Civil and Sustainable Urban Engineering

Research Article
Volume 6(2), 2026, 510−529
https://doi.org/10.53623/csue.v6i2.1485

Institutionalizing Project Controls in Construction Organizations: Evidence from Australian Professionals

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SUBMITTED: 23 October 2026; REVISED: 11 November 2026; ACCEPTED: 15 November 2026

ABSTRACT: Project Controls is well established within construction project delivery, but limited attention had been given to how this capability was positioned and sustained within permanent organizational structures. This study examined how Project Controls was institutionalized within construction organizations and identified the organizational conditions influencing the structural arrangements used to maintain this capability. The research employed semi-structured interviews with 34 experienced professionals representing five professional perspectives within the Australian construction industry. The interview data were analyzed thematically. The findings revealed considerable variation in the organizational positioning of Project Controls, including project-embedded, centralized, commercial-integrated, Project Management Office (PMO)-related, matrix, and hybrid arrangements. Participants associated stronger institutionalization with continuity across projects, consistent practices, effective governance, professional capability, and clearly defined organizational responsibilities. A dedicated Project Controls department was identified as one approach to supporting these conditions but was not considered essential for institutionalization. Organizational scale, project portfolios, resource availability, leadership, role clarity, functional relationships, organizational support, and proximity to project delivery influenced the feasibility and effectiveness of different structural arrangements. The study distinguished institutionalization from departmentalization and demonstrated that Project Controls could be sustained as a continuing organizational capability through various structural arrangements. The findings provided practical insights for construction organizations seeking to establish Project Controls structures suited to their specific organizational circumstances rather than adopting a standardized organizational model.

KEYWORDS: Project controls; institutionalization; construction organizations; organizational capability; governance

1. Introduction

Project Controls is an established component of construction project delivery. Its primary functions include planning and scheduling, cost management, forecasting, risk management, progress measurement, performance reporting, and related control activities. These functions

provide project teams and management with essential information to evaluate performance, anticipate potential outcomes, and implement corrective actions. Recent research has also examined Project Controls from a broader systems perspective, recognizing the organizational, human, technological, and operational factors influencing the effectiveness of Project Control Systems in construction project delivery [1].

Previous research has focused more extensively on Project Controls at the project level than on its positioning within permanent organizational structures. Construction organizations typically execute activities through temporary project structures, while the parent organization continues operating across successive projects. Consequently, Project Controls personnel, processes, systems, and expertise may be developed within individual projects without necessarily being retained as continuing organizational capabilities. For organizations managing multiple projects, this raises important questions regarding how Project Controls capabilities are governed, developed, retained, and shared across projects and the wider organization. These issues extend beyond the effectiveness of Project Controls within individual projects and concern how these capabilities are positioned and sustained at the organizational level.

Recent studies on Project Controls provide a foundation for examining this organizational context. Alotaibi et al. [1] identified organizational factors alongside human, technological, and operational factors influencing the effectiveness of Project Control Systems in construction project delivery. Their findings indicated that Project Controls did not operate independently of its organizational environment. However, existing research on the organizational determinants of control effectiveness has not adequately explained how Project Controls is structurally positioned, how its capabilities are retained between projects, or how responsibility for maintaining these capabilities is established within permanent organizational structures.

Research on project-based organizations provides additional insights into the relationship between temporary projects and permanent organizational structures. Mahura and Birollo [2] examined knowledge transfer within a project-based organization and found that organizational practices could facilitate or constrain knowledge transfer across temporary projects. Although their study did not specifically address Project Controls or the construction sector, the relationship between temporary and permanent organizational structures remains relevant. Project Controls capabilities developed within individual projects may require organizational arrangements that enable professional expertise, established practices, and functional responsibilities to continue beyond the completion of individual projects.

Research on Project Management Offices (PMOs) offers another perspective on organizational arrangements. Previous studies of PMOs in construction have examined organizational support, structural configurations, and the establishment and promotion of project management practices [3]. This literature demonstrates how project-related functions can be incorporated into permanent organizational structures. However, PMOs should not be considered equivalent to Project Controls because their functional scope, professional composition, technical responsibilities, and organizational authority may differ. Although PMO research provides useful insights into organizational structures, it does not fully explain how Project Controls capabilities are positioned and sustained within construction organizations.

Institutionalization must also be distinguished from the establishment of a dedicated Project Controls department. Although a formal department represents one possible organizational arrangement, its existence does not necessarily indicate that Project Controls capabilities are effectively embedded and sustained. Institutionalization refers to the continued integration of Project Controls practices, professional expertise, functional responsibilities, governance arrangements, organizational knowledge, and operational routines within an organization. These elements may be maintained through various structural arrangements, including project management structures, commercial functions, centralized corporate functions, PMO-related arrangements, and matrix or hybrid structures. Nevertheless, empirical evidence remains limited regarding how these arrangements influence the institutionalization of Project Controls within construction organizations.

This study employed a qualitative research approach involving 34 experienced professionals representing five professional perspectives within the Australian construction industry. It examined how Project Controls was positioned and institutionalized within construction organizations and identified the organizational conditions influencing the structural arrangements used to sustain this capability. Accordingly, the study addressed the following research question: How is Project Controls institutionalized within construction organizations, and what organizational conditions influence the structural arrangements through which this capability is sustained?

This study contributed to the existing literature by examining the institutionalization of Project Controls as a continuing organizational capability rather than focusing exclusively on its effectiveness within individual projects. Drawing on insights from five professional groups, the research investigated how different organizational arrangements supported or constrained the continuity of Project Controls capabilities and identified the conditions influencing their suitability. A key contribution was the distinction between institutionalization and departmentalization. The findings demonstrated that establishing a dedicated Project Controls department represented one possible organizational approach but was not essential for sustaining this capability. This distinction extended the existing discussion beyond formal organizational structures by emphasizing the importance of governance, functional relationships, professional continuity, and organizational responsibilities in maintaining Project Controls capabilities across successive projects.

