contract Develop and construct

A quantity surveyor was appointed to manage the cost of the projects independently, while the design team of architects and engineers developed the initial and detailed designs separately prior to the introduction of a contractor in the planning stages. The design team conducted the costing and design of the project independently, without the presence of any constructors. At this stage, a report on each design update was submitted to the quantity surveyor to revise the cost of the detailed design and offer financial guidance to the design team. This information was essential for determining whether to proceed with or modify the design based on budget constraints before proceeding to tender. Cost reports reflecting variation orders were utilized in post-contract cost management to inform the client of progress.

Interviewees were posed questions to explore their views on the effectiveness of collaborative cost management practices in addressing the challenges faced. The quantity surveyors and project managers observed that designers frequently did not communicate essential information to other consultants, providing such information to the cost managers only after the designs had been finalized with the clients. The focus was primarily on client approval rather than on the collaborative decisions of the team.

Collaboration management practices were founded on lean tools, including Target Value Design (TVD) and Integrated Project Delivery (IPD). Participants engaged in discussions regarding lean tools to assess their comprehension of the concept and to clarify the application of lean construction. The tools included set-based design, team formation, a risk and reward system, target cost setting based on design and value with a cross-functional team, the use of an integrated form of agreement, the application of BIM, and the implementation of choosing by advantage (CBA) methods for decision-making. Nonetheless, among the tools listed, BIM was utilized to a limited extent, and the big room facility was employed solely for site meetings, failing to serve as an effective collaborative platform for all team members. Participation of other stakeholders in the site meetings was not consistently ensured. Additionally, interviewees employed the term 'collaboration' synonymously with 'partnering.' All interviewees concurred that collaboration denotes a transaction between organizations aimed at utilizing resources for a shared objective. Architect 1 equated a joint venture with collaboration, whereas Project Manager 2 contended that cooperation is synonymous with collaboration.

5. Discussion

Collaborative cost management within the construction industry has garnered significant attention in recent years as organizations seek to optimize costs and improve project outcomes. Collaborative cost

management within the construction industry remains a multifaceted process that requires effective stakeholder collaboration, leveraging of technology, proactive risk management, and thoughtful design of contractual arrangements. By integrating these key findings into their cost management practices, construction organizations can enhance project outcomes, achieve cost savings, and improve overall project performance.

Cost management in traditional projects tends to use historical data, which might possess waste (non-value-adding) activities from previous projects. Again, estimating for projects is done in isolation without including suppliers as part of the team (Ahmed et al., 2019). Instead, suppliers are given carte blanche to quote and choose the profit margins they prefer. The data from interviewees showed that participants did not employ any collaborative principles derived from lean management practices. It was evident that collaboration was still a long way from being understood by those involved in project delivery in South African construction. Team selection is a key factor in the success of a high performing project team. Moreover, big room meetings would encourage all stakeholders to work together and collaborate during the design phase, where designers, contractors, subcontractors and owners meet to discuss design details without having to resort to tedious requests for information (RFIs) (Ballard, 2009). To limit variations in the case-study projects, set-based design and TVD would have improved the commitment to the design to avoid changes during construction. The cost over-runs experienced by all the projects could have been prevented by using target costing 6.

According to Hamzeh et al. (2016), implementing the last planner system (LPS) could have helped to reduce the construction and design delays, to predict upcoming challenges and to eliminate wastes. Moreover, consulting all stakeholders early and involving them in the design phase would have produced innovative ideas. The involvement of different stakeholders in the design phase not only guarantees enhanced communication and better understanding, but also ensures quality, cost and time efficiencies. The collaboration of various parties and the alignment of shareholders' interests is the basis of lean construction. However, collaborative behavioural changes are required in addition to contract changes to effect such a system in construction.

