ISSN 2228-9860 eISSN 1906-9642 CODEN: ITJEA8

International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies

http://TuEngr.com

The Effect of Project Management Office on the Organizational Performance: A Case Study of Saudi Arabia

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Paper ID: 12A8T

Volume 12 Issue 8

Received 08 April 2021
Received in revised form 07 June 2021
Accepted 18 June 2021
Available online 21 June 2021

Keywords:
Program management office (PMO); Vision realization office; Multi-Project Management; Public sector; Maturity level; PMO maturity; PMO framework.

Abstract

Project Management Offices (PMOs) have been adopted worldwide by many companies and government agencies to cope with the accelerated pace of change in all industries and fields. In Saudi Arabia, PMOs have gained much momentum recently, especially in the public sector. Many offices were established in all types of governmental authorities to manage and support the implementation of Vision 2030 programs. However, the specific roles of PMOs and their added value to organizations are still vague. This study develops a framework for identifying PMOs' functions, maturity levels, and effect on the public sector organizations of Saudi Arabia. A questionnaire was used to solicit responses from 29 PMOs around the country. Findings revealed that PMOs have an overall moderate maturity of the provided services. Their focus is to control & monitor project performance, develop project management methodologies & competencies, and support strategic management. Thereby, PMOs were able to affect organizations positively and create values. The results showed that the overall effect is moderate on many aspects of the organization, mainly on strategic management and project management. Also, PMOs contribute to improving multi-project management, organizational learning, and culture change.

Disciplinary: Industrial Engineering, Project Management.

Cite This Article:

Albaiti, A. H., and Alsulami, H. E. (2021). The effect of Project Management Office on the Organizational Performance: A Case Study of Saudi Arabia. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 12(8), 12A8T, 1-16. http://TUENGR.COM/V12/12A8T.pdf DOI: 10.14456/ITJEMAST.2021.167

1 Introduction

In Saudi Arabia, many changes have taken place recently. The accelerated pace of change in the kingdom is driven by an ambitious strategy by the government, which is Vision 2030. The Vision aims for Saudi Arabia to become the heart of the Arab and Islamic worlds, an investment powerhouse, and the hub connecting three continents. It has many transformative programs and initiatives, and for these programs and initiatives to be accomplished correctly, many Project Management Offices (PMOs) have been established. Therefore, PMOs have gained much momentum in recent times. However, the work that has been done to study PMOs, their functions, and added value on the organizations is little.

Before going to specifics, it is essential to shedding light on some basic concepts of projects, program & portfolio management to pave the way for a better understanding of PMOs. Thus, it is worthy to start with the project.

According to the Project Management Institute (PMI), a project is defined as the following: "a temporary endeavor undertaken to create a unique product, service or result". Then, a set of interrelated projects with similar goals or objectives is known as a program. The program definition is "a group of related projects, subsidiary programs, and program activities that are managed in a coordinated manner to obtain benefits not available from managing them individually". Afterward comes the portfolio, which is a broader term that can include a set of programs; it is defined as "a collection of projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives" (PMI, 2017, p. 13).

Project Office (PO) was the start of the PMOs evolution. PO was responsible for managing one project or a program, usually government-funded projects (1950-1990). Then, the roles of PMOs kept changing as the needs in the industry changed (Linde & Steyn, 2016).

Currently, organizations have various PMO functions and responsibilities, and this variation has made it challenging to have a standard definition for the term PMO. For instance, the definition of the PMO varies between the fourth (PMI, 2008) and fifth (PMI, 2013) editions of the PMI PMBOK Guide. The former one stated that the role of PMO is variable and could range from providing support to managing projects directly. In contrast, the later one underlined standardization and sharing resources, methodologies, tools, and techniques. The reason behind the differences is that PMOs are established to solve certain issues or fill specific gaps; consequently, every organization has its own needs. In PMI (2017), the definition remained the same as the previous version describing PMO as "an organizational structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools, and techniques". In addition to stating that the responsibilities can range from supporting to direct management.

According to Pinto et al. (2010, p. 3), many opinions describe PMO differently, but they have agreed that a PMO "is an area in which certain functions (also called services) relating to project management are centered, and its objective is to help the organization achieve better results through projects". PMO definitions are still generic and do not clearly define PMOs'

responsibilities, making it difficult to standardize PMO roles. The several differences between PMOs have made measuring the impact of PMOs a challenge. For instance, Unger et al. (2012) acknowledged that measuring the impact of PMO roles is unclear.

Nevertheless, several studies were made to quantify the impact and show the added value. These studies showed that PMO has added value in several ways other than a direct financial benefit. Unger et al. (2012) have introduced a method to determine the added value by identifying the relationship between each PMO role and its associated value created. He revealed that resource allocation, commitment, project performance, and alignment were improved, as well as the quality of the information provided to top management, which has contributed to better decision-making. Hurt and Thomas (2009) showed that PMO could add value to the financial performance by increasing efficiency and enhancing revenue streams, leading to a better financial position. Other benefits are identified, such as improving competitiveness, attaining strategic objectives, strategic alignment, improved general use of resources, and improved project decision-making.

This study sheds light on the PMOs of the public sector of Saudi Arabia, understanding their current practices and their effect on organizations. Therefore, the main objectives of the study are

- Identifying functions/services of PMOs in the public sector of Saudi Arabia,
- Examining maturity levels of PMOs in the public sector of Saudi Arabia,
- Investigating the added value of PMOs in the public sector of Saudi Arabia,
- Building a relationship model to examine how PMOs can affect organizations and add value.

