



Midocean University
Faculty of Management
Master of Project Management

Research Title

أثر مكتب إدارة المشاريع على جودة تنفيذ مشروع التوسعة الثالثة للحرم المكي

**The impact of the Project Management Office on the quality of
implementation of the 3rd expansion of Holy Mosque project**

Prepared by:

Eng. Ahmad M. Al-Zahrani
Eng. Abdulrahman R. Balud Al-Sulami

Dissertation submitted in partial Fulfillment for the degree of
Master of Science in Project Management

Dissertation Supervisors

Dr. Alfaisal Abdulhameed

Dr. Waleed Suliman

Abstract

Alongside the move by organizations towards utilizing project management techniques for managing their operations, the PMO has recently become a key business unit in organizations that can positively impact organizational performance. To assess the role of the PMO as a key driver for implementation quality of the 3rd Expansion of the Holy Mosque project.

The role of the PMO varies from one organization to another, as it might have a very strategic role for the organization by managing and directing the overall organization's business and operations and might have a minimal supportive role in some divisions, this variation is due to nature of business, type of organization structure, and the PMO location within the organization.

The study used a descriptive methodology and the data gathered from all employees at the project through an exploratory survey by using a Google form questionnaire to evaluate the current system of PMO quality Assurance plan in the ongoing project of Holy Mosque, investigating the major obstacles of the current system PMO Quality Assurance plan. determining which part of the PMO quality Assurance plan needs to be enhanced or updated. Descriptive analysis to describe the sample via using SPSS analysis software has been done to obtain qualified analysis.

The study emphasized the role of PMO in the Quality Assurance Plan of the project, the study demonstrates that there is a positive role of PMO in the project. The findings are helpful for the construction community as well as for researchers to understand the insightful issues that may face the PMO to conduct its role properly.

Key words: Project Management Office, Quality Assurance Plan, Project Governance, PMO Roles, Organization structure, PMO maturity.

Acknowledgment

The researchers would like to thank those who contributed to the completion of this research. First and foremost, we would like to thank Midocean University for giving us this learning opportunity that helped us develop valuable life lessons of patience, perseverance, teamwork, resilience, cooperation, and most of all, the endless pursuit of knowledge.

Second, we would like to convey our deep and sincere gratitude toward ***Dr.Alfaisal Abdulhameed*** and ***Dr.Waleed Suliman*** for providing invaluable guidance, support, advice, comments, suggestions, and provisions that helped in the completion and success of this study. It was a great privilege and honor to work and study under their guidance.

We would also like to express our greatest gratitude towards our parents for their endless love, prayers, support, and sacrifices. This would not have been possible without their unselfish love and support always given to us.

A big thanks to Almighty God for giving us the strength, knowledge, ability, and opportunity to undertake this research study. Without His guidance and mercy, we would not be able to accomplish this research and all our daily endeavors. To God be the Glory!

Lastly, our thanks go to all the people who have supported us to complete the research directly or indirectly.

List of Content	Page Number
Chapter 1	
List of Figures	Page-5
List of Tables.....	Page-5
List of Abbreviations	Page-5
1.1 Introduction	Page-6
1.2 Significance of PMO In Construction Sector.....	Page-8
1.3 PMO Summary.....	Page-10
1.4 PMO Maturity.....	Page-11
1.5 The role of PMO	Page-13
1.6 Benefits Of PMO.....	Page-14
1.7 Advantages Of PMO.....	Page-15
1.8 Quality Services Of PMO.....	Page-16
Chapter 2	
2.1 Study problem.....	Page-18
2.2 The importance of the study.....	Page-18
2.3 Objectives of the study.....	Page-19
2.4 Study Questions.....	Page-19
Chapter 3	
3.1 Methodology and research methods.....	Page-20
3.2 Study limitations.....	Page-20
3.3 Study tools (data Collection tools).....	Page-20
Chapter 4	
4.1 Research Hypotheses.....	Page-20
4.2 Role Of PMO As Quality Assurance Point Of View.....	Page-21
4.3 Theoretical premises of study.....	Page-24
Chapter 5	
5.1 Finding.....	Page-25
Chapter 6	
6.1 Results and proposal analysis.....	Page-28
Chapter 7	
7.1 Conclusion.....	Page-35
7.2 Recommendation.....	Page-36
Chapter 8	
8.1 Appendix.....	Page-37
Chapter 10	
9.1 List of references and preliminary sources.....	Page-38

List of Figures

- F1.1 PMO Block Diagram**
- F1.2 King Abdullah Third Expansion Of Holy Haram**
- F1.4 PMO capabilities across PMO competency, Adapted (Hill, 2004)**
- F6.1 Fig 6.1 Distribution of the employees Organization**
- F6.2 Position In The Organization**
- F6.3 Duration of work in the 3rd expansion of the holy mosque project**
- F6.4 Educational level among the studied participants**

List of Tables

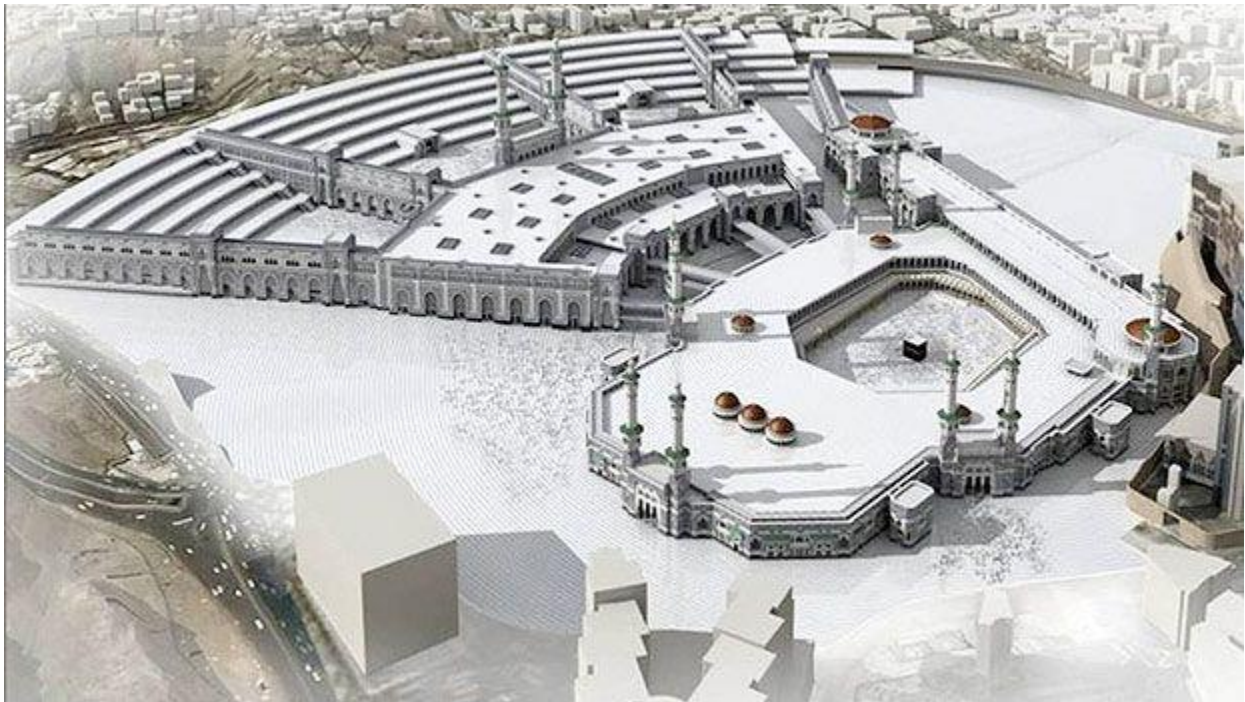
- Table 2.1 Classified Roles Under PMO**
- Table 4.2 Quality Assurance- Point Of View in PMO**
- Table 5.1** Table 5.1- Analysis done by SPSS V 26
- Table 5.2** Table 5.2- Analysis done by SPSS V 26
- Table 5.3** Table 5.3- Analysis done by SPSS V 26
- Table 5.4** Table 5.1- Analysis done by SPSS V 26
- Table 5.5 Tool Of Study Measurement Work**
- Table 6.1 Social- Demographic Characteristics Of Studied Participants**
- Table 6.2** Table 6.2- Analysis done by SPSS V 26
- Table 6.3** Table 6.3- Analysis done by SPSS V 26
- Table 6.4** Table 6.4- Analysis done by SPSS V 26
- Table 6.5** Table 6.5- Analysis done by SPSS V 26

