ESJ Social Sciences Peer-reviewed

The Organizational Contribution of the PMO: An Assessment Using Structural Equation Modeling

El Yacoubi Zouheir
Jahidi Rachid
University Hassan 1st, ENCG Settat, Morocco

Doi:10.19044/esj.2024.v20n34p150

Submitted: 21 August 2024
Accepted: 19 December 2024
Published: 31 December 2024

Cite As:
El Yacoubi Z. & Jahidi R. (2024). *The Organizational Contribution of the PMO: An Assessment Using Structural Equation Modeling*. European Scientific Journal, ESJ, 20 (34), 150. https://doi.org/10.19044/esj.2024.v20n34p150

Abstract

This research is part of a thesis project that includes two main phases, and it aims to develop and examine a conceptual model to understand and verify the contribution of the PMO to the performance of Moroccan organizations as well as to their level of project management maturity in terms of organization and practices. Thus, the main objectives of this research are: (1) to examine the PMO's contribution to organizational performance and project management maturity, but also (2) to contribute to consolidating the theoretical basis of the project management school. To this end, a quantitative approach was adopted, with a questionnaire administered online over three consecutive months. Firstly, the president of the Moroccan chapter of PMI was contacted to solicit his collaboration. Secondly, direct interaction was carried out with people working in project management in organizations with a Project Management Office (PMO), who were able to respond to the questionnaire via the "LinkedIn" professional network. Two hundred and five (205) responses were received, of which seventy-six (76) were discarded because respondents stated that no PMO existed within their organization, or that it had existed for less than three years. Finally, one hundred and twenty-nine (129) responses were considered usable and represented our final database from which we proceeded to a series of analyses and tests. Data analysis was carried out in two stages. First, a descriptive and exploratory analysis of the data collected was carried out using SPSS. Then, a

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

confirmatory analysis using structural equation modeling was carried out with SmartPLS to examine the validity of the model's concepts and test hypotheses. The results of this study provide a solid basis for linking PMO functions to organizational contributions. The study concluded that PMO functions contribute to organizational performance and project management maturity. It also highlights the mediating effect of project management maturity. However, the possible moderating effect of PMO type on structural relationships could not be verified.

Keywords: Project Management Office, Organizational performance, Project management maturity, Structural equation modeling

Introduction

There are several reasons that can lead organizations to implement a PMO. Reasons that consider the organizational context and market expectations (Alghadeer & Mohamed, 2016).

The PMO implementation is far from being standardized by a single approach (Andersen et al., 2007). Instead, it is guided by several factors that must be considered (Zouheir el al., 2020; Desouza & Evaristo, 2006; Andersen et al., 2007; Hobbs & Aubry, 2007), in addition to a multitude of barriers and challenges that must be addressed (Desta et al., 2006; Singh et al., 2009; Hubbard & Bolles, 2012; Oliveira et al., 2017).

Today, the true value of the PMO is perceived through its contribution to performance and the degree to which objectives are achieved (Pellegrinelli & Garagna, 2009). Thus, the creation of a PMO contributes primarily to the improvement of project management maturity (Hobbs & Aubry, 2007; Andersen et al., 2007; Al Ahmad, 2015), but also plays a key role in the success of projects within organizations (Kiani et al., 2015; Shalal et al., 2016; Aubry & Brunet, 2016; Lavoie-Tremblay et al., 2017; Szalay et al., 2017). Furthermore, the establishment of such an entity within the organization participates in the improvement of organizational performance and the development of project management by providing a range of management tools as well as strengthening communication within the organization (Zouheir et al., 2019; Rachid, 2019; Lavoie-Tremblay et al., 2012; Spalek, 2012).

According to Aubry et al (2010), the PMO is subject to events from its external and internal environment, just like the organization, which prevents it from following a clear life cycle. For this reason, the establishment of a sustainable PMO should be based on the reality of the organization’s environment and the recognition of the need to adapt to the changing users’ expectations and not necessarily the performance of the project (Kutsch et al., 2015).

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Indeed, the major obstacle to the PMO implementation remains the diversification of existing models in addition to the lack of a consensus on its added value within the organization (Ferreira et al., 2016). This ties in with the findings of Hobbs et al. (2008) who argue that when setting up the PMO, organizations should perceive the real value that this one will bring, by identifying in advance its mission and functions in line with organizational expectations, and not trying to imitate existing models that can lead to a total failure. In fact, the real value perceived through the PMO implementation lies primarily in the synergy between its functions and roles (Van der Linde & Steyn, 2016).

At this stage, the PMO as an organizational structure continues to attract the interest of researchers and practitioners around the world, increasingly focusing on areas that have not yet been explored or reinforcing and substantiating early findings.