2. Literature Review

The literature on Project Controls provides substantial knowledge of the functions, processes, systems, and practices supporting project delivery. Previous research has examined planning and scheduling, cost management, forecasting, risk management, performance measurement, reporting, and the integration of these activities within Project Control Systems. More recent studies have expanded this focus by examining the organizational and human factors influencing the effectiveness of these systems. Although the literature is well established at the project level, the organizational positioning and continuity of Project Controls beyond individual projects remain relatively underexplored. Accordingly, this study focused on the organizational dimensions of Project Controls. This review first examines Project Controls within the context of project delivery, followed by the relationship between temporary projects and permanent organizational structures. Literature on project-based organizations and Project Management Offices (PMOs) is incorporated to provide insights into permanent organizational

arrangements. However, these research areas are not considered substitutes for direct empirical evidence concerning Project Controls. The review subsequently examines institutionalization and alternative organizational arrangements before identifying the specific research gap addressed in this study.

2.1. Project Controls and the Organizational Context.

Project Controls encompasses planning, scheduling, cost management, forecasting, risk management, progress measurement, performance reporting, and other activities supporting project delivery. Previous research has examined these activities as interconnected components of Project Control Systems rather than isolated control practices. Jawad and Ledwith [4], for example, developed a maturity-based approach to assessing Project Control Systems, while Jawad et al. [5] investigated Project Control System components and implementation factors in relation to project scope, schedule, and cost performance. These studies contributed to understanding how Project Controls operates and how its effectiveness can be evaluated within project delivery. The importance of the organizational environment has also been recognized in recent Project Controls research. Alotaibi et al. [1] investigated the determinants of Project Control System effectiveness in construction, considering organizational, human, technological, and operational factors. Their findings indicated that the effectiveness of Project Controls depended not only on technical processes but also on the organizational environment in which these processes were implemented.

Further empirical research by Alotaibi et al. [6] examined the effectiveness of Project Control Systems in Saudi Arabian construction projects. Their study highlighted the importance of organizational factors, including leadership, team capability, stakeholder integration, and knowledge management, in influencing project control processes and outcomes. These findings reinforced the significance of organizational conditions in determining Project Controls effectiveness. However, the study primarily addressed the relationships between control system determinants and project performance rather than the organizational positioning and continuity of Project Controls as a permanent capability. Although organizational factors have received increasing attention, their consideration does not fully explain how Project Controls is positioned within permanent organizational structures. Management support, governance, team capability, and coordination may influence Project Control System effectiveness without clarifying where the function is located, how organizational responsibility is maintained, or how its capabilities are sustained across successive projects. These issues concern Project Controls as a continuing organizational function rather than solely its effectiveness within individual projects.

Earlier research established connections between project management and broader organizational contexts. Milosevic and Srivannaboon [7], for example, examined the relationship between business strategy and project management. Although their findings provided insights into the organizational context of project management, the study did not directly investigate the institutionalization of Project Controls as a continuing organizational function. Overall, existing research provides substantial knowledge of Project Controls functions, systems, implementation, and effectiveness at the project level. Although organizational factors are increasingly recognized, direct empirical evidence regarding the organizational positioning and continuity of Project Controls remains limited. In particular,

insufficient attention has been given to how Project Controls capabilities are maintained between temporary projects and integrated into permanent organizational structures.

2.2. Project-Based Organizations and the Permanent Organization.

Construction organizations commonly execute their activities through temporary projects while maintaining permanent organizational structures across successive projects. Consequently, temporary project teams operate alongside continuing corporate and functional structures. Hobday [8] examined project-based organizations in comparison with traditional functional and matrix structures and demonstrated how project-based arrangements could be organized around the requirements of individual projects and clients. Although these arrangements provided flexibility for complex project delivery, they also presented challenges in maintaining organizational capabilities across project boundaries. The relationship between temporary projects and permanent organizational structures also influences the continuity of knowledge, professional expertise, and organizational practices. Mahura and Birollo [2] investigated knowledge transfer within a public-sector project-based organization and found that practices within the permanent organization could facilitate or constrain formal and informal knowledge transfer across temporary projects. Although their research did not specifically address Project Controls or the construction industry, it provided relevant evidence regarding how permanent organizational structures could influence the continuity of practices developed and implemented within temporary projects.

Project Controls faces comparable challenges in maintaining organizational continuity. Capabilities related to planning, scheduling, cost management, risk management, forecasting, and reporting are frequently developed and applied within individual projects, while the organizations responsible for delivering these projects continue operating after their completion. Sustaining these capabilities across successive projects requires the retention of professional expertise, clearly defined responsibilities, established systems, and consistent organizational practices. Research on project-based organizations provides valuable insights into the relationship between temporary project delivery and permanent organizational structures. However, direct empirical evidence concerning the organizational positioning of Project Controls remains limited. Existing studies have not adequately explained where continuing responsibility for Project Controls capabilities is located or how these capabilities are coordinated across project-level and organizational structures.

2.3. Organizational Positioning and Related PMO Evidence.

Research on PMOs has examined how project-related functions are structured and maintained within permanent organizations. PMOs are commonly associated with project management practices, governance, coordination, and oversight across multiple projects, although their responsibilities and organizational configurations vary. Aubry et al. [9] examined PMOs within the broader relationships among organizational strategy, projects, and structures, while Hobbs et al. [10] investigated their establishment and reconfiguration as part of organizational change. Research within the construction industry has provided further evidence regarding PMO structures and functions. Ershadi et al. [3] reviewed PMO research from a construction perspective and identified organizational support and PMO structuring as important factors associated with successful implementation. In a separate study involving the Australian construction industry, Ershadi et al. [11] compared PMO functions in high-performing public

and private construction organizations. Their findings revealed differences in the relative emphasis placed on PMO functions between the two sectors.