2 Literature Review

2.1 PMO Functions

Many authors have explored PMO services (Dai, 2002; Hill, 2004; Hobbs & Aubrey, 2007; P3O, 2013). Even though these PMOs are different in terms of the provided services, their purpose is similar, which is helping the organizations to achieve better results (Pinto et al., 2010).

Dai (2002) identified six primary PMO functions:

- Developing and maintaining PM standards and methods.
- Developing and maintaining project historical archives.
- Providing project administrative support.
- Providing human resources/staffing assistance.
- Providing PM consulting and mentoring.
- Providing or arranging PM training.

Hill (2004) identified 20 PMO functions and grouped them into practice management, infrastructure management, resource integration, technical support, business alignment.

Hobbs & Aubrey's (2007) study for more than 500 PMO professionals has identified the most common PMO functions. They used factorial analysis to group the functions into five main groups:

- Group 1: Monitoring and Controlling Project Performance.
- Group 2: Development of Project Management Competencies and Methodologies.
- Group 3: Multi-Project Management.
- Group 4: Strategic Management.
- Group 5: Organizational Learning.

Another interesting list of services for PMOs is provided by the P3O (Portfolio, Programme & Project Offices) guide in its second edition (2013), which has identified 22 PMO functions distributed under three functional groups (Planning, Delivery & Centre of Excellence).

2.2 PMO Maturity Levels

The Cambridge Dictionary defines the term as "a very advanced or developed form or state". When this concept is applied to project management, it is known as Organizational Project Management Maturity (OPMM), referring to the progressive improvement of project, program, and portfolio management practices throughout the organization. Many institutions and authors have tackled this topic and have developed various assessment models for organizational project management maturity. However, these models are not effective for PMOs, since PMO maturity and organizational maturity are two different things. Many of these models consider the existence of a PMO as a maturity sign. The different types of PMOs have made it challenging to identify a unified method to assess PMO maturity. The reason behind the differences is PMOs flexibility and ability to satisfy different needs & expectations, which is critical for their success. (PMO Value Ring, 2017).

Several authors have tried to develop maturity assessment tools considering the differences between PMOs. Ferreira (2019) summarized all maturity assessments for organizations and PMOs. Table 1 shows the two most recognized PMO maturity assessment tools.

Table 1: Comparison Between Various Maturity Models.

Maturity Model	Developed by	Description	Levels of Maturity
PMO Maturity Cube	Pinto et al. (2010)	PMO maturity assessment tool that allows PMOs to self-evaluate maturity in any type of organization. The methodology has three levels of sophistication (maturity). It helps identify the "current level of PMO maturity in each service provided for that particular scope and the target level of maturity for the PMO that is being analyzed" (Pinto et al., 2010)	1) Basic 2) Intermediate 3) Advanced
P3M3	P3O (2013)	"The Portfolio, Programme & Project Management Maturity Model (P3M3) can be used as the basis for improving portfolio, program and project management processes" P30 (2013)	1) Initial Process 2) Repeatable Process 3) Defined Process 4) Managed Process 5) Optimized Process

2.3 PMO Added Values

Boles & Hubbard (2012) have recognized that PMOs add value by leading the improvement, expansion, and implementation of project management practices throughout the enterprise. Moreover, Boles & Hubbard (2015) identified more than twenty-eight key benefits & values of PMOs to the organizations, such as: advancing the enterprise's project management maturity, improving business results from completed projects, accomplished business objectives, and advancing its talent capability.

Pinto (2013) has developed a new approach from which PMO functions can be determined & established according to the desirable benefits. 30 potential PMO benefits were captured through a survey with PMO clients in various organizations & industries. The list included: better availability of resources with skills in project management, better communication among the organization, and better project time and project cost control.

Santos and Varajão (2015) investigated the advantages of implementing PMO; the outcome included an increased percentage of project success, enhanced transparency & enhanced quality output.

3 Methodology

3.1 Research Design, Method, and Data Type Collected

This research is descriptive, explanatory, and quantitative. This research aims to find out more and explore PMOs in the public sector of Saudi Arabia and discover their types, services, and their added value to organizations. Additionally, exploring how certain PMOs' functions can affect the result of the added value. In terms of the nature of information, this research will use a quantitative tool to gather the information through a structured survey. Also, other statistical tools will be used to analyze the data statistically: descriptive analysis and correlation analysis.

3.2 Conceptual Framework

The literature review is the primary source of information used to develop the research methodology and the conceptual framework. The conceptual model is developed to support achieving the research goals. The framework guides the thinking process of this study. Also, it identifies the factors involved in this research, which is measured through a questionnaire.

Therefore, the development process of the framework went through five main steps:

1. Exploring PMOs Value Creation Process /Model.
2. Identifying PMO Mix of functions and the associated maturity levels.
3. Identifying PMO added value to organizations and their level of impact.
4. Develop the assessment tool.
5. Analyze the data to identify the relationship between PMO maturity levels and the created values to organizations.

The first step is to understand how PMOs can add value to organizations? The process or the model that the PMOs can follow to generate value. Van der Linde & Steyn (2016) have identified a model to measure the impact of PMOs on organizational performance. However, the model did not factor - in the maturity level of the provided services by PMOs. The maturity levels significantly affect the value generated from each service (PMO Value Ring, 2017). Therefore, functions/ services maturity was added to the model that was established by Linde & Steyn (2016), see Figure 1.

