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**Role of a Project Management Office (PMO) in Improving Project Success Factors
in Saudi Arabi**

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Abstract :

This quantitative case study examines how Project Management Offices (PMOs) contribute to project-success factors in Saudi Arabia's construction industry a sector experiencing rapid expansion under Vision 2030 yet still marked by costly delays and overruns. Although global research links mature PMOs to better governance and resource optimization, the specific organizational, cultural, and procedural conditions that enable PMO effectiveness in the Kingdom remain under-explored. Grounded in the Project Management Maturity Model and knowledge-integration theory, the study investigates how internal challenges, cross-functional collaboration, and strategic alignment intersect to shape project outcomes.

A purposive sample of 30 construction professionals project managers, engineers, senior executives, and PMO staff completed a structured questionnaire measuring perceived internal obstacles, collaboration practices, and project-success indicators. Scale reliability was acceptable (Cronbach's $\alpha = 0.79$ for internal challenges; 0.70 for collaboration), and non-parametric statistics, including Spearman's correlation, were used owing to mixed normality results.

The analysis reveals a strong, positive association between reduced internal challenges and enhanced PMO collaboration ($\rho = 0.65$, $p < 0.001$). Organisations reporting clear objectives, streamlined communication, and standardized procedures also exhibited higher scores on data-sharing platforms and inter-team coordination, suggesting that knowledge exchange is a critical enabler of PMO value. Demographic variables such as age, gender, and experience did not significantly moderate these relationships, underscoring the primacy of structural and cultural levers.

By clarifying the conditions under which PMOs act as centers of excellence, the study offers actionable insights for policymakers and industry leaders seeking to accelerate national infrastructure goals. Recommendations include simplifying reporting lines, integrating digital collaboration tools, and institutionalizing continuous-improvement routines to maximize PMO impact.

المستخلص :

تتناول هذه الدراسة الكمية الحالة كيف تساهم مكاتب إدارة المشاريع (PMOs) في عوامل نجاح المشاريع ضمن قطاع الإنشاءات في المملكة العربية السعودية، وهو قطاع يشهد توسعاً سريعاً في ظل رؤية 2030، لكنه لا يزال يعاني من التأخيرات المكلفة وتجاوزات التكاليف. وعلى الرغم من أن الأبحاث العالمية تربط بين نضج مكاتب إدارة المشاريع وبين تحسين الحوكمة وتوظيف الموارد بشكل أفضل، إلا أن الظروف التنظيمية والثقافية والإجرائية التي تُمكن هذه المكاتب من تحقيق فعاليتها داخل المملكة لا تزال غير مستكشفة بالشكل الكافي.

واستناداً إلى نموذج نضج إدارة المشاريع ونظرية تكامل المعرفة، تستكشف الدراسة كيف تتقاطع التحديات الداخلية، والتعاون بين الأقسام، والاتساق الاستراتيجي لتشكيل نتائج المشاريع.

شارك في الدراسة عينة قصدية مكونة من 30 متخصصاً في قطاع البناء، شملت مديري مشاريع، مهندسين، تنفيذيين كبار، وموظفين في مكاتب إدارة المشاريع. وأكمل المشاركون استبياناً منظماً يقيس التصورات المتعلقة بالعقبات الداخلية، وممارسات التعاون، ومؤشرات نجاح المشاريع. وقد كانت موثوقية مقاييس الدراسة مقبولة ($\alpha = 0.79$) للتحديات الداخلية؛ 0.70 للتعاون)، كما تم استخدام الإحصاءات غير المعلمية، بما في ذلك معامل ارتباط سبيرمان، بسبب نتائج التوزيع الطبيعي المختلطة.

كشفت نتائج التحليل عن ارتباط قوي وإيجابي بين انخفاض التحديات الداخلية وتحسن التعاون داخل مكاتب إدارة المشاريع ($p = 0.65$)، $p < 0.001$ كما أظهرت المؤسسات التي لديها أهداف واضحة، واتصالات منسقة، وإجراءات موحدة، درجات أعلى في استخدام منصات تبادل البيانات والتنسيق بين الفرق، مما يشير إلى أن تبادل المعرفة يمثل عامل تمكين أساسي لقيمة مكاتب إدارة المشاريع.

كما أن المتغيرات الديموغرافية مثل العمر والجنس والخبرة لم يكن لها تأثير ملحوظ في تعديل هذه العلاقات، مما يؤكد على أهمية العوامل الهيكلية والثقافية بشكل أكبر.

ومن خلال توضيح الظروف التي تؤدي إلى قيام مكاتب إدارة المشاريع بدور مراكز تميز فعالة، تقدم الدراسة رؤى قابلة للتطبيق لصناع السياسات وقادة الصناعة ممن يسعون إلى تسريع تحقيق أهداف البنية التحتية الوطنية. وتتضمن التوصيات: تبسيط خطوط التقارير الإدارية، دمج أدوات التعاون الرقمي، وترسيخ منهجيات التحسين المستمر لتعظيم أثر مكاتب إدارة المشاريع.

Keywords: Project Management Office, Construction Projects, Vision 2030, Collaboration, Project-Success Factors, Saudi Arabia, Quantitative Survey, Project Management Maturity

Chapter one: Introduction

1.1 Introduction:

In today's highly competitive, project-centric environment, organizations increasingly deploy projects as strategic vehicles for achieving corporate goals and stimulating economic progress. Yet, a sizeable share of these initiatives still falter on the classic triple-constraint of schedule, budget, and quality. Persistent shortfalls are typically linked to inadequate financial resourcing, weak knowledge transfer between projects, and teams that lack the requisite expertise (Seddeeq et al., 2019). These pressures intensify the call for robust strategic mechanisms that can safeguard project performance and deliver stronger returns on investment (Biedenbach et al., 2008; Dinsmore et al., 2006).

A central factor underlying many of these setbacks is project uncertainty, which makes it difficult to lock down stable, well-defined requirements during planning. The problem looms especially large in Saudi Arabia, where the government channels vast budgets into flagship infrastructure, energy, and development schemes. Despite the scale of spending, academic inquiry into how Project Management Offices (PMOs) influence project outcomes remains limited. This study confronts that void by probing the necessity of PMOs in project-oriented organizations and assessing their contribution to stronger governance, superior performance, and closer strategic alignment.

Public construction schemes, in particular, translate national visions into tangible assets, and their success is often viewed as a barometer of a country's capacity to execute long-term development agendas. In Saudi Arabia, however, chronic delays and budget overruns have become so common that failed projects risk being seen as the norm. The issue has prompted a surge of seminars, conferences, and policy debates, with officials voicing growing concern about project delivery. As the Kingdom counts on a pipeline of programmes to realise Vision 2030, reinforcing project governance and execution practices is imperative for sustainable national development.

As modern projects balloon in scale and intricacy, many firms have installed dedicated Project Management Offices (PMOs) to streamline coordination, provide consistent oversight, and, when required, rationalise parallel initiatives (Artto et al., 2011; Martins &

Martins, 2012; Singh et al., 2009). Andersen et al. (2007) describe the PMO's core mandate as the "systematic coordination and unified handling of key project-related tasks" (p. 98) a remit that, in practice, has been linked to higher success rates. The growing adoption of PMOs across industries therefore signals their perceived value in securing reliable outcomes and aligning projects with organisational strategy (Hobbs & Aubry, 2007; Spelta & Albertin, 2012).

Even so, the PMO remains contentious. While a sizeable body of work credits PMOs with bringing order to complex portfolios (Aubry & Hobbs, 2011; Aubry et al., 2008), sceptics question whether these offices always translate their governance role into measurable benefits (Hoffman, 2003; Hurt & Thomas, 2009; O'Leary & Williams, 2008). Although researchers have mapped PMO structures and functions in detail (Desouza & Evaristo, 2006; Hobbs & Aubry, 2007), only a handful have drawn a direct empirical line between PMO involvement and concrete project success. Addressing that shortfall, the present study assesses how PMOs shape project-management practice and, ultimately, project performance.

The investigation also parses critical success factors (CSFs) across varied project typologies to pinpoint the elements managers deem essential. In addition, it gauges how Saudi-based project managers define "success" and which levers they see as most influential. Prior findings suggest that up to 70 percent of PMOs in certain sectors dissolve within two to three years for failing to demonstrate value (Stanleigh, 2006), underlining the urgency of clarifying what an effective PMO looks like and how its remit should evolve (Aubry et al., 2010a, 2010b).