Tshuma et al. [12] investigated the role of PMOs in facilitating knowledge transfer between projects. Their study identified organizational awareness, trust among project personnel, and a knowledge-sharing culture as important conditions supporting knowledge transfer. These findings demonstrated how permanent organizational arrangements could facilitate the retention and exchange of knowledge developed within temporary projects. Although the research focused on PMOs rather than Project Controls, it provided relevant insights into the organizational mechanisms through which project-related knowledge and practices could be sustained. Nevertheless, PMOs and Project Controls should not be considered equivalent organizational functions. PMOs may encompass governance, methodologies, portfolio coordination, project management practices, and organizational oversight, whereas Project Controls has a more specialized professional and technical focus on planning, scheduling, cost management, risk management, forecasting, performance measurement, and reporting. Therefore, although PMO research contributes to understanding permanent organizational arrangements supporting project delivery, it does not fully explain how Project Controls is positioned or institutionalized within construction organizations.

2.4. Institutionalizing Project Controls: The Research Gap.

Institutionalization extends beyond the formal establishment of an organizational structure, process, or function. Institutional theory explains how organizational practices become established, accepted, reproduced, and sustained over time. Meyer and Rowan [13] demonstrated how formal organizational structures could acquire legitimacy while becoming partially disconnected from ongoing organizational activities. Subsequent institutional research has further examined the processes through which organizational practices develop persistence and legitimacy. Project management research provides examples of these institutionalization processes. Mignerat and Rivard [14] examined the institutionalization of project management practices over an extended period and identified planning and control among the practices that acquired institutional status. Although their research focused on information systems project management rather than construction and did not examine Project Controls as a distinct organizational function, it demonstrated how control-related practices could extend beyond individual project activities and become established within broader professional and organizational practices.

Institutionalization has also been investigated in construction and infrastructure contexts. Bygballe and Swärd [15] found that organizational routines contributed to the institutionalization of partnering practices, while Aaltonen and Turkulainen [16] examined how a collaborative governance model developed beyond individual infrastructure projects. Hall and Scott [17] investigated the early institutionalization of Integrated Project Delivery and the processes through which this model gained legitimacy within the construction industry. Although these studies addressed different organizational practices and arrangements, they collectively demonstrated that formal adoption alone was insufficient to explain how practices became established and sustained. Existing Project Controls research has generated substantial knowledge regarding control functions, Project Control Systems, implementation, and project-level effectiveness. Research on project-based organizations has examined the relationships between temporary projects and permanent organizational structures, while PMO studies have

investigated organizational arrangements supporting project management. Institutional research has provided theoretical explanations of how organizational practices become established and sustained. However, empirical understanding of Project Controls as a continuing organizational function remains limited, particularly regarding its positioning within permanent organizational structures and the arrangements through which its capabilities are maintained across successive projects.

Within the Australian construction industry, Project Controls is an established professional practice. Nevertheless, limited empirical attention has been given to how experienced professionals perceive its organizational positioning and institutionalization. Accordingly, this study examined these issues through the experiences and perspectives of professionals familiar with Project Controls and organizational practices within Australian construction organizations.

3. Materials and Methods

This study employed a qualitative research design to investigate the organizational positioning and institutionalization of Project Controls within construction organizations. Semi-structured interviews were conducted with experienced professionals familiar with Project Controls and its organizational interfaces. Participants were recruited through purposive sampling to capture perspectives from different professional backgrounds within the Australian construction industry. The interview data were analyzed thematically, with NVivo software used to facilitate data organization, coding, retrieval, and comparison. The study was not designed to determine the prevalence of specific organizational structures across the Australian construction industry.

3.1. Research Design.

The study adopted an interpretivist philosophical perspective and an abductive qualitative research approach. Interpretivism was considered appropriate because the research aimed to understand how professionals from different organizational functions experienced and interpreted the positioning and institutionalization of Project Controls within construction organizations. Rather than assuming that organizational arrangements operated uniformly, the study explored how their functions and significance were understood across different professional and organizational contexts.

An abductive approach was employed to establish an iterative relationship between existing theoretical understanding and empirical evidence [18]. The literature review, initial conceptual framework, and research propositions informed the topics explored during the interviews and provided preliminary concepts for analysis. However, these concepts were not treated as predetermined explanations requiring confirmation. During thematic analysis, interview evidence was examined to identify patterns that supported, qualified, challenged, or extended the initial conceptual understanding. This approach enabled the emerging interpretations to remain informed by existing literature while being grounded in participants' professional experiences. Consequently, the research propositions guided the investigation rather than serving as hypotheses for statistical testing.

Semi-structured interviews were employed as the primary method of empirical data collection. Participants described their experiences with Project Controls, its organizational positioning, and the structural arrangements through which it operated within their organizations. The flexible interview format enabled the researchers to capture different

organizational arrangements and professional perspectives without requiring participants to conform to a predetermined organizational model.

3.2. Participants and Data Collection.

Purposive sampling was employed to recruit professionals with direct experience in Project Controls or its organizational interfaces within the Australian construction industry. Participants were selected based on their professional responsibilities, relevant industry experience, and familiarity with the organizational positioning and operation of Project Controls. The inclusion of participants from five professional groups enabled the study to capture perspectives from professionals directly involved in Project Controls and those responsible for managing, overseeing, or utilizing its outputs. The study involved 34 participants representing five professional groups. Table 1 summarizes their professional backgrounds, roles, and distribution. Participants were recruited from contractor, consultant, and project sponsor organizations operating within the Australian construction industry.

Table 1. Professional Characteristics of Interview Participants.

