

Exploring the Driving Factors to Establish PMO in Saudi Construction Companies

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Abstract: *The Saudi construction industry is embracing productive and efficient tools for enhancement. This embracement includes applying PMO in construction companies. In addition, the Saudi construction market suffers from insufficient delivery, lack of cost, and time consuming. Hence, PMO is a management structure including standardizes, governance processes, and facilitates the sharing of resources, methodologies, tools, and techniques. Therefore, this paper explores the driving factors that lead construction organizations to establish PMO in the Saudi construction industry. Twenty driving factors were acknowledged as of a structured literature review of preceding relevant researches regarding PMO in different areas. Those driving factors were measured through Delphi survey questionnaires. Thus, altogether twenty driving factors were identified, nevertheless participants only agreed on thirteen driving factors. A descriptive method was used to define and arrange these driving factors. The study findings reveal that the main significant driving factors are 1) Lack of PM main pillars, 2) poor monitoring & controlling perf. of projects, 3) lack of training and education, 4) and lack of project methodology. These findings are vital in exposing the reasons that lead construction organizations to establish in Saudi Arabia, thereby helping construction organizations to apply the appropriate model of MPO based on understanding of functions.*

Keywords: PMO, Driving Factors, Construction, Vision 2030, Saudi Arabia

1. Introduction

The Saudi construction industry plays a significant role in the national economy (Alrashed et al., 2014), where receiving the governmental spending in the primary three National Development Plans, from 1970 to 1985 (Al - Sedairy, 2001). Importantly, the construction industry reflects the country's economic development level as well as including delivery of the infrastructure needed by the other industries (Suresh et al., 2017). Thus, frequent delays or failure and incompletion of infrastructural projects are the significant outcomes of failing to launch the methodical principles of project management in the projects (Silvius, 2021). Therefore, project management plays a key role in the effectiveness of projects and enhancing organizations competitiveness. Nowadays, project management techniques can internationally execute, run, and exploit projects (Raharjo et al., 2018). However, the Saudi government launched pack of initiatives to enable and accelerate tools and techniques of project management (Vision 2030).

The Kingdom of Saudi Arabia has lunched the "Saudi vision 2030" in April 2016. The 2030 vision is consistent with the sustainable development goals in which having implementation programs to provide supporting for the sustainable development goals in the national planning process (Vision 2030). Correspondingly, the EXPRO was founded by a decision of the Council of Ministers on February 2021 to include the National Program for Government Support and Promotion in Public Areas to projects to achieve efficient spending, and to transform the center into an authority for efficiency and plans for government projects (EXPRO, 2021). Generally, EXPRO is an introduction to the PMOs for the government projects. Therefore, a reliable strategy for enabling organizations is to improving systems and processes (Bredillet et al., 2018). MPOs is capable to play the role of empowering organizations.

Construction industry faces major challenges especially in preconstruction phase (Alahmadi & Alghaseb, 2022). As well as, the awareness of PMO concepts has grown in architecture, engineering, and construction sectors in Germany (Desta et al., 2006). Therefore, project management is essential in construction organizations and construction industry as they are project - based business, thereby the establishment of PMOs within construction organizations can lead to empowering in construction industry (Ferreira et al., 2016). Oliveira recommended a set of functions by Aubry & Hobbs in which will answer to the organization's difficulties in engineering and construction businesses (Oliveira et al., 2017). More, Crawford argued that the PMO supposes to focus on less potential for activities risk and generating less possible resistance on the part of employees (Crawford, 2010). Thus, Ershadi originate that ten functions of PMO achieve addressing fifteen types of complexities in construction projects (Ershadi et al., 2021).

In 2015, Eriksson and Leiringer stated four driving factors to lead organizations for establish PMOs which are lack of support for strategic management, lack of training and education, poor monitoring and controlling performance of projects, and poor project portfolio management (Eriksson & Leiringer, 2015). Also, Oliveira et al. found seven driving factors include decentralized information, lack of standardized PM processes, neglect for cost management, complications in internal planning management, complications in fronting the turnover growth, inadequacies in communication management, and misunderstanding perceived responsibilities (Oliveira et al., 2017). Moreover, Ntshwene et al. addressed nine driving factors comprise lack of project management main pillars, poor documentation and record, unmanaged risk events, inability to optimize resources, lack of project methodology, lack of project communication, lack of project governance, inability to define business goals, and inability to recruit competent staff (Ntshwene et al., 2022). Table: 1 represents driving factors.