List of Abbreviations

PMO	Project Management Office
QAP	Quality Assurance Plan
PMI	Project Management Institute
KPI	Key Performance Indicator

1.1 Introduction

The Holy Mosque in Mecca is the largest and most important mosque in Islam. It surrounds the Kaaba, the most sacred site in Islam. Due to its immense religious significance, there has been an ongoing expansion of the Holy Mosque complex to accommodate the growing number of pilgrims and worshippers.



F1.2 (KING ABDULLAH THIRD EXPANSION OF HOLY HARAM)

The third expansion of the Grand Mosque in the holy city of Makkah was its largest in history. Throughout the centuries, the expansions would focus on raising the capacity of worshippers. The central Mataf area has maintained its size over the years given the limited space available to expand it, so focus would often turn to the surrounding structures(english.aawsat Newspaper, 2023).

In 2005, King Abdullah bin Abdulaziz ordered that a study be made over expanding the capacity at the Grand Mosque to receive more worshippers and Hajj and Umrah pilgrims.

The expansion was implemented with the addition of four floors to the al-Masaa area to accommodate 120,000 people per hour. The Mataf area was expanded to

accommodate 105,000 people per hour. The northern building of the Grand Mosque was expanded to accommodate more worshippers and the number of columns throughout was reduced to make more space for people and combat crowding(Middle east Newspaper, 2023).

Management and delivery of such a large-scale, complex program of construction projects presents many challenges. Therefore, implementing an effective Project Management Office (PMO) can have a significant positive impact on the quality of project implementations.

The PMO would enable centralized oversight, governance, and capability building across the multitude of construction projects underway. Standardizing project management policies, processes, tools and quality metrics will promote consistency and efficiency.

The PMO auditing and reporting capabilities would identify issues early, enabling corrective actions. Its strategic prioritization and portfolio management of projects would align resource allocation with religious objectives.

Overall, the structure and discipline enabled by an empowered PMO will likely enhance the Holy Mosque project implementation quality in planning, delivery, monitoring, and closure. Realizing these quality improvements would fulfill the Saudi government's vision of providing a sublime experience for pilgrims visiting Islam's most sacred place.

This paper will analyze how implementing a PMO can influence various aspects of project quality for the Holy Mosque projects. It will study leading practices for PMOs and draw lessons for the specific context of the mega Mosque projects. The insights from this analysis will inform recommendations on how to structure and empower a PMO for optimal impact.

1.2 Significance of PMO in the Construction Sector:

A project management office (PMO) is a group, agency or department that defines and maintains the standards of project management for a company. The PMO retains the documentation and metrics for executing projects and is tasked with ensuring projects are delivered on time and within budget.

PMO typically comprises a mix of professionals from IT, planning, finance and risk management who collaborate to ensure that all projects meet the defined organizational outcomes.

The PMO has several functions, like ensuring that projects are completed on time, within budget, and to the required standard. The main tasks include:

Project planning: documenting steps, scope, and milestones for completing a project

Project process improvement: outlining how a project's processes can be improved in the future

Project resourcing: allocating resources to complete a project, including people, financing, software, and materials

Project monitoring: tracking a project's metrics, progress, and tasks to make sure the project will be completed on time and within budget

Project control: a set of processes for tracking potential threats, issues, and opportunities for enabling project decision-making.



F1.1 PMO CYCLE

Above diagram is the basic block for PMO

PMO are used in various sectors as mentioned below:

- **IT and computing**
- **Financial services**
- **Pharmaceuticals and clinical products**
- **Public sector and government contracts**
- **Energy and utilities**
- **Manufacturing.**

But our main focus related to the Project Management Office is in the construction sectors with benefits and advantages in order to know the quality of services which PMO will provide in the construction of “King Abdulah Third Expansion Holy Makkah.

1.3 PMO Summary

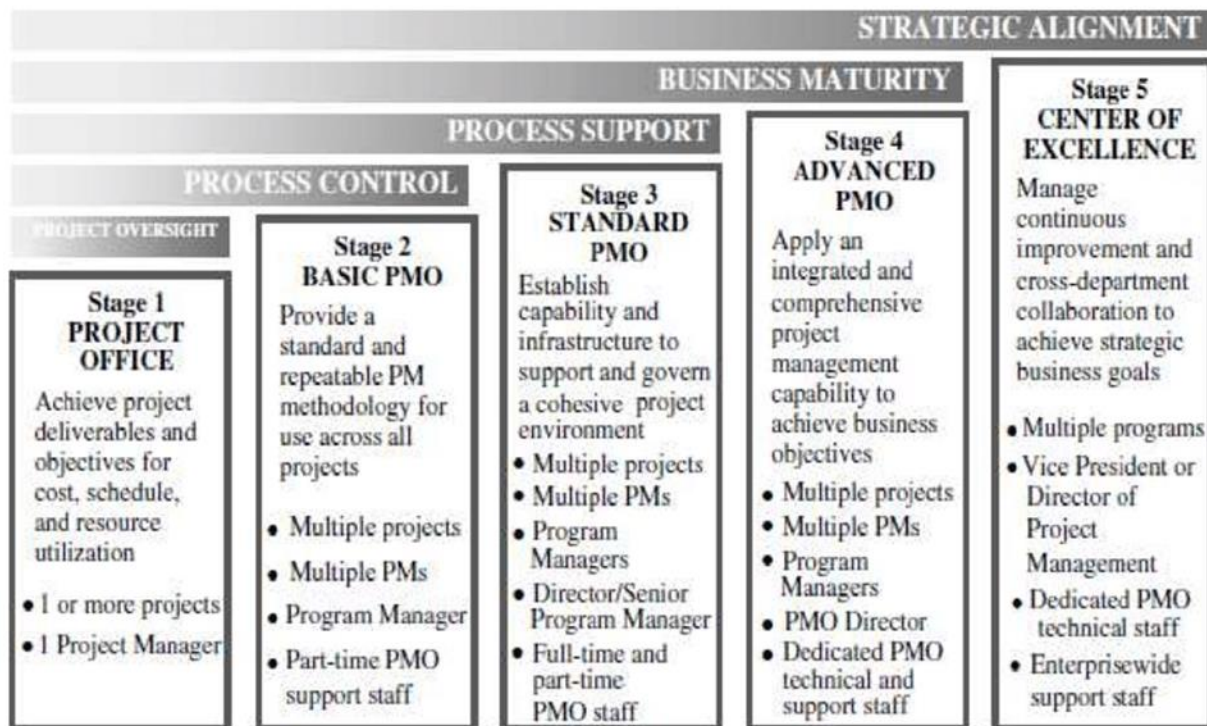
There is no specific definition for the PMO (Desouza and Evaristo ,2006). There is no specific unified definition for the PMO but the PMO in any shape is about leadership and achievements (Taylor, 2011).The PMO is: [an] organizational body or entity assigned various responsibilities related to the centralized and coordinated management of those projects under its domain according to PMI (2008, p.25). The responsibilities of a PMO can range from providing project management support functions to actually being responsible for the direct management of a project.