Figure 1 shows the framework used to achieve the research objectives, which are: identifying PMO functions, their impact on organizations, and the link between them. Therefore, to identify the functions of the public sector PMOs in Saudi Arabia, a more comprehensive view of the most common services/function worldwide has to be explored. Therefore, 26 services were identified according to Hobbs & Aubrey's (2007) study that included more than 500 PMOs from all over the world. These services represent the most common services of PMOs globally.

The Value Ring Methodology (2017) has developed a maturity model for each one of these services. The maturity assessment takes into account considerations such as authority, process, standardization, tools, technology, integration & knowledge transfer. This maturity model evolved,

started as PMO maturity cube (Pinto et al., 2010), and it was enhanced in the PMO Value Ring Methodology (2017) to be more comprehensive.

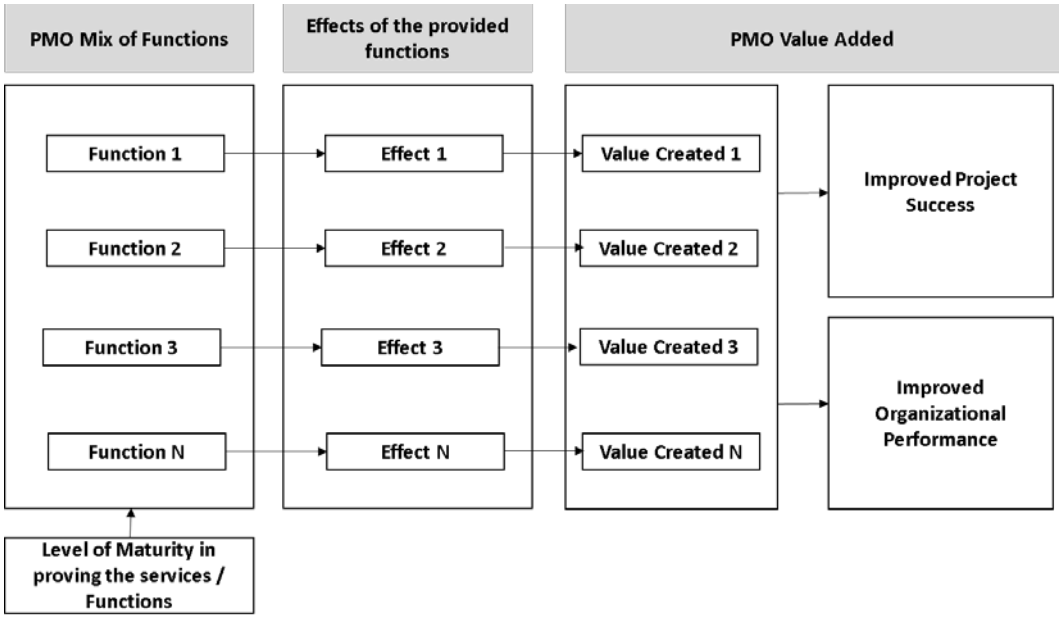

Figure 1: The Effect of PMO on Project and Organizational Performance.

These services were grouped according to functionality, based on Hobbs & Aubrey's (2007) functional groups that were determined using the factorial analysis. Grouping the services that support the same function will provide a clearer picture of the functions and indicate the public sector's functional gaps. Also, increase the reliability of the maturity scores for each function. Thus, the list of the targeted services was reduced to 19 based on services' functionality and importance. Each function is covered by at least three services, as Table 1.

PMOs' efforts to create value for organizations are covered in the previous section, including the services, functional groups, and the associated maturity level. Consequently, after providing all these services, specific values or benefits are expected to be generated in exchange. The following few paragraphs will cover PMOs values and benefits to organizations.

Many articles and researches have studies PMOs added values (Bolles & Hubbard, 2015; Pinto, 2013; Santos and Varajão, 2015), mentioning over 70 PMO added values. These values were analyzed and combined. The final list includes 16 added value items of the PMOs in general. These items were grouped under five main categories in terms of their contributions to:

- Project management.
- Multi-Project management.
- Strategy and performance.
- Organizational learning in project management.
- Cultural changes.

Table 1: PMO Functional Groups and Services.

#	Functional Group	Code	PMO Services
1	Monitoring and Controlling Project Performance (CM)	CM1	Provide project or program performance/status reports to upper management
2		CM2	Provide strategic dashboard consolidating the status information and realization of benefits of the projects/programs
3		CM3	Provide technological tools and an integrated information system for project management
4		CM4	Monitor and control the performance of the projects
5	Development of Project Management Competencies and Methodologies (CT)	CT1	Promote project management within the organization
6		CT2	Provide project management methodology/framework for the projects
7		CT3	Provide training and other initiatives to enhance project management competencies & skills
8	Multi-Project Management (MP)	MP1	Monitor & control portfolio performance
9		MP2	Manage resource allocation between projects
10		MP3	Support project portfolio definition (identify, select, evaluate & prioritize projects)
11	Strategic Management (SM)	SM1	Manage projects and programs benefits realization
12		SM2	Participate in the strategic planning processes
13		SM3	Provide advice to upper management to support executive decision-making
14	Organizational Learning (OL)	OL1	Manage central database to record the lessons learned in projects
15		OL2	Conducts audits on projects to verify the use of established standards
16		OL3	Manage the documentation generated by the projects
17	Others (OR)	OR1	Directly manage projects or programs
18		OR2	Support or manage the organizational change process related to projects.
19		OR3	Perform technical/specialized tasks to the project manager

Table 2 demonstrates all sixteen potential added values under the five main categories. PMOs play an essential role in changing and affect organizational performance through improving these areas.

