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The impact of Project Management Offices on organizational performance: a comprehensive review of the literature

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Abstract:
In today's dynamic environment, information technology (IT) stands as the cornerstone for organizational success and competitive advantage, with project management playing a crucial role in efficiently deploying IT resources. Recognized across diverse sectors like telecommunications, aerospace, and construction, Project Management Offices (PMOs) facilitate task organization and supervision, whether it is for IT product development, service improvement, system design, or implementing organizational changes. Despite extensive research on the positive impact of PMOs on organizational performance, a significant research gap exists due to the absence of a direct comparison between the influence of PMOs on IT and non-IT industries, indicating the necessity for further investigation in this domain. This study delves into the contribution of PMOs to organizational performance using the Competing Values Framework and evaluates five models and 17 performance metrics within the IT industry and across sectors. When comparing PMO performance, non-IT sectors precede interpersonal relationships, competency-based training, and workplace environment, whereas IT sectors emphasize the knowledge of PMO resource teams, efficient training, technology utilization, and collaboration for project success. Additionally, IT industries underline the role of technology in averting project management failures and prioritizing the punctual delivery of client requirements. These differences highlight the variations in PMO priorities between these industries, underscoring the significance of PMOs in enhancing organizational performance.

Keywords:
project management office; PMO; information technology; organizational performance; systematic literature review; competing values framework.

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1. Introduction

In this rapidly advancing Era, the significance of information technology (IT) cannot be overstated, as it serves as a vital catalyst for organizational success and competitive advantage [1]. IT has transformed how businesses work, allowing them to streamline procedures, increase productivity, and make more informed decisions. With the rapid evolution of IT, companies may use data analytics to acquire essential insights into customer behavior, market trends, and internal processes [2], [3]. For instance, Khin et al. [2] demonstrate the use of artificial intelligence (AI) technology as a unique digital solution within market intelligence software. This technology connects smoothly with organizations, allowing them to identify prevailing trends among their target clientele. As a result, it enables firms to modify their product offerings to fit these trends efficiently, boosting their market competitiveness. In their study, Shen et al. [4] reveal the tactics used by airlines to gain a competitive advantage, allowing for the seamless integration of operational procedures. This integration, in turn, helps to improve aircraft utilization efficiency, knowledge development, data integration, and personnel productivity. Thus, managing IT-related projects and initiatives becomes crucial to harnessing the full potential of these technological advancements in enhancing organizational efficiency and competitiveness.

Project management has become critical in efficiently deploying IT resources [5]. Organizations acknowledge its importance in task structuring and oversight, whether for IT product development, service development, information system design, or organizational change implementation. As a result, IT has emerged as a critical domain for project management, spawning significant interdisciplinary research at the IT-project management confluence [6], [7], [8]. In the realm of IT project management, previous research has highlighted that organizations place significant emphasis on four key aspects: project people management, IT project knowledge management, IT project control management, and ensuring the attainment of optimal project performance [5], [9], [10]. Numerous organizations have established specialized Project Management Offices (PMOs) dedicated to overseeing and coordinating IT-related endeavors. PMOs can embrace sustainable project management approaches by upholding methodologies or standards, executing strategies, facilitating benefit realization management, managing human resource development & training, offering project assistance, and handling knowledge management [11]. IT-focused PMOs are pivotal in ensuring that IT projects are harmonized with business strategies and contribute to the organization's overall performance [6], [12].

Initially developed within the IT sector, PMOs are now in various industries that demand technology and engineering projects, including telecommunications, aerospace, and construction [13]. The primary goals of IT PMOs are typically to improve project success by implementing effective project management methods, to provide support for IT projects, to manage multiple projects efficiently, to increase project delivery effectiveness, and to centralize decision-making authority in project management-related activities [14]. Santos & Varajão [15] emphasized the role of PMOs in public administration as a shared service. PMOs serve a dual purpose within universities by executing projects and identifying and capturing new ones [7]. Additionally, when universities collaborate with the industry, they are expected to establish a PMO to oversee research and development initiatives and projects [16]. In the construction and engineering sector, the suggested PMO aims to provide templates, optimal approaches, training, project data centralization, and knowledge exchange. Its primary future goals involve increasing the number of employees with project management training and tailoring project management methodologies to project complexity [6], [17]. In summary, while PMOs share common underlying objectives across sectors, their specific roles and goals may alter to meet each industry's unique needs and difficulties. PMOs serve as a central hub for project management, assisting organizations in meeting their objectives by promoting efficient and successful project implementation.

Although multiple studies have thoroughly examined the beneficial effect of PMOs on organizational performance [8], [18], [19], a substantial research gap exists in the current literature as no research has been conducted to directly compare the influence of PMOs on IT and non-IT industries. This gap indicates that, despite a wealth of research confirming the benefits of PMOs across sectors, there is a scarcity of studies comparing the impact of PMOs in the context of IT and non-IT sectors. Addressing this gap could lead to a better understanding of the role of PMOs in various industry settings. Aubry & Hobbs [20] presented the Competing Values Framework (CVF) [21] as an approach for analyzing PMO performance, and multiple studies [19], [21], [22] have effectively utilized this approach for evaluating PMO performance. This framework is based on 17 distinct criteria divided into three key dimensions: the structural dimension

(emphasizing the balance of flexibility and control), the focus dimension (emphasizing the balance of internal and external considerations), and the dimension of purpose and direction. The CVF is not a static performance measurement instrument but a dynamic process that promotes trust and a shared understanding of a PMO's expected contribution to overall success [23]. These criteria, indicators, and a multicriteria decision support method were valuable in constructing a performance evaluation model for PMOs [19].

Thus, this study postulates the following research question: How does the influence of PMOs on organizational performance differ between IT and non-IT industries, and what factors contribute to these distinctions?

The subsequent sections of this paper are organized as follows: Section 2 offers background information and a review of related research. In Section 3, the authors detail the research methodology employed. Section 4 presents the study's outcomes. Lastly, Section 5 comprises the conclusion and outlines directions for future research.

2. Literature Review

2.1 Project Management Office (PMO) and Organizational Performance

A PMO is a well-recognized entity established to address specific organizational needs by enhancing project management and aligning it with corporate strategy [8], [19]. PMOs have varied primary focuses, including project monitoring, progress reporting, and method development [24]. They also promote standardization and resource-sharing in project management, boosting efficiency [25].

Research on PMOs spans areas like project success, organizational performance, and PMO models [14], [20], [22], [23], [25], [26]. PMOs are acknowledged for driving project success and improving organizational performance. In the IT sector, PMOs are seen as tools to refine project management, ensuring structured project objectives, resource allocation, and monitoring [12], [20], [25], [26].