Volume 12 Issue 4, April 2023

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Currently, construction industry demands for engaging further productive and efficient PMOs to lead changes and bring more value in the project management environment (Bredillet et al., 2018). Therefore, accomplishing optimistic outcomes from applying PMO in construction organizations depend on catching the intrinsic capabilities of PMO (Jalal & Koosha, 2015). However, this research aims to explore the drivers as likely that lead construction organizations to establish PMOs in Saudi Arabia.

2. Method

A qualitative approach was used for this research through a mix of data sources (Figure: 1). The primary source was a Delphi method, while the secondary source was a comprehensive structured review regarding the driving factors lead organizations to establish PMO. Delphi method is regarded and settled as a qualitative method by researchers (MacCarthy & Atthirawong, 2003; Padel & Midmore, 2005), regardless of traditional quantitative

techniques such as questionnaire surveys. The procedure of Delphi successively comprises the development of a rounds' surveys, spreading of and follow - up procedures for the rounds' surveys, gathering of rounds' surveys, and analysis of the results of the rounds' surveys. Sourani and Sohail considered the use of a Delphi method in construction management research (Sourani & Sohail, 2015). Consequently, the process continues until accomplishment a consensus or awaiting it becomes obvious that no consensus can be extended.

A structured literature review covered the PMOs in multidisciplinary area such as IT, construction, healthcare, banking, education, mining, and public administration. The literature review revealed a well covered over PMOs functions and typologies. Nonetheless, few references covered the reasons lead organizations to establish PMO. However, twenty driving factors were identified that are likely reasons that lead organizations to establish PMO.

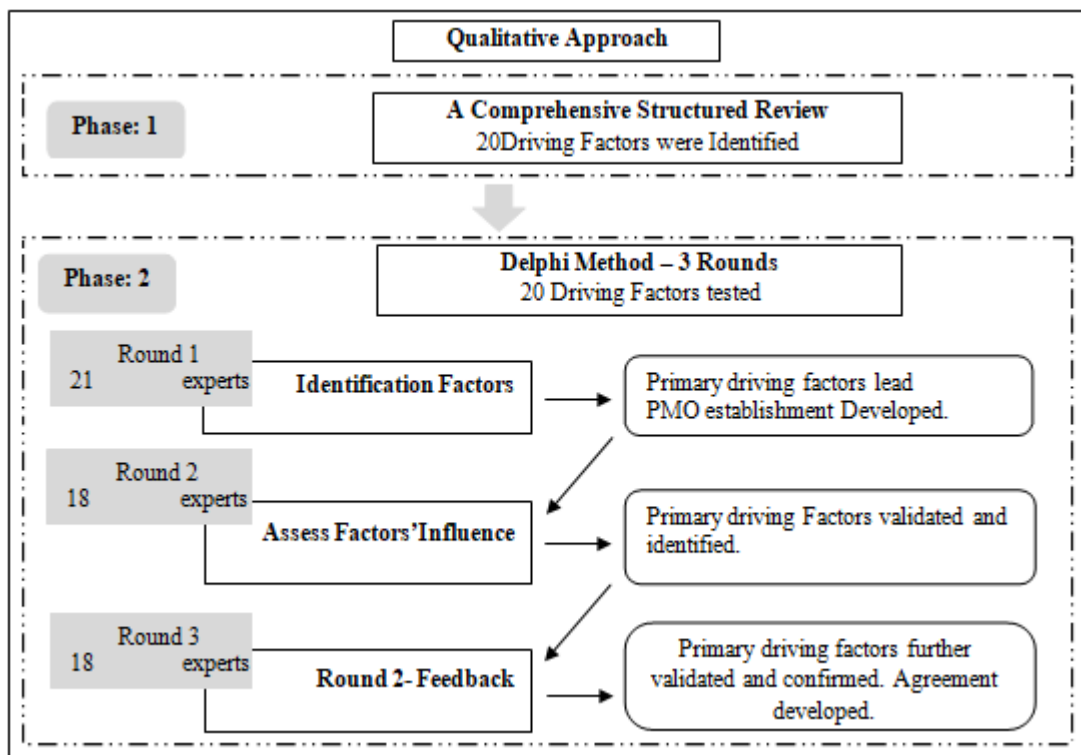


Figure 1: Research Design (Authors)

Delphi Questionnaire

The Delphi method broadly has been applied in the research of construction engineering and management (CEM) (Sourani & Sohail, 2015; Ameyaw et al., 2016). The Delphi method aims to reach a consensus in which is a recurrence tool that creates unidentified controlled feedback and depend on participants' experiences (Shan, 2017). Delphi is a method often utilized to examine and identify the factors that affect or may affect any specific topic (MacCarthy & Atthirawong, 2003). Moreover, either consensus or discrepancies among participants is presented through applying statistical summarization and comparisons (Al - Mabrouk & Soar, 2006). However, the validity and/or reliability of a Delphi method influenced by the

characteristics of participants and successive rounds that applied to acquire consensus (Hasson et al., 2000).