Professional group	Professional roles represented	Participants (nos.)
Project Controls	Project Controls Managers, Planning Managers and Leads, Risk Manager, Document Controls Manager, Project Controls Specialist, Forensic Expert	13
Commercial and Contracts	Contracts Manager, Contracts Administrator, Commercial Manager, Claims Specialist	4
Project and Operational Leadership	Project Directors, Deputy Project Director, Project Leader, Project Manager	5
Executive and Corporate Management	General Manager, Chief Executive Officer, Operations Manager, Finance Manager, Business Development Manager, IT Manager	6
Construction and Project Delivery	Construction Managers, Quality Controls Manager, Safety Manager, Testing and Commissioning Manager	6
Total		34

The final sample of 34 participants was considered appropriate for the study's qualitative objectives. The analysis identified recurring patterns while also capturing differences between professional groups and contrasting or minority perspectives. The relevance and diversity of participants' experience, together with the depth of the interview evidence, provided a basis for examining how Project Controls is positioned and sustained within construction organizations. The sample was intended to support an in-depth qualitative understanding rather than statistical representation of the Australian construction industry. Interviews were conducted face-to-face or online and generally lasted approximately two hours. A common semi-structured interview guide provided consistent coverage of the principal areas of inquiry. Participation was voluntary. Participants received information explaining the purpose and scope of the research, the nature of their involvement, and the intended use of the information collected. Formal informed consent was obtained before participation. Participant identities and organizational information were protected during analysis and reporting, with analytical identifiers used in place of personal names. Participants could withdraw from the study without affecting their relationship with the researcher or organizations involved.

3.3. Data Analysis.

The interview data were examined using thematic analysis informed by Braun and Clarke [19]. Analysis began with familiarization with the interview records, followed by first-cycle coding of meaningful segments of participants' accounts. Codes were developed from the issues raised

by participants rather than from the sequence of interview questions. Existing codes were applied where similar meanings appeared in subsequent interviews, while new codes were introduced when the evidence raised distinct issues. Coding was undertaken iteratively, with reviews of the developing codebook at selected stages. After all 34 interviews had been coded, a coding audit examined overlapping concepts, code definitions, and the consistency of coding decisions. This process resulted in 85 finalized first-cycle codes. Related codes were then examined together to identify broader analytical categories and develop candidate themes. These themes were reviewed and refined against the interview evidence, with attention to their conceptual boundaries and the relationships between them.

NVivo 15 was used to organize the interview records, manage coding and participant classifications, retrieve coded passages, and support comparisons across the five professional groups. The software also helped maintain records of coding decisions, codebook revisions, and analytical memos. NVivo supported the management and examination of the evidence, while coding judgments, theme development, and interpretation remained the responsibility of the researcher. The analysis considered recurring patterns alongside contrasting and minority perspectives. Comparisons across professional groups helped identify differences in how Project Controls practitioners, commercial professionals, project leaders, executives, and construction delivery professionals understood the organizational positioning of Project Controls. The broader analysis produced nine themes, with the present article focusing on the findings relevant to organizational positioning and institutionalization.

3.4. Thematic Adequacy and Research Trustworthiness.

The adequacy of the interview evidence was considered in relation to information power and thematic coverage rather than a fixed numerical threshold for saturation [20]. The 34 participants provided perspectives from five professional groups, allowing the analysis to examine organizational positioning and institutionalization from different functional viewpoints. The interviews generated detailed accounts of organizational practices, while the iterative analysis identified recurring patterns, differences between professional groups, and contrasting perspectives. Together, these characteristics provided sufficient analytical depth to address the focus of this article. The study does not claim that all possible perspectives were exhausted or that the findings are statistically representative of Australian construction organizations.

Research trustworthiness was supported through several procedures. Cleaned interview records were returned to participants for verification before analysis, allowing them to check the accuracy of their recorded responses. This verification concerned the interview records rather than the researcher's subsequent interpretations. The coding process included codebook reviews and an analytical audit, while NVivo was used to maintain coded references, analytical memos, and links between the interview evidence and developing themes. These procedures are consistent with established approaches to strengthening trustworthiness in thematic analysis [21]. Contradictory and minority perspectives were retained during interpretation rather than excluded in favor of dominant patterns.

The study also recognized the researcher's professional experience in Project Controls as a potential influence on interpretation. Existing knowledge informed the inquiry, but participants were able to challenge initial assumptions and propose alternative organizational arrangements. The documented analytical process, together with the description of the research

context and participant characteristics, provides a basis for assessing the credibility, dependability, confirmability, and potential transferability of the findings.

4. Results

Table 2 summarizes the main thematic findings relevant to the institutionalization of Project Controls, together with their associated subthemes and representative interview quotations. The findings are organized around four areas: organizational positioning, institutionalization beyond formal structure, conditions influencing institutionalization, and alternative organizational arrangements. These areas are examined in the following subsections.

Table 2. Major Themes, Subthemes, and Representative Interview Evidence.

Major theme	Subtheme	Representative interview quotation
Organizational positioning of Project Controls	Project-level positioning	PC09: "Project Controls reports to the Project Director. I have not seen a Project Controls department at headquarters; normally it sits within the project."
	Limited corporate representation	LD03: "Project Controls sits within project delivery units and not at the corporate leadership table"
	Executive-level positioning	EM02: "I believe it should be closer to executive management."
Institutionalization beyond formal structure	Standardization of systems and methodologies	LD02: "As a formal department, Project Controls would bring consistency in systems and methodologies."
Conditions influencing institutionalization	Resource and budget constraints	CC03: "not always feasible due to budget constraints."
	Leadership and functional integration	CC02: "The only risk I see is fragmentation, when departments work in silos. But that's a leadership issue, not a structural flaw."
	Duplication of responsibilities	CC01: "Duplication of effort is a real concern."
	Bureaucracy and operational proximity	CM03: "But don't bury it in bureaucracy."
	Connection with project delivery	CM03: "stay close to the ground and understand the site."
Dedicated department and alternative organizational arrangements	Preference for Commercial integration	CC03: "I don't really think they need to be a completely separate function, at least from a commercial standpoint."
	Integrated Commercial and Project Controls leadership	CC02: "I believe Commercial and Project Controls should absolutely work as one, but under the leadership of Project Controls."