The presence of a PMO and its maturity level can impact organizational performance, a subjective metric with varying interpretations among different stakeholders [27]. Aubry & Hobbs [20] have suggested the adoption of the CVF to assess PMO performance [20], [21]. This framework, encompassing 17 criteria categorized into three dimensions: structure (balancing flexibility and control), focus (considering internal and external aspects), and purpose & orientation, enables a holistic evaluation of PMO performance, fostering dialogue among stakeholders with diverse values and perspectives [19]. Furthermore, to refine the assessment of PMO performance, Aubry & Hobbs [20] have employed five distinct models, namely human resources, internal processes, rational goals, open systems, and output quality, as proposed by Quinn and Rohrbaugh [21]. These models provide specific and concrete indicators, as illustrated in Figure 1, for evaluating different facets of PMO performance, emphasizing aspects such as human resource management, internal processes, goal setting, and adaptation to the external environment [20], [28]. Integrating these models within the CVF makes a comprehensive and dynamic evaluation of PMO performance possible, offering a nuanced understanding of its impact on organizational performance [19].

In the context of PMO, the instrument provided by CVF assists in highlighting paradoxes among values [20]. PMO enhances staff competencies in the *human resources* domain by aligning them with future project goals, considering employee preferences, and ensuring effective human resource management [20], [29]. The *internal process* view of organizational performance emphasizes project management and the PMO's role in managing processes. Regarding *rational goals*, project selection, portfolio, and program management recognize their role in improving organizational performance by optimizing resource allocation and utilization for higher productivity. *Open system* domain indicators prioritize flexibility, adaptation, and innovation, primarily assessing corporate growth, sales, quality outcomes, and overall effectiveness due to project benefits [20]. The criterion of *output quality* introduced by Aubry & Hobbs [20] is not directly related to any of the models, focusing instead on product quality and reflecting the satisfaction of the PMO's sponsor and its clients.

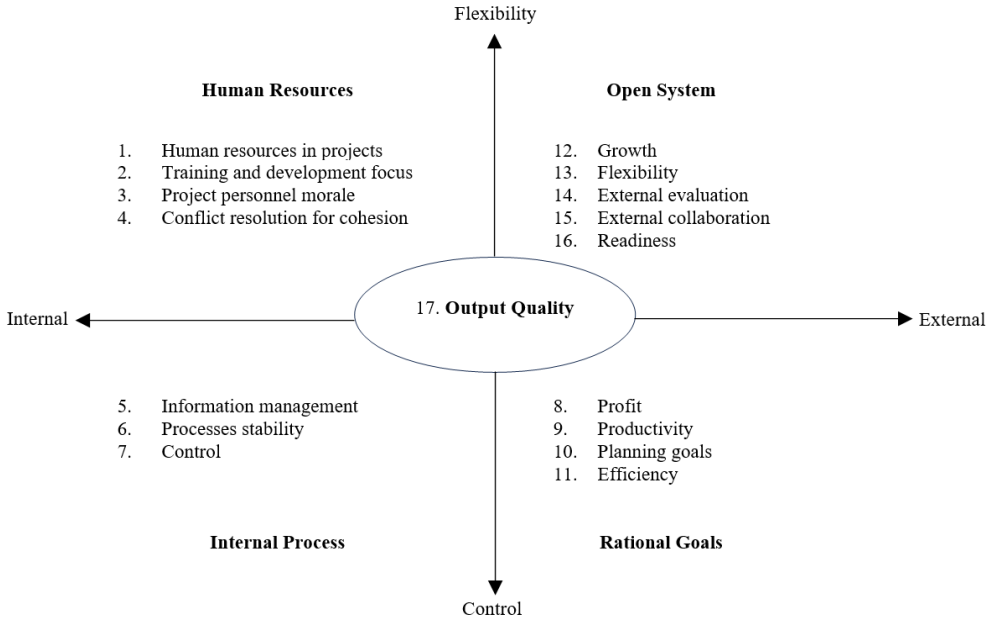

Fig. 1. Competing Values Framework proposed by Aubry & Hobbs [20]

2.2 PMO in different industries

According to Dai and Wells [18], many organizations began using PMOs in the mid-1990s. Recent polls, however, show that roughly two-thirds of big firms involved in IT-enabled business change projects and programs have now implemented some type of PMO. Due to the increasing complexity of IT projects, it is reasonable that many organizations have recognized the importance of designing and implementing a centralized set of support services for IS development activities, usually referred to as a PMO. A PMO's principal goal is to enable systematic coordination and unified administration of important project-related tasks [30].

Across all industries, the role of PMOs goes beyond ensuring successful project completion within schedule and budget [31]. Their primary focus is attaining the organization's strategic goals by aligning initiatives with broader business objectives. The significance of this function cannot be overemphasized, as the efficiency of a PMO is directly determined by project alignment with the enterprise's business objectives. According to research, the degree of strategic alignment and agreement between projects and business priorities has a statistically significant impact on the performance of a PMO [32].

Recent studies have extensively examined the impact of PMOs on organizational performance across various sectors. For instance, Dai & Wells [18] assessed different PMO functions and services, finding a positive correlation with project performance. Barbalho et al. [24] investigated PMOs in new product development (NPD), identifying performance drivers and their influence on project success. Scholars also analyzed operational transitions and PMO performance in a technology-oriented company [8]. Viglioni et al. [19] proposed a performance evaluation method for PMOs in the software industry, while Ko et al. [6] assessed PMO effectiveness in large-scale information systems and its impact on organizational performance. Kutsch et al. [30] employed the Balanced Scorecard technique to highlight PMOs' successes and failures. Conversely, Moura et al. [22] conducted a systematic assessment of PMOs, finding a significant correlation between PMOs and project performance. In summary, while recent research has extensively explored PMOs' influence on organizational performance in various sectors, there remains a notable research gap concerning direct comparisons between PMOs in the IT and non-IT sectors. Thus, further research is imperative to offer comprehensive insights into PMOs' effectiveness across diverse industry contexts.

3. Methodology

According to Kitchenham [33], a systematic literature review (SLR) is a methodology used to systematically explore, analyze, and interpret all relevant research variables that align with the research questions or topics of interest. The purpose of conducting an SLR is to gain up-to-date insights into the existing research within a specific area. A SLR, as defined by Kitchenham consists of three primary stages [33], [34], [35]: planning, conducting, and reviewing the review. To reduce bias, the authors of this study completed all three stages of the SLR and conducted inter-rater reliability evaluations during the initial and final selection phases. The authors closely adhered to the procedures in all three SLR parts, shown in Figure 2.