Table 2: PMO Created Values.

#	Benefits Groups	Code	PMO Created Values
1	Project Management (PMB)	PMB 1	Definition of roles and responsibilities in projects
2		PMB 2	Visibility & control of project progress
3		PMB 3	Proactive project risks/issues management
4		PMB 4	Project Management success (Deliver project on time, within scope. within budget & according to the required quality)
5	Multi-Project Management (MPB)	MPB 1	Projects' resource management (Allocation, control, motivation & commitment)
6		MPB 2	Visibility & coordination of the relationship among projects
7		MPB 3	Better evaluation, prioritization & selection of projects
8	Strategy Management & performance (SMB)	SMB 1	Strategic alignment (between projects & organizational strategy)
9		SMB 2	Improved business results from completed projects and accomplished business objectives.
10		SMB 3	Ability & confidence to achieve strategic objectives
11	Organizational Learning (OLB)	OLB 1	Knowledge transfer in Project Management
12		OLB 2	Enterprise's talent capability in Project Management
13		OLB 3	Organizational project management maturity
14	Cultural Changes (CCB)	CCB 1	Information availability & transparency within the organization
15		CCB 2	The tendency to change and innovation within the organization
16		CCB 3	Communication, collaboration & integration among departments/units

After identifying PMO Functional groups and benefits groups, the conceptual framework is modified (Figure 2) to identify the relationship among them. This step helps to understand the

current practices and their impact on organizations. Also, to build a model that can be used to establish or refresh PMOs mix of functions according to the desired effect or benefits.

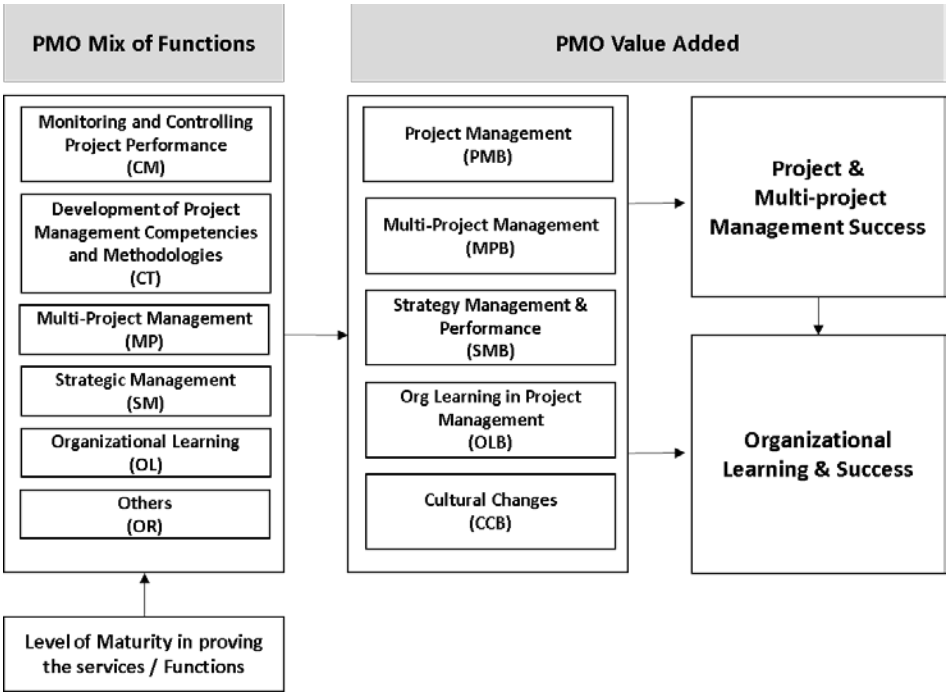

Figure 2: Conceptual Framework.

The assessment tool is a questionnaire comprises of three parts: general information, functions maturity assessment, and the effect & value assessment. The first part is the sample and the public PMOs, such as the number of employees in the PMOs. The second part is the functions maturity assessment to identify the provided services and their associated maturity levels. The third part is the PMO effect on specific areas of the organization.

For part two, 19 questions are designed to explore the maturity level of each service through a 5-point Likert scale (0-4). The various levels in the scale determine to which extent an organization is sophisticated in performing the services. The maturity levels were derived from the PMO Value Ring Methodology (2017) maturity assessment. After calculating services' maturity levels, the functional and overall maturity levels are the services' aggregate results.

For part three, 16 questions were designed to examine the level of PMO effect on specific areas. Each PMO benefit has a 5-point Likert scale (0-4), as shown in Table 3. Then the benefit group results are calculated as the aggregate results of the benefits under each group.

Table 3: PMO Effect Levels on Organizations.

Scale	PMO Effect
0	No Improvement
1	Slightly Improved
2	Moderately Improved
3	Mostly Improved
4	Extremely improved

The last step of this research is to analyze the data through descriptive analysis techniques and identify the significance level of the relationship between PMO overall maturity and benefits groups. Also, the relationship between each grouped function and the benefits groups. This will be done after conducting reliability analysis for the used scales and normality test to determine which type of correlation analysis to be used. Finally, conduct correlation analysis to examine the relationships between the different grouped variables.