4.1. Organizational Positioning of Project Controls.

Participants described considerable variation in the organizational positioning of Project Controls. Project-level arrangements were common, with Project Controls personnel typically located within project delivery structures and reporting through project management. This arrangement was evident across all five professional perspectives. The interviews did not point to a single organizational arrangement. Project Controls was described within project management structures, corporate or centralized functions, Commercial, PMO-related structures, and matrix or hybrid arrangements. Commercial and Contracts participants provided some of the clearest support for integrated arrangements, reflecting the close relationship between Project Controls and commercial activities. Project and Operational Leadership participants identified the limitations of keeping Project Controls within project delivery structures, while Executive and Corporate Management participants emphasized the importance of closer access to organizational leadership (Table 2). Participants therefore placed importance on more than the formal location of Project Controls. Their accounts addressed reporting relationships, functional ownership, corporate representation, continuity across projects, and connection with project delivery. Different organizational arrangements were

evident, but participants repeatedly identified the need to maintain Project Controls capability beyond the life of an individual project.

4.2. Institutionalization Beyond Formal Structure.

Participants associated stronger institutionalization of Project Controls with greater consistency in how controls practices were maintained across projects. Standardization was evident across all five professional perspectives, with participants linking a formalized Project Controls function with common systems, methodologies, templates, and working practices. Participants associated institutionalization with governance arrangements that extended beyond individual projects. These included clearer responsibility for Project Controls practices, consistent methodologies, and accountability for maintaining the function across organizational units. Governance was therefore important not only for overseeing project-level activities but also for establishing how Project Controls capability would be maintained within the wider organization. Participants also emphasized continuity of specialist expertise between projects, particularly where project-based teams were disbanded after completion. A continuing organizational function could provide a means of retaining this expertise, maintaining common practices, and making specialist resources available to subsequent projects.

The interviews did not equate institutionalization with establishing an independent Project Controls department. Participants described project-based, centralized, Commercial-integrated, PMO-related, and matrix or hybrid arrangements. Some Commercial and Contracts participants preferred Project Controls to remain within or closely connected with Commercial rather than operate as a separate department. Departmentalization and institutionalization therefore represented different aspects of the organizational arrangement. Departmentalization referred to the formal structural location of Project Controls. Institutionalization concerned whether its responsibilities, practices, governance, professional capability, and routines were established and sustained within the organization. A dedicated department could provide one means of achieving this, but the participant evidence did not establish an independent department as a necessary condition for institutionalization.

4.3. Conditions Influencing Institutionalization.

Participants did not consider the same Project Controls arrangement appropriate for every organization. Organizational size, project portfolio, workload, leadership, resources, existing functional arrangements, and proximity to project delivery influenced how Project Controls could be sustained within the organization. Organizational size, project complexity, and resource availability influenced the feasibility of different Project Controls arrangements. Larger organizations with continuing project portfolios may be better positioned to maintain a centralized function and deploy specialist personnel across projects. Smaller organizations, particularly those with intermittent workloads, may find a separate department difficult to sustain and instead retain Project Controls within project teams or existing functions. Project complexity also matters because projects involving multiple disciplines, contractual interfaces, and demanding reporting requirements may require greater coordination and specialist oversight. However, the need for these capabilities does not necessarily justify a separate department. Where financial or personnel resources are constrained, integrated or matrix

arrangements may offer a means of maintaining Project Controls capability without the overhead of a fully independent function.

The effectiveness of formal Project Controls arrangements depended partly on leadership. Participants emphasized capable leadership, communication, governance, and relationships with other organizational functions. CC02 identified functional fragmentation as a leadership concern rather than an unavoidable consequence of organizational structure (Table 2). Formal Project Controls arrangements also required support from within the organization. Formal recognition of the function did not by itself address organizational acceptance, resourcing, or integration with other functions. Institutionalization depended on the function being supported and used within the organization rather than existing only as a formal structural arrangement. Role clarity became important where Project Controls operated alongside Project Management, Commercial, or a PMO. Participants identified the possibility of duplicated responsibilities and unclear accountability where functional boundaries were not well defined. CC01 specifically raised the risk of duplicated effort (Table 2).

Participants also cautioned against arrangements that separated Project Controls too far from project delivery. CM03 emphasized the risks of excessive bureaucracy and the importance of maintaining a practical understanding of site conditions (Table 2). Maintaining operational proximity remained important even where Project Controls had a stronger corporate presence. PC09 described a matrix arrangement involving dual reporting to the Project Director and the corporate head of Project Controls. This combined project accountability with functional continuity without removing Project Controls from the delivery environment. No single structural arrangement addressed these conditions in every organizational setting. The feasibility of sustaining Project Controls depended on factors including scale, available resources, leadership, functional relationships, role clarity, organizational support, and continued involvement in project delivery.

4.4. Dedicated Department and Alternative Organizational Arrangements.

Participants from several professional perspectives supported a dedicated or centralized Project Controls function. They associated a permanent function with organizational continuity, common standards, professional leadership, capability development, and support across projects. Views on structural independence were not uniform. Some Commercial and Contracts participants preferred Project Controls to operate within or closely alongside Commercial because of the relationship between controls information and commercial activities. Other participants supported integrated arrangements or placed greater importance on the availability and effectiveness of Project Controls capability than on whether it operated as a separate department. The contrasting views of CC02 and CC03 illustrate these different preferences for organizational integration (Table 2).