Similar definition to PMI and defined it as “an organizational entity established to assist project managers, teams and various management levels on strategic matters and functional entities throughout the organization in implementing project management principles, practices, methodologies, tools and techniques” (Dai and Wells 2004).

Neither PMI (2008) nor Dai and Wells (2004) have indicated that functions of PMO can be handled by department or section. However Pole to Pole communications (2009, p.05) has assured that the PMO is: [t]he department or group that defines and maintains the standards of process, generally related to project management, within the organization. The PMO strives to standardize and introduce economies of repetition in the execution of projects. The office is also the source of documentation, guidance and metrics on the practice of project management and execution.

1.4 PMO Maturity

The variation in PMO roles can be justified due to the level of PMO maturity, organization needs, and organization maturity. The PMO maturity has been classified into 5 levels as illustrated in Figure () under certain attributes for PMO which increase gradually depending on the level of maturity (Hill 2004).



F1.4 PMO capabilities across PMO competency, Adapted (Hill, 2004)

The PMO has three major roles which are coordinating role, controlling role, and supporting role and it has been classified to sub functions for each role as illustrated in table (2.1)(Unger et al. ,2012).

Role	Sub Functions
Coordinating Role	Project appraisal and selection Cross-project support Cross-department coordination Managing and resolving conflicts Resources Management
Controlling Role	Information Management Provide inputs to decision making Project Monitoring and Control
Supporting Role	Providing services to project members/leaders Training Promoting PM culture Project Management Methodology

Table 2.1 (Classified Roles Under PMO)

1.5 The role of PMO:

The PMO has many roles that researchers sometimes clarify in a high level way, and sometimes go deeply to daily processes and details. In this section; the PMO Only Quality Assurance role to be discussed in this research.

1.5.1 The role of a Project Management Office (PMO) as a Quality Assurance point of view:

The PMO plays a crucial, overarching role in quality management for projects through oversight, governance, capability-building, and the use of data-driven insights to drive continuous improvements. The PMO essentially establishes and promotes a quality culture across projects. These roles are listed below:

- PMO is responsible for establishing quality assurance standards, policies, and procedures across projects in an organization. This includes setting quality targets, defining metrics to measure quality, and creating quality assurance plans.
- The PMO oversees the implementation of quality assurance activities within projects. This can involve conducting process audits, tracking quality metrics, and reviewing project deliverables to ensure they meet established quality criteria.
- The PMO may provide training and mentoring to project managers and teams on utilizing quality assurance best practices and methods. This helps ensure consistency in how quality is managed.
- The PMO is responsible for quality assurance governance. This governance provides clear guidelines on roles and responsibilities related to quality, outlines quality reporting procedures, and sets change control processes.
- A critical PMO responsibility around quality is the collection and analysis of quality metrics from different projects. The data and insights gathered are used to drive quality improvements across the project portfolio.
- The PMO oversees remediation plans when major quality issues are uncovered in projects. They guide the project teams in addressing gaps to meet quality standards.

1.6 Benefits of PMO:

The greatest advantage of a PMO is that: it helps an organization develop project management skills which results in various positive impact in terms of cost savings along with:

- Value for money by adding to the bottom line of delivering cost savings.
- Achieving strategic objectives to drive the organization forward and work for its success.
- PMO increases the accuracy of projects in terms of the budget, resources, and schedule associated with them as discussed in details below:

Increased Accuracy:

The PMO increases the accuracy of projects in terms of the budget, resources, and schedule associated with them. By being accurate or predictable you will ensure that your projects are less likely to fail and also that the project teams are more likely to be consistent.

Cost Savings:

Directly linked to the point above cost savings are definite when accuracy comes into the equation. By being more accurate from the beginning of the project right through to the end you will reduce the chances of changes needing to be made. Making changes to projects is where you tend to spend money that has not been budgeted for.

Develop Standards:

A PMO ensures organizations develop and enforce standards across the board which leads to an improvement in project management expertise and uniformity across a project team. These standards are developed through data collection and analysis, reporting and communication etc.

Decisions:

A PMO provides a platform for good decision-making by linking strategic plans together with corporate results. This will allow organizations to achieve more success in their projects.

Project Control:

The PMO excels in control over projects through its set processes, procedures, and effective communication. This control will help the organization achieve its strategic goals.

Resource Assistance:

The PMO can assist an organization with any resourcing issues. By examining the skills of the project managers available, the PMO can allocate the ideal project manager to the ideal project.

Problem Solving:

Regardless of the nature, size and urgency of a project, mistakes and problems are bound to emerge. PMO determines the cause of the problem and takes immediate steps to rectify the mistake.

1.7 Advantages of PMO:

There are many advantages of PMO as compared to other management services as mentioned below:

- PMO services enhances the communication skills within the organizations.
- PMO is efficient enough to solve conflict management, if it arises.
- PMO has a centralized approach to projects, which helps to ensure clarity and consistent, accurate results.
- PMO is typically task provider to provide a professional support.
- PMO has the ability to priotrizes the task depending on the priority of the work.
- PMO keeps a constant tab on the budget.
- PMO ensures no resources are wasted or unused.
- PMO eliminates redundancies and bureaucratic practices that affects projects.
- PMOs have consistent and repeated practices for project management that are continually used throughout the organization.

1.8 Quality Services provided by PMO:

Let us see below the supreme qualities of PMO's which are practically done in any projects:

Since PMO's are the Client Representatives, so these PMO's have the full authority to lead the whole project from the front, by commanding the whole team on one page, in order to deliver the projects on time.

All the Contractors/ Sub-Contractors/ Cost Consultant/ Design Consultant works under the leadership of PMO's as mentioned below:

-PMO's decides the costing of the projects by having meetings with the Cost Consultants in order to avoid any loss of money during all the phases of the projects by maintaining the BOQs of the contractors.

-PMO's initiates the meetings with all parties to ensure a tentative programme in order to ensure the projects are delivered on time.

-PMO's does meetings with the Contractors + Design Consultants in order to avoid the mistakes/ errors as much as possible.

-PMO's meets with the Procurement Team, so that the materials which are purchased are of best qualities.

-PMO's also have meetings with the Technical teams in order to maintain a smooth workflow related to technical works like:Electrical, Mechanical, HVAC, Sound,Plumbing, BMS.

-PMO's also deals with the civil team, to ensure a good Fit-Out works.

-PMO ensures that safety measures are achieved by having meetings with Safety Engineers, by implementing Safety Inductions to all the Labors/ Engineers in order to avoid all the safety hazards.