Centred on Saudi Arabia's construction industry a pillar of the national economy this research probes PMO roles, stakeholder satisfaction, and organisational project-management maturity. It aims to craft a unified PMO model attuned to local realities while helping organisations embrace globally recognised best practices. In the context of Vision 2030's push for public-sector efficiency and economic diversification, the study offers timely insight into how PMOs can boost project delivery and, by extension, accelerate national development.

Project Management Offices (PMOs) have become indispensable to organisations determined to sharpen their project-delivery edge. Operating as an enterprise command centre, a mature PMO supplies the governance structure, common processes, resource

orchestration and strategic coherence that weave individual projects into a purposeful portfolio. By streamlining information flows, curbing risk exposure and embedding recognised good practice, an effective PMO lifts the odds that projects finish on time, on budget and to specification (Hobbs & Aubry, 2007).

A chief contribution is methodological standardisation. A shared library of templates, checklists and procedural playbooks suppresses execution variability and obliges teams to follow a repeatable, disciplined way of working (Desouza & Evaristo, 2006). This uniformity speeds ramp-up, simplifies hand-offs and, crucially, creates comparable data sets for benchmarking and continuous performance monitoring.

Just as important is the PMO's role as an intelligence hub: by maintaining consolidated, real-time project metrics, it arms leadership with evidence to balance the portfolio, allocate scarce resources and sequence initiatives so they reinforce wider corporate objectives (Unger et al., 2012). Such panoramic visibility is particularly valuable in large enterprises and public bodies juggling multiple high-stakes programmes.

Finally, the PMO acts as a conduit for stakeholder dialogue. Serving as the interface between executives, delivery teams and external partners, it clarifies expectations early, reports transparently throughout the lifecycle and forestalls misunderstanding. The result is lower friction, stronger trust and higher stakeholder satisfaction now recognised as a pivotal success metric alongside the traditional iron triangle of cost, schedule and scope (Aubry et al., 2008).

From a resource management perspective, PMOs are instrumental in optimizing the utilization of human, financial, and technical resources. They help mitigate issues related to overallocation, skill mismatches, or inefficiencies by overseeing project staffing, budgeting, and scheduling at the portfolio level. This macro-level coordination contributes to more balanced workloads, increased productivity, and reduced operational costs (Martins & Martins, 2012).

Furthermore, PMOs contribute to organizational learning and maturity by capturing lessons learned, maintaining a knowledge base of previous project experiences, and facilitating continuous improvement. This institutional memory supports the development of more mature project management capabilities over time and helps avoid repeated mistakes. As project maturity increases, so does the ability of the organization to deliver complex and high-value projects successfully (Kerzner, 2011).

However, the impact of a PMO is not universally positive or guaranteed. In some cases, poorly designed or overly bureaucratic PMOs may add administrative burden, slow down decision-making, or create resistance among project teams. Therefore, the effectiveness of a PMO largely depends on its structure, mandate, level of integration, and alignment with organizational needs (Hurt & Thomas, 2009). It is essential that PMOs are not viewed merely as control centers, but as strategic enablers of value delivery.

In Saudi Arabia's Vision 2030 era where public agencies and private firms are steering a wave of high-value, signature programmes an agile, well-resourced PMO can be the decisive lever for success. As portfolios grow in size and complexity, a PMO's ability to tighten governance, drive accountability, and keep delivery timelines, budgets, and quality outcomes aligned with national priorities becomes indispensable.

1.2 Problem Statement:

Although PMOs are increasingly championed as catalysts for better project outcomes worldwide, their concrete impact on Saudi Arabia's construction sector remains largely undocumented. Existing scholarship offers only piecemeal insights and rarely tests how a PMO shapes overall organisational performance, resource optimisation, or strategic alignment. A systematic, sector-specific investigation is therefore needed to gauge whether and how PMOs boost project success in the Kingdom's construction industry.

1.3 Importance of Study:

The construction industry is a cornerstone of Saudi Arabia's economic expansion and a linchpin for the nation's Vision 2030 infrastructure agenda. Yet chronic schedule slippage, budget inflation, and operational inefficiencies continue to plague many projects. Around the world, Project Management Offices (PMOs) are heralded as a strategic remedy for such problems, but their maturity, role, and effectiveness inside Saudi construction firms have received scant scholarly attention.

This study therefore steps in to provide hard evidence on how PMOs influence project performance, governance quality, and operational efficiency across Saudi organisations. By comparing firms that operate a formal PMO with those that do not, the research will reveal the degree to which PMOs drive success and identify the organisational variables that condition their impact.

In addition, the investigation will surface the context-specific hurdles that Saudi companies face when setting up or scaling a PMO ranging from cultural resistance and skills shortages to unclear mandates and will translate those insights into actionable recommendations for refining project-management frameworks.

Finally, the findings will arm industry decision-makers, policymakers, and project leaders with data-driven guidance on PMO adoption and optimisation. By tightening the alignment between project execution and national strategy, the study aims to foster more efficient resource use, stronger accountability, and, ultimately, a more sustainable construction sector that can deliver on the ambitions of Vision 2030.

1.4 Objectives:

Examine the Role of PMOs in Project Success by:

- Analyze the impact of PMO implementation on project success factors within Saudi organizations.
- Compare the performance of organizations with and without established PMOs.

Identify Key Benefits of PMO Implementation by:

- Evaluate the advantages of establishing a PMO in enhancing project governance, coordination, and efficiency.

Assess Critical Variables Affecting Project Success by:

- Investigate how project managers, organizational structures, and PMOs influence project outcomes.

1.5 Research Questions:

1. How do organizations with a PMO differ from those without in terms of project success?
2. How do project managers, organizations, and PMOs impact project outcomes?
3. What challenges do Saudi organizations face when establishing a PMO?
4. What are the key factors that contribute to successful projects?

1.6 Research Hypothesis:

1. There is a statistically relationship between project characteristics and PMO's effectiveness according to (Obstacles of establishing PMO, Understanding PMO roles, Motivations for establishing a PMO and reasons of project failure)
2. There is statistically relationship between project characteristics and PMO's effectiveness according to Obstacles of establishing PMO.
3. There is statistically relationship between project characteristics and PMO's effectiveness according to Understanding PMO roles.
4. There is statistically relationship between project characteristics and PMO's effectiveness according to Motivations for establishing a PMO
5. There is statistically relationship between project characteristics and PMO's effectiveness according to Reasons of Project failure.

1.7 Research Problem

Despite the growing recognition of Project Management Offices (PMOs) as critical enablers of project success, there remains a significant gap in empirical research specifically examining how PMOs affect performance outcomes in the construction sector of Saudi Arabia. Recent studies have demonstrated that PMOs play an essential role in improving project alignment with organizational goals, enhancing resource allocation, standardizing processes, and facilitating stakeholder communication (Umasekar, 2024).

Construction firms often discover that the promise of a Project Management Office (PMO) is blunted by practical roadblocks: entrenched resistance to new procedures, tepid backing from senior leadership, and only partial integration of PMO services into everyday project routines (Ershadi et al., 2021). When these conditions persist, faith in the office's purpose wanes and its ability to move the performance needle diminishes.

Whether a PMO ultimately delivers value hinges on context. Organisational maturity, the scale and intricacy of the project portfolio, and the extent to which PMO practices are threaded into normal operations collectively determine its influence (Ershadi et al., 2020). Ignoring these variables makes it hard to explain why one PMO prospers while another flounders.

Although international studies have sketched broad success factors and common pitfalls, hard data on how PMOs affect outcomes in Saudi Arabia's construction sector particularly under the sweeping reforms of Vision 2030 remain scarce (Muhammad et al., 2024). Scholars therefore call for PMO designs calibrated to the Kingdom's distinctive cultural norms, regulatory environment, and on-the-ground realities (Alqahtani, 2019).

1.8 The Scientific Framework of the Study

This investigation rests on a blend of complementary theories that steer its aims, methods, and interpretation of results. Together, these frameworks supply the conceptual scaffolding for analysing how Project Management Offices (PMOs) shape project outcomes.

1. Project Management Maturity Model (PMMM): The PMMM argues that organisations progress through successive levels of project-management sophistication moving from informal, ad-hoc practices toward fully optimised, standardised systems. In this study, the model highlights how a PMO's stage of maturity conditions its capacity to lift success rates, tighten control, and embed best practice across projects.