Project Management and PMO structures provided further alternatives. Project-level positioning under Project Management was evident across all five professional perspectives, while participants also identified potential overlap between Project Controls and PMO responsibilities. Where existing functions already carried responsibilities for reporting, governance, standards, or portfolio oversight, the boundaries of a separate Project Controls function required clear definition. Matrix and hybrid arrangements provided another way of combining corporate continuity with project-level involvement. PC09 described dual reporting to the Project Director and the head of Project Controls. Such an arrangement allowed

functional leadership to remain at the organizational level while Project Controls personnel continued to work directly within project delivery. The choice was therefore not simply between an independent department and project-based Project Controls. The interviews identified centralized, project-embedded, Commercial-integrated, PMO-related, matrix, and hybrid arrangements. Each provided a different means of locating and maintaining Project Controls within the organization.

Across these arrangements, participants placed greater emphasis on continuity, clear responsibilities, governance, professional capability, organizational support, and connection with project delivery than on a particular organizational label. A dedicated department could provide these conditions, especially where the scale and project portfolio supported a permanent specialist function. Integrated and hybrid arrangements could also maintain Project Controls capability where responsibilities and interfaces were clearly established. The findings therefore support institutionalization without prescribing a single organizational structure. Different structural arrangements may sustain Project Controls as a continuing organizational capability where they support continuity and governance while retaining an effective connection with project delivery. Figure 1 illustrates five organizational arrangements identified in the study: project-embedded, centralized, Commercial-integrated, PMO-related, and matrix or hybrid structures. The arrangements differ in their reporting relationships, functional oversight, and connections with project delivery. They represent alternative configurations rather than successive stages of organizational development. Their suitability depends on the organizational context and the mechanisms established to sustain Project Controls capability across projects.

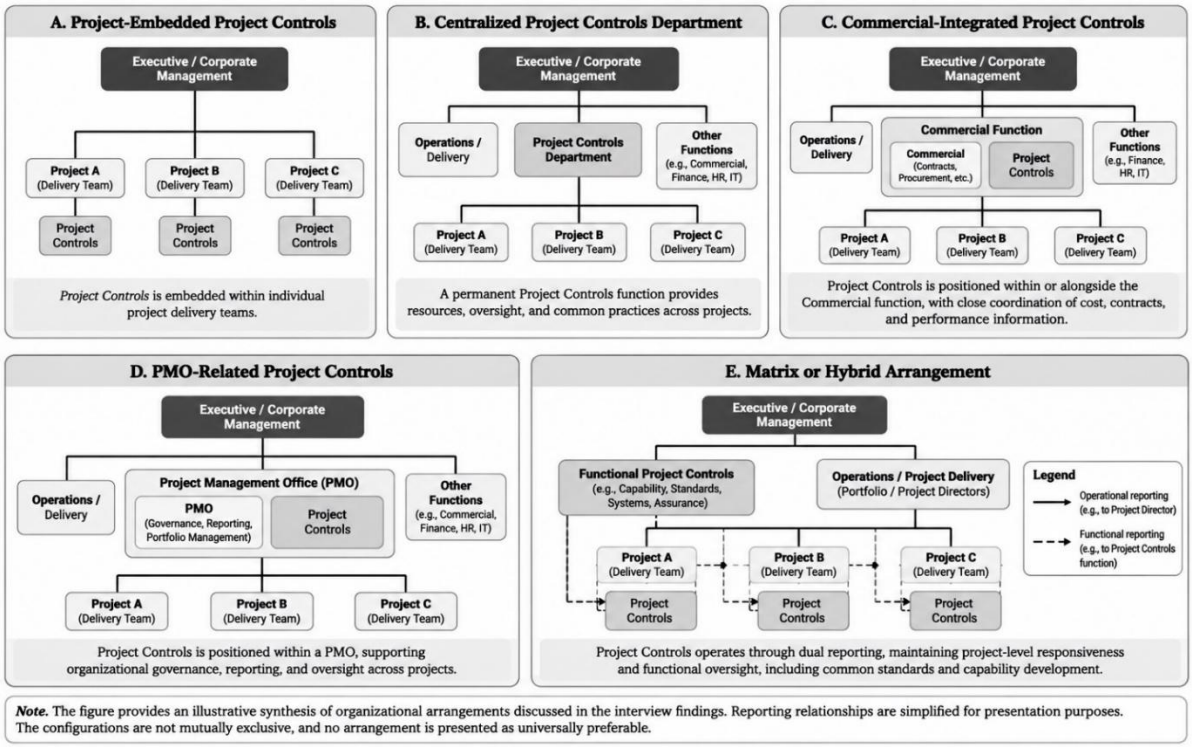


Figure 1. Alternative Organizational Arrangements for Sustaining Project Controls Capability.

Figure 1 illustrates the alternative organizational structures through which Project Controls may be positioned within construction organizations. These arrangements provide different reporting relationships and forms of functional oversight, but their ability to support

institutionalization depends on organizational conditions rather than structure alone. Organizational scale, project workload, available resources, leadership, governance, functional integration, and proximity to project delivery influence the suitability of each arrangement. Institutionalization is supported where the chosen structure enables continuity of Project Controls capability across projects, consistent practices, clear organizational responsibilities, and the retention of professional expertise. Table 3 compares the potential advantages and limitations of the five arrangements, illustrating why no single structure can be considered universally appropriate.

Table 3. Comparative Assessment of Project Controls Organizational Arrangements.