In Morocco, despite the numerous projects, programs and portfolios launched every day, the role of the PMO is not very visible within organizations. Today, only some large organizations have embarked on the adventure of setting up a PMO. This implementation does not follow the same path and certainly does not have the same goals, since the framework in which it was carried out remains influenced by many factors.

This lack of visibility prompted our interest in conducting an initial research project closely related to this issue, and more specifically about the PMO's contribution to organizational performance and project management maturity.

Indeed, this research is part of a thesis project comprising two main phases; the first, which focuses on the problem of setting up the PMO, and the second, which is the subject of this research work, and which aims to develop and examine a conceptual model in order to understand and verify the contribution of the PMO to the performance of Moroccan organizations, as well as to their level of project management maturity in terms of organization and practices.

Accordingly, the main objectives of this research phase are as follows:

1) To examine the contribution of PMO to organizational performance and project management maturity, but also
2) To contribute to the solidification of the theoretical basis of the project management school.

Literature review

In recent years, the PMO concept has been increasingly associated with the success of projects, programs, and portfolios (Aubry & Brunet, 2016; Lavoie-Tremblay et al., 2017; Szalay et al., 2017) and is a key lever for performance improvement (Aubry et al., 2010).

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Today, the PMO is constantly under pressure (Aubry & Richer, 2011), due to numerous organizational expectations (Desouza & Evaristo, 2006; Hobbs et al., 2008; Alghadeer & Mohamed, 2016). It acts as a guarantor of improvement and expansion of best practices in project management (Hubbard & Bolles, 2012), but also as a catalyst for excellent project management (Hill, 2004), making the success of projects closely linked to an organization's ability to succeed in achieving these goals (Martin & Martin, 2012).

Effect on organizational performance

According to Aubry and Hobbs (2011), the PMO's contribution to organizational performance is the result of multiple values that exist within the organization. To measure this contribution, the two researchers drew attention to the fact that it is necessary to consider the possible changes that the PMO undergoes to get closer to reality. Based on an analysis of four case studies, Aubry et al. (2011) provided an initial examination of PMO's contribution to organizational performance using the competing values framework. They concluded that a paradox existed since the results obtained showed that there were oppositions between the two groups of respondents regarding the value of the PMO's contribution to organizational performance. The same approach was applied one year later where the PMO seemed to be an interesting transition towards supporting changes and contributing to organizational performance (Lavoie-Tremblay et al., 2012). This can be explained probably by the changes found in the context of the PMO that make the assessment of its contribution to organizational performance also change over time (Cunha & Moura, 2014).

Using the transition process model, Aubry (2015) attempted to explore the relationship that may exist between the factors promoting PMO change and performance improvement. The model adopted in this research was able to explain between 33% and 47% of the observed performance improvement within organizations. Aubry (2015) also provided strong arguments, justifying the need to consider and implement a change management plan to ensure better project performance and, consequently, better organizational performance.

For their part, Kutsch et al. (2015) used the BSC approach to assess the PMO's contribution to improving organizational performance. They used four main perspectives in their assessment approach: (1) The project value perspective, (2) The "user" perspective, (3) The internal process perspective, and (4) The learning and innovation perspective. The BSC approach has allowed researchers to have a contextual view of the PMO through the application of the strategic map, which provides a synthetic view of the different implications and contributions of the PMO within the organization.

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Indeed, Kutsch et al. (2015) concluded that the PMO through its services actively participates in the generation of value within any organization, especially regarding the actors benefiting from its services. These findings were also validated by Van der Linde and Steyn (2016) by assessing the effect of the PMO functions in the creation of value, both within projects and within the organization. To do so, both researchers assumed the existence of a set of effects created by the PMO and adding value to the organization, a value that can be positive or negative and that influences the organization's performance. The two researchers made a comparison before and after the implementation of the PMO and found that there was a clear improvement in project management that impact the overall performance of the organization.

On the other hand, perfect management of the PMO should be guaranteed to reach an improvement in organizational performance (Spalek, 2013), especially in terms of knowledge management and communication (Müller et al., 2013). Also, the operationalization of the PMO and its direct involvement in problem-solving can lead to improved management of initiatives and thus to improved organizational performance (Spalek, 2013; Sandhu et al., 2019).

However, we can clearly observe that the examination of the relationship between PMO and organizational performance has received little attention and is still generating more research due to the lack of a consensus on whether PMO contributes to the improvement of organizational performance or not. Indeed, the attempts to provide evidence supporting this relationship have yielded little empirical validation (Unger et al., 2012).

Effect on Project Management Maturity

One of the reasons behind implementing or changing the PMO remains the improvement of project management maturity (Hubbard & Bolles, 2012). The relationship between project management maturity and PMO can be characterized as circular and self-reinforcing (Hobbs & Aubry, 2007). Indeed, several studies have concluded that PMO contributes to the improvement of the level of project management maturity within organizations (Hobbs & Aubry, 2007; Andersen et al., 2007; Al Ahmad, 2015), but also that the success of its implementation remains under the influence of the organizational maturity level (Martins & Martins, 2012; Salamah & Alnaji, 2014).