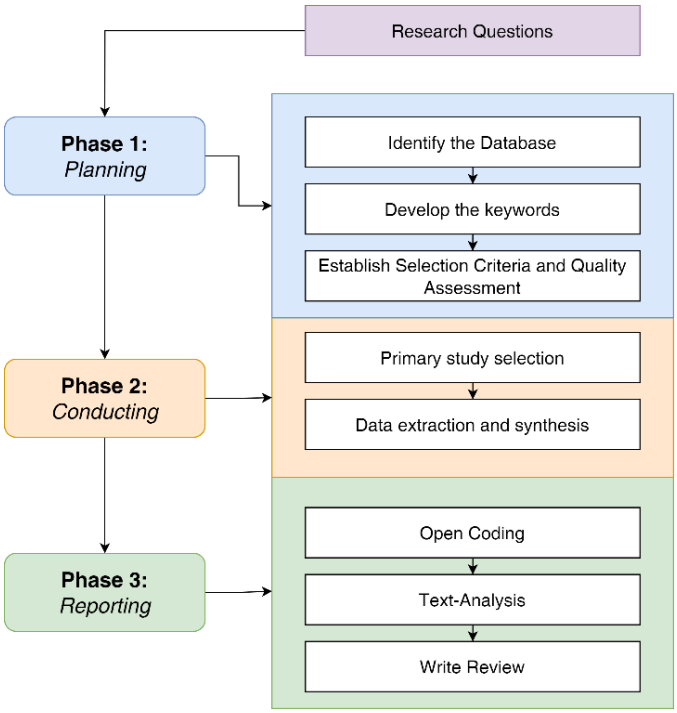

Fig. 2. SLR Methodology

3.1 Phase 1: Planning

While the impact of PMOs on organizational performance has been widely studied in earlier research [6], [8], [18], [19], [20], [22], [30], there is a compelling need for a comprehensive literature review that explicitly focuses on the performance of PMOs in both IT and non-IT industries. This SLR will provide insights into the similarities, differences, and performance implications of PMOs across IT and other domains based on a detailed analysis of existing research. The following research questions guide the research objectives of mapping studies in this field: how does the influence of PMOs on organizational performance differ between IT and non-IT industries, and what factors contribute to these distinctions?

3.1.1 Identify the Database

The data for this study is gathered using an automated search strategy. To find the most relevant literature, researchers utilize an optimized search strategy that applies a specialized search query. Eight digital repositories in total were chosen. The following digital sources have been chosen:

- ACM Digital Library;
- IEEE Explore;
- ProQuest;
- Sage Journals;
- ScienceDirect;
- Springer Link;
- Taylor & Francis;
- Emerald Insight.

3.1.2 Develop the keywords

To extract relevant literature from selected digital sources, the authors develop a streamlined search query matched to the research inquiries offered. The authors combined the keywords into search strings with the Boolean "OR" and "AND" operators. The combination of key terms was formulated as ((“PMO” OR “Project Office” OR “Project Management Office” OR “PMO Function”) AND (“Corporate” OR “Institutional” OR “Company-Wide” OR “Enterprise-level”) AND (“Effectiveness” OR “Productivity” OR “Efficiency”) AND (“Impact” OR “Effect” OR “Role” OR “Implication”)). The search keywords are summarized in Table 1. This targeted search query was utilized to identify studies related to and applied to article titles, abstracts, and keywords.

Table 1. Category and sample search keyword

Category	**Search Keyword**
Project management office	PMO, Project Office, Project Management Office, PMO Functions
Organizational	Corporate, Institutional, Company-Wide, Enterprise-level
Performance	Effectiveness, Productivity, Efficiency
Influence	Impact, Effects, Role, Implication

3.1.3 Establish Selection Criteria and Quality Assessment

The authors followed the criteria used by other researchers to establish criteria for inclusion and exclusion [22], [36], [37], shown in Table 2.

Concurrently, the data extraction and quality assessment (QA) of the chosen papers were conducted. The authors developed a checklist for objective and subjective ratings of the key research to ensure a thorough examination. This checklist was formed following the guidelines [36] that were provided to ensure consistency and accuracy in our assessment process. Six questions were developed as QA criteria (see Table 3). The assessment was conducted by assigning a score of 1 for a comprehensive response to a checklist question, 0.5 for a partial answer, and 0 when the question was not addressed on the checklist. The quality assessment evaluates how well the chosen studies suit the study topics, and Appendix A shows the quality questions and scores of the papers included.

Table 2. Selection Criteria

Category	Criterion
Inclusion	Papers in English.
	Published from 2013 to 2023.
	Access to whole text documents from available databases.
	Studies that match the keywords within the specified search domains.
	Papers that provide empirical insight into PMOs and their impact on organizational performance.
	Conference and journal papers were peer-reviewed.
Exclusion	The papers do not discuss PMOs' impact on organizational performance in their findings.
	Papers related to organizational project management but with less focus on PMOs.
	Case studies of PMO implementation in specific contexts without a theoretical framework.
	Articles that don't match specific aspects of PMO on organizational performance based on title and abstract are excluded.
	Duplicate articles.
	Papers written in languages other than English.

Table 3. Quality assessment criteria

QA Code	Checklist of Question
QA1	Is the paper empirically supported?
QA2	Is the research's purpose clearly stated?
QA3	Was the research design acceptable for addressing the research goal?
QA4	Was the data analysis carried out with sufficient rigor?
QA5	Is there a clear presentation of the findings?
QA6	Are the limitations of the study acknowledged?

3.2 Phase 2: Conducting

3.2.1 Primary study selection

Afzal et al. [38] developed the tollgate approach, which consists of the five processes listed below, to improve the research papers identified during the primary study collection:

Step 1: Use search terms to find relevant articles.

Step 2: Article inclusion and exclusion based on title and abstract.

Step 3: Applying inclusion and exclusion criteria to articles based on the introduction and conclusion sections.

Step 4: Determine article inclusion or exclusion based on a thorough full-text review.

Step 5: Using QA criteria, finalize the selection of primary studies for inclusion in the SLR.

A search string was initially developed, and 2205 papers were obtained from selected online databases. The primary study utilized a list of 31 articles gathered through the tollgate method. Following that, a quality assessment was conducted to determine the relevant papers. The list of selected primary studies is provided in Appendix A.

3.2.2 Data extraction and synthesis

The research questions for evaluating study quality were combined with inclusion and exclusion criteria to extract the papers. This involved using inclusion and exclusion criteria based on the title and abstract, followed by inclusion and exclusion criteria based on the introduction and conclusion. Finally, inclusion and exclusion criteria are based on the complete text, and the final phase involves utilizing quality assessment criteria to finish the selection of primary studies. Next, the authors categorized the preliminary studies into two themes: PMO related to the IT industry and PMO in non-IT industries to facilitate a comparative analysis of PMO performance in both sectors. The selected articles using a tollgate approach are shown in Table 4.

Table 4. Articles are chosen using a tollgate approach

No	Database	Step 1	Step 2	Step 3	Step 4	Step 5
1	ProQuest	436	207	39	13	10
2	Sage Journals	355	155	92	26	3
3	Science Direct	255	117	85	18	5
4	Springer Link	96	72	32	15	0
5	ACM Digital	47	36	24	18	1
6	IEEE Explore	6	5	4	3	3
7	Taylor & Francis	474	215	26	13	5
8	Emerald Insight	539	319	32	26	4
	Total	**2205**	**1322**	**334**	**132**	**31**

3.3 Phase 3: Reporting

In the final phase, the authors administer open and text analysis. Open coding, a qualitative data analysis technique commonly employed in grounded theory research, seeks to develop a complete set of concepts and categories that accurately reflect the data [39]. This approach is well-suited for SLR since it aids in discovering new ideas and patterns in the literature, acting as a foundation for subsequent analysis during the research process. This method can be helpful for SLR as it identifies new ideas and trends in literature, laying the framework for further research. The data will be coded and categorized based on the CVF domain and its subdomain [20] to analyze PMO performance within the organization. NVivo will be the open coding tool used in this research.