The experts' selection is a key step in the Delphi process. Therefore, three groups of qualified participants were used as consultants, contractors, and government officials. Participants are well aware about the PMO principles and knowledge in construction works, and willing to participate. The Saudi Contractors Authority (SCA) and the Saudi Council of Engineers (SCE) were the reference to identify participants as well as governmental experts were identified through their high qualifications in the construction industry. All the invited participants require to have both membership in SCA and/or SCE and a minimum 10 years of proficient knowledge in the construction industry.

Table 1: Drive Factors to establish PMO

Code	Group	Drive Factors
D 1	Strategic	Lack of support for strategic management (Eriksson & Leiringer 2015)
D 2		Inability to define business goals (Ntshwene et al., 2022)
D 3		Poor project portfolio management (Eriksson & Leiringer 2015)
D 4		Poor monitoring & controlling perf. of projects (Eriksson & Leiringer 2015)
D 5		Complications in fronting the turnover growth (Oliveira et al., 2017)
D 6	Tactical	Misunderstanding perceived responsibilities (Oliveira et al., 2017)
D 7		Lack of project governance (Ntshwene et al., 2022)
D 8		Lack of standardized PM processes (Oliveira et al., 2017)
D 9		Unmanaged risk events (Ntshwene et al., 2022)
D 10	Operational	Inadequacies in communication management (Oliveira et al., 2017)
D 11		Complications in internal planning management (Oliveira et al., 2017)
D 12		Lack of PM main pillars (Ntshwene et al., 2022)
D 13		Lack of project communication (Ntshwene et al., 2022)
D 14		Neglect for cost management (Oliveira et al., 2017)
D 15	Administrative	Poor documentation and record (Ntshwene et al., 2022)
D 16		Inability to recruit competent staff (Ntshwene et al., 2022)
D 17		Inability to optimize resources (Ntshwene et al., 2022)
D 18		Decentralized information (Oliveira et al., 2017)
D 19	Methodology	Lack of training and education (Eriksson & Leiringer 2015)
D 20		Lack of project methodology (Ntshwene et al., 2022)

The consensus among the participants is reached through the use of precise comment and are petition approach. Therefore, participants in the chronological round are informed of their unidentified counterparts' opinions in the prior round, where slight statistical reviews are offered such as mean, median, and/or quartile ranges. However, three Delphi rounds were accompanied to identify viewpoints, justification, and share information with other participants. The primary driving factors that lead organizations to establish PMO was developed in the first round, the second round validates the primary driving factors and identify their importance, and the third round develops agreement. However, these three rounds were performed online questionnaires allowing the anonymous participants thru several locations.

The literature recommends higher degree of consensus among participants (Alahmadi & Alghaseb, 2022). This study used ten - point Likert scale. Thus, lower variance in responses between participants in Delphi represents a higher agreement rate, thereby median (\bar{x}), standard deviation (Std.), and interquartile range (IQR) were implemented in this research to measure the consensus of participants.

3. Results

Table: 2 presents the twenty driving factors according three Delphi rounds. Therefore, the driving factors were formed, classified, and listed under five main areasthat strategic, tactical, operational, administrative, and methodology category.

Table 2: Results from three round

Code	Round1			Round2			Round3		
	\bar{X}	Std.	IQR	\bar{x}	Std.	IQR	\bar{x}	Std.	IQR
D 1	6	2.25	2.00	8	1.72	2.00	8	1.55	1.00
D 2	6	2.57	2.00	6	2.04	2.00	6	1.96	2.00
D 3	6	1.85	2.00	6	1.85	2.00	6	1.81	2.00
D 4	9	1.43	1.00	9	1.11	1.00	9	0.92	1.00
D 5	6	1.89	2.00	6	1.73	2.00	6	1.69	2.00
D 6	6	2.38	2.00	6	2.38	2.00	6	2.14	2.00