According to Khaksefidi and Miri (2015), any attempt to implement the PMO within an organization without taking into consideration the organizational project management maturity level will fail. The positioning of the PMO within the organization is largely dependent on the level of project management maturity and its success will be enhanced if the latter is high (Salamah & Alnaji, 2014). By using correlation and regression statistical models, Khalema et al. (2015) confirmed the existence of a positive

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

relationship between PMO maturity and organizational project management maturity. Indeed, PMO maturity and project management maturity are highly interdependent (Khaksefidi & Miri, 2015).

Through the results of their research program, Hobbs and Aubry (2007) concluded that the level of project management maturity can improve with the presence of an effective PMO. Indeed, over the course of its life, the PMO is likely to progress and become more mature, and thus participate in improving organizational project management maturity (Andersen et al., 2007). Hobbs and Aubry (2008) demonstrated a significant relationship between PMO maturity and its age. They concluded that, over time, the PMO contributes to the improvement of project management maturity within the organization through the implementation of numerous processes and tools.

Similarly, Blažević et al. (2014) confirmed the remarkable involvement of the PMO in improving the level of project management maturity. Most of the interviewees in their study emphasized the role of the PMO in this process through different initiatives. This ranges from standardizing data collection and processing to decision support (do Valle & Soares, 2014).

Aubry (2015) for her part, and by studying the evolutionary process of the PMO, showed that this one is also capable of improving the level of project management maturity within organizations. She even pointed out the need to rely on effective change management to achieve the desired objectives. Van der Linde and Steyn (2016), based on an analysis of maturity assessments conducted before and after the implementation of the PMO, found an impressive improvement in project management maturity within the organizations they studied. They found no other explanation except that the PMO was responsible for this improvement, primarily through the acquisition of knowledge from lessons learned in previous projects and by providing a range of project support and facilitation services.

Finally, although the current trend defends the idea that with an empowered PMO, organizations move on to the next stages of maturity (Al Ahmad, 2015), some research has highlighted contradictory results. Indeed, according to (Martins & Martins, 2012), there is no dependency between the existence of the PMO through its functions and competencies and the degree of project management maturity within organizations.

Methodology

Data Collection

The data collection for this research phase was characterized by the administration online of our questionnaire for 3 consecutive months, to analyze and understand the implications of PMO implementation regarding performance and maturity. Indeed, two main ways were adopted. Firstly, we

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

contacted the president of the PMI Moroccan chapter to request their collaboration. Secondly, we interacted directly with people who could answer our questionnaire through the professional network "LinkedIn".

Sample

Our questionnaire was sent to people evolving in project management within organizations that have a Project Management Office (PMO). We received two hundred and five (205) responses, of which fifty-five (55) were discarded because the respondents declared the non-existence of a PMO within their organizations. Of the remaining one hundred and fifty (150) responses, we decided to retain the responses stating that the PMO has existed for at least three years. Finally, one hundred and twenty-nine (129) responses were considered usable and represent our final database from which we proceeded to a set of analyzes and tests to measure the PMO's organizational contribution in terms of project management performance and maturity.

Data analysis

We conducted a two-step data analysis. First, we conducted a descriptive and exploratory analysis of the data collected on SPSS (Version 25.0). Then, we proceeded with a confirmatory analysis using structural equation modeling, an analysis technique that uses both regression and factor analysis (Roussel et al., 2002), with the help of SmartPLS (Version 3.2.9) to examine the validity of the constructs of our model (Figure 1) and to test our hypotheses:

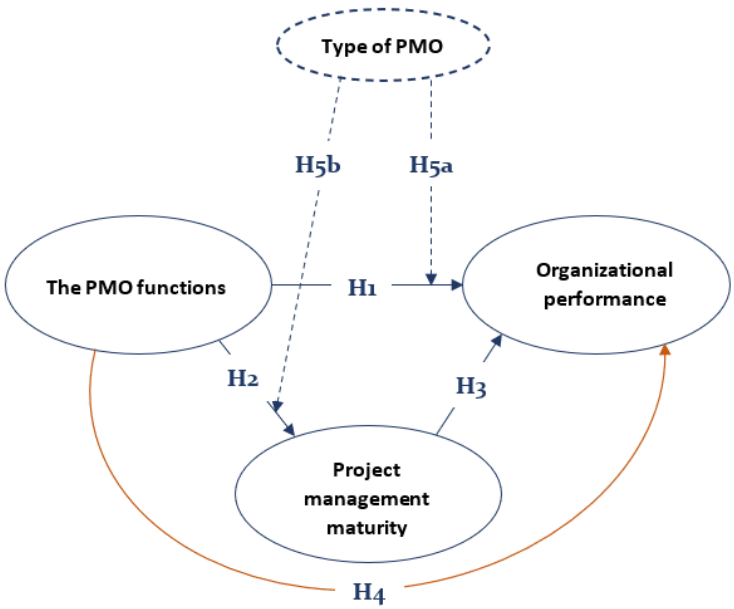

Figure 1: Conceptual model

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

H1: The PMO through its functions contributes to organizational performance
H2: The PMO through its functions contributes to project management maturity
H3: Project management maturity contributes to organizational performance
H4: Project management maturity has a mediating role between the functions performed by the PMO and the organizational performance
H5a: The type of PMO has a moderating role on the relationship between the functions performed by the PMO and the organizational performance
H5b: The type of PMO has a moderating role on the relationship between the functions performed by the PMO and the project management maturity

Results and discussion

Exploratory analysis

At the end of this exploratory analysis, we can conclude that the results obtained are promising (Table 1). The KMO value clearly exceeds the threshold of 0.5 and Bartlett's sphericity test yielded sufficiently high values at a significance level of p< 0.000, which fulfills the criteria of sample adequacy for factor analysis. On the other hand, Cronbach's α is well above 0.8 for all indicators. The unidimensionality is confirmed for all the dimensions of each construct.

Table 1: Reliability and dimensionality analysis

Dimensions	KMO	Bartlett's sphericity	Eigenvalue	Percentage of variance explained	Communality	Factor weight	Cronbach's Alpha
PRO	0.817	0,000	2.796	69.907	0.582 > 0.756	0.763 > 0.869	0.855
NOR	0.727	0,000	2.474	82.468	0.759 > 0.864	0.871 > 0.930	0.893
SPP	0.740	0,000	2.546	84.856	0.826 > 0.888	0.909 > 0.943	0.909
GMP	0.781	0,000	2.681	67.032	0.503 > 0.760	0.709 > 0.872	0.834
GS	0.762	0,000	2.617	87.247	0.854 > 0.883	0.924 > 0.940	0.925
GC	0.744	0,000	2.496	83.198	0.801 > 0.859	0.895 > 0.927	0.898
PF	0.839	0,000	3.099	77.466	0.741 > 0.822	0.861 > 0.906	0.903
PNF	0.870	0,000	4.554	65.059	0.551 > 0.759	0.742 > 0.871	0.909
PGP	0.914	0,000	6.052	60.516	0.520 > 0.743	0.721 > 0.862	0.927
OGP	0.911	0,000	5.889	73.613	0.609 > 0.820	0.781 > 0.905	0.948
Recommended value	> 0.5	Close to 0	≥ 1	≥ 0.6	≥ 0.5	≥ 0.5	≥ 0.7
Reference	Jolibert & Jourdan (2006)	Evrard et al., 2009	Hair et al. (2006)	Hair et al. (2006)	Jolibert & Jourdan (2006)	Evrard et al. (2009)	Thiétart (2007)

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Confirmatory analysis

To examine our research hypotheses and to validate the results obtained at this stage, we conducted a confirmatory analysis, using structural equation modeling performed on the SmartPLS.

Evaluation of the measurement model

The evaluation of the measurement model provided a ruling on the reliability and validity of the constructs (Table 2). The recovered loadings exceed the threshold of 0.7, with a Cronbach's α above 0.8 for all dimensions and a composite reliability that ranges between 0.889 and 0.967. On the other hand, the convergent validity is confirmed since the AVE displays values above 0.6. Discriminant validity is also verified through the two indices HTMT and Fornell-Larcker.

Table 2: Reliability and validity analysis of constructs

Dimensions	Loading	Cronbach's Alpha	Composite reliability	AVE	Fornell-Larcker criterion	HTMT
PRO	0.769 > 0.866	0.855	0.903	0.699	Verified	Verified
NOR	0.872 > 0.928	0.893	0.934	0.825		
SPP	0.907 > 0.937	0.911	0.944	0.848		
GMP	0.751 > 0.867	0.834	0.889	0.668		
GS	0.920 > 0.942	0.927	0.954	0.872		
GC	0.892 > 0.928	0.899	0.937	0.832		
PF & PNF	0.720 > 0.844	0.942	0.950	0.633		
PGP OGP	0.721 > 0.856	0.964	0.967	0.621		
Recommended value	> 0.7	> 0.7	> 0.7	> 0.5	AVE > Square of correlations between latent variables	< 0.9
Reference	Hair et al. (2011)	Hair et al. (2011)	Hair et al. (2011)	Hair et al. (2011)	Fornell & Larcker (1981)	Gold et al. (2001)

Evaluation of the structural model

Overall, the model has a high level of quality and a very good predictive capacity. Indeed, the evaluation indices of the structural model are of a satisfactory level (Table 3), with coefficients of determination "R^2" that exceed 0.6 and a GoF of about 0.643.