4 Results and Discussion

4.1 Respondents Representation

The targeted segment is PMO professionals in the public sector of Saudi Arabia from various governmental bodies. Twenty-nine professionals have completed the survey achieving 97% of the targeted sample. The first part of the survey is general information about the sample and the public PMOs in general, Figure 3 shows the distribution of respondents' positions. PMO Managers have contributed the most to the survey. The others consist of Program Manager, Portfolio Manager, and Performance Management Manager. 98% of the sample are managers and above, the contribution of such a level of representation increases the reliability of the results enormously.

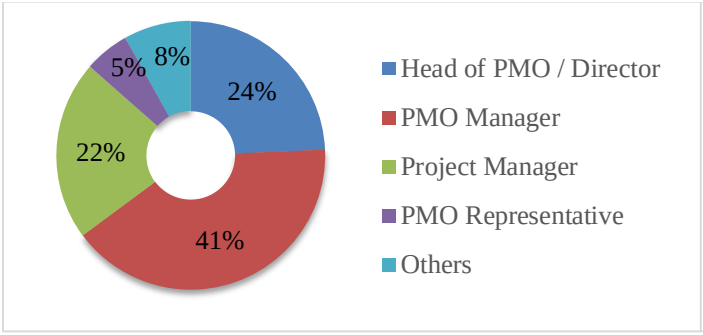

Figure 3: Respondents by Position.

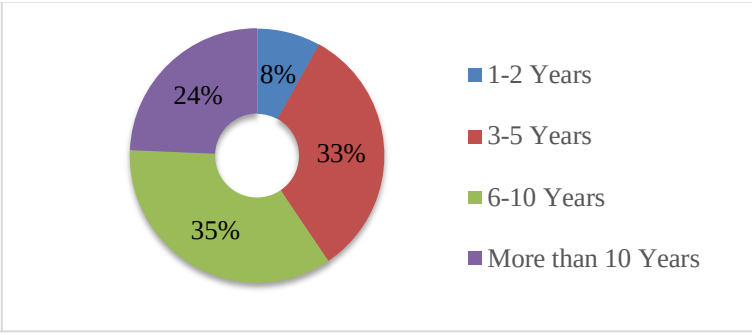

Figure 4: Respondents by Years of Experience.

Most of the respondents (92%) have more than two years of experience in the PMO field, which increases the reliability of the research results, see Figure 4.

One of the critical success factors for the research is segment diversity to have a compressive view of the public sector. Figure 5 shows that respondents have contributed from all public organizations categories.

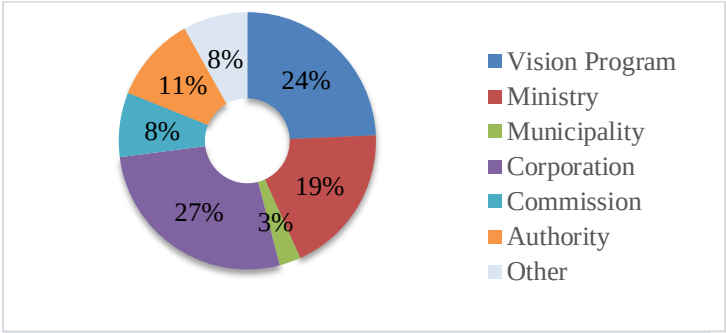

Figure 5: Respondents by Public Organization Category.

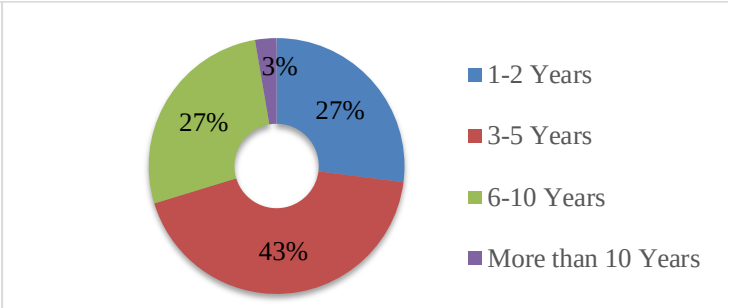

Figure 6: Age of PMOs.

4.2 Public Sector PMOs Overview

According to Hobbs & Aubrey (2007), the average age of a PMO is two years. However, the Saudi case is different; many of these PMOs were established to manage and monitor mega programs and projects with timelines ending in 2030. According to the results, 70% of the PMOs existed for less than six years, as seen in Figure 6.

Many Saudi talents are working day and night to drive the change through the implementation of the various Vision programs. 51% of the PMOs have less than 11 employees, and 49% have more than ten employees, as seen in Figure 7. The number of employees varies according to the scope and the role.

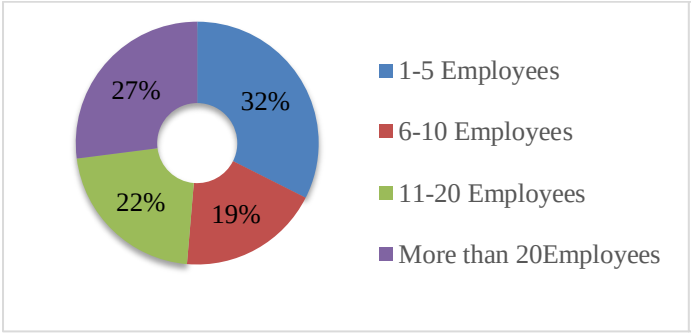

Figure 7: Number of Employees.