Figure 1 illustrates the collaborative cost management framework for the South African public sector projects. The framework depicts the processes for all stakeholders to follow in order to manage costs in a collaborative manner rather than in the current fragmented fashion. The contribution of the collaborative cost management framework will be realised when combined with the procurement system that enables collaboration, as required by the Public Finance Management Amendment Act for public sector projects in South Africa. The development of this framework combines the steps of Ballard (2009) and those of Seed (2015). Ballard and Seed's contributions, particularly through the Last Planner System (LPS) and lean construction principles, emphasize collaboration, iterative improvement, and the reduction of waste in project management. Their approaches focus on improving project efficiency and achieving reliable workflow by integrating planning and performance measurement into project execution. In the context of a collaborative cost management framework, Ballard and Seed’s principles can be integrated to enhance the feedback loop system by introducing structured, iterative steps that improve cost control and project outcomes.

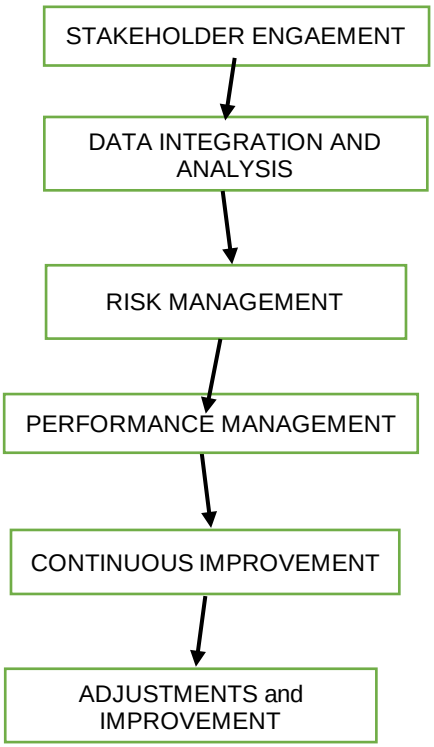

Figure 1 Proposed collaborative cost management model

The following discussion addresses the most prominent insights and trends identified from an analysis of these findings.

- The Significance of Stakeholder Collaboration: Collaborative cost management in construction underscores the significance of stakeholder collaboration. Research regularly demonstrates that engaging key stakeholders, such as contractors, subcontractors, suppliers, and clients, in cost management processes results in improved project outcomes and cost efficiencies (Garcia et al., 2022).
- Significance of Technology and Data Integration: Technology is essential for improving collaborative cost management strategies in construction. The application of Building Information Modeling (BIM), project management software, and data analytics tools enhances data integration, real-time monitoring, and informed decision-making, thereby optimizing cost control and project efficiency (Jones & Smith, 2020).

- Effective risk management and contingency planning are vital elements of collaborative cost management in construction. Research underscores the necessity of early identification and mitigation of potential risks in the project lifecycle, with the formulation of contingency plans to manage unforeseen events and reduce cost overruns (Brown & Martinez, 2023).

5. CONCLUSIONS

This study examined the effectiveness of the collaborative cost management framework as a solution to the problems obstructing the successful implementation of standard cost management frameworks in public building projects. A collaborative cost management framework was proposed based on an analysis of the deficiencies in traditional cost management frameworks regarding optimal performance in selected public sector projects, as well as the viewpoints of project participants on the potential of

collaborative frameworks to address these challenges. The proposed paradigm may aid practitioners in optimizing the collaborative cost management process of projects to get their desired outcomes. The work elucidates previously unexamined aspects of collaborative cost management. The study's findings highlight the necessity for genuine collaboration among project participants, which should be promoted by cost managers through the use of principles like target costing and the distribution of risks and benefits via multi-party agreements. It also underscores the importance of prioritizing team formation via boot camps to cultivate team dynamics. The study's findings underscore the importance of technological innovation, stakeholder engagement, and agile approaches in facilitating collaborative cost management, hence improving cost efficiency, transparency, and accountability in project delivery. Addressing the difficulties of data interoperability, cultural resistance, and institutional impediments necessitates a collaborative effort by policymakers, practitioners, and researchers. By fostering ongoing collaboration and knowledge exchange, a robust and economical infrastructure that satisfies the requirements of current and future generations can be achieved.

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