Organizational arrangement	Potential advantages	Potential limitations
Project-embedded Project Controls	Close integration with project delivery; responsiveness to project requirements; direct access to operational information	Limited organizational consistency; possible loss of capability between projects; weaker corporate-level visibility
Centralized Project Controls department	Consistent systems and methodologies; stronger functional leadership; improved capability retention and organizational oversight	Additional overhead; potential bureaucracy; risk of becoming disconnected from project delivery
Commercial-integrated Project Controls	Closer coordination between commercial and Project Controls functions; improved alignment of cost, contracts, and performance information	Potential overlap in responsibilities; risk of Project Controls becoming subordinate to commercial priorities
PMO-related Project Controls	Alignment with organizational reporting and governance; greater visibility across projects; opportunities for standardization	Possible duplication of responsibilities; unclear functional authority where PMO and Project Controls roles overlap
Matrix or hybrid arrangement	Combines project-level responsiveness with functional oversight; supports common standards while retaining operational proximity	Dual reporting relationships; potential conflicts in authority; greater coordination requirements

Taken together, Figure 1 and Table 3 indicate that institutionalization does not depend on a single organizational structure. The arrangements differ in their reporting relationships and potential advantages and limitations, while their effectiveness depends on clear responsibilities, consistent practices, functional coordination, and the continuity of Project Controls capability across projects.

4.5. Differences Across Professional Perspectives.

Although participants from all five professional groups recognized the importance of maintaining Project Controls capability beyond individual projects, their accounts reflected different organizational priorities. Project Controls professionals emphasized the limitations of arrangements in which the function remained primarily within individual project teams. Their accounts highlighted the importance of functional continuity, consistent practices, and connections between project-level personnel and corporate Project Controls leadership. PC09, for example, described both project-based reporting and a matrix arrangement involving project and corporate responsibilities. Commercial and Contracts participants placed particular emphasis on functional integration and the relationship between Project Controls and commercial activities. Their views on structural independence differed. CC03 questioned the need for a completely separate function, while CC02 supported closer integration between Commercial and Project Controls under Project Controls leadership. Other concerns within this group included duplication of responsibilities, functional fragmentation, and the financial implications of maintaining specialist resources.

Project and Operational Leadership participants emphasized the organizational positioning of Project Controls and its ability to support project delivery while maintaining consistency across projects. LD03 identified the limitations of keeping Project Controls within

delivery units without corporate-level representation, while LD02 associated a formal department with greater consistency in systems and methodologies. Executive and Corporate Management participants considered the organizational standing of Project Controls and its relationship with corporate decision-making. EM02, for example, expressed a preference for positioning the function closer to executive management. This perspective highlighted the importance of organizational recognition and access to leadership beyond individual project structures. Construction and Project Delivery participants emphasized the practical implications of organizational arrangements. Their accounts highlighted the importance of keeping Project Controls connected with site operations and avoiding excessive bureaucracy. CM03 cautioned against arrangements that could separate the function from the realities of project delivery. These differences did not amount to five competing organizational models. Rather, they reflected the responsibilities and concerns associated with each professional perspective. Across the groups, participants recognized the need for continuing Project Controls capability, while differing in their emphasis on corporate positioning, functional integration, organizational resources, and operational proximity.

5. Discussion

5.1. Institutionalization as an Organizational Capability Issue.

Existing Project Controls research has established the importance of organizational factors in the effectiveness of Project Control Systems [1, 4]. The present study extends this understanding by examining what happens to Project Controls capability beyond individual projects. Project-level arrangements can provide the capability required during delivery, while institutionalization concerns how responsibility for that capability continues within the permanent organization. This includes its governance, professional ownership, and established practices across successive projects. Project-based structures allow organizations to configure resources around individual projects, but capabilities developed within temporary arrangements can become fragmented when projects are completed and teams disperse [8]. Mahura and Birollo [2] similarly showed that the permanent organization can enable or constrain knowledge transfer across temporary projects. The results of the present study show a comparable issue for Project Controls. Participants associated stronger institutionalization with continuity across projects, common practices, governance, and the retention of specialist capability.

Departmentalization alone did not provide this continuity. Creating a formal Project Controls department establishes a structural location for the function, but leadership, organizational support, resources, functional interfaces, and connection with project delivery remain necessary. This finding is consistent with institutional research distinguishing formal organizational arrangements from practices that become established in organizational activity [13, 14]. Studies of partnering routines and collaborative governance in construction and infrastructure have similarly demonstrated that institutionalization involves the development and continuation of organizational practices beyond their initial adoption [15, 16]. The present study extends this discussion to Project Controls by showing that institutionalization may occur through different organizational structures, provided that the arrangements sustain professional capability, established practices, and organizational responsibility across projects. The contribution is therefore not the identification of a preferred organizational structure, but the

distinction between the formal location of Project Controls and the organizational conditions through which its capability is maintained. Project Controls can therefore be institutionalized through more than one organizational arrangement. A centralized department can provide formal ownership, standards, governance, and professional continuity. Matrix, hybrid, Commercial-integrated, PMO-related, and other arrangements can also provide continuity where responsibilities and interfaces are clearly established. What matters is whether the arrangement sustains Project Controls capability across projects while maintaining its connection with project delivery.

5.2. Alternative Organizational Structures.

The study identified project-embedded, centralized, Commercial-integrated, PMO-related, matrix, and hybrid arrangements. Their suitability varied according to organizational scale, project portfolio, available resources, existing functions, leadership, and the need to maintain close involvement in project delivery. PMO research provides a useful comparison because it shows that permanent project-related functions can take different forms according to organizational circumstances [9, 10]. Construction-specific research has also identified PMO structuring and organizational support as factors associated with successful PMOs [3]. The findings from this study show similar structural variation for Project Controls, although the functions should not be treated as equivalent. Project Controls retains its professional focus on planning, scheduling, cost, risk, forecasting, performance measurement, and reporting.