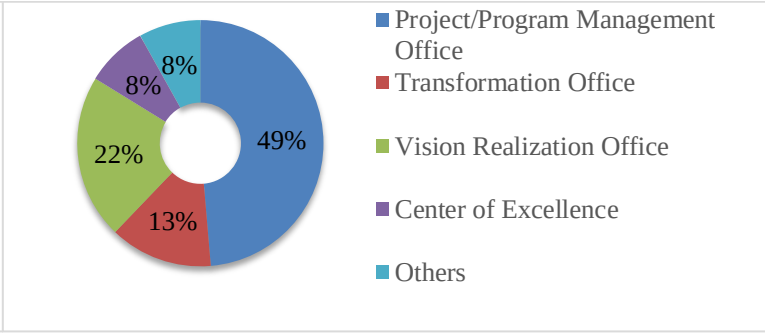

Figure 8: Names of Organizational Entities.

The majority of the entities are called "Project/Program Office," which goes in line with Hobbs & Aubrey's (2007) study of the common PMOs names. Also, Figure 8 shows the other names used for the PMOs.

Table 4: Most Common Services in the Public Sector of Saudi Arabia.

#	Code	Services	% of PMOs that provide the service
1	MC1	Provide project or program performance/status reports to upper management	100%
2	MC4	Monitor and control the performance of the projects	100%
3	SM3	Provide advice to upper management to support executive decision-making	100%
4	MC3	Provide technological tools and an integrated information system for project management	97%
5	CT1	Promote project management within the organization	97%
6	CT2	Provide project management methodology/framework for the projects	97%
7	CT3	Provide training and other initiatives to enhance project management competencies & skills	97%
8	SM2	Participate in the strategic planning processes	97%
9	OL3	Manage the documentation generated by the projects	97%
10	OR2	Support or manage the organizational change process related to projects.	97%
11	MC2	Provide strategic dashboard	93%
12	MP1	Monitor & control portfolio performance	93%
13	MP3	Support project portfolio definition	90%
14	SM1	Manage projects and programs benefits realization	90%
15	OL2	Conducts audits on projects to verify the use of established standards	90%
16	OR1	Directly manage projects or programs	90%
17	OR3	Perform technical/specialized tasks to the project manager	90%
18	MP2	Manage resource allocation between projects	83%
19	OL1	Manage central database to record the lessons learned in projects	76%

4.3 Services and Their Maturity Levels

Table 4 illustrates the set of services provided by the PMOs; all the PMOs provided three services, representing 16% of the total number of public services. Most of the PMOs (89%) provided more than 90% of the services.

The results indicate that PMOs in the Public sector provides most of the common services, which is more than the other studies (Ferreira, 2019). This is expected to deliver higher value for the organizations. However, the value created is affected by services' maturity levels.

In regards to services maturity, Table 5 shows the maturity level of each service. One service was above level 3, which is MC1 "Provide project or program performance/status reports to upper management", which shows the importance and ability of the PMOs to provide it, and that goes in line with Hobbs & Aubrey's (2007) study for more than 500 PMOs all over the world, they found that 83% of the PMOs rank this service as the most important. 89% of the services showed above 2.5 moderate maturity scores, which indicate a moderate level of sophistication.

MP2 "Manage resource allocation between projects" and OR2 "Support or manage the organizational change process related to projects" were the least mature services. This result indicates low involvement and control from the PMOs side, which will affect the added value in these aspects.

Table 5: Average Maturity Level of the Provided Services.

#	Code	Services	Average Maturity Level of the provided services (Out of 4)
1	MC1	Provide project or program performance/status reports to upper management	3.1
2	MC2	Provide strategic dashboard	2.96
3	CT2	Provide project management methodology/framework for the projects	2.89
4	MC3	Provide technological tools and an integrated information system for project management	2.86
5	SM2	Participate in the strategic planning processes	2.79
6	MC4	Monitor and control the performance of the projects	2.72
7	SM3	Provide advice to upper management to support executive decision-making	2.72
8	OL2	Conducts audits on projects to verify the use of established standards	2.69
9	OL3	Manage the documentation generated by the projects	2.68
10	MP1	Monitor & control portfolio performance	2.67
11	MP3	Support project portfolio definition	2.65
12	CT3	Provide training and other initiatives to enhance project management competencies & skills	2.61
13	SM1	Manage projects and programs benefits realization	2.58
14	OR1	Directly manage projects or programs	2.58
15	CT1	Promote project management within the organization	2.57
16	OR3	Perform technical/specialized tasks to the project manager	2.54
17	OL1	Manage central database to record the lessons learned in projects	2.5
18	MP2	Manage resource allocation between projects	2.29
19	OR2	Support or manage the organizational change process related to projects.	2.25

4.4 Functional Groups and Their Maturity Levels

Figure 9 shows the maturity scores for each function. The scores show a moderate level of maturity for all the functions. However, MC "Monitoring and Controlling Project Performance", CT "Development of Project Management Competencies and Methodologies" and SM "Strategic

Management" are the highest in scores which indicate that the PMOs current focus is on the successful delivery of projects that are aligned with the strategy.