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Table 3: Overall analysis of the structural model

	R^2	Q^2		GoF
		Comm.	Red.	
OP	0.685	0.528	0.398	0.643
PMM	0.632	0.539	0.358	
Criterion	< 0.19 « not acceptable » between 0.19 and 0.33 « low » between 0.33 et 0.67 « moderate » > 0.67 « high »	> 0	> 0	< 0.1 « nothing » between 0.1 et 0.25 « small » between 0.25 et 0.36 « medium » > 0.36 « large »
Reference	Chin (1998)	Tenenhaus et al. (2005)		Wetzels et al. (2009)

Regarding the significance of the structural relationships, hypotheses H1, H2 and H3 were confirmed at a level of 1% (Table 4), which ruling the contribution of the PMO to organizational performance and project management maturity, but also the non-negligible impact of the latter on performance.

Table 4: Significance of structural relationship

	Regression coefficient	t-value	p-value	Decision
PMO functions -> OP	0.335	4.133	0.000	Confirmed**
PMO functions -> PMM	0.795	15.616	0.000	Confirmed**
PMM -> OP	0.536	6.707	0.000	Confirmed**

* p< .05 ; ** p< .01

Indeed, we have reached the same conclusions as Kutsch et al. (2015) and Van der Linde and Steyn (2016), who stipulate that the PMO, through its functions and services actively participate in the generation and creation of value within the organization. This contribution to organizational performance can be seen in different components and at distinct levels. The implementation of the PMO seems to be an interesting step towards contributing to organizational performance.

These results also contradict the findings of Martins and Martins (2012), and therefore confirm those set out by Blažević et al. (2014), Valle and Soares (2014), Al Ahmad (2015) as well as Van der Linde and Steyn (2016) and which argue for the remarkable participation of the PMO in the improvement of the project management maturity level. A contribution that is conditioned according to Hobbs and Aubry (2007) by the effective implementation of the PMO, as well as its maturity level (Andersen et al., 2007).

The analysis of the mediator effect (H4) that the construct "Project Management Maturity" presents in the model was confirmed as the value zero does not exist between the two calculated levels LL and HL (Table 5). This analysis was based on Preacher and Hayes (2008) approach.

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Indeed, the result of the data analysis demonstrated a significant relationship between the two constructs, such that the presence of a high level of maturity generally translates into positive impacts on performance (Lockamy & McCormack, 2004). And considering that the PMO is supposed to promote project management practices (Hubbard & Bolles, 2012), this can only lead to efficiency gains and better performance as was suggested by Lavoie-Tremblay et al. (2017).

Table 5: Analysis of the mediator effect

					Confidence interval	
IV -> Mediator	Mediator -> DV	Indirect effect	SD	t-value	95% LL	95% HL
0.795	0.536	0.426	0.073	5.837	0.283	0.569

Based on the analysis technique proposed by (Lacroux, 2009), the moderating effect of the PMO type could not be confirmed (rejection of H5a and H5b). According to the results obtained, the type of PMO does not play a moderating role in the relationship between "Project Management Office (PMO) Functions" and the two constructs "Organizational Performance" and "Project Management Maturity" (Table 6 and 7).

Table 6: Moderator effect analysis (OP)

	Regression coefficient	t-value	R^2	Decision
(1) Y = a + b1 X + b2 Z	b1 = 0.350	4.227	0.689	Rejection of the moderator effect hypothesis
	b2 = -0.065	1.310		
(2) Y = a + b1 X + b2 Z + b3 XZ	b1 = 0.370	3.945	0.693	
	b2 = -0.069	1.263		
	b3 = 0.058	0.523		

t must be > 2.58 for a significance level α = 1% and > 1.96 for an α = 5%

Table 7: Moderator effect analysis (PMM)

	Regression coefficient	t-value	R^2	Decision
(1) Y = a + b1 X + b2 Z	b1 = 0.777	14.163	0.658	Rejection of the moderator effect hypothesis
	b2 = -0.163	2.857		
(2) Y = a + b1 X + b2 Z + b3 XZ	b1 = 0.781	15.004	0.684	
	b2 = -0.165	2.990		
	b3 = 0.161	1.519		

t must be > 2.58 for a significance level α = 1% and > 1.96 for an α = 5%

This result is surprising, since the support type PMO generally refers to the improvement of project performance and the development of increased project management skills, while the control type PMO is mainly concerned with practices and governance modes compliance (Aubry et al., 2010). This implies that the implementation of one or the other should have an impact on the performance and project management maturity within the organization.