Text data descriptive analysis is used to aid further study, with a particular emphasis on identifying differences in PMO performance between firms in the IT and non-IT sectors. The research uses NVivo treemaps, which provide a visually appealing and simply interpretable depiction of coding themes [40]. These treemaps highlight the subfactors commonly referenced in the literature, providing significant insights into the elements driving PMO performance in the IT and non-IT sectors.

4. Result and Analysis

The study's includes research articles for comparing PMO performance in IT and non-IT sectors using the CVF. The final selection consists of 31 papers, comprising ten conference papers and 21 journal articles. These papers were subject to detailed analysis to address the research questions. The initial identification process for selected articles involved categorizing them based on article types and publication years. Subsequent steps aim to distinguish PMO studies in IT or non-IT sectors and streamline the classification process.

Objects of study are classified as "IT" when the research pertains to the IT sector or is associated with IT projects. Conversely, articles are labeled as "non-IT" if the investigation occurs in a general firm unrelated to the IT sector or IT

projects. The distribution of selected articles by year and type is depicted in Figure 3 and Figure 4. Figure 4 reveals that the pertinent journals for this inquiry encompass only the most recent decade.

Figure 3 indicates a notable portion of prior research concentrated on industries not related to IT. This observation underscores the extensive body of literature regarding the efficacy of PMOs in non-IT realms. Furthermore, Figure 4 delineates a fluctuating trend in scholarly articles spanning from 2013 to 2023. Although the number of articles initially surged, notably peaking in 2015, the trend has since oscillated in response to variations in publishing figures. This finding underscores the dynamic nature of research output within the specified timeframe.

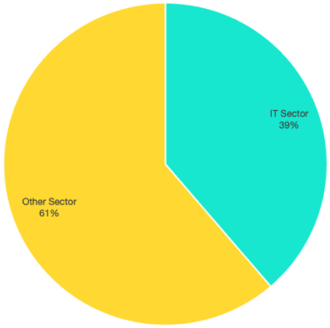

Fig. 3. Total articles by category IT and non-IT sector

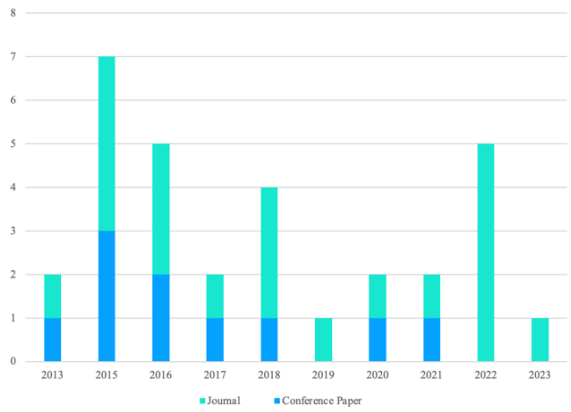

Fig. 4. Distribution of selected articles based on the year and article type

4.1 PMO performance in non-IT and IT sector with CVF

Our research successfully applied the CVF, encompassing four models: human resources conception, internal processes conception, rational goals, and open system. These models revealed various indicators within each one. In addition, the authors included an additional model, output quality, based on the work of Aubry & Hobbs [20]. However, it is unfortunate that our review did not identify any previous systematic reviews explicitly addressing the assessment by external entities in both IT and non-IT sectors, the link with internal entities in the IT sector, and readiness in non-IT sectors. This section presents a comprehensive discussion of the findings related to the factors within PMOs that influence organizational performance and addresses the research questions stated earlier. The mapping studies are shown in Table 5. To conduct this analysis, the authors utilized 17 criteria derived from the five models proposed by Aubry & Hobbs [20], [19]. The

discussion includes a comparative analysis of relevant studies, categorizing them into two groups: PMOs in general and PMOs in the IT industry. By employing this approach, the authors can provide valuable insights into the similarities and differences in the impact of PMOs on organizational performance across these two contexts. In the analysis of the results, it is evident that the most discussed article criteria center around training, information and communication management, control, productivity, planning, efficiency, and flexibility. These aspects take the forefront of discussions. Meanwhile, criteria such as stability in processes, output quality, and the value of human resources come in second place, as indicated by the number of articles addressing them.

As shown in Table 5, the study developed a comprehensive list of PMO performance criteria across enterprises, spanning both the IT and non-IT industries. A comparison between both sectors was conducted using NVivo tools to assist researchers in organizing and visualizing their findings. The references were analyzed to create a treemap, as depicted in Figure 5, illustrating the mapping of the findings.

Table 5. Mapping and categorizing studies into general PMO and IT-specific

Criteria	Freq.	Non-IT Sectors	IT Sectors
Human Resources [20]			
Value of human resources working on the project	10	[19], [31], [41], [42]	[8], [12], [17], [29], [30], [43]
Training and emphasis on development	18	[7], [13], [41], [42], [44], [45], [46], [47]	[8], [12], [17], [26], [27], [30], [48], [49], [50], [51]
Moral on project personal	2	[52]	[51]
Conflict resolution and search for cohesion	5	[13], [45], [52]	[8], [36]
Internal Processes [20]			
Information and communication management	22	[7], [13], [15], [25], [41], [42], [44], [45], [47], [53], [54]	[6], [8], [12], [17], [26], [27], [29], [30], [43], [48], [49]
Stability in processes	16	[7], [13], [15], [19], [25], [44], [45], [52], [53], [55]	[8], [12], [26], [27], [29], [43]
Control	17	[7], [13], [19], [41], [44], [45], [52], [55]	[6], [8], [17], [26], [27], [30], [43], [48], [50]
Rational Goals [20]			
Profit	5	[19], [25], [31], [53]	[17]
Productivity	17	[7], [19], [25], [32], [41], [44], [45], [47], [52], [53], [54]	[26], [27], [30], [43], [50], [51]
Planning goals to reach	17	[13], [15], [31], [32], [44], [46], [52], [54], [55]	[8], [12], [17], [26], [27], [30], [43], [56]
Efficiency	18	[7], [13], [25], [31], [32], [41], [42], [45], [46], [47], [53]	[6], [12], [17], [27], [43], [48], [49]
Open System [20]			
Growth	4	[15], [44], [55]	[8]
Flexibility/adaptation/innovation in project management	17	[13], [25], [32], [41], [45], [52], [54], [55]	[17], [26], [27], [29], [43], [48], [49], [50], [51]
Assessment by external entities	0	-	-
Links with the external environment	2	[15], [52]	-
Readiness	3	-	[30], [43], [51]
Output Quality [20]			
Output quality	14	[13], [15], [19], [42], [45], [54], [55]	[6], [8], [27], [30], [48], [49], [56]

Figure 5—NVivo treemap—reveals that the rational goal domain receives the most mentions in IT and non-IT sectors. Efficiency, productivity, planning goals, and profit emerge as essential subdomains, indicating that stakeholders prioritize these factors when assessing PMO performance. Specifically, 17 articles explore rational goals in non-IT sectors, while 13 delve into rational goals in IT sectors. The extensive research on this domain in both industries underscores its significance in shaping PMO performance strategies. Hence, acknowledging and enhancing rational goals are crucial for enhancing PMO performance across all enterprises.