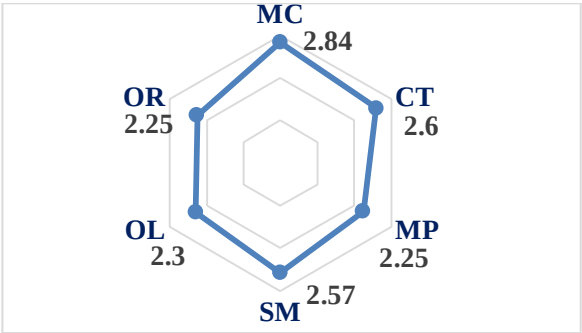

Figure 9: Functional Groups Scores.

4.5 PMOs Overall Maturity

The overall maturity score of the public sector PMOs of Saudi Arabia is 2.49 out of 4, which can be represented in percentage as 62%. This result indicates an overall moderate level of maturity. The result is higher than Ferreira's (2019) study of the Irish public sector PMOs maturity which is 46%. Ferreira (2019) studied 26 services according to the old maturity cube assessment.

In addition, the overall maturity score for the provided services is 2.67 out of 4, which can be represented in percentage as 67%, excluding not provided services.

In summary, the services and functional groups' results are similar to the literature findings & showed an overall moderate level of maturity. Compared to the public PMOs maturity (Ferreira, 2019), the Saudi Public sector showed 37% better results in PMOs overall maturity.

There is room for improvement for most services in terms of the authority, process definition, integrations, the used technologies, and systems.

Public sector PMOs could contribute much more to the process of changing the mindset associated with projects. The pace of change in the public sector is rapid, and employees should comprehend and process these changes with better communication and in a much more involving environment.

4.6 PMOs Effect on Organizations

The most rated area where the PMOs have to affected organizations the most is SMB1, "the strategic alignment". This role is essential to ensure that strategies are implemented, and all efforts are aligned. This result was expected due to the high maturity level of the services that support the strategic approach.

The results (Figure 10) show that PMOs contributed the most to improve strategic management, project management, and knowledge transfer. The overall PMO effect on the studied areas is slightly above a moderate level on various fronts. Many studies were conducted to examine the link between PMOs and project management success. However, not as much researches are conducted on the other contributions.

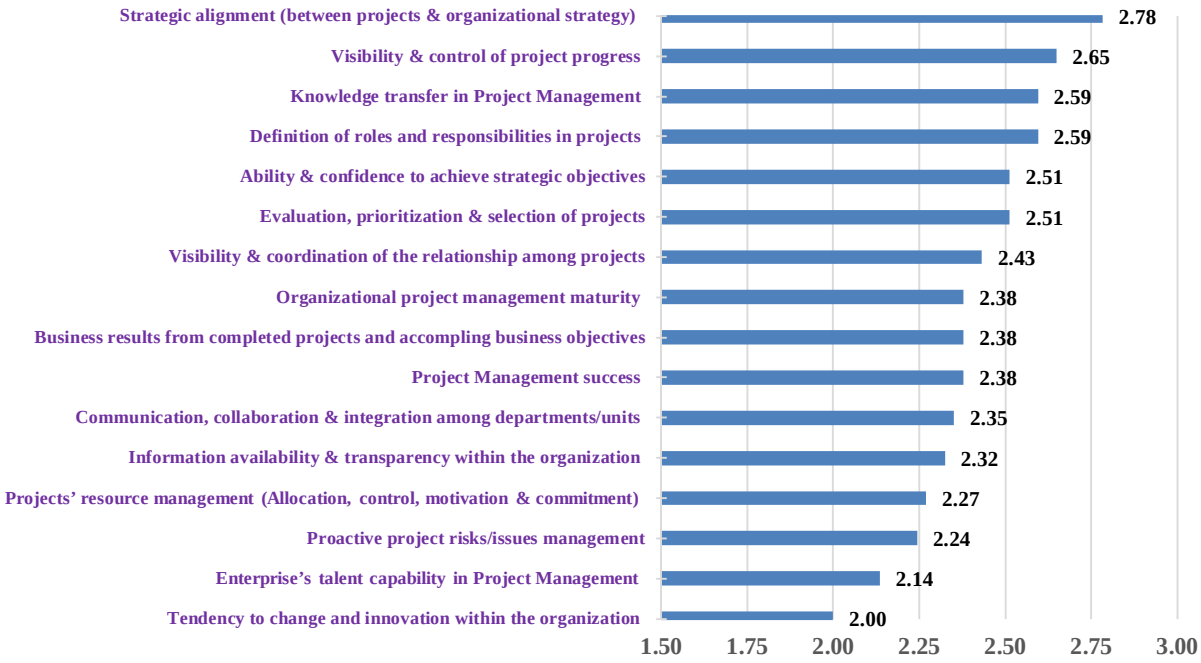

Figure 10: PMO Benefits Scores.

4.7 PMOs Grouped Value Added

As seen in Figure 11, SMB "Strategy Management & Performance" is the highest score which is expected due to the high maturity of the services that support strategic purposes. PMB "Project Management" is the second-highest score.

The results showed a contribution of PMOs to enable cultural changes, and this area is worth investigating since very little research was done to examine PMOs' effect on organizational culture.

The results indicate that PMO implementation enables organizations to manage their portfolio of projects better. Therefore, increase their ability, confidence, and capabilities to achieve their strategy.