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

Therefore, this result suggests that perhaps the lack of a moderating effect of the PMO type in the context of the relationships studied is due to confusion about the functions supposed to be performed by each type, if not because of the host organizations' lack of mastery of the notion of typology.

Conclusion

Using a quantitative approach, this research enabled us to assess the PMO's organizational contribution. This contribution was examined from two perspectives: (1) organizational performance and (2) project management maturity.

The examination of the significance of the relationships between the constructs of the conceptual model confirmed the basic hypotheses. Indeed, according to the results, the PMO through its functions and roles contributes to both organizational performance and project management maturity.

On the other hand, the hypothesis stipulating the existence of a significant relationship between project management maturity and organizational performance was also confirmed. Consequently, the mediating effect that maturity plays in the relationship between the PMO through its functions and organizational performance is in turn verified. In other words, improved maturity leads primarily to improved performance.

However, the hypotheses concerning the moderating effect associated with the type of PMO (support PMO and control PMO) were rejected. The type of PMO had no influence on the relationship between PMO functions and organizational performance, or between PMO functions and project management maturity.

The conclusions drawn from this research represent a new building block in the current debate on the PMO's organizational contribution and its role in value creation, as well as another avenue for guiding the implementation of the PMO in line with organizational expectations.

Indeed, the results of this research phase may represent an opportunity for organizations that have implemented a PMO or are considering implementing one, to reflect further on the expectations behind this implementation and the resulting implications, to ensure alignment with the vision and strategic/operational objectives.

However, it should be noted that this study has some limitations. First, given the difficulty in identifying our target sample, we used convenience sampling, which to some extent constrains the representativeness and generalizability of the results.

In consequence, we believe that it would also be interesting to examine this issue in greater depth through the implementation of longitudinal studies of cases characterized by similarities or evolving in similar or almost similar

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

contexts. This would provide more visibility on this contribution and its implications.

Declaration for Human Participants: This study has been approved by Ecole Nationale de Commerce et de Gestion – ENCG Settat**,** University Hassan 1st and the principles of the Helsinki Declaration were followed.

Conflict of Interest: The authors reported no conflict of interest.

Data Availability: All data are included in the content of the paper.

Funding Statement: The authors did not obtain any funding for this research.

References:

1. Al Ahmad, A. (2015, November). Project Management Office: The Strategic Trend In Petroleum Industry. In *Abu Dhabi International Petroleum Exhibition and Conference*. Society of Petroleum Engineers. https://doi.org/10.2118/177580-MS
2. Alghadeer, A., & Mohamed, S. (2016). Diffusion of organisational innovation in Saudi Arabia: The case of the Project Management Office (PMO). *International Journal of Innovation and Technology Management*, *13*(04), 1650019. https://doi.org/10.1142/S021987701650019X
3. Andersen, B., Henriksen, B., & Aarseth, W. (2007). Benchmarking of project management office establishment: Extracting best practices. *Journal of Management in Engineering*, *23*(2), 97-104. https://doi.org/10.1061/(ASCE)0742-597X(2007)23:2(97)
4. Aubry, M. (2015). Project management office transformations: Direct and moderating effects that enhance performance and maturity. *Project Management Journal*, *46*(5), 19-45. https://doi.org/10.1002/pmj.21522
5. Aubry, M., & Brunet, M. (2016). Organizational design in public administration: Categorization of project management offices. *Project Management Journal*, *47*(5), 107-129. https://doi.org/10.1177/875697281604700508
6. Aubry, M., & Hobbs, B. (2011). A fresh look at the contribution of project management to organizational performance. *Project Management Journal*, *42*(1), 3-16. https://doi.org/10.1002/pmj.20213
7. Aubry, M., Hobbs, B., Müller, R., & Blomquist, T. (2010). Identifying forces driving PMO changes. *Project Management Journal*, *41*(4), 30-45. https://doi.org/10.1002/pmj.20191