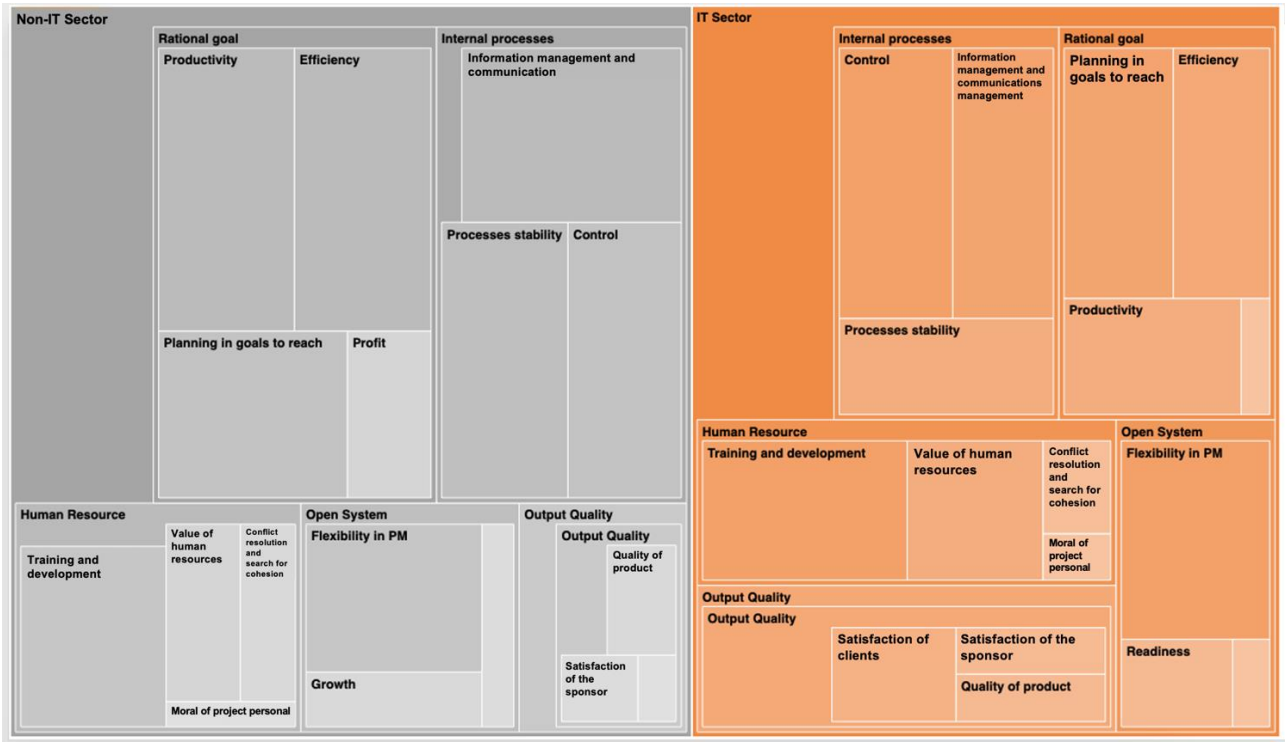

Fig. 5. Treemap of PMO performance in IT and non-IT sectors with CVF

4.1.1 The conceptualization of human resources

The value of human resources inside PMOs is underlined in the non-IT and IT industries, but the focus and emphasis differ. PMO members in the non-IT sector [19], [31], [41], [42] highlight the importance of human interactions and individual maturity for efficiency while managing workforce assets such as skills and availability. In contrast, the IT industry [8], [12], [17], [29], [30], [43] emphasizes the PMO's resource team, emphasizing the importance of their knowledge and competencies in producing value.

PMOs in non-IT and IT sectors acknowledge the importance of training and development, while their methodologies differ. PMOs prioritize human competency and support in the non-IT industry [7], [13], [41], [42], [44], [45], [46], [47], providing services such as personnel provision, training, and expert assistance for skill gaps, promoting knowledge transfer, and supporting career progression. The emphasis in the IT sector [8], [12], [17], [26], [27], [30], [48], [49], [50], [51] is on minimizing project durations and increasing efficiency through knowledge transfer. They focus on leadership development, long-term project manager training, increased PM-trained staff, and adapting efficient approaches, with digital technology playing a significant role in their operations.

Work climate difficulties in the PMO can impact morale and job satisfaction in the non-IT sector [52]. In contrast, the IT industry [51] has seen an increase in virtual teams, demanding advanced digital technologies to provide connectivity among team members and maintain productivity levels. Both sectors [8], [36], [52] emphasize the value of PMOs in conflict resolution and project management. PMO transformation addresses organizational and stakeholder disputes in the non-IT sector [13], [45], whereas PMO transitions minimize conflicts and enhance project management effectiveness.

4.1.2 Internal processes conception

Regarding information and communication management, both the non-IT and IT sectors recognize the value of PMOs in improving project management through standardized processes and reporting [7], [15], [26], [27], [41], [43], [49], [54]. They also stress the PMO's consolidation and management of project information for more outstanding communication and decision-making [8], [13], [17], [27], [30], [42], [44], [47], [53]. Furthermore, PMOs in all sectors attempt to learn from project successes and mistakes by providing written processes and recommendations for project teams to follow [13], [25], [29], [44], [45].

Regarding process stability, both the non-IT and IT sectors recognize the critical role of PMOs in standardizing procedures and enhancing project efficiency through good communication and information sharing [12], [26], [27], [29], [43], [52]. Nonetheless, in the non-IT industry [19], [44], [52], [55], PMOs are highlighted for their role in adjusting to cultural changes, leading organizational change by adopting best practices, and maintaining independence to address complicated project management difficulties. In contrast, the IT industry emphasizes the importance of PMO experiences in merging interface functions to improve collaboration [8].

There are some similarities and differences between the non-IT and IT sectors in the dimension of control. PMOs are valued in both industries [6], [7], [8], [13], [27], [30], [41], [45], [50], [55] for improving project success, organizational performance, and alignment with strategic goals. While the non-IT sector [19], [44], [52] emphasizes centralized project support, coordination, and stakeholder alignment, the IT sector [17], [26], [43], [48] emphasizes knowledge investment, adaptability to changing environments, and using PMO technologies to avoid software project management failures.

4.1.3 Rational goals

In the dimension of profit, both the non-IT and IT sectors recognize the significance of PMOs in improving project performance and promoting organizational alignment and transformation. PMO implementation in the non-IT sector [19], [25], [53] is associated with solid executive board support and considerable organizational changes. Meanwhile, the IT industry [17] emphasizes that establishing a PMO extends beyond better project management and is critical to organizational transformation and evolution.

In the productivity dimension, there are similarities and differences between the non-IT and IT sectors. Both sectors emphasize the relevance of PMOs in improving project delivery, maturity, and project management processes. While the non-IT industry [7], [32], [45], [47], [53], [54] emphasizes resource management and the strategic role of PMOs, the IT sector [26], [27], [43], [50], [51] focuses on aligning projects with business strategy, consulting, and resource support, as well as the direct impact of PMO establishment on streamlining project management and improving customer satisfaction.