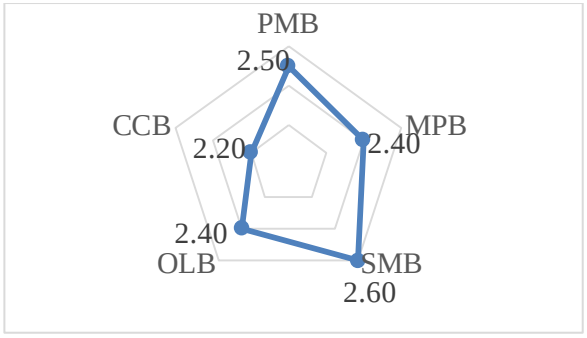

Figure 11: Grouped Benefits/Added Values.

4.8 Relationship between PMOs Maturity Levels & the Created Values

This research aims to examine the influence of the functional groups on the dependent variables such as Project management success and organizational learning. The relationship between dependent and independent variables was investigated through correlation analysis using the correlation coefficient, which indicates the strength and the direction of the relationship.

Table 6 shows the results of the Spearman correlation analysis extracted from the Minitab software.

Table 6: Spearman Correlation Analysis.

Dependent variables	Independent variables						
	Overall Maturity	CM	CT	MP	SM	OL	OR
PMB	0.483*	0.469*	0.523*	0.373*	0.358	0.52*	0.403*
MPB	0.636*	0.637*	0.622*	0.566*	0.513*	0.583*	0.562*
SMB	0.512*	0.614*	0.492*	0.427*	0.436*	0.307	0.433*
OLB	0.500*	0.463*	0.539*	0.383*	0.458*	0.594*	0.436*
CCB	0.601*	0.546*	0.581*	0.534*	0.437*	0.539*	0.628*

* Correlation is significant at the 0.05 level, alpha = 0.95

The correlation coefficients (Spearman's rank) indicate a significant relationship between almost all PMO functional groups and all of the grouped benefits. These results complicate the ability to identify the impact of each functional group separately.

However, the previous results point toward that PMOs overall maturity can affect all of the grouped benefits, and this assumption is confirmed through the significant correlation coefficients between overall maturity and CM, CT, MP, SM, OL, OR.

Thus, overall maturity improvement significantly improves the PMOs grouped benefits scores due to the interaction between these services. This finding is similar to Linde & Steyn (2016), that "no single function can truly add value in isolation from the other functions. For instance, the tools and systems will be useless unless they are combined with the methodologies or the support functions to run this system. Each function on its own can add value, but the true value of the PMO lies in the synergy between the functions" (Linde & Steyn, 2016). Therefore, the model (Figure 12) is modified to reflect research findings.

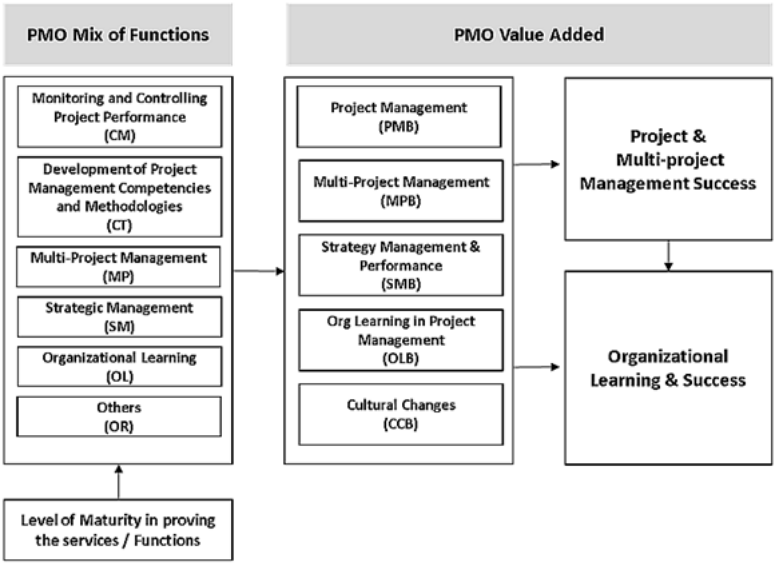

Figure 12: Relationship Model between Functional Groups and Benefits Groups.

5 Conclusion

The research has contributed to the literature by enhancing a framework to understand how PMOs work and their effect on organizations. The framework is utilized to quantify the current maturity levels of PMO functions, such as monitoring project performance and the development of

project methodologies. Furthermore, the framework is used to quantify the effect of PMOs on various areas such as project management and organizational learning.

All assessment tool components that were used to obtain the framework quantifying scores have high Cronbach's values which indicate their reliability in measuring current practices of public sector PMOs.

The study showed that PMOs have an overall moderate maturity of the provided functions. The main focus is to control and monitor project performance, develop project management methodologies & competencies, and provide strategic management-related services.

Through the mentioned above functions, PMOs were able to create values for the organizations. They have a moderately positive effect on many aspects of the organization, mainly on strategic management and project management. Also, it contributed to other aspects such as multi-project management, organizational learning in project management, and culture change.

The conceptual framework is used to show the relationship between PMO functions and the value created. The results show that PMOs actual value is on the synergy and interaction among the functions, and it is challenging to show the effects of each function separately.

6 Availability of Data and Material

All information is included in this study.

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