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

8. Aubry, M., Richer, M. C., Lavoie-Tremblay, M., & Cyr, G. (2011). Pluralism in PMO performance: The case of a PMO dedicated to a major organizational transformation. *Project Management Journal*, *42*(6), 60-77. https://doi.org/10.1002/pmj.20269
9. Blažević, G., Mišić, S., & Šimac, M. (2014). Importance of managing PMO in Croatian PM market. *Procedia-Social and Behavioral Sciences*, *119*, 949-956. https://doi.org/10.1016/j.sbspro.2014.03.106
10. Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research*, *295*(2), 295-336.
11. Cunha, J. A., & Moura, H. (2014, November). Project management office: The state of the art based on a systematic review. In *European conference on management, leadership & governance* (p. 41). Academic Conferences International Limited.
12. Desouza, K. C., & Evaristo, J. R. (2006). Project management offices: A case of knowledge-based archetypes. *International Journal of Information Management*, *26*(5), 414-423. https://doi.org/10.1016/j.ijinfomgt.2006.07.002
13. Desta, S., Root, D., & Diederichs, C. J. (2006). The practice of project management office (PMO) concept within the German architect, engineer, contractor (AEC) sector. *Journal of Engineering, Design and Technology*, *4*(1), 46-59. https://doi.org/10.1108/17260530610818642
14. do Valle, J. A. S., & Soares, C. A. P. EFFECTIVE IMPLEMENTATION OF PROJECT MANAGEMENT OFFICES-PMO-IN ORGANIZATIONS.
15. Evrard, Y., Pras, B., Roux, E., Desmet, P., Dussaix, A. M., & Lilien, G. L. (2009). *Market-Fondements et méthodes des recherches en marketing* (No. hal-00490724).
16. Ferreira, H., Tereso, A. P., & Fernandes, A. G. G. (2016). Conceptualization of project management offices structures. In *ICOPEV 2016-3rd International Conference on Project Evaluation* (pp. 261-266). University of Minho. http://hdl.handle.net/1822/43680
17. Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. https://doi.org/10.1177/002224378101800313
18. Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. *Journal of management information systems*, *18*(1), 185-214. https://www.jstor.org/stable/40398521

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

19. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). Multivariate Data Analysis: Pearson Prentice Hall. *Upper Saddle River, NJ*, 1-816.
20. Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, *19*(2), 139-152. https://doi.org/10.2753/MTP1069-6679190202
21. Hill, G. M. (2004). Evolving the project management office: a competency continuum. *Information systems management*, *21*(4), 45-51. https://doi.org/10.1201/1078/44705.21.4.20040901/84187.6
22. Hobbs, B., & Aubry, M. (2007). A multi-phase research program investigating project management offices (PMOs): the results of phase 1. *Project Management Journal*, *38*(1), 74-86. https://doi.org/10.1177/875697280703800108
23. Hobbs, B., Aubry, M., & Thuillier, D. (2008). The project management office as an organisational innovation. *International Journal of Project Management*, *26*(5), 547-555. https://doi.org/10.1016/j.ijproman.2008.05.008
24. Hubbard, D. G., & Bolles, D. (2012, August). Executive PMO--Blending Project Management and Business Management. Project Management Institute.
25. Jolibert, A., & Jourdan, P. (2006). *Marketing research: méthodes de recherche et d'études en marketing*. Dunod.
26. Khaksefidi, M., & Miri, M. (2015). The Role of Project Management Office in the Organization with the Knowledge Approach. *Mediterranean Journal of Social Sciences*, *6*(6 S6), 11-11. 10.5901/mjss.2015.v6n6s6p11
27. Khalema, L. S., Van Waveren, C. C., & Chan, K. Y. (2015). The relationship between project management office maturity and organisational project management maturity: An empirical study of the South African government infrastructure departments. *South African Journal of Industrial Engineering*, *26*(3), 12-26. http://dx.doi.org/10.7166/26-3-1021
28. Kiani, S., Yousefi, V., Nouri, S., Khadivi, A. M., & Mehrabanfar, E. (2015). Determining the Role of Project Management Office in the Success of Project-Based Organizations. *Mediterranean Journal of Social Sciences*, *6*(6 S2), 325. DOI: 10.5901/mjss.2015.v6n6s2p325
29. Kutsch, E., Ward, J., Hall, M., & Algar, J. (2015). The contribution of the project management office: A balanced scorecard perspective. *Information Systems Management*, *32*(2), 105-118. https://doi.org/10.1080/10580530.2015.1018768