D 7	6	2.45	2.00	6	2.12	2.00	6	2.12	2.00
D 8	7	1.52	2.00	7	1.52	2.00	7	1.50	1.00
D 9	9	1.86	1.00	9	1.69	1.00	9	1.61	1.00
D 10	6	1.96	2.00	8	1.29	2.00	8	1.12	2.00
D 11	6	1.89	2.00	6	1.89	2.00	6	1.85	2.00
D 12	10	0.77	1.00	10	0.77	1.00	10	0.61	1.00
D 13	8	1.70	1.00	8	1.70	1.00	8	1.64	1.00
D 14	9	1.89	1.00	9	1.89	1.00	9	1.83	1.00
D 15	6	1.91	2.00	8	1.33	2.00	8	1.33	1.00
D 16	8	1.74	2.00	8	1.63	2.00	8	0.91	1.00
D 17	8	2.03	2.00	8	2.03	2.00	8	1.26	1.00
D 18	6	2.21	2.00	6	2.02	2.00	6	1.912	2.00
D 19	9	1.63	1.00	9	1.47	1.00	9	0.96	1.00
D 20	8	1.44	2.00	8	1.44	2.00	8	1.44	2.00

Participants' Demographics

Several researches have debated the ideal number for participants in a Delphi study, thereby the optimal number in construction studies ranged from 9 to 20 (Ameyaw et al., 2016). Therefore, twenty – one participants accomplished all the rounds of the Delphi process. Furthermore, fair involvement of altogether group of participants performed in which contractors (38%), consultants (33%), and the government officials (29%) Details groups of the participants are shown in Table: 3& Table: 4.

Table 3: Participants Type

Participants	
Contractors	8
Consultants	7
Governmental officials	6
Total	21

Table 4: Participants Experience

Experience in Years	
11 - 15	56%
16 - 20	36%
20+	8%
Total	100%

Round One

The first round targets participants for identifying the initial set of driving factors that lead organizations to establish PMO in the construction industry in Saudi Arabia. Round one includes a two - section questionnaire which was sent via e - mail to the thirty – three practitioners. The demographic information of participants is the first section and the second section is for the participants to evaluate driving factors to establish PMO in the Saudi construction industry based on knowledge and experience. A total of twenty - one out of thirty - three experts (response rate 63%) participate in round one, thereby a list of twenty driving factors were evaluated and consequentially synthesized and categorized. Thus, round one revealed that altogether driving factors were identified with different level of consensus, but only ten were evaluated eight or higher. The driving factors that reach consensus in round one are 1) poor monitoring & controlling perf. of projects, 2) lack of standardized PM processes, 3) unmanaged risk events, 4) lack of PM main pillars, 5) lack of project communication, 6) neglect for cost management, 7) inability to recruit competent staff, 8) inability to optimize resources, 9) lack of training and education, and 10) lack of project methodology.

Round Two

Participants in round two received a second questionnaire including a list of altogether twenty driving factors identified from round one. Thus, participants were requested to evaluate the impact of driving factors that lead organizations to establish PMO in the Saudi construction industry. However, ten - point Likert scale was used where number one represents “not at all important” and ten represents “extremely important”. Eighteen participants responded in round two (response rate 85%) in which three more driving factors reach the consensus which are lack of support for strategic management, inadequacies in communication management, and poor documentation and record.

Round Three

The participants were requested to provide significance assessment of the identified driving factors, also to submit remarks for justification. Round three received feedback from eighteen participants (response rate 85%). However, round three confirmed that participants agreed on thirteen driving factors lead organizations to establish PMO in the Saudi construction industry. Other identified driving factors that disagreed on are 1) inability to define business goals, 2) poor project portfolio management, 3) complications in fronting the turnover growth, 4) misunderstanding perceived responsibilities, 5) lack of project governance 6) complications in internal planning management, 7) decentralized information.

4. Discussion

The driving factors lead organizations to establish PMO are somewhat mentioned in the literature review regarding the construction industry. More, there is a lack of research regarding driving factors lead organizations to establish PMO in construction industry within Saudi Arabia. However, driving factors in this research were grouped from different fields of research for example; IT, construction, healthcare, banking, education, mining, and public

administration. Thus, the consensus among driving factors are discussed in each category.