In the dimension of planning goals to reach, both the non-IT and IT industries emphasize the value of PMOs in aligning projects with organizational or company objectives and the benefits of good PMO utilization. The non-IT sector [13], [15], [31], [32], [44], [52], [54], conversely, emphasizes pragmatic project planning, role adaptation, and strategic planning. In contrast, the IT sector [8], [12], [17], [26], [27], [43] emphasizes the competitive advantage achieved by aligning projects with business goals.

Regarding efficiency, both the non-IT and IT industries recognize the value of PMOs in improving project performance and efficiency. Their approaches and priorities, however, differ. The formation of PMOs for increased organizational efficiency is essential in the non-IT industry, emphasizing trust, practicality, and the role of scale in inefficiencies [7], [13], [25], [32], [41], [42], [45], [47], [53]. PMO success in the IT sector [6], [12], [43], [48], [49] is linked to efficient PMO methods, and PMO success depends on alignment with the organization's particular demands in diverse circumstances.

4.1.4 Open system

PMOs are viewed as growth accelerators in the non-IT sector [15], [44], [55], enabling agile project management and stimulating innovation. The IT sector [8] focuses on the difficulties and disagreements that develop inside a successful PMO around its growth and status.

Both industries emphasize the need for project management PMOs that balance standardization and customization. They recognize the need for adaptation in achieving project objectives. A successful PMO is crucial for Agile project management in the non-IT industry [25], [32], [41], [45], as it requires adaptive personnel for complex and small projects. It is assumed that implementing a PMO will improve project management through tools, auditing, standardization, and adaptability [13], [54]. PMOs in the IT sector [17], [26], [27], [29], [43], [49], [50], [51] assess, modify, and assist project processes while ensuring compliance using standardized methods, systems, and tools; nevertheless, a predictive approach is discouraged because it may slow down change management.

In the dimension of links with the external environment, In the non-IT sector [15], [52], PMO changes are driven by a complex combination of external influences, internal dynamics, and organizational politics, with a significant emphasis on stakeholder communication coordination. However, no information about this topic can be discovered in the IT sector. Also, there is no information on the research subject for the non-IT and IT industries regarding external entity assessment. The absence of information on external entity assessment in non-IT and IT industries could be attributable to various factors. The research may have concentrated on internal PMO performance rather than external reviews. Furthermore, it is possible that external entity assessment was not deemed critical in the industries under consideration.

Within the research subject, no information or conclusions are connected to readiness in the non-IT industry. PMOs are described in the IT sector [30], [43], [51] as responding to agile project management and focusing responsiveness to changing user needs as well as the dynamic business and project environment.

4.1.5 Output quality

There are similarities and differences between the non-IT and IT sectors regarding output quality. PMOs in the non-IT sector oversee maintaining quality, client interactions, contracts, and advising on company and supplier qualifications [15], [42], [45], [54]. They focus on standardizing processes, optimizing resources, and improving project quality to meet customer expectations [13], [19], [55]. The primary purpose of IT PMOs in the IT sector is to deliver client demands efficiently [48], [56]. Furthermore, project performance is inextricably linked to sponsor and team satisfaction, influencing management satisfaction. Notably, customer satisfaction is critical in determining project success and the structure of PMOs in the IT sector [6], [8], [27], [30], [49]. Customer satisfaction directly influences project success by meeting customer expectations, ensuring timely delivery, and staying within budget. Effective project management relies on a well-structured PMO, providing support, guidance, and resources for project teams to overcome challenges and achieve successful outcomes. The goal thus remains to optimize performance metrics like project delivery time, budget adherence, and deliverable quality. Consequently, organizations strive to cultivate high levels of customer satisfaction.

Table 6 depicts a comprehensive overview of PMO performance in various organizations, covering IT and non-IT sectors. Researchers used NVivo technologies to compare these sectors, which helped organize and visualize the results. The table summarizes the impact of PMOs in both IT and non-IT sectors.

Table 6. Summary of the impact of PMO on IT and non-IT Sector

Criteria	Non-IT Sectors	IT Sectors
Human Resources [20]		
Value of human resources working on the project	▪ PMO members emphasize the importance of human relations and individual maturity for efficiency [19]. ▪ Workforce assets, including skills and availability, significantly affect PMO efficiency, and PMO is responsible for managing these human resources [31], [41], [42].	▪ PMO's resource team is crucial for delivering value through their expertise and capabilities [8], [12], [17], [29], [30], [43].
Training and emphasis on development	▪ The PMO, emphasizing human competence and support, offers people-oriented services like staff provision, training, and expert assistance for team members with qualifications gaps [7], [13], [44], [45]. ▪ The PMO's mediation role is vital in adapting knowledge management infrastructure and processes for effective knowledge transfer [46], [47]. ▪ The PMO supports career growth and provides mentorship for implementing best project management practices from the program governance model [41], [42].	▪ Knowledge transfer among projects reduces individual project durations and total batch durations [48]. ▪ The PMO concentrates on enhancing leadership, long-term training for project managers, increasing employees with PM training, and adapting methodologies for efficiency and knowledge sharing [8], [12], [17], [26], [27], [30], [49], [50]. ▪ Digital technology plays a significant role in PMO operations [51].
Moral on project personal	▪ Work climate issues in the PMO and project-based management can harm morale and job satisfaction [52].	▪ The rise in virtual teams has created a great demand for digital technologies to link team members and allow them to stay productive [51].
Conflict resolution and search for cohesion	▪ PMO transformation resolves organizational and stakeholder conflicts, enhancing project management. It handles multi-project selection, resource allocation, coordination, and conflict resolution [13], [45], [52].	▪ PMO transitions play a role in mitigating conflicts and tensions within the organization, leading to enhanced project management performance [8], [36].
Internal Processes [20]		
Information and communication management	▪ PMOs support project managers with planning, recovery, and reporting [13], [25], [45]. ▪ They enhance project management maturity and decision-making through knowledge sharing [13], [42], [44], [47], [53]. ▪ The PMO ensures accurate project information availability through standardized reporting systems, aiding decision-making and communication across projects [7], [15], [41], [54].	▪ PMO standardizes processes and reporting for consistency, including the use of execution reports, joint meetings, one-page status reports, and earned value analysis [26], [27], [43], [49]. ▪ PMO centralizes and manages project information, facilitating communication and offering added value through data integration and administrative relief [8], [17], [27], [30]. ▪ A PMO improves project management by learning from successes and failures and providing documented processes and guidelines for project teams [29].
Stability in processes	▪ PMO should adapt to cultural changes, focus on effective processes, and lead organizational change by adopting best practices [19], [44], [52]. ▪ PMO governance can remain independent, oversee the project portfolio, and address project management complexities [44], [55]. ▪ The PMO oversees multi-project assessment, resource allocation, conflict resolution, and standardization for efficient project management and goal achievement [7], [13], [15], [25], [45], [53].	▪ PMO contributes to project success by standardizing processes, sharing valuable knowledge, and facilitating decision-making through effective communication [12], [26], [27], [29], [43]. ▪ The PMO's previous experiences influenced the integration of interfacing functions to enhance collaboration [8].
Control	▪ Focus on improving organizational performance through centralized project support and control,	▪ Adapting to changing environments requires knowledge investment and utilization [48].