-If the projects does not complete on time, then PMO's needs to make a Programme which shows the new tentative dates by officially making EOT (Extension Of Time), in order to ensure that the projects are finished within the new specified dates.

-PMO's stays throughout the Project from the start till the end, until the projects doesn't gets technically complete with all the commissioning done with proper operation is achieved during the time of the handover of the projects.

-PMO's also make sure that all the parties are getting paid for the amount of work done depending on the Baseline Programme Plans and ensure all the payments are cleared.

-PMO's ensures that, all contract obligations are complete in terms of every aspects during the closure of the projects.

-PMO's also help all the parties to get back the Retention Monies once the project is completed, which is hold by the clients during the tender stages.

2.1 Study problem

The ongoing expansions of the Holy Mosque in Mecca involve a complex, multi-year program of construction projects aimed at accommodating the growing number of pilgrims. However, there are widespread challenges in consistent, high-quality execution of these strategically important projects. Issues such as cost overruns, schedule delays, safety incidents, and quality defects have been prevalent. For example, the project to construct the additional Mataf (circumambulation areas around the Kaaba) suffered delays of over 2 years and billions of dollars in cost overruns before opening in 2016.

These deficiencies point to a lack of centralized governance, standardization, oversight, and capability development across the multitude of Holy Mosque projects. As a result, projects are not benefiting from institutional learning and improvement. Moreover, project issues are often identified late, leading to crisis management. The absence of disciplined project portfolio management also leads to disconnects between resource allocation and strategic religious priorities.

Therefore, the core problem is that the lack of a structured Project Management Office (PMO) with appropriate authority and responsibilities has negatively impacted the quality of project delivery for the strategic Holy Mosque expansion program. Solving this problem by implementing an empowered PMO is critical to enable consistent, efficient, and high-quality execution of projects for this sacred site through best practice project management.

2.2 The importance of the study

The study is critically important for several reasons:

- The Holy Mosque is the most sacred site in Islam and its expansion is strategically vital to accommodate growing numbers of pilgrims. Poor project delivery quality undermines the religious vision and service for pilgrims.
- Billions of dollars are being invested in the expansions. Inefficiencies and poor quality execution lead to massive cost overruns, which is unacceptable.
- There are risks to worker and pilgrim safety from poor quality control. Construction flaws have already led to incidents like building collapses.

- Learning how to effectively implement a PMO will enable institutional learning and continuous improvement in project delivery, ensuring quality keeps pace with Saudi Arabia's expanding religious tourism industry.
- Findings will inform PMO design and governance for other large public sector programs in the Kingdom and globally that involve complex construction project portfolios.
- This research fills an important knowledge gap, as empirical studies on implementing PMOs in the public sector and religious context are limited.

In summary, improving Holy Mosque project delivery through an empowered PMO has immense religious significance and strategic economic impact. The research insights will be invaluable for the custodianship of Islam's holiest site and for large public projects across Saudi Arabia and internationally.

2.3 Objectives of the study

The study aims to evaluate the role of the project management office (PMO) in ongoing projects of the Holy Mosque in Mecca and its contribution to ensuring project management policies, processes, procedures, tools, and techniques to achieve high-quality of work implementation.

2.4 Study Questions:

In order to achieve the aim of this study, selective objectives have to be met as follows:

1. To evaluate the current system of PMO quality Assurance plan in the ongoing projects of the Holy Mosque?
2. To investigate the major obstacles of the current system PMO quality Assurance plan that have been met?
3. To determine which part of the PMO quality Assurance plan needs to be enhanced or updated?

3.1 Methodology and research methods:

In this study, three stages have been investigated starting with evaluating the current system of PMO- Quality Assurance plan in the ongoing projects of Holy Mosque. Secondly, investigating the major obstacles of the current system. Thirdly, determining which part of the PMO quality plan needs any enhancement or update. Lastly, Implementation & evaluation of the updated PMO quality plan.

3.2 Study Limitation:

The study is limited to the ongoing expansions of the Holy Mosque in Mecca. It covers the governmental, semi governmental and private sectors in the industry including stakeholders and parties (eg., client, client representative, consultant, main contractor, subcontractors and end user).

3.3 Study tools (data Collection tools):

To collect information from stakeholders and parties (eg., client representative, consultant, main contractor, subcontractors and end user), electronic questionnaire by using google forms to be used in this study.

4.1 Research Hypotheses

H1: The implementation of a centralized PMO with clearly defined roles and responsibilities will result in improved standardization of project management policies, processes, and tools across Holy Mosque projects.

H2: Training and mentoring of project managers and team members by the PMO will significantly enhance project management knowledge and skills for Holy Mosque projects.

H3: Enhanced project audits, oversight, and performance reporting by the empowered PMO will enable earlier identification and mitigation of project issues and risks.

H4: Strategic prioritization and resource allocation of projects by the PMO will lead to improved alignment of project portfolios with religious and operational objectives.

H5: Instituting PMO-led processes for project approvals, stage gate reviews, and closures will improve governance and accountability across all Holy Mosque projects.

H6: Overall project quality metrics including cost performance, schedule adherence, safety, and defect rates will improve significantly after PMO implementation compared to the pre-PMO baseline.

H7: PMO capabilities including dashboards, lessons learned, and PM training will create measurable, sustained improvements in project delivery quality over multiple years after implementation.

These hypotheses can be tested through quantitative and qualitative methods including surveys, interviews, audit studies, and statistical analysis of project performance metrics before and after PMO implementation.

4.2 The role of a Project Management Office (PMO) from a Quality Assurance point of view:

The PMO plays a crucial, overarching role in quality management for projects through oversight, governance, capability-building, and using data-driven insights to drive continuous improvements. The PMO essentially establishes and promotes a quality culture across projects. These roles listed below:

- PMO is responsible for establishing quality assurance standards, policies, and procedures across projects in an organization. This includes setting quality targets, defining metrics to measure quality, and creating quality assurance plans.
- The PMO oversees the implementation of quality assurance activities within projects. This can involve conducting process audits, tracking quality metrics, and reviewing project deliverables to ensure they meet established quality criteria.
- The PMO may provide training and mentoring to project managers and teams on utilizing quality assurance best practices and methods. This helps ensure consistency in how quality is managed.
- The PMO is responsible for quality assurance governance. This governance provides clear guidelines on roles and responsibilities related to quality, outlines quality reporting procedures, and sets change control processes.

- A critical PMO responsibility around quality is the collection and analysis of quality metrics from different projects. The data and insights gathered are used to drive quality improvements across the project portfolio.
- The PMO oversees remediation plans when major quality issues are uncovered in projects. They guide the project teams in addressing gaps to meet quality standards.