Strategic Factors

Strategically, participants from altogether rounds highly agreed on the driving factor “*poor monitoring & controlling perf. of projects*” as driving factor which obtained average consensus rate (0.86). This agreement is in consistence with Artto et al., where addressed monitoring and controlling project performance is a common PMO function (Artto et al., 2011). While the participants barely agreed on the driving factor “*lack of support for strategic management*” that has consensus rate (0.72) which in consistence with Aubry where stated that strategic management support by PMO can take many forms such as participating in strategic planning and aligning the project portfolio with overarching strategic objectives (Aubry et al., 2011). Nonetheless, participants disagreed on “*inability to define business goals*”, “*poor project portfolio management*” and “*complications in fronting the turnover growth*”.

Tactical Factors

Tactically, participants agreed on driving factors “*lack of standardized PM processes*” which obtained average consensus (0.76) which in consistence with Formentini and Romano when addressed that the PM standardized moves the focus away from the common practice of merely collecting and storing knowledge to actually reusing it (Formentini and Romano, 2011). Likewise, the driving factor “*unmanaged risk events*” with average consensus (0.72) which inconsistency with Crawford argument that stated the PMO should focus on activities with less potential for risk and are less likely to generate resistance on the part of employees (Carwford, 2010). However, consensus was not reached among participants regarding driving factors “*misunderstanding perceived responsibilities*” and “*lack of project governance*”.

Operational Factors

Operationally, the participants highly emphasized the agreement in all rounds for driving factor “*lack of PM main pillars*” with average consensus (0.96) in which consistence with Oliveira et al. where PM cost, quality, and time are vital in PMO conceptualization for engineering and construction businesses (Oliveira et al., 2017). In addition, participants moderately recognized the driving factor “*neglect for cost management*” with average consensus (0.81) and the driving factor “*lack of project communication*” (0.76), while barely in round one agreed on the driving factor “*inadequacies in communication management*” with consensus (0.73). These consensus are in consistence with Eriksson since addressed that communication - intensive process for knowledge sharing and integration is related to explorative learning (Eriksson, 2013). However, participants disagreed on the driving factor “*complications in internal planning management*”.

Administrative Factors

From administrative point of view, participants respectively agreed on “*Inability to recruit competent staff*” and “*Inability to optimize resources*” with consensus rate (0.78) and (0.76). These consensus are in consistence with Artto et al., where addressed recruiting, selecting and evaluating

project managers as well as allocating resources to different projects is a common PMO function (Artto et al., 2011). Also, participants barely in round one agreed on “*Poor documentation and record*” with consensus rate (0.73) which is in consistence with Aubry et al. that stated PMO manages post - project reviews and archives of project documentation as well as implementing and managing a database of lessons - learnt (Aubry et al., 2011). Nevertheless disagreed on the driving factor “*decentralized information*”.

Methodology Factors

Methodologically, participants prominently in all rounds agreed to recognize the driving factor “*Lack of training and education* with consensus rate (0.84) as well as the driving factor “*lack of project methodology*” with consensus rate (0.79). These agreements are in consistence with Aubry where stated that PMO assist development of competences, training in PM, and coaching of PMs (Aubry et al., 2010).

Conclusion

PMO enhances establishing and implementing of project business management’s standards, methodology, and practices. The PMO also has tools and templates provides education and training in which enabling project management competency on an enterprise - wide, division, business unit, or project basis. The function and typologies of PMO are well covered in researches in many different areas. The decision to embrace PMO in an organization initially depends on understanding the likely reasons that lead organizations to establish PMO. Thus, this research focuses on the driving factors that lead construction organizations to establish PMO in Saudi Arabia. The literature review revealed that there are twenty driving factors. Those driving factors were evaluated through three rounds of Delphi method. The findings shows that only thirteen driving factors that participants were agreed on in which significant to establishing PMO in Saudi construction industry. Those consensus driving factors in altogether rounds are 1) Lack of PM main pillars, 2) poor monitoring & controlling perf. of projects, 3) lack of training and education, 4) lack of project methodology, 5) lack of standardized PM processes, 6) unmanaged risk events, 7) lack of project communication, 8) neglect for cost management, 9) inability to recruit competent staff, and 10) inability to optimize resources. Participants were hesitant in round one regarding driving factors lack of support for strategic management, inadequacies in communication management, poor documentation and record, then participants were agreed on those driving factors in rounds two and three. Other seven driving factors were identified, and then participants did not reached the minimum level of agreement. These finding supposed to assist construction organizations to understand their shortage in order to be able to select the proper functions and model of PMO that can help enabling growth. The significance of these findings will assist the Saudi construction industry to enhance the adoption of PMO applications.

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