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

30. Lacroux, A. (2009). L'analyse des modèles de relations structurelles par la méthode PLS: une approche émergente dans la recherche quantitative en GRH. *XXème congrès de l'AGRH, Toulouse du*, *9*.
31. Lavoie-Tremblay, M., Aubry, M., Cyr, G., Richer, M. C., Fortin-Verreault, J. F., Fortin, C., & Marchionni, C. (2017). Innovation in health service management: Adoption of project management offices to support major health care transformation. *Journal of nursing management*, *25*(8), 657-665. https://doi.org/10.1111/jonm.12505
32. Lavoie-Tremblay, M., Bonneville-Roussy, A., Richer, M. C., Aubry, M., Vezina, M., & Deme, M. (2012). Project management office in health care: A key strategy to support evidence-based practice change. *The health care manager*, *31*(2), 154-165. doi: 10.1097/HCM.0b013e3182520676
33. Lockamy III, A., & McCormack, K. (2004). The development of a supply chain management process maturity model using the concepts of business process orientation. *Supply Chain Management: An International Journal*, *9*(4), 272-278. https://doi.org/10.1108/13598540410550019
34. Martins, V. A., & Martins, M. R. (2012). Outsourcing operations in project management offices: The reality of Brazilian companies. *Project management journal*, *43*(2), 68-83. https://doi.org/10.1002/pmj.21256
35. Müller, R., Glückler, J., Aubry, M., & Shao, J. (2013). Project management knowledge flows in networks of project managers and project management offices: A case study in the pharmaceutical industry. *Project Management Journal*, *44*(2), 4-19. https://doi.org/10.1002/pmj.21326
36. Oliveira, C., Tereso, A., & Fernandes, G. (2017). PMO Conceptualization for Engineering and Construction Businesses. *Procedia computer science*, *121*, 592-599. https://doi.org/10.1016/j.procs.2017.11.078
37. Pellegrinelli, S., & Garagna, L. (2009). Towards a conceptualisation of PMOs as agents and subjects of change and renewal. *International Journal of Project Management*, *27*(7), 649-656. https://doi.org/10.1016/j.ijproman.2008.12.001
38. Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods*, *40*(3), 879-891. https://doi.org/10.3758/BRM.40.3.879
39. Rachid, J. PMO within Moroccan Organizations: Towards a Synthetic Model of Implementation. https://doi.org/10.19044/esj.2019.v15n13p191

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

40. Roussel, P., Durrieu, F., & Campoy, E. (2002). *Méthodes d'équations structurelles: recherche et applications en gestion*. Economica.
41. Salamah, H., & Alnaji, L. (2014). Challenges in establishing, managing, and operating a Project Management Office. *Recent Advances in Economics, Management and Development*.
42. Sandhu, M. A., Al Ameri, T. Z., & Wikström, K. (2019). Benchmarking the strategic roles of the project management office (PMO) when developing business ecosystems. *Benchmarking: An International Journal*, *26*(2), 452-469. https://doi.org/10.1108/BIJ-03-2018-0058
43. Shalal, A. M., Mohammed, I. A., & Alzwainy, F. M. (2016). Evaluation Performance Of The Project Management Office In Oil Companies. *Journal of Engineering and Applied Sciences*, *11*(6).
44. Singh, R., Keil, M., & Kasi, V. (2009). Identifying and overcoming the challenges of implementing a project management office. *European journal of information systems*, *18*(5), 409-427. https://doi.org/10.1057/ejis.2009.29
45. Spalek, S. (2012). The role of project management office in the multi-project environment. *International Journal of Management and Enterprise Development*, *12*(2), 172-188. https://doi.org/10.1504/IJMED.2012.047891
46. Spalek, S. (2013). Improving industrial engineering performance through a successful project management office. *Inzinerine Ekonomika-Engineering Economics*, *24*(2), 88-98. https://ssrn.com/abstract=2581494
47. Szalay, I., Kovács, Á., & Sebestyén, Z. (2017). Integrated Framework for Project Management Office Evaluation. *Procedia engineering*, *196*, 578-584. https://doi.org/10.1016/j.proeng.2017.08.033
48. Tenenhaus, M., Vinzi, V. E., Chatelin, Y. M., & Lauro, C. (2005). PLS path modeling. *Computational statistics & data analysis*, *48*(1), 159-205. https://doi.org/10.1016/j.csda.2004.03.005
49. Thiétart, R. A. (2007). *Méthodes de recherche en management-3ème édition*. Dunod. http://hdl.handle.net/123456789/99972
50. Unger, B. N., Gemünden, H. G., & Aubry, M. (2012). The three roles of a project portfolio management office: Their impact on portfolio management execution and success. *International Journal of Project Management*, *30*(5), 608-620. https://doi.org/10.1016/j.ijproman.2012.01.015
51. Van der Linde, J., & Steyn, H. (2016). The effect of a project management office on project and organisational performance: A case

 ISSN: 1857-7881 (Print) e - ISSN 1857-7431

study. *South African Journal of Industrial Engineering*, *27*(1), 151-161. http://dx.doi.org/10.7166/27-1-1114

52. Wetzels, M., Odekerken-Schröder, G., & Van Oppen, C. (2009). Using PLS path modeling for assessing hierarchical construct models: Guidelines and empirical illustration. *MIS quarterly*, 177-195. https://doi.org/10.2307/20650284
53. Zouheir, E. Y., Rachid, J., & Jamal, E. A. (2019). PMO within Moroccan Organizations: Towards a Synthetic Model of Implementation. *European Scientific Journal*, ESJ, *15*(13), 191. https://doi.org/10.19044/esj.2019.v15n13p191
54. Zouheir, E. Y., & Rachid, J. (2020). PMO Typologies and Functions: A Systematic Review. *European Scientific Journal*, ESJ, *16*(13), 180. https://doi.org/10.19044/esj.2020.v16n13p180