4.2 Literature Review

Study	Publisher	Conclusion
Failure factors of Makkah's mega construction projects: qualitative study	Nashwan Al-Emad1,*, Ismail Abdul Rahman1 ,and Humair Khan2	The study has found that 30 % of project failure is due to Client/PMC, 50% due to contractors, 15% caused by the supervision consultant team and finally external factors contribute approximately 5% to project failures. It also identified 58 factors causing project failures, these factors were then classified into 4 main clusters namely Client Instigated Factors with 17 failure factors, Contractor Instigated Factors with 27 failure factors, Consultant Instigated Factors with 10 failure factors and External Instigated Factors with 4 failure factors
Identifying and overcoming the challenges of implementing a project management office	Rajendra Singh1 , Mark Keil2 and Vijay Kasi3	The study has found that there are many challenges. The top-three challenges identified were (1) rigid corporate culture and failure to manage organizational resistance to change, (2) lack of experienced PMs and PMO leadership, and (3) lack of appropriate change management strategy. In order to overcome these challenges, organizations need to have a strong PMO champion, start small and demonstrate the value of the PMO, obtain support from opinion leaders, hire an experienced program manager who understands the organization, bring the most talented PMs into the PMO implementation team, adopt a flexible change management strategy, and standardize PM processes prior to PMO implementation
The role of time, communication, and cost management on project management success: an empirical study on sample of construction projects customers in Makkah City, Kingdom of Saudi Arabia	Bahaà Abdul-Hafez Attallah Al-Nady* Sulieman Ibraheem Shelash Al-Hawary Main Naser Alolayyan	The study's findings suggested that successful PMs who implement the right time management (TM), Cost management (CM) and Cost management (COM) which all are interaction practices strongly influence project operation, workers and employees' sense of job success. The research finding underpinned the importance of the managerial role in the workplace and the value of the project manager's contribution to building a positive and success project environment, regardless of whether the project environment is stable or undergoing continual changes and growth initiated by project acquisitions. Good COM is an integral part of good management and an organizational and individual responsibility.

4.3 Theoretical premises of study

The study used a descriptive methodology and the data gathered from all employees at the project through an exploratory survey by using a Google form questionnaire to evaluate the current system of PMO quality Assurance plan in the ongoing project of Holy Mosque, investigating the major obstacles of the current system PMO Quality Assurance plan. determining which part of the PMO quality Assurance plan needs to be enhanced or updated. Descriptive analysis to describe the sample via using SPSS analysis software has been done to obtain qualified analysis.

5.1 Findings

After building the study tool and ensuring its apparent validity by presenting it to a group of specialized and experienced arbitrators, Pearson's Coefficient Correlation was calculated to verify the validity of the internal consistency between the statements of each goal and the total score for the belonging axis. To know the degree of correlation of each statement of the questionnaire with the total score, as the following tables show:

Statement number	R	Statement number	r
1	0.633**	6	0.744**
2	0.734**	7	0.726**
3	0.703**	8	0.712**
4	0.711**	9	0.714**
5	0.741**		

Table 5.1- Analysis done by SPSS V 26

** : p value <0.001

Table 5.1 Pearson Correlation of the statement of the current system of PMO quality Assurance plan with the total score.

Statement number	R
1	0.704**
2	0.666**
3	0.740**
4	0.696**
5	0.595**

Table 5.2- Analysis done by SPSS V 26

** : p value <0.001

Table 5.2 Pearson Correlation of the statement of obstacles of the current system PMO quality Assurance plan with the total score

Statement number	R
1	0.840**
2	0.822**

Table 5.3- Analysis done by SPSS V 26

** : p value <0.001

Table 5.3 Pearson Correlation of the statement of the Quality Assurance plan needs to be enhanced or updated. with the total score

It is clear from the previous tables (5.1-5.3) that all of the six-goal statements are significant at the 0.01 level, as the values of the dimensional correlation coefficients ranged between (0.595 - 0.840), which are good correlation coefficients, and this gives an indication of high internal consistency coefficients as well. It indicates high validity indicators that can be trusted in applying the current study tool.

Reliability of the study tool:

As for measuring the reliability of the questionnaire, we used Cronbach's alpha coefficient, and the following table shows the reliability axes of the study tool as follows:

	No. of statements	Cronbach's alpha
The evaluation of the current system of PMO quality Assurance plan	9	0.703
The obstacles of the current system of PMO quality Assurance plan	5	0.773
The action to be taken about the Quality Assurance plan (enhanced or updated).	2	0.854
Total	16	0.771

Table 5.4 Analysis done by SPSS V 26

The table showed that the Cronbach's alpha reliability coefficient for the evaluation of the current system of PMO quality Assurance plan (0.703), The obstacles of the current system of PMO quality Assurance plan (0.773),, and The action to be taken about the Quality Assurance plan (enhanced or updated). (0.854) while the general score for the total score of the questionnaire was (0.771), which is a high-reliability coefficient suitable for the study.

Tool of the study measurement rank

Disagree	1-1.75
Neutral	1.76 - 2.50
Agree	2.51 - 3.25
Strongly agree	3.26 – 4.00

Table 5.5- Tool of the study measurement work.

6.1 Results and Proposal Analysis

Socio-demographic variables	Study participants (n=98)	
	No.	%
Organization working with		
Consultant	38	38.8
Contractor /Sub-Contractor	25	25.5
End User	9	9.2
PMO	26	26.5
position in the organization		
Director /Manger	15	15.3
Engineer	37	37.8
Senior Engineer	26	26.5
Supervisor	20	20.4
Duration of work in the 3rd expansion of the holy mosque project		
From 1-5 years	20	20.4
From 5-10 years	29	29.6
Less than a year	11	11.2
More than 10 years	38	38.8
Educational level		
Bachelor's degree	60	61.2
Doctorate's degree	9	9.2
Master degree	13	13.3
Technician	16	16.3