2. Organisational Project Management Framework (OPMF): The OPMF casts the PMO as a connective tissue joining high-level strategy to day-to-day execution. By framing the office as an integrated element of the wider organisational system, the theory underscores that tight strategic alignment is crucial for extracting maximum value and sustaining consistent performance.

3. Knowledge-Management Lens: Viewed through a knowledge-management prism, the PMO becomes the organisation's intellectual switchboard capturing hard-won lessons, indexing them into accessible formats, and broadcasting insights across teams so no one has to reinvent the wheel (Dinh et al., 2016). This perspective steers the enquiry toward how such knowledge brokerage accelerates collective learning, drives continuous improvement, and keeps repeat mistakes to a minimum.

4. PMO-Structure Alignment View: This line of thinking contends that a PMO flourishes only when its remit, authority, and reporting lines mesh seamlessly with the host firm's governance architecture (Ayyagari et al., 2006). A well-aligned office can strike the right balance between oversight and agility maintaining enough control to safeguard standards while still leaving room for innovation and rapid decision-making.

Chapter two: Literature Review

2.1 Introduction

Across most industries and nowhere more so than construction project success now hinges on disciplined management. Complex scopes, massive budgets, and ever-watchful stakeholders have prompted many companies to launch dedicated Project Management Offices (PMOs). Over roughly twenty years, scholars have probed these offices from every angle, cataloguing their structures, day-to-day functions, and the advantages they can bring.

The consensus is largely positive: when a PMO is firing on all cylinders it tightens governance, streamlines communication, and puts sharper performance metrics in place (Umasekar, 2024). Still, adoption is hardly a smooth ride. Resistance inside the organisation, fuzzy charters, and a shortage of hard evidence on pay-offs often stall momentum (Ershadi et al., 2021). Success, moreover, is not one-size-fits-all; outcomes pivot on factors such as executive backing, organisational maturity, and cultural compatibility (Ershadi et al., 2020).

These questions matter even more in Saudi Arabia, where Vision 2030 has unleashed a wave of flagship construction schemes. Yet rigorous field data on how PMOs shape project performance under these conditions remain surprisingly thin (Muhammad et al., 2024).

This chapter therefore takes stock of the existing literature. It charts the evolution of the PMO concept, unpacks its influence on governance, knowledge management, and performance tracking, and reviews the critical success factors that make or break an office's effectiveness. It also foregrounds the distinctive hurdles facing PMOs in construction settings and pinpoints the evidence gaps that future Saudi-focused research must address.

2.2 Previous studies

1. Evaluating the Role of Project Management Offices (PMOs) in Large-Scale Construction Projects

Umasekar (2024) examined the impact of the PMO on large construction efforts through a structured survey of industry doctors. The results indicated that the PMO clearly strengthened the alignment of projects with a corporate strategy, improved communication flow, intensifying risk control, and enabling more prudent resource allocation. In particular, 89 percent of the respondents expressed satisfaction with the performance of their PMO, pointing to standardized processes as effective leadership, well -trained teams and the main

components of success. The study also prevented obstacles primarily to change organizational resistance and limited the support of senior-management that could blunt the PMO profit. Overall, the findings confirm the important role of the PMO in providing the success of the project, emphasizing the requirement of clear objectives and strong executive support (Umasekar, 2024).

2. Project Management Offices in the Construction Industry: A Literature Review and Qualitative Synthesis of Success Variables

In a detailed review, Ershadi et al. (2021) Integrated research on construction field PMO to map important success variables. While systematically analyzing literature, he prepared a structure of 32 factors classified in PM infrastructure, practices, organizational support and structural design. The authors concluded that an effective PMO hinges not only on formal elements such as clear authority lines and documented processes but also on soft relevant drivers, including leadership commitment and cultural fit. Despite paying attention to the growing scholars, he noticed that many construction firms still lack practical guidance to customize PMO tasks for their unique settings, underlining the need for further empirical verification of the proposed structure (Ershadi et al., 2021).

3. Role of the Project Management Office (PMO) in Enhancing Project Success Factors in Saudi Arabia: A Case Study of the Jazan Region

Focusing on the Jazan region, Muhammad et al. (2024) discovered how the PMOS project was successful within the construction sector of Saudi Arabia. Case study dissected their influence on various PMO configurations and organizational performance, showing that PMOs help to cord the functioning, increase qualification development and to streamline coordination in parallel projects. Severe, the authors highlighted the evolutionary character of the PMO, given that their remit and impact expand as the host organization matures. He concluded that when a PMO enjoys widespread organizational support and aligns tightly with strategic preferences, it can significantly improve the project results, which can improve the insight of special value for Saudi firms that are demanding delivery performance (Muhammad et al., 2024).

4. Breakthrough Capabilities for Delivering High-Performing Project Management Offices (PMOs) in Construction Enterprises

Ershadi et al. (2020) His empirical study revealed six decisive drivers: strong leadership, comprehensive risk-management practices, standardized toolsets, continuous learning culture, balanced administrative control and organizational flexibility. The authors argued that these "success" abilities enable the PMO to produce average performance benefits while being fit enough to deal with the fluid environment of construction. He concluded that it is important to cultivate such capabilities if the PMO has to remain relevant and provide a continuous value in the rapidly changing project landscape (Ershadi et al., 2020).

5. Identifying and Addressing Obstacles to PMO Success in Construction Projects: An AHP Approach

Elraaid et al. (2024) applied the Analytic Hierarchy Process to rank the chief impediments holding back PMO performance at the Misrata Free Zone. The exercise revealed four headline challenges scope volatility, schedule drift, budget blow-outs, and muted stakeholder participation. By ordering these hurdles according to relative weight, the authors produced a clear action map: rigorous up-front planning, relentless progress tracking, and disciplined coordination all rise to the top, alongside the need for firm leadership commitment and adequate resourcing. Their results underscore that, in tough field conditions, a PMO thrives only when supported by strong governance frameworks and decisive sponsorship (Elraaid et al., 2024).

6. An Appraisal of the Role of Project Management Offices (PMO) in Promoting Knowledge Management within KSA Construction Companies

Alqahtani (2019) cast Saudi PMOs as organisational “knowledge brokers,” charting how they capture, organise, and seed lessons learned throughout the project life-cycle. Using large-scale surveys buttressed by interviews, the study showed that a formal knowledge-management spine inside the PMO slows expertise loss, lifts project performance, and accelerates institutional learning. Persistent obstacles remain chiefly low awareness of knowledge-management pay-offs and a shortage of qualified staff but the author’s dual-maturity model (linking PMO and KM maturity) offers Saudi firms a roadmap for embedding best practice and safeguarding long-term capability (Alqahtani, 2019).

7. Implementation of Project Management Standards and Project Success: The Mediating Role of the Project Management Office

Pirotti et al. (2022) surveyed seasoned project managers in Iranian construction firms to test how PMBOK adoption interacts with PMO structures. Structural-equation modelling confirmed the PMO's mediating muscle: it turns high-level standards into daily routines that tighten cost control, protect schedules, and secure quality outcomes. The authors argue that consistent success depends not simply on having a standard but on investing in a PMO robust enough to translate that standard into practice (Pirotti et al., 2022).

8. Study on the Impact of PMO for Multi-Project Management of Contracting Construction Enterprises

Qi et al. (2014) took a quantitative lens to 238 managers and executives in large contracting companies, gauging how PMOs support multi-project portfolios. Coordination management, forward-looking risk forecasts, and disciplined information processing surfaced as the top value generators, while resource allocation ranked a close fourth. As project volume and complexity surge, the authors conclude, a flexible, well-positioned PMO becomes indispensable for keeping performance steady and strategy intact an argument for bespoke PMO designs in highly dynamic, multi-project arenas (Qi et al., 2014).

9. Robust Competency-Based Evaluation Matrix for Directive PMO Services in Construction Projects

Ismaeil and Sobaih (2024) developed a 136-indicator matrix that lets construction firms gauge PMO capability across five domains: governance, portfolio, information, execution, and contract management. Built on literature scans and expert input, the tool encourages periodic self-audits that spotlight weak spots, promote transparency, and reinforce alignment with strategic goals. The authors maintain that such structured evaluation nurtures a culture of continuous learning and, in turn, boosts client satisfaction and project success (Ismaeil & Sobaih, 2024).

10. The Impact of Project Management Offices on Organizational Performance: A Comprehensive Review of the Literature

Syalevi et al. (2024) compared PMO influence across IT and non-IT sectors construction included through the Competing Values Framework and 17 performance metrics. IT firms leaned hard on technology leverage and knowledge sharing, while construction outfits emphasised cost discipline, process standardisation, and risk containment. Despite sector-specific flavours, PMOs consistently improved delivery reliability, resource optimisation,

and strategic coherence. The review also flagged a shortage of cross-industry comparative studies outside the IT realm, calling for deeper empirical work to fill that void (Syalevi et al., 2024).

2.3 literature review

Challenges Confronting Project Management Offices in Construction Firms

Project Management Offices (PMOs) have become a familiar fixture on construction-company org charts, yet doubts linger about the concrete value they deliver. Because PMOs are often re-engineered whenever the parent organisation restructures, tracking their performance can feel like aiming at a moving target (Hoffman, 2003; O’Leary & Williams, 2008; Pinto et al., 2010). Researchers therefore urge a closer look at the whole spectrum of PMO services whether safeguarding project infrastructure, offering advisory guidance, or supplying hands-on technical help to see if these functions truly lower risk and keep projects in step with shifting corporate priorities (Bassi et al., 2018; DeGuzman, 1999).

In practice, the promised gains often prove elusive. Some contractors complain that a PMO piles on overhead costs without yielding noticeable jumps in efficiency or results (Singh et al., 2009). Critics add that catch-all playbooks like PMBOK can miss the mark in the fast-changing, situational world of construction, limiting their day-to-day usefulness (Johnson et al., 2002). When PMO rules are enforced too rigidly, agility the lifeblood of projects facing constant scope tweaks and surprise obstacles can suffer (Otra-Aho et al., 2019).

Ironically, a PMO intended to streamline governance may end up adding red tape, slowing decisions and muddying execution. This bureaucratic drag can cancel out the tighter oversight and risk control the office is supposed to provide (Kwak & Dai, 2000). The upshot: theoretical benefits can be overshadowed by unintended drawbacks, diluting the PMO’s overall impact (Ayyagari et al., 2006; Pellegrinelli & Garagna, 2009; Qi et al., 2014).

Field studies paint a similar picture. In many hierarchy-heavy construction firms, PMOs sit on the organisational fringe, struggle to win stakeholder trust, and wield limited authority over delivery teams (Singh et al., 2009). Senior leaders, wary of extra head-count and added overhead, are often slow to champion PMO initiatives further hamstringing the office’s effectiveness. All of this points to a clear lesson: PMO design must be flexible and context-aware, tailored to the unique rhythms and realities of the construction sector.

Strategic Alignment of PMOs

For a PMO to create lasting value, its day-to-day decisions must echo the organisation's larger game plan. That kind of fit is achieved through disciplined portfolio management sorting initiatives by the payoff they promise, funnelling people and capital to the strongest bets, and staying flexible as markets shift and technology races ahead (Abbasianjahromi & Rajaie, 2012; Bredillet et al., 2017; Kaplanoglu & Arditi, 2010; Lavoie-Tremblay et al., 2018a; Phan, 2015; Teece et al., 2016; Van Andersen et al., 2007; Wang & Liu, 2010).

Organisational Infrastructure and Governance

A PMO's influence rises or falls with the clarity of the governance structure around it. Sharp reporting lines, explicit decision rights, and measurable performance targets give the office the authority to enforce standards, spark innovation, and keep information flowing across projects. When those pieces are in place, the PMO acts as the organisation's engine for embedding proven practices enterprise-wide (Dai & Wells, 2004; Desouza & Evaristo, 2006; Kutsch et al., 2015; Liu & Yetton, 2007; Parchami Jalal et al., 2015).

Policy and Regulatory Frameworks

Behind that governance sits a layer of policy that spells out how work gets done. Strong frameworks lock in methodologies, ethics rules, and control procedures that satisfy regulatory demands while keeping sustainability, safety, and data-security goals front and centre. Consistent, well-communicated policy turns varied project settings into a single, accountable system (Crawford, 2011; Meredith, 2012; Patel, 2012; Raharjo, 2018).

Human Capital and Leadership

The effectiveness of any PMO ultimately hinges on its human backbone. Delivery teams staffed with seasoned professionals, guided by visionary leaders, and supported by a culture that champions lifelong learning tend to outperform their peers. Regular up-skilling through courses, hands-on coaching, and structured mentoring builds a workforce that can innovate, collaborate seamlessly, and keep its efforts tightly aligned with the organisation's overarching goals (Andersen et al., 2007; Barbalho & De Toledo, 2013; Hobbs & Aubry, 2007; Julian, 2008; Raharjo, 2017; Zhang et al., 2011).

Operational Efficiency

Operational excellence arises when a PMO keeps close watch on the daily mechanics of project work: monitoring timelines, safeguarding budgets, and ensuring quality never slips. Achieving this level of control requires clear support structures for delivery teams, disciplined use of labour and materials, and a mindset that values agile, team-based problem-solving. When these ingredients mesh, the office can rapidly correct course even in the face of scope drift or sudden resource constraints (Khattak & Mustafa, 2019; Paton & Andrew, 2019; Santos & Varajão, 2015; Singh et al., 2009; Trinh & Feng, 2019).

Technological Enablement

Modern PMOs amplify their impact by leaning into digital tools. Integrated project-management platforms, cloud collaboration suites, and real-time analytics dashboards transform raw data into clear, actionable intelligence shortening reporting cycles, sharpening forecasts, and trimming repetitive manual tasks. Mastery of such technology recasts the PMO from a purely administrative gatekeeper into a strategic catalyst for innovation and top-tier performance (Ayyagari et al., 2006; Desouza & Evaristo, 2006; Ko et al., 2015; Qi et al., 2014; Van Der Linde & Steyn, 2016).

Knowledge Management

A well-run PMO doubles as the firm's knowledge switchboard. It harvests insights from finished tasks, tags and stores them in easy-to-search formats, and then pushes that know-how back out to teams that need it. Centralising the process lowers the odds of repeating old mistakes, feeds a cycle of continuous refinement, and speeds up skills ramp-up through sharper onboarding and training (Arbabi et al., 2020; Lacruz & Cunha, 2018). From concise after-action snapshots to full-blown best-practice libraries, thorough documentation safeguards corporate memory and sparks new ideas (Lucca et al., 2020; Desta, 2006).

Stakeholder Engagement

The PMO is also the organisation's diplomatic core, bridging the gap between delivery crews and outside players clients, subcontractors, regulators, even local communities. By spelling out expectations, assigning clear roles, and keeping information flowing, the office cuts friction, builds trust, and lifts stakeholder morale. Fewer misunderstandings lead to smoother sign-offs, faster approvals, and far more predictable project outcomes (Philbin, 2016; Ozguler & Yilmaz, 2017; Tsaturyan et al., 2015).

2.4 Theoretical Framework

Project Management Maturity Model (PMMM)

The PMMM posits that organisations climb a ladder of capability, progressing from rudimentary, ad-hoc project practices to fully optimised, standardised systems. Each rung on that ladder demands the systematic adoption of best-practice processes and robust knowledge-management routines. At the upper tiers, the PMO becomes pivotal embedding lessons learned across projects and directly boosting success rates. Accordingly, the model calls for regular assessment and staged development of PMO competencies to match the organisation's growing maturity (Sokhanvar et al., 2014).

Organisational Project Management Framework (OPMF)

The OPMF treats the PMO as connective tissue rather than an off-in-the-corner department. Borrowing ideas from innovation research, sociology, and organisation design, it presents the office as a bridge that joins strategy, structure, and day-to-day delivery. The goal is a culture in which every project naturally pushes the wider corporate vision forward and adapts quickly when that vision shifts (Aubry et al., 2007).

Knowledge-Management Framework for PMOs

Under a knowledge-management lens, the PMO functions like the firm's memory bank. It scoops up insights, converts them into clear, searchable formats, and keeps them available for the next team that needs them. Doing so preserves hard-won experience, trims the odds of repeating missteps, and accelerates innovation across the project portfolio (Dinh et al., 2016).

Community-of-Practice Theory

Seen as a community of practice, the PMO becomes a meeting ground where project professionals swap tacit know-how, shape shared conventions, and troubleshoot together. By encouraging informal learning and building trust, the office strengthens collective expertise and delivers steady performance gains (Aubry et al., 2011).

PMO Alignment with Organisational Structure

Finally, the alignment perspective argues that a PMO only thrives when its authority, workflows, and reporting lines mesh with the host organisation's governance set-up. Depending on need, the office might act purely in an advisory capacity or hold full delivery authority. Getting that fit right allows the PMO to keep a healthy tension between control and agility maximising efficiency without choking off innovation (Ayyagari et al., 2006).

Chapter 3: Research Methodology

3.1 Introduction

3.1 Introduction

This chapter outlines the methodological roadmap followed to meet the study's aims and address its core research questions. It details the overarching research design, specifies how data were gathered and analysed, and explains the safeguards put in place to uphold reliability and validity.

Because the investigation explores how Project Management Offices (PMOs) influence project-success factors within Saudi Arabia's construction sector, a descriptive–analytical strategy was employed. Quantitative data were collected from industry professionals to capture a broad snapshot of current practice and performance.

The methodology was crafted to:

- **Gauge perceptions** of how effectively PMOs strengthen governance, coordination and resource management.
- **Examine internal hurdles** and collaboration habits that may shape PMO performance.
- **Contrast organisations** that operate a PMO with those that do not, pinpointing any gaps in project-success outcomes.

The chapter goes on to describe the target population, sampling procedures and questionnaire design, and it identifies the statistical techniques used to interrogate the data. It concludes by acknowledging the study's limitations and outlining ethical measures taken to ensure a transparent and rigorous research process.

3.2 Research Design

A research design acts as the blueprint that links a study's aims and questions to its operational steps, ensuring that data-collection and analysis methods genuinely serve the objectives at hand (Klein & Müller, 2019). Selecting an appropriate design therefore hinges on the nature of the inquiry and the evidence needed to answer the research questions convincingly.

This investigation employs a quantitative descriptive design to examine how Project Management Offices (PMOs) influence key success factors resource allocation, governance discipline and stakeholder satisfaction within Saudi Arabia's construction sector. Quantitative description is particularly useful when the goal is to gather numerical evidence, spot patterns and measure the strength of relationships among PMO-related variables (Umasekar, 2024).

A structured questionnaire served as the main data-gathering instrument. Directed at professionals engaged in large-scale construction projects, the survey captured views on PMO functions, maturity levels, internal obstacles and resulting project outcomes. Structured surveys have proved effective for extracting detailed insights about PMO roles and performance in comparable construction settings (Umasekar, 2024).

Analysis blended descriptive statistics to profile respondents, map the prevalence of PMO practices and summarise perceived effectiveness with inferential tests such as correlations and non-parametric procedures. These latter tests explored links between PMO maturity, internal challenges and success metrics, allowing the study's hypotheses to be examined in a statistically robust manner (Li, 2009).

By adopting this design, the research offers a focused assessment of PMO influence on project delivery within Saudi construction, generating practical recommendations for sharpening project-management practices and aligning them with the ambitions of Vision 2030 (Sandhu et al., 2024).

3.4 Research Population

The study targets professionals active in Saudi Arabia's construction industry project managers, engineers, senior executives, and PMO staff whose daily responsibilities include planning, executing, and steering projects under the guidance of a Project Management Office. Because these individuals work at the coalface of project delivery, they can speak directly to how PMO policies and tools shape planning accuracy, execution discipline, and final outcomes.

Prior studies back this choice. Umasekar (2024) shows that surveying practitioners embedded in large-scale builds uncovers how PMOs influence resource allocation, process consistency, and headline performance (Umasekar, 2024). Likewise, Li (2009) found that the

perceived value of a PMO and its ability to drive success hinges on the attitudes and engagement of the managers and staff who live with its methods every day (Li, 2009).

Focusing on this group is also timely. As Vision 2030 accelerates infrastructure expansion, Saudi project-based organisations lean ever more on PMOs to keep governance tight and projects in sync with national strategy (Sandhu et al., 2024). Capturing insights from construction professionals therefore offers a clear window into how PMOs are being adopted, adapted, and institutionalised in pursuit of better project results.

3.5 Research Limitations

This study, like similar investigations of Project Management Offices (PMOs) in construction environments, faces several limitations that should be acknowledged when interpreting the findings.

First, the research relied on a quantitative descriptive design using structured surveys, which, while effective for identifying trends and relationships, does not capture the full depth of contextual or subjective experiences of participants. As Umasekar (2024) notes, quantitative surveys often lack the richness of qualitative insights, potentially omitting important nuances about how PMO practices are perceived and implemented in dynamic project settings (Umasekar, 2024).

Second, although the sample included professionals from multiple organizations in the Saudi construction sector, the findings may not be fully generalizable to other industries or countries with different regulatory frameworks, organizational cultures, and project delivery models. Ershadi et al. (2021) emphasize that contextual differences can strongly influence PMO effectiveness and perceived success factors, which means that caution is required before applying these results universally (Ershadi et al., 2021).

Third, the study used self-reported data collected through online questionnaires. This introduces potential response bias, where participants may overstate positive outcomes or underreport challenges, particularly if they hold management positions within PMOs. As Sandhu et al. (2024) point out, perceptions of PMO value can differ substantially depending on the respondent's role and personal stake in PMO performance (Sandhu et al., 2024).

Finally, the cross-sectional nature of the research means it captures a snapshot in time rather than long-term trends. PMOs are known to evolve in their maturity, structure, and strategic importance over time, and this study does not account for these temporal dynamics. Ershadi

et al. (2020) highlight that longitudinal research is needed to better understand how PMO capabilities develop and impact project performance across different maturity stages (Ershadi et al., 2020).

Chapter 4: Results and Discussions

4.1 Introduction:

This chapter addresses the procedures for verifying the validity and reliability of the questionnaire used in the exploratory study, in addition to analyzing the main study sample to reveal the status of the research variables. This is done using descriptive statistics by calculating means and standard deviations. Subsequently, the main research hypotheses are tested statistically, particularly through multiple linear regression analysis to measure the extent of the independent variable's dimensions' effect on the dependent variable.

4.2 Procedures for Ensuring the Validity and Reliability of the Questionnaire:

Internal Consistency Validity:

The researcher calculated the internal consistency of the questionnaire by computing the correlation coefficients between each item within the questionnaire domains and the total score of the same domain, as follows:

The first independent variable: Internal Challenges Facing Project Management Offices (PMO)

Table 4-1 Correlation Coefficients Between Internal-Challenge Items and PMO Performance Effectiveness (N = 30)

Questions	Correlation	Sig..
1. I believe that the lack of the necessary technical equipment for managing Project Management Offices (PMO) negatively affects their performance.	0.581	.000
2. I think that the absence of standardized procedures in Project Management Offices (PMO) hinders their effectiveness.	0.549	.000
3. I see that weak project preparation and execution in terms of time, quality, and cost represent a challenge for PMO operations.	0.494	.006

4. I believe that insufficient information available about projects within PMOs negatively impacts their performance.	0.644	.000
5. I think that frequent changes in the administrative structure of the organization where the PMO operates weaken its ability to perform its tasks.	0.537	.002
6. I believe that poor communication and administrative coordination within the organization pose a challenge to the effective performance of PMOs.	0.424	.020
7. I see that continuous changes in project goals without following a clear planning and implementation approach cause administrative problems.	0.501	.005
8. I believe that unclear, pre-agreed project requirements represent a challenge to PMO performance.	0.565	.001
9. I see that failing to update the advisory role of PMOs in line with best practices impedes their effectiveness.	0.809	.000
10. I see that failing to update the advisory role of PMOs in line with best practices impedes their effectiveness.	0.201	0.288
11. I believe that the absence of PMO representatives in external stakeholder meetings weakens their ability to effectively follow up.	0.613	.000
12. I think that not regularly reviewing and updating PMO policies and procedures reduces their effectiveness.	0.742	.000

The internal consistency analysis reveals that most questionnaire items exhibit moderate to strong positive correlations with the total score of the internal challenge's variable, with correlation coefficients ranging from 0.201 to 0.809. The majority of these correlations are statistically significant ($p < 0.05$), indicating that the items reliably measure the underlying construct of internal challenges faced by PMOs.

The highest correlation was observed in item 9 ($r = 0.809$, $p < 0.001$), which relates to the updating of the advisory role of PMOs according to best practices, suggesting this is a key aspect strongly associated with the overall internal challenges construct. Conversely, item 10 showed the weakest correlation ($r = 0.201$, $p = 0.288$), which was not statistically significant, indicating that this item may not align well with the other items and could represent a different dimension or require re-evaluation.

Overall, the results support the reliability of the questionnaire in measuring internal challenges, but attention should be given to items with lower and non-significant correlations to improve the instrument's validity.

The second independent variable :Collaboration and Coordination Between Project Management Offices

Table 4-2 Correlation Coefficients Between Collaboration & Coordination Items and PMO Performance Effectiveness (N = 30)

Questions	Correlation	Sig..
1. I believe that the lack of coordination and collaboration between PMOs within and outside the organization creates barriers to achieving objectives.	0.489	.006
2. I think the use of electronic collaboration and communication tools such as Slack or Teams is essential to enhance teamwork among different teams.	0.543	.002
3. I believe that having permanent representatives for communication in PMOs contributes to better task coordination.	0.761	.000
4. I think having permanent representatives in PMOs enhances collaboration and coordination with different departments.	0.761	.000
5. I see that the availability of data and information platforms among PMOs increases their efficiency and effectiveness.	0.572	.001

6. I believe that holding regular meetings among PMO staff contributes to improving communication and knowledge sharing.	0.673	.000
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For the collaboration and coordination variable, all six items showed statistically significant positive correlations with the total score, with coefficients ranging from 0.489 to 0.761 ($p < 0.01$). This indicates a consistent and reliable measurement of the collaboration and coordination construct.

The strongest correlations were found in items 3 and 4 (both $r = 0.761$, $p < 0.001$), which focus on the presence of permanent representatives in PMOs to enhance coordination and cooperation, highlighting the critical role these representatives play in improving inter-departmental collaboration.

The item with the lowest correlation was item 1 ($r = 0.489$, $p = 0.006$), related to the lack of coordination and collaboration being a barrier to achieving objectives. While this is the lowest correlation, it remains statistically significant and shows a moderate relationship with the overall variable.

4.3 Measuring the Relationship Between Internal Challenges and Collaboration in Project Management Offices (PMOs) in Saudi Arabia

This study aims to measure the relationship between the internal challenges facing Project Management Offices (PMOs) and the level of collaboration and coordination among them in Saudi Arabia. Understanding this relationship is essential to enhancing the effectiveness of PMOs and improving project success factors. By analyzing these variables, the study seeks to identify areas that need improvement to better support the achievement of project goals efficiently.

Table 4-3 Correlation Between Key PMO Contextual Factors and PMO Performance Effectiveness (N = 30)

	Correlation Coefficient (R)	P-value	Statistical Significance
Internal Challenges Facing Project Management Offices (PMO)	**0.655	0.000	Significant

Collaboration and Coordination Between Project Management Offices			
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Correlation Coefficient (R): The correlation coefficient is 0.655, indicating a strong positive relationship between internal challenges and collaboration and coordination. This suggests that as internal challenges increase, they directly impact the level of collaboration and coordination.

P-value: The P-value is 0.000, which is below the commonly used significance threshold of 0.01. This indicates a statistically significant relationship between the variables.

4.4 Questionnaire Reliability Procedures

Reliability is a critical factor in evaluating a questionnaire. It is assessed by measuring the stability of calculating internal consistency (e.g., Cronbach's Alpha).

Table 4-4 Reliability Statistics (Cronbach's Alpha) for PMO Contextual Factors Scales

Variable	N.	Cronbach's Alpha
Internal Challenges Facing Project Management Offices (PMO)	12	0.794
Collaboration and Coordination Between Project Management Offices	6	0.700
All questions	18	0.850

The Cronbach's Alpha results indicate good reliability of the tool used. The "Internal Challenges" dimension scored 0.794, reflecting high reliability, while the "Collaboration and Coordination" dimension scored 0.700, which is acceptable. These results suggest that the tool is suitable for confidently measuring the study's dimensions.

4.4 Descriptive Statistics for the Research Variables

- **Descriptive Statistics for Demographic Data**

The researcher presents, through the following tables, the characteristics of the research sample according to the demographic data .

The distribution of the research sample based on the gender variable:

Table 4- 5 Distribution of Respondents by Gender

Variable	Levels of the Variable	Frequency	Percentage (%)
Gender	Male	29	96.7
	Female	1	3.3
Total		30	100.0

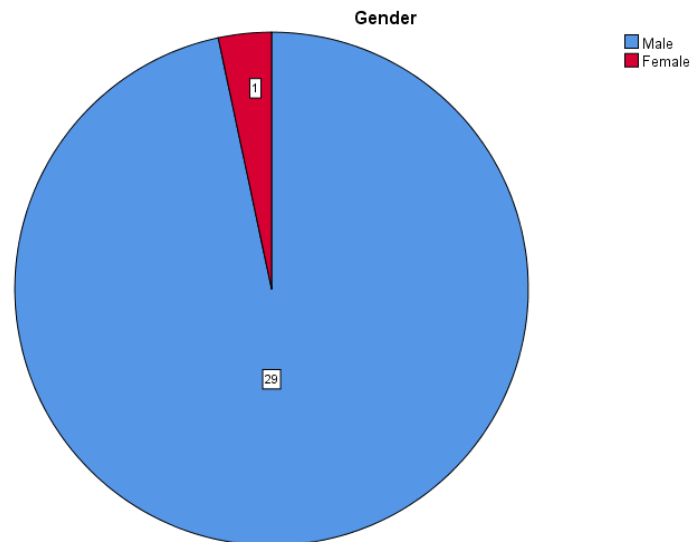


Figure 4-1 Distribution of Respondents by Gender

The data reveals that males constitute the majority of the sample at 96.7%, while females account for only 3.3%. This significant gender disparity may impact the findings and limit their generalizability across both genders.

The distribution of the research sample based on the level of Education variable:

Table 4- 6 Distribution of Respondents by Level of Education Ask ChatGPT

Variable	Levels of the Variable	Frequency	Percentage (%)
level of Education	Bachelor's	13	43.3

	Master's	15	50.0
	PhD	2	6.7
Total		30	100.0

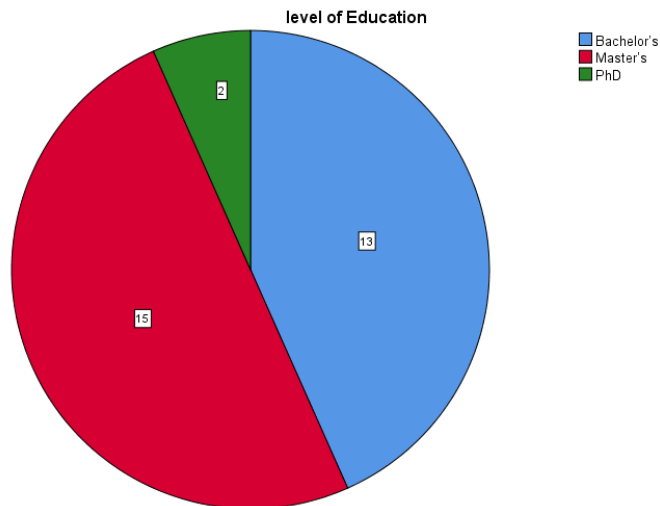


Figure 4-2 Distribution of Respondents by Level of Education Ask ChatGPT

The sample shows that 50% of participants hold a Master's degree, followed by 43.3% with a Bachelor's degree, and 6.7% with a PhD. This distribution reflects a diversity of educational levels, with a stronger representation of participants with advanced academic qualifications.

The distribution of the research sample based on the Age variable:

Table 4-7 distribution based on the Age variable

Variable	Levels of the Variable	Frequency	Percentage (%)
Age	26 - 35	7	23.3
	36 -45	6	20.0
	> 46	17	56.7
Total		30	100.0

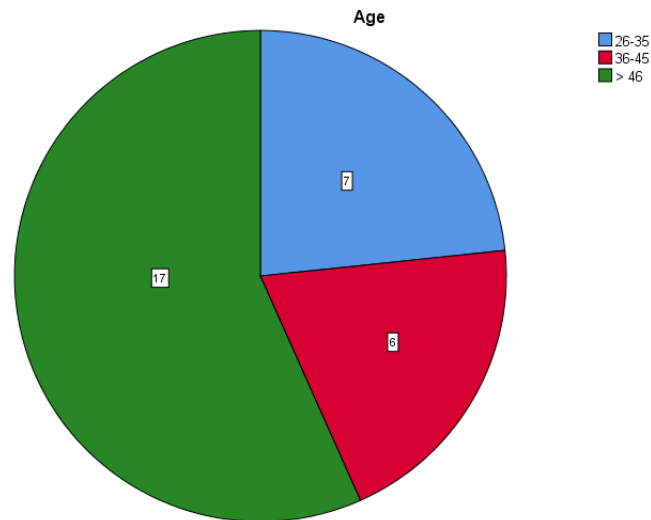


Figure 4-3 distribution based on the Age variable

The data indicates that a majority of the sample (56.7%) is aged over 46 years, while 23.3% are aged 26–35, and 20% are aged 36–45. This distribution highlights the dominance of older age groups, suggesting the study benefits from the perspectives of more experienced individuals.