The findings suggest that structural decisions should reflect the relationship between organizational scale, project complexity, and available resources rather than organizational size alone. A large organization with a continuing portfolio of complex projects may have sufficient demand to maintain a centralized Project Controls function. In contrast, an organization with fewer projects or limited resources may achieve greater flexibility through project-embedded, Commercial-integrated, or PMO-related arrangements. Project complexity can increase the need for specialist coordination and oversight, but this requirement may also be met through matrix or hybrid structures. These findings do not establish a preferred structure or a minimum organizational-size threshold. Instead, they indicate that organizations should consider how best to sustain the required capability within their operational and resource constraints. A stronger organizational presence for Project Controls also needs to preserve its connection with project delivery. Participants identified bureaucracy, duplication, fragmented responsibilities, and functional silos as potential problems where organizational arrangements were poorly defined. They also emphasized the need for Project Controls personnel to remain close to project operations. Corporate continuity and project-level involvement therefore need to operate together rather than as competing objectives.

5.3. Implications for Construction Organizations.

The findings indicate that decisions about organizational positioning should consider both the Project Controls capability to be maintained and the organizational conditions in which it will operate. This includes responsibility for Project Controls, consistency of practices, continuity of specialist capability between projects, functional leadership, and the relationship between corporate and project-level personnel. The findings suggest that governance, leadership, and functional integration need to be considered together when establishing a continuing Project Controls capability. Governance provides the basis for defining responsibilities, reporting

relationships, and accountability across projects and organizational functions. Leadership is important in securing organizational support, maintaining professional standards, and addressing conflicts between functional and project-level priorities. Functional integration is equally important because Project Controls operates alongside Project Management, Commercial, and PMO functions, where responsibilities for reporting, performance oversight, and decision support may overlap. Clear interfaces and effective coordination can reduce duplication and fragmentation while allowing Project Controls to remain closely connected with project delivery.

The appropriate arrangement will depend on organizational circumstances. A large organization managing multiple projects may be able to maintain a centralized function and deploy specialist resources across its portfolio. Another organization may retain Project Controls within Commercial, a PMO, or a matrix arrangement while maintaining common practices and functional leadership. Project-based arrangements may remain appropriate where organizational scale or workload does not support a permanent department. The differences between professional groups also have implications for organizational decisions. Project Controls practitioners may place greater emphasis on functional continuity and professional oversight, while Commercial and Contracts professionals may prioritize integration with existing commercial responsibilities and the efficient use of resources. Project and Operational Leadership participants highlighted consistency and organizational positioning, whereas executive perspectives emphasized corporate recognition and access to decision-making. Construction and Project Delivery participants drew attention to operational proximity and the risks of excessive bureaucracy. These differences suggest that decisions about institutionalizing Project Controls should consider the requirements of several organizational functions rather than rely solely on the preferences of Project Controls practitioners.

From a theoretical perspective, the findings contribute to understanding the relationship between temporary project structures and the permanent organization. Research on project-based organizations has examined the challenges of maintaining knowledge and organizational practices across temporary projects [2, 8], while PMO research has demonstrated variation in the structures through which project-related functions are supported [9, 10]. The present study brings these perspectives together in the specific context of Project Controls. It suggests that the institutionalization of Project Controls is better understood through the continuity of organizational responsibility, professional expertise, governance, and established practices than through departmental location alone. This provides a more differentiated understanding of how a specialist project-related function may become embedded within the permanent organization while continuing to support temporary project delivery. Construction organizations therefore do not need to adopt a single Project Controls structure to institutionalize the capability. Continuity, governance, professional capability, role clarity, organizational support, and proximity to project delivery can be provided through different arrangements. The structure needs to reflect the organization’s circumstances while maintaining Project Controls capability beyond individual projects.

6. Conclusion

This study shows that institutionalizing Project Controls is not simply a decision about where the function appears on an organizational chart. Its continuity depends on whether responsibility, professional capability, governance, and established practices can be maintained

across projects while retaining a close connection with project delivery. A dedicated Project Controls department is one means of providing this continuity, particularly where organizational scale and a continuing project portfolio support a permanent specialist capability. It is not, however, a necessary condition for institutionalization. Different structural arrangements can sustain the capability where responsibilities and interfaces are clear and where leadership, resources, organizational support, and operational proximity are maintained. The study contributes to Project Controls research by distinguishing institutionalization from departmentalization and by locating Project Controls within the relationship between temporary project delivery and the permanent construction organization. This suggests that organizational design should begin with the capability that needs to be sustained rather than with a predetermined structural model. The study is based on qualitative evidence from professionals familiar with Australian construction organizations and does not establish the prevalence of particular organizational arrangements across the industry. Future research could compare Project Controls structures across different organizational and project environments and examine their relationships with capability continuity, governance, and project-level outcomes.

Author Contributions

Hasan Zaidi: Conceptualization, methodology, investigation, formal analysis, data curation, and writing, original draft. Cordelia Mason: Supervision, review, and editing. Nazia Hasan: Data curation, NVivo data entry, and data mapping. All authors reviewed and approved the final manuscript.

Funding

This research received no external funding.

Data Availability Statement

The interview data are not publicly available because they contain confidential information provided by research participants. Supporting research data are retained in accordance with the ethical and confidentiality requirements of the study.

Ethics and Informed Consent

The research involved human participants. Participation was voluntary, and informed consent was obtained from all participants before participation. Participant confidentiality was maintained throughout data collection, analysis, and reporting.

Conflicts of Interest

The authors declare no conflict of interest.

Generative AI Disclosure

During the preparation of this manuscript, the authors used ChatGPT (OpenAI) to assist with language editing, manuscript organization, literature synthesis, and reference checking. Generative AI was not used to generate participant evidence or determine the empirical

findings. The authors reviewed and verified the manuscript and take full responsibility for its content.

Acknowledgments

The authors gratefully acknowledge the professionals who participated in this research and shared their experience and perspectives. The first author also acknowledges the support and encouragement of his family throughout the doctoral research.

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