Analysis done by SPSS V 26

Table 6.1 Socio-demographic characteristics of the studied participants

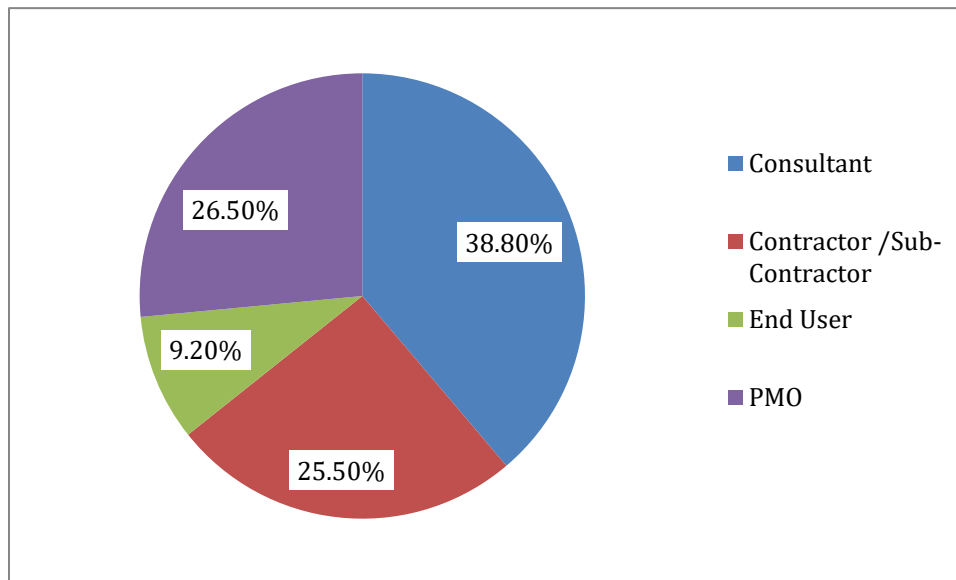


Fig 6.1 Distribution of the employees Organization

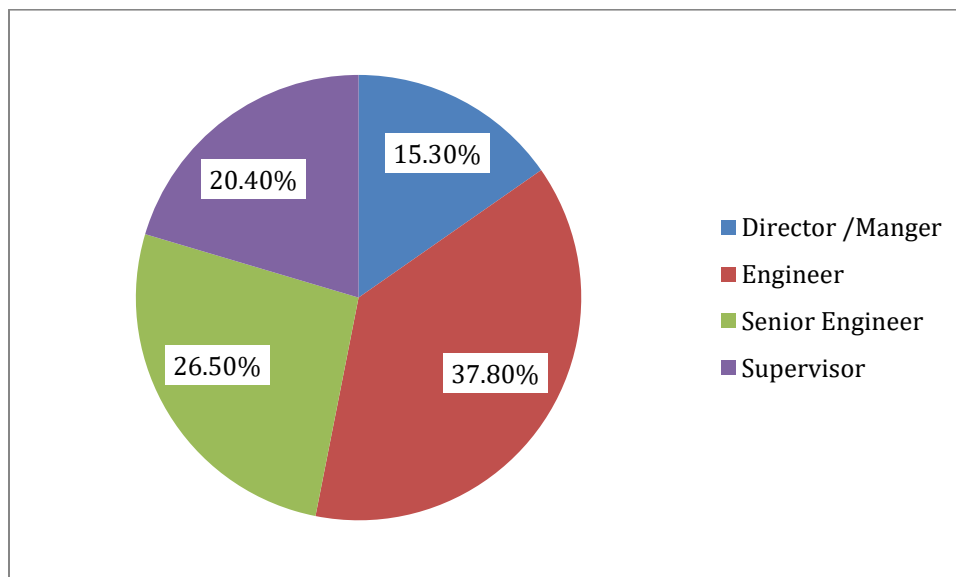


Fig 6.2 Position in the organization

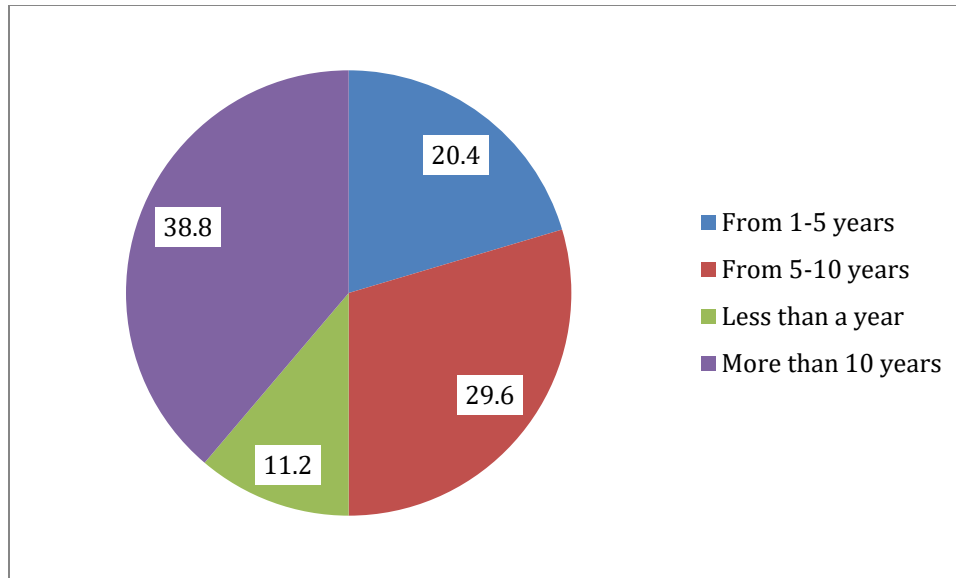


Fig 6.3 Duration of work in the 3rd expansion of the holy mosque project

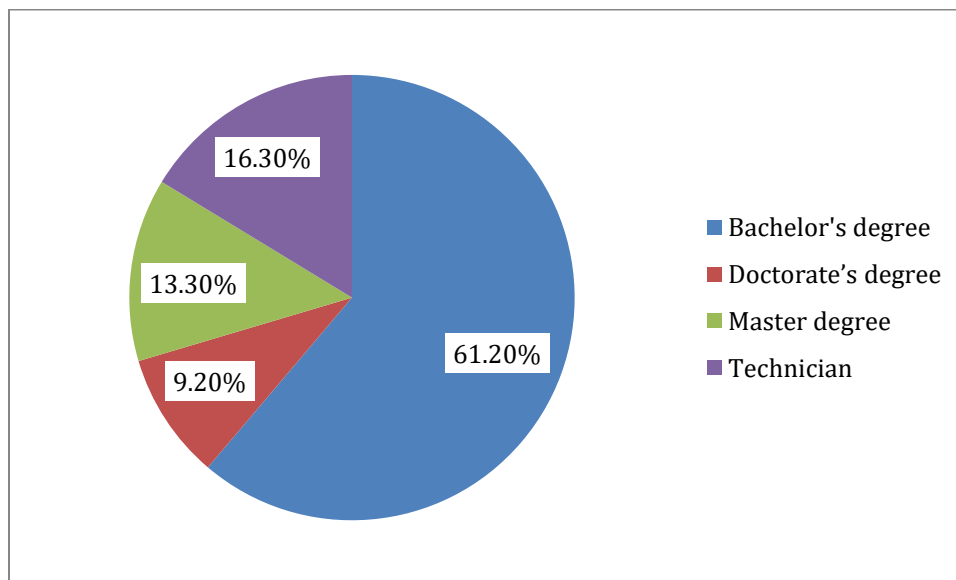


Fig 6.4 Educational level among the studied participants

Table 6.1 and fig (6.1- 6.4) showed that 38.8% of the studied participants worked as Consultant while 25.2% and 26.5% worked as Contractor /Sub-Contractor and PMOs respectively but only 9.2% worked as End User. Regarding to the position in the

organization, 37.8% worked as Engineer and 26.5% worked as Senior Engineer. 38.8% worked more than 10 years in the 3rd expansion of the holy mosque project and 20.4% and 29.6% worked from 1-5 years and from 5-10 years respectively. As regard to educational level, 61.2% carried Bachelor's degree and only 9.2% carried Doctorate's degree

Evaluation the current system of PMO quality Assurance plan							
		No.	%	Mean	SD	Category	Rank
the implementation quality of the 3rd Expansion of the holy mosque project is high	Disagree	10	10.2	2.77	78.1	Agree	2
	Neutral	14	14.3				
	Agree	63	64.3				
	Strongly agree	11	11.2				
PMO has an important role in the implementation of the 3rd expansion of the holy mosque project	Disagree	6	6.1	2.92	0.84	Agree	1
	Neutral	21	21.4				
	Agree	46	46.9				
	Strongly agree	25	25.5				
PMO has a positive impact on the implementation quality of the 3rd expansion of the holy mosque project	Disagree	15	15.3	2.73	0.98	Agree	3
	Neutral	18	18.4				
	Agree	43	43.9				
	Strongly agree	22	22.4				
execution of work be done in the project is as per PMO Quality Assurance Plan	Disagree	18	18.4	2.49	0.96	Neutral	4
	Neutral	29	29.6				
	Agree	36	36.7				
	Strongly agree	15	15.3				
the current PMO's Quality Assurance Plan is efficient	Disagree	21	21.4	2.46	1.07	Neutral	5
	Neutral	27	27.6				
	Agree	34	34.7				
	Strongly agree	16	16.3				
Total score				2.67	0.86	Agree	

Table 6.2- Analysis done by SPSS V 26

Table 6.2 evaluates the current system of PMO quality Assurance plan in the ongoing projects of the Holy Mosque among the studied participants.