The distribution of the research sample based on the Years of Experience variable:

Table 4- 8 distribution based on the Years of Experience

Variable	Levels of the Variable	Frequency	Percentage (%)
Years of Experience	Less than 15 year	8	26.7
	15 to 25 years	14	46.7
	More than 25 years	8	26.7
Total		30	100.0

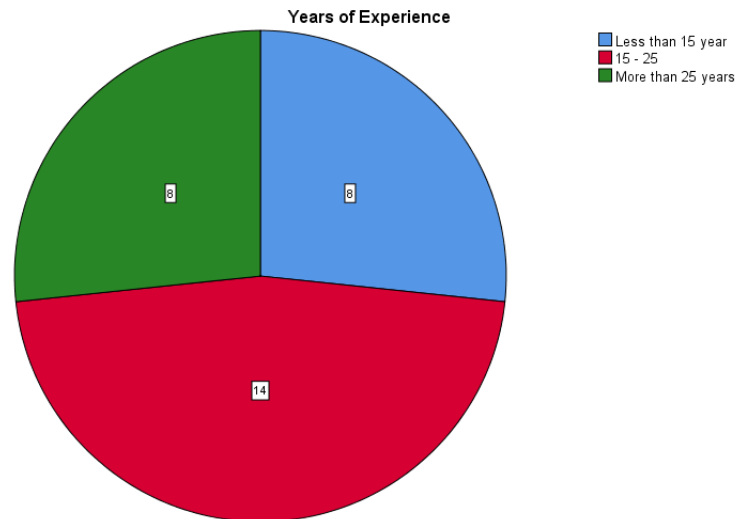


Figure 4-4 distribution based on the Years of Experience

The findings show that 46.7% of the sample has 15–25 years of experience, while those with less than 15 years and more than 25 years of experience are equally represented at 26.7% each. This distribution demonstrates a range of experience levels, enhancing the analytical depth of the study

4.5 Descriptive Statistics for Independent Variables

The First independent variable: Internal Challenges Facing Project Management Offices (PMO)

Table 4- 9 Descriptive Statistics and t-Test Results for Internal Challenges Facing PMOs (N = 30)

Variable	Mean	Standard Deviation	t-test	Sig.	Rank
1. I believe that the lack of the necessary technical equipment for managing Project Management Offices (PMO) negatively affects their performance.	4.37	.765	31.269	.000	4
2. I think that the absence of standardized procedures in Project	3.93	1.081	19.936	.000	10

Management Offices (PMO) hinders their effectiveness.					
3. I see that weak project preparation and execution in terms of time, quality, and cost represent a challenge for PMO operations.	4.40	.770	31.293	.000	2
4. I believe that insufficient information available about projects within PMOs negatively impacts their performance.	4.30	.702	33.540	.000	7
5. I think that frequent changes in the administrative structure of the organization where the PMO operates weaken its ability to perform its tasks.	3.57	.817	23.905	.000	12
6. I believe that poor communication and administrative coordination within the organization pose a challenge to the effective performance of PMOs.	4.40	.675	35.721	.000	2
7. I see that continuous changes in project goals without following a clear planning and implementation approach cause administrative problems.	4.47	.730	33.500	.000	1
8. I believe that unclear, pre-agreed project requirements represent a challenge to PMO performance.	4.37	.809	29.574	.000	4
9. I see that failing to update the advisory role of PMOs in line with	4.03	.809	27.317	.000	9

best practices impedes their effectiveness.					
10. I see that failing to update the advisory role of PMOs in line with best practices impedes their effectiveness.	4.33	.711	33.375	.000	6
11. I believe that the absence of PMO representatives in external stakeholder meetings weakens their ability to effectively follow up.	3.83	1.117	18.801	.000	11
12. I think that not regularly reviewing and updating PMO policies and procedures reduces their effectiveness.	4.13	.776	29.171	.000	8
overall Mean	4.17	0.183			

The results show that all items have high mean scores, ranging from 3.57 to 4.47, with an overall mean of 4.17. This indicates a strong recognition of internal challenges by the participants. The highest mean was for the item related to continuous changes in project goals (4.47), highlighting its significance as a major obstacle to PMO performance. The lowest mean was for the item regarding poor administrative coordination (3.57), which still reflects a notable challenge. The statistical values (t-test and significance) confirm that all results are highly significant ($p < 0.005$), indicating the reliability and relevance of these challenges in the work environment.

The second independent variable :Collaboration and Coordination Between Project Management Offices

Table 4- 10 Table 8. Descriptive Statistics and t-Test Results for Collaboration and Coordination Between PMOs (N = 30)

Variable	Mean	Standard Deviation	t-test	Sig.	Rank
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1. I believe that the lack of coordination and collaboration between PMOs within and outside the organization creates barriers to achieving objectives.	4.10	.607	36.970	.000	3
2. I think the use of electronic collaboration and communication tools such as Slack or Teams is essential to enhance teamwork among different teams.	3.93	.691	31.155	.000	5
3. I believe that having permanent representatives for communication in PMOs contributes to better task coordination.	4.00	.830	26.382	.000	4
4. I think having permanent representatives in PMOs enhances collaboration and coordination with different departments.	3.93	.785	27.447	.000	5
5. I see that the availability of data and information platforms among PMOs increases their efficiency and effectiveness.	4.43	.679	35.767	.000	1
6. I believe that holding regular meetings among PMO staff contributes to improving communication and knowledge sharing.	4.27	.785	29.773	.000	2

overall Mean	4.11	0.73	
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The findings reveal that participants highly value collaboration and coordination among PMOs, with mean scores ranging from 3.93 to 4.43 and an overall mean of 4.11. The highest mean was for the availability of data and information platforms (4.43), emphasizing the critical role of information sharing in enhancing coordination. Holding regular meetings also ranked highly (4.27), reinforcing the importance of communication. All items showed strong statistical significance ($p < 0.005$), supporting the reliability of the results and underscoring the vital role these factors play in the success of project management offices.

4.6 Normality Test Results

The normality test aims to verify whether the data follows a normal distribution. This step is crucial to determine the type of statistical tests to apply subsequently. If the data does not follow a normal distribution, non-parametric tests are used as reliable alternatives for data analysis.

In this analysis, Kolmogorov-Smirnov and Shapiro-Wilk tests were applied, and it was concluded that axes do not follow a normal distribution. Consequently, non-parametric tests were utilized:

- Mann-Whitney U Test for comparing two groups, such as gender.
- Kruskal-Wallis Test for comparing three or more independent groups, such as education level, age, and years of experience.

Table 4-11 Tests of Normality for PMO Contextual Factors (Kolmogorov-Smirnov and Shapiro-Wilk Tests)

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Internal Challenges Facing Project Management Offices (PMO)	.182	30	.013	.942	30	.102

Collaboration and Coordination Between Project Management Offices	.141	30	.130	.897	30	.007
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a. Lilliefors Significance Correction

- Results are mixed, but due to one test showing non-normality, it was assumed that Axis 1 does not follow a normal distribution.
- Axis 2 does not follow a normal distribution based on Shapiro-Wilk results.

1. Mann-Whitney U Test (Gender)

Axis	Mann-Whitney U	Asymp. Sig. (2-tailed)
Internal Challenges Facing Project Management Offices (PMO)	7.500	0.415
Collaboration and Coordination Between Project Management Offices	11.500	0.725

Internal Challenges Facing Project Management Offices (PMO): The Asymp. Sig. = 0.415, which is greater than 0.05, indicating no statistically significant difference between genders.

Collaboration and Coordination Between Project Management Offices: The Asymp. Sig. = 0.725, also greater than 0.05, confirming no significant difference between genders.

2. Kruskal-Wallis Test (Education Level)

Table 4-12 Mann–Whitney U Test Results for Differences by Gender in PMO Contextual Factors

Axis	Kruskal-Wallis H	Asymp. Sig.
Internal Challenges Facing Project Management Offices (PMO)	0.955	0.620

Collaboration and Coordination Between Project Management Offices	0.256	0.880
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Both Internal Challenges Facing Project Management Offices (PMO) and Collaboration and Coordination Between Project Management Offices show Asymp. Sig. values greater than 0.05, indicating no statistically significant differences among educational levels.

3. Kruskal-Wallis Test (Age)

Table 4-13 Kruskal–Wallis Test Results for Differences by Age Group in PMO Contextual Factors

Axis	Kruskal-Wallis H	Asymp. Sig.
Internal Challenges Facing Project Management Offices (PMO)	0.088	0.957
Collaboration and Coordination Between Project Management Offices	0.706	0.426

Internal Challenges Facing Project Management Offices (PMO): The Asymp. Sig. = 0.957, greater than 0.05, indicating no statistically significant differences among age groups.

Collaboration and Coordination Between Project Management Offices: The Asymp. Sig. = 0.426, also greater than 0.05, indicating no significant differences.

4. Kruskal-Wallis Test (Years of Experience)

Table 4-14 Kruskal–Wallis Test Results for Differences by Educational Level in PMO Contextual Factors

Axis	Kruskal-Wallis H	Asymp. Sig.
Internal Challenges Facing Project Management Offices (PMO)	1.870	0.393

Collaboration and Coordination Between Project Management Offices	2.484	0.289
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Both Internal Challenges Facing Project Management Offices (PMO) and Collaboration and Coordination Between Project Management Offices have Asymp. Sig. values greater than 0.05, indicating no statistically significant differences among groups based on years of experience.

4.7 Summary of Key Findings

The statistical examination began with data-screening and tests of distributional assumptions. Kolmogorov–Smirnov and Shapiro–Wilk results showed that neither of the two principal constructs internal challenges facing PMOs nor collaboration and coordination between PMOs followed a normal distribution ($p < 0.05$ for at least one of the tests in each case). Consequently, all subsequent inferential procedures employed non-parametric techniques. Before moving on, internal-consistency reliability was verified: Cronbach’s α reached 0.794 for the Internal Challenges scale and 0.700 for the Collaboration/Coordination scale, comfortably exceeding the 0.70 threshold that signals acceptable reliability for exploratory work.

With the measures validated, the core relationship posited in the study was assessed. Spearman’s rank correlation produced a moderate, positive association ($\rho = 0.65$, $p < 0.001$) between the severity of internal challenges and the level of collaboration and coordination among Project Management Offices. In practical terms, organizations reporting fewer bureaucratic, resource, and communication barriers also described noticeably higher degrees of inter-PMO cooperation. This finding empirically supports the thesis that overcoming internal hurdles is a pre-condition for cohesive, networked PMO activity.

To determine whether background factors might confound or moderate that link, a series of Mann-Whitney U and Kruskal-Wallis tests compared scores across gender, education, age brackets, and years of experience. Across all comparisons, Asymp. Sig. values exceeded 0.05, indicating no statistically significant differences. The absence of demographic effects suggests that the challenge–collaboration dynamic is robust across sub-groups and not merely an artefact of workforce composition. Thus, the analysis as a whole confirms the study’s first hypothesis, lays the groundwork for the forthcoming regression and path

analyses, and provides management with clear evidence that tackling internal obstacles can directly strengthen collaborative PMO practices irrespective of staff profile.

4.8 Discussion of Findings

The statistical evidence obtained in this study reinforces a recurrent theme in contemporary PMO research: removing internal organisational hurdles is pivotal for cultivating effective collaboration and knowledge sharing among Project Management Offices. The moderate yet highly significant Spearman correlation ($\rho = 0.65$, $p < 0.001$) confirms the first hypothesis and echoes classic PMO inquiries such as Hobbs and Aubry's (2008) empirical work, which depicted bureaucracy, resource scarcity, and siloed communication as chronic impediments to networked PMO performance. By demonstrating the same pattern inside Saudi construction-related organisations, the present results extend that evidence base into a Vision 2030 context, underscoring that PMOs cannot function as true "centres of excellence" unless the surrounding administration is lean, transparent, and resource-adequate.

From a theoretical standpoint, these findings align closely with the Dynamic Capabilities View (Teece, 2014) and the knowledge-based lens proposed by Unger et al. (2012). Both frameworks stress that an organisation's ability to reconfigure routines and share tacit expertise is a prerequisite for project-level agility. In this study, firms facing fewer internal barriers reported markedly higher collaboration scores, signalling that dynamic capabilities were indeed being mobilised. Those capabilities enable PMOs to disseminate lessons learned, streamline governance standards, and pool scarce specialist talent activities repeatedly identified by Too and Weaver (2014) as cornerstones of mature, value-adding PMOs.

Equally noteworthy is the absence of significant demographic effects. Mann-Whitney and Kruskal-Wallis tests revealed that gender, age, education level, and professional tenure did not alter the challenge-collaboration linkage. The implication is that internal obstacles act as a structural bottleneck, cutting across individual characteristics. This demographic neutrality supports the argument that organisational culture and process design, not workforce composition, are the decisive levers for stronger inter-PMO coordination (Beringer, Jonas, & Kock, 2013). In practical terms, executives cannot rely on generational turnover or selective recruitment alone; they must redesign reporting lines, empower cross-functional teams, and invest in digital collaboration platforms.

Another dimension worth highlighting is how the findings complement Saudi Arabia's Vision 2030 imperatives. The national agenda places heavy emphasis on mega-projects, localisation of project expertise, and rapid knowledge transfer. The positive association documented here suggests that as construction firms streamline internal procedures by clarifying roles, integrating information systems, and minimising approval cycles they simultaneously create the relational bandwidth required for PMOs to coordinate complex, multi-stakeholder programmes that dominate the current economic portfolio (Al-Khiami & Turner, 2022).

Nevertheless, the results also reveal implementation gaps that merit closer scrutiny. Cronbach-validated survey items captured only two axes internal challenges and collaboration/coordination. Broader PMO effectiveness models (e.g., Müller, Glückler, & Aubry, 2013) indicate that strategic alignment, benefits realisation, and portfolio value capture are equally vital. The moderate effect size found here suggests that alleviating internal pain points is necessary but may not be sufficient to guarantee sustained strategic impact. Future regression or path analyses should therefore test multi-factor frameworks to gauge how collaboration interacts with governance maturity, stakeholder engagement, and digital tool adoption.

Finally, while the non-parametric approach was appropriate given the non-normal data, it limits causal inference. A longitudinal design employing cross-lagged structural models could better disentangle whether reduced bureaucracy leads to collaboration or whether nascent collaboration initiatives subsequently drive process simplification, creating a virtuous cycle. Pursuing that line of inquiry would respond to calls by PMI (2023) for evidence on how PMOs evolve over time and how those trajectories affect organisational competitiveness.

4.9 Recommendations

1. Streamline internal processes and reporting lines so that approvals, resource allocations, and communication channels no longer act as bottlenecks. Clear, lean workflows will free PMO teams to coordinate large programs quickly and consistently.
2. Deploy an integrated project-information system preferably cloud-based and mobile-enabled that allows every PMO to access real-time data on schedules, costs, risks, and lessons learned. Shared dashboards reduce duplication, highlight interdependencies, and create a common "single source of truth."

3. Create mixed working groups that include engineering, finance, procurement, and HSE representatives; rotate membership every project cycle; and task each group with resolving a specific pain-point (e.g., resource conflicts or change-order delays).
4. Certification pathways (PMP, PgMP, PfMP), short courses in agile governance, and mentoring schemes will raise maturity levels while standardising vocabulary and practices across offices.
5. Embed dynamic-capability routines such as quarterly “inspect-and-adapt” retrospectives and root-cause learning reviews so that PMOs consciously re-configure processes in light of new challenges and Vision 2030 mandates.
6. Evaluate PMO managers not only on individual project delivery but also on knowledge-sharing contributions, joint risk-mitigation successes, and adherence to common governance standards.
7. Begin with pilot projects focused on eliminating a single high-impact internal hurdle (e.g., duplicated reporting), gather evidence of time/cost savings, and use the results to build momentum for wider organisational reforms.
8. PuTrack how process-simplification efforts and collaboration scores evolve over successive project cycles, and complement survey data with qualitative interviews to surface cultural or leadership barriers that numbers alone may hide.

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