Criteria	Non-IT Sectors	IT Sectors
	primarily in project performance monitoring and control [19], [44], [52]. ▪ The PMO's role involves coordinating, supporting, and controlling projects within a network of collaborating firms, identifying areas of cooperation, and defining project structures, roles, responsibilities, and stakeholders to align project managers in the organization [7], [13], [41], [45], [55].	▪ PMOs primarily aim to align project management with strategic goals to improve efficiency and project success, focusing on core success criteria like cost, content, and schedule [6], [8], [27], [30], [50]. ▪ Implementing PMO tools and processes to prevent software project management failures should be required for specific risk categories across all projects [17], [26], [43].
Rational Goals [20]		
Profit	▪ The PMO was created to improve project performance and align with the organization's rational goals with strong executive board support [19], [25], [53]. ▪ The introduction of the PMO brought significant organizational changes, including a specific project management methodology and governance [31].	▪ Establishing a PMO improves project management techniques and encourages organizational transformation and evolution [17].
Productivity	▪ PMO performance aims to enhance project delivery and maturity [19], [25], [32], [44], [52]. ▪ PMOs consolidate project management, improve processes, support teams, manage resources, and increase knowledge transfer to improve project planning and definition [32], [45], [47], [54]. ▪ PMO's strategic importance is acknowledged in improving project management, especially in the public sector [7], [41], [53].	▪ PMO is essential for aligning projects with business strategy and resource management and providing consulting and external resource support for complex projects [26], [27], [43], [50], [51]. ▪ Establishing a PMO in three cases likely streamlines project management, optimizes resources, and improves customer satisfaction [27], [50].
Planning goals to reach	▪ Effective PMO change influences pragmatic project planning for the future [31], [52], [54]. ▪ PMOs adapt roles, assess capabilities, and facilitate strategic planning [13], [15], [32], [44], [54]. ▪ The PMO uses knowledge strategies but mainly focuses on planning and reporting despite the benefits of project management methodology [46], [54].	▪ The PMO aligns projects with business goals for a competitive edge [8], [12], [17], [26], [27], [43]. ▪ Effective PMO utilization enhances satisfaction and the likelihood of achieving realistic business case benefits [30], [56].
Efficiency	▪ The establishment of a PMO facilitates improved project performance, resulting in enhanced corporate efficiency, increased project success, and higher fundraising stability [7], [13], [25], [32], [41], [42], [45], [47], [53]. ▪ The PMO should prioritize trust and practicality for efficiency and recognize that inefficiencies are mainly due to scale, not technical factors [31], [46].	▪ Efficient PMO practices connected to program success are valuable when the PMO, management, and execution teams define and evaluate success criteria [6], [12], [43], [48], [49]. ▪ PMO success relies on aligning functions with the organization's unique needs in diverse contexts [17], [27].
Open System [20]		
Growth	▪ PMOs drive growth, shift to agile project management, and foster innovation [15], [44], [55].	▪ A successful PMO faces tensions and disputes over its growth and status [8].
Flexibility/adaptation/ innovation in project management	▪ PMOs prioritize standardization and adaptability balance [52], [55]. ▪ A successful PMO is crucial for Agile project management, requiring flexible staff and adaptability for complex and more straightforward projects [13], [54]. ▪ Implementing a PMO enhances project management with tools, auditing, standardization, and adaptability [25], [32], [41], [45].	▪ In a PMO, programs require adaptability to achieve objectives, while a predictive approach can slow down change management [17], [48], [51]. ▪ The PMO evaluates, adopts, and supports project practices, gaining authority and ensuring compliance through standardized methods, systems, and tools [26], [27], [29], [43], [49], [50].
Assessment by external entities	-	-

Criteria	Non-IT Sectors	IT Sectors
Links with the external environment	▪ PMO change is influenced by external factors, internal dynamics, and organizational politics, particularly in stakeholder communication coordination [15], [52].	-
Readiness	-	▪ PMOs adapt to agile project management and prioritize responsiveness to changing user needs and the dynamic business and project environment [30], [43], [51].
Output Quality [20]		
Output quality	▪ PMOs manage quality, client interactions, and contracts and advise on business and supplier qualifications [15], [42], [45], [54]. ▪ PMOs standardize processes, optimize resources, and enhance project quality to meet client expectations [13], [19], [55].	▪ IT PMOs prioritize delivering customer requests efficiently [48], [56]. ▪ Project success depends on sponsor and team satisfaction, which impacts management satisfaction, while customer satisfaction affects project performance and PMO structure [6], [8], [27], [30], [49].

4.2 Comparing PMO performance in IT and non-IT sectors

PMOs are considered valuable in IT and non-IT sectors, albeit with differing emphases. In non-IT sectors, PMOs prioritize human relationships, maturity, and workforce management [19], [41], [42], while IT sectors emphasize the knowledge and competencies of PMO resource teams [8], [29]. Training in non-IT sectors focuses on competency and assistance [37], [45], while IT training prioritizes efficiency through knowledge transfer and technology [5], [27], [48]. Workplace climate issues are addressed in non-IT but not in IT.

Both sectors stress PMOs' roles in dispute resolution and project management with distinct approaches. Regarding internal processes, both recognize PMOs' value in improving project management, standardized processes, and learning from past experiences [25], [43], [54]. Non-IT sectors emphasize agility and independence [13], [55], while IT sectors prioritize collaboration through PMO experiences [8]. Regarding project success and performance improvement, both sectors value PMOs, with non-IT focusing on centralized support [41] and the IT sector emphasizing technological measures to prevent project management failures [26].

PMOs ensure quality and maximize project performance in both sectors [42], [55]. Non-IT PMOs advise on corporate and supplier qualifications and standardized processes [13], [19]. In contrast, IT PMOs prioritize efficient client demand delivery and emphasize the interconnection between project success, satisfaction, and PMO structure [30], [56].

To summarize, while there are differences in emphasis and approach between the IT and non-IT sectors regarding PMO roles and functions, it is clear that PMOs play an essential and valuable role in both. Although human interactions and workforce management are more important in non-IT sectors than knowledge and abilities in IT sectors, PMOs are critical for project success, performance improvement, and quality assurance in both domains. Its engagement in conflict resolution, project management, and internal processes emphasizes its significance across industries. Thus, it is possible to conclude that PMOs have a similar impact on the IT and non-IT sectors but with subtle modifications customized to each sector's needs and priorities.

4.3 Implications

The implications of this research are significant both practically and theoretically. Practically, the findings provide more essential insights into the role of PMOs in both the IT and non-IT sectors, assisting firms in optimizing PMO services based on the unique needs of each industry. For example, understanding that PMOs in non-IT sectors concentrate on human interactions and workforce management can help firms build PMO strategies that emphasize these areas. Recognizing that PMOs in the IT sector prioritize knowledge and competency of PMO resource teams can help IT firms direct their training and human resource development activities.