Table (2) shows that the mean of the total score of Evaluation of the current system of PMO quality Assurance plan was 2.67 (agree). The statement “PMO has an important

role in the implementation of the 3rd expansion of the holy mosque project “came in the first rank with a mean of 2.92 and 46.9% agreed regarded to it. 64.6% agreed with the statement that the implementation quality of the 3rd Expansion of the holy mosque project is high followed by " PMO has a positive impact on the implementation quality of the 3rd expansion of the holy mosque project " with a mean of 2.73 and 43.9% agreed. Regarding to execution of work done in the project is as per the PMO Quality Assurance Plan and the current PMO's Quality Assurance Plan is efficient, only 36.7% and 34.7% agreed respectively.

Role of the current system of PMO quality Assurance plan							
		No.	%	Mean	SD	Category	Rank
PMO have quality assurance standards, policies, and procedures	Disagree	17	17.3	2.64	1.018	Agree	1
	Neutral	23	23.5				
	Agree	36	36.7				
	Strongly agree	22	22.4				
PMO provide training and mentoring to project managers and project team	Disagree	25	25.5	2.37	1.009	Neutral	4
	Neutral	25	25.5				
	Agree	35	35.7				
	Strongly agree	13	13.3				
PMO have quality assurance governance by providing a clear guideline on roles and responsibilities related to quality	Disagree	21	21.4	2.46	1.017	Neutral	3
	Neutral	28	28.6				
	Agree	32	32.7				
	Strongly agree	17	17.3				
PMO oversee the implementation of quality assurance activities within projects	Disagree	15	15.3	2.61	0.938	Agree	2
	Neutral	24	24.5				
	Agree	43	43.9				
	Strongly agree	16	16.3				
Total score				2.52	1.015	Agree	

Table 6.3- Analysis done by SPSS V 26

Table 6.3 Distribution of responses about the role of the current system of PMO quality Assurance plan in the ongoing projects of Holy Mosque among the studied participants

Table (3) shows that the mean of the total score of the role of the current system of PMO quality Assurance plan was 2.52 (agree). The statement "PMOs have quality assurance standards, policies, and procedures " came in the first rank with a mean of 2.64 and 36.7% agreed regarding to it. 43.9% agreed with the statement that PMO oversee the implementation of quality assurance activities within projects followed by " PMO have quality assurance governance by providing clear guidelines on roles and responsibilities related to quality " with a mean of 2.46 and 32.7% agreed. While regarding PMO providing training and mentoring to project managers and project team, only 35.7% agreed.

Major obstacles of the current system PMO quality Assurance plan							
		No.	%	Mean	SD	Category	Rank
Poor PMO Quality Assurance	Disagree	26	26.5	2.41	1.018	Neutral	4
	Neutral	26	26.5				
	Agree	31	31.6				
	Strongly agree	15	15.3				
lack of skills/expertise in quality assurance practices	Disagree	22	22.4	2.48	1.012	Neutral	3
	Neutral	24	24.5				
	Agree	36	36.7				
	Strongly agree	16	16.3				
poor quality assurance processes	Disagree	23	23.5	2.36	1.038	Neutral	5
	Neutral	26	26.5				
	Agree	34	34.7				
	Strongly agree	15	15.3				
weak quality culture in the project	Disagree	18	18.4	2.56	1.000	Agree	2
	Neutral	25	25.5				
	Agree	36	36.7				
	Strongly agree	19	19.4				
Mis coordination or poor integration of	Disagree	13	13.3	2.71	0.951	Agree	1
	Neutral	22	22.4				
	Agree	41	41.8				

work	Strongly agree	22	22.4				
Total score				2.51	1.024	Agree	

Table 6.4- Analysis done by SPSS V 26

Table 6.4 Distribution of responses about the major obstacles of the current system PMO quality Assurance plan for inadequate quality implementation of the project among the studied participants

Table 6.4 shows that the mean of the total score of Major Obstacles of the current system PMO quality Assurance plan was 2.51 (agree). 41.8 agreed that Mis coordination or poor integration of work were Major obstacles to the current system PMO Quality Assurance plan and this statement came in the first rank with a mean of 2.71. 36.7% agreed with the statement of weak quality culture in the project followed by " lack of skills/expertise in quality assurance practices " with a mean of 2.48 and 36.7% agreed. Regarding Poor PMO Quality Assurance and poor quality assurance processes, only 31.6% and 34.7% agreed as those considered as obstacles of the current system PMO Quality Assurance plan .

quality Assurance plan needs to be enhanced or updated							
		No.	%	Mean	SD	Category	Rank
Current Quality Assurance plan to be updated	Disagree	13	13.3	2.84	1.002	Agree	1
	Neutral	19	19.4				
	Agree	37	37.8				
	Strongly agree	29	29.6				
Current Quality Assurance plan to be changed	Disagree	14	14.3	2.71	1.043	Agree	2
	Neutral	26	26.5				
	Agree	29	29.6				
	Strongly agree	29	29.6				
Total score				2.77	1.003	Agree	

Table 6.5- Analysis done by SPSS V 26

Table 6.5 Distribution of responses about part of the PMO quality Assurance plan needs to be enhanced or updated among the studied participants

Table 6.5 showed that the mean of the total score of quality Assurance plan needs to be enhanced or updated was 2.77 (agree). 37.8% and 29.6% agreed and strongly agree respectively with Current Quality Assurance plan to be updated and this statement came in the first rank with a mean of 2.84. while the same percent 29.6% agreed and dis agree with the statement of the Current Quality Assurance plan to be changed " with a mean of 2.71.

7.1 Conclusions

According to the analysis in section 7 of this research paper, We can conclude that:

- The PMO played an important role in the project, Therefore, The quality of implementation of the project was high. The PMO Quality Assurance Plan was sufficient in some aspects such as quality assurance standards, policies, and procedures.
- We found that the major obstacle to achieving high quality of implementation was the Miscoordination or poor integration of work . Moreover, weak quality culture in the project and lack of skills/expertise in quality assurance practices.
- The researchers suggested updating the Quality Assurance Plan to achieve more high quality and apply project governance to handle miscoordination issues and provide training for non-experienced manpower.
- project governance is a very important part of the overall corporate governance regardless of the organization's nature of type structure. However; the project governance in a more projectized organizations have more contribution and even the corporate governance function are becoming enterprise project governance. Therefore; the more mature PMO will ensure more mature project governance which will support the corporate governance

7.2 Recommendations

Recommendations for Project Management Offices staff

- It is recommended to increase and enhance the PMO maturity and role. This can show how important the PMO is and help to show the impact and advantages of the PMOs in organizations. It is also recommended to focus on communications, cooperation, and support to the other business units within the same organization.
- The project auditing is very important function that shall be maintained and implemented in all organizations. Having such role will support the internal auditing function which is a key factor to ensure strong corporate governance structure regardless of whether it is handled by the PMO or other business units keeping in mind the independency of the unit that is responsible for this function
- The role of project governance and auditing is recommended to be enhanced as the organization is fully projectized and the PMO can play better in role in establishing control board, project reviews, and the sustainability and HSE related issues.

Recommendations for future research

The following aspects are recommended for future researchers:

- With the increasing demand and need for the PMOs, it is recommended to conduct researches on criteria for assessing the PMO maturity based clear rating and scale system is highly recommended for all functions and roles of the PMO. This will provide organizations with a valuable input in setting up PMOs according to their needs and requirements.
- It is recommended to conduct researches on the advantages of implementation of project information system in the Holy Mosque Project.

8.1 Appendices

Appendix (1): Questions used for the questionnaire

- What is the organization you are working with ?
- What is your position in the organization?
- How long have you worked in the 3rd expansion of the holy mosque project?
- What is your educational level ?
- Do you agree with the implementation quality of the 3rd Expansion of the holy mosque project is high?
- Do you agree with the PMO has an important role in the implementation of the 3rd expansion of the holy mosque project?
- Do you agree with the PMO has a positive impact on the implementation quality of the 3rd expansion of the holy mosque project?
- Do you agree with the execution of work be done in the project is as per PMO Quality Assurance Plan?
- Do you agree with the current PMO's Quality Assurance Plan is efficient ?
- Do you agree with the PMO have quality assurance standards, policies, and procedures that have been implemented during the project?
- Do you agree with the PMO provide training and mentoring to project managers and project team on utilizing quality assurance best practices and methods?
- Do you agree with the PMO have quality assurance governance by providing a clear guidelines on roles and responsibilities related to quality, quality reporting procedures, and setting change control processes?
- Do you agree with the PMO oversee the implementation of quality assurance activities within projects by conducting process audits, tracking quality metrics, and reviewing project deliverables to ensure they meet established quality criteria?
- Do you agree with the main reason for inadequate quality implementation of the project is due to poor PMO Quality Assurance?
- Do you agree with the main reason for inadequate quality implementation of the project is due to lack of skills/expertise in quality assurance practices?
- Do you agree with the main reason for inadequate quality implementation during the project is due to poor quality assurance processes?
- Do you agree with the main reason for inadequate quality implementation of the project is due to weak quality culture in the project?

- Do you agree with the main reason for inadequate quality implementation of the project is due to miscoordination or poor integration of work?
- Do you agree with the the current Quality Assurance plan to be updated?
- Do you agree with the the current Quality Assurance plan to be changed?

9.1 List of references and preliminary sources:

1. Alarabiat, Ayman, and Isabel Ramos. "The delphi method in information systems research (2004-2017)." *Electronic Journal of Business Research Methods* 17, no. 2 (2019): pp86-99.
2. Al-Emad, Nashwan, Ismail Abdul Rahman, and Humair Khan. "Failure factors of Makkah's mega construction projects: qualitative study." In *MATEC Web of Conferences*, vol. 250, p. 05003. EDP Sciences, 2018.
3. Al-Nady, Bahaà Abdul-Hafez Attallah, Sulieman Ibraheem Shelash Al-Hawary, and Main Naser Alolayyan. "The role of time, communication, and cost management on project management success: An empirical study on sample of construction projects customers in Makkah City, Kingdom of Saudi Arabia." *International Journal of Services and Operations Management* 23, no. 1 (2016): 76-112.
4. Bandar Abdul-Rahman bin Muammar. *Third Expansion of Grand Mosque Launched by King Abdullah, Completed by King Salman*. English.aawsat, Issue 07 (2023).
5. Al Ameri, Tareq Zeyad Awad. "The Roles of the Project Management Office In The Execution of the Organization's Strategic Plan." (2016).
6. Pole to Pole Communications. *The Value of Project Management Office*. Survey conducted on behalf of CA.
7. Dai C.X., and Wells W.G. (2004). An exploration of project management office features and their relationship to project performance, *International Journal of Project Management*, vol. (22), pp. 523-532.
8. Hill, G.M. (2004) *Evolving the Project Management Office: A competency continuum*, *Information Systems Management Journal*, pp. 45-51
9. Hill, G. M. (2008). *The Complete Project Management Office Handbook*, 2nd Edition, USA: Taylor and Francis Group.
10. Unger, B. N., Gemünden, H. G., and Aubrey M. (2012). The three roles of a project portfolio management office: Their impact on portfolio management Page - 137 - execution and success, *International Journal of Project Management*, vol. (30), pp. 608-620.

11. Storey, A. & Briggs, R. & Jones, H. & Russell, Ronald. (2011). Chapter 4*: QUALITY ASSURANCE.
12. Bekker, M., and Steyn, H. (2008). The Impact of Project Governance Principles on Project Performance. PICMET Proceedings, South Africa: Cape Town.
13. Misner, J. (2008). The Role of the Project Management Office in a MultiProject Environment: Enhancing Governance for Increased Project Success Rates. Portland: University of Orego.
14. Project Management Institute. (2008). PMBOK Guide – A Guide to the Project Management Body of Knowledge, 4th edition, Newtown Square, PA: PMI, Inc.
15. Page - 136 - Project Management Solutions (2011). PMO of the year: Project Management Office Award 2011. PM Solution, PMI, and Program Office Community of Practice.
16. Weaver, P. (2005). Effective Project Governance: The Tools for Success. Project Management Institute of New Zealand Annual Conference. Auckland. 13-14 October. Mosaic Project Services.

الخلاصة :

إلى جانب تحرك المؤسسات نحو استخدام تقنيات إدارة المشاريع لإدارة عملياتها، أصبح مكتب إدارة المشاريع مؤخرًا وحدة عمل رئيسية في المؤسسات حيث يمكنها التأثير بشكل إيجابي على الأداء التنظيمي و تقييم دور مكتب إدارة المشروع كمحرك رئيسي لجودة تنفيذ مشروع التوسعة الثالثة للمسجد الحرام.

يختلف دور مكتب إدارة المشاريع من منظمة إلى أخرى، حيث قد يكون له دور استراتيجي للغاية في المنظمة من خلال إدارة وتوجيه أعمال وعمليات المنظمة بشكل عام، وقد يكون له دور داعم بسيط في بعض الأقسام، ويرجع هذا الاختلاف إلى طبيعة المنظمة و الأعمال ونوع الهيكل التنظيمي وموقع مكتب إدارة المشاريع داخل المنظمة.

استخدمت الدراسة المنهج الوصفي والبيانات التي تم جمعها من جميع العاملين في المشروع من خلال مسح استطلاعي باستخدام استبيان نموذج جوجل لتقييم النظام الحالي لخطة ضمان الجودة بمكتب إدارة المشاريع في مشروع المسجد الحرام المستمر، والتحقيق في أهم المعوقات التي تواجه المشروع. خطة ضمان الجودة للنظام الحالي لمكتب إدارة المشاريع (PMO) وتحديد أي جزء من خطة ضمان الجودة بمكتب إدارة المشاريع يحتاج إلى تعزيز أو تحديث. تم إجراء التحليل الوصفي لوصف العينة باستخدام برنامج التحليل SPSS للحصول على تحليل مؤهل.

أكدت الدراسة على أهمية دور مكتب إدارة المشاريع في خطة ضمان الجودة للمشروع، وأظهرت الدراسة أن هناك دور إيجابي لمكتب إدارة المشاريع في المشروع. وتعتبر النتائج مفيدة لمجتمع البناء وكذلك للباحثين لفهم القضايا الثاقبة التي قد تواجه مكتب إدارة المشاريع للقيام بدوره بشكل صحيح.

الكلمات الاستدلالية: مكتب إدارة المشاريع، خطة ضمان الجودة، حوكمة المشروع، أدوار مكتب إدارة المشاريع، الهيكل التنظيمي، نصج مكتب إدارة المشاريع.