Theoretically, this research contributes valuable insights into understanding the role and function of PMOs in IT and non-IT sectors. The implication is that models such as the Aubry & Hobbs model can be applied and further developed to depict the dynamics of PMOs in both industries. Thus, this research not only provides practical insights for practitioners but also has the potential to enrich academic literature on project management and the role of PMOs in different industry contexts.

4.4 Limitations

This study contains limitations due to a lack of complete evaluation of variances in PMO terminology, classification, and assessment methodologies, which may alter knowledge of how PMOs contribute to organizational performance. Understanding that these differences may impact the interpretation of findings and the evaluation of PMO success in delivering positive organizational outcomes is critical. These limitations also allow future research to provide a more holistic perspective on the relationship between PMO success and organizational performance, considering the complexities and varied opinions on PMO assessment and terminology.

5. Conclusion

This study explores the PMO's role in enhancing organizational performance within IT and non-IT sectors. It seeks to gain insights into how project management influences overall organizational performance through the Competing Values Framework. SLR was conducted using 31 articles published between 2013 and 2023. The study identified 32 conditions in the non-IT sector and 26 conditions in the IT sector, linked to 17 factors within the four domains of the CVF. In conclusion, PMOs are helpful in both the IT and non-IT industries, stressing conflict resolution and successful project management in various ways. Standardized practices and experience-based learning improve internal processes. Both industries emphasize the importance of project management offices in attaining project success and improving performance, as well as their role in maintaining quality standards and maximizing project performance.

To address the research question comparing PMO performance in IT and non-IT sectors, this study unveils that non-IT sectors prioritize human relationships, competency-focused training, workplace climate, agility, independence, centralized support, and standardized processes. Conversely, IT industries concentrate on the expertise and capabilities of PMO resource teams, efficient training, technology utilization, and collaborative endeavors to accomplish project success. They also stress the critical role of technology in averting project management failures and prioritizing the efficient delivery of client requests while recognizing the interconnectedness of project success, satisfaction, and PMO structure. These disparities underscore the differing priorities in PMO functions between the two sectors.

PMOs contribute substantial value in IT and non-IT sectors, albeit with distinct emphases. Non-IT sectors prioritize human interactions, competency-focused training, workplace ambiance, agility, and centralized support. In contrast, IT sectors highlight PMO resource team knowledge, efficient training, technology usage, and collaborative efforts for project success. Despite these discrepancies, PMOs play a crucial role in project success, performance enhancement, and quality assurance across both domains.

Finally, a comparison of PMO performance in IT and non-IT sectors reveals varying priorities and strategies. Non-IT industries emphasize human-centric elements and centralized support, while IT sectors prioritize PMO resource team capabilities, technology use, and collaborative activities. These differences hence underscore the customization of PMO responsibilities to meet each sector's specific needs and priorities, highlighting PMOs' adaptability and versatility in driving project success and organizational efficiency—*an impactful approach for organizational performance.*

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Appendix A. Research and quality assessment score

No.	Paper Title	Year	QA1	QA2	QA3	QA4	QA5	QA6	Total Score
1.	A Performance Evaluation Model for Project Management Office based on a Multicriteria Approach	2016	1	1	1	1	1	1	6
2.	Project Management Office Transformations: Direct and Moderating Effects That Enhance Performance and Maturity	2015	1	1	1	1	1	1	6
3.	Configurations for Interorganizational Project Networks: The Interplay of the PMO and Network Administrative Organization	2018	1	1	0.5	0.5	0.5	0	3.5
4.	Modeling the Capabilities of High-Performing Project Management Offices in General Contracting Companies	2023	1	0.5	1	1	1	1	5.5
5.	Exploring the Project Management Office (PMO) – Role, Structure and Processes	2016	0.5	1	1	0.5	1	0	4
6.	Linkages Among Project Management Maturity, PMO, and Project Success	2023	1	0.5	1	1	1	0	4.5
7.	PMO as a key ingredient of public sector projects' success – position paper	2015	0.5	0.5	1	0.5	1	0	3.5
8.	Prioritizing Multi-Interwoven Factors in the Project Management Office Using Delphi and Fuzzy DEMATEL	2022	1	1	1	1	1	0.5	5.5

No.	Paper Title	Year	QA1	QA2	QA3	QA4	QA5	QA6	Total Score
9.	Project management office in non-governmental organizations: an ex post facto study	2018	0.5	1	0.5	0.5	1	0.5	4
10.	Project Offices and The Federal Universities: A Study on Project Management in the Context of Higher Education Institution	2017	0.5	0.5	1	0.5	1	0	3.5
11.	The Effect of a Project Management Office on Project and Organizational Performance: A Case Study	2016	1	1	1	0.5	1	0	4.5
12.	The Effects of Maturity of Project Portfolio Management and Business Alignment on PMO Efficiency	2019	1	1	1	1	1	1	6
13.	The mediation role of the PMO in the transfer of knowledge between projects – a case study of five PMOs	2021	1	1	1	0.5	1	0.5	5
14.	The Project Management Office: it's just not what it used to be	2015	1	1	1	1	1	0.5	5.5
15.	The Role Played by PMOs in the Transfer of Knowledge Between Projects: A Conceptual Framework	2018	0.5	1	1	0.5	1	1	5
16.	The roles of a Programme and Project Management Office to support collaborative university–industry R&D	2020	1	1	1	0.5	1	0	4.5
17.	Using the project management office to connect the dots between projects and strategy	2015	0.5	0.5	1	0.5	1	0.5	4
18.	Batch-based agile program management approach for coordinating IT multi-project concurrent development	2021	1	0.5	1	1	1	0	4.5
19.	Critical Success Factors for Project Management Office: An Insight from Indonesia	2018	1	1	1	1	0.5	0.5	5
20.	Digital project management: rapid changes define new working environments	2022	0.5	0.5	1	0.5	1	0	3.5
21.	Efficiency Analysis of Project Management Offices for Large-scale Information System Projects: Insights for Construction Megaprojects	2015	0.5	1	1	1	1	1	5.5
22.	Evaluation of Information Systems Project Success – Insights from Practitioners	2022	1	1	1	1	1	1	6
23.	How to reduce risk effectively in fixed price software development	2020	1	0.5	1	1	1	0	4.5
24.	PMO Conceptualization for Engineering and Construction Businesses	2017	0.5	1	0.5	0.5	1	0	3.5
25.	Project Management Office Models – a review	2016	1	1	1	1	1	0	5
26.	Strategic Alignment and Project Management Offices: Case Studies from Successful Implementations in Turkey	2013	1	0.5	0.5	0.5	1	0	3.5
27.	The Contribution of the Project Management Office: A Balanced Scorecard Perspective	2015	1	0.5	1	0.5	1	1	5
28.	The Project Office as Project Management Support in Complex Environments	2015	1	1	1	0.5	0.5	0	4
29.	The role of project management offices (PMOs) in IS project success and management satisfaction	2013	1	1	1	0.5	1	1	5.5
30.	The role of the PMO in enforcing and standardizing attendance to the needs of software project teams by project managers	2021	0.5	1	0.5	0.5	0.5	0.5	3.5
31.	Transitions in Project Management Offices: A Framework Relating Functions, Success Factors and Project Performance in a High-Technology Company	2022	1	0.5	1	1	0.